

Prince Rupert Gas Transmission Project

ASSESSMENT REPORT

With Respect to
the Application by Prince Rupert Gas Transmission Ltd.
for an Environmental Assessment Certificate
pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c.43

Prepared by:

Environmental Assessment Office

November 12, 2014



Preface

The Environmental Assessment Office (EAO) manages the assessment of proposed major projects in British Columbia (BC), as required by the Environmental Assessment Act (Act). The process includes:

- Opportunities for the involvement of all interested parties;
- Consultation with Aboriginal Groups;
- Technical studies to identify and examine potential significant adverse effects;
- Strategies to prevent or reduce adverse effects; and,
- Comprehensive reports summarizing input and findings.

At the conclusion of each environmental assessment, EAO provides a comprehensive assessment report (Assessment Report), and makes recommendations to the Minister of Environment and, for proposed natural gas projects, to the Minister of Natural Gas Development. The Ministers may decide to certify a project, decline to certify a project, or require further assessment.

This Assessment Report considers the potential for the Prince Rupert Gas Transmission Project (proposed Project) to cause significant adverse environmental, economic, social, heritage and health effects. It identifies measures to prevent or reduce adverse effects, and sets out EAO's analysis and conclusions. It also summarizes the work undertaken by EAO to consult and accommodate Aboriginal Groups and treaty nations, in keeping with the Supreme Court of Canada's direction in *Haida v. Minister of Forests* and related case law.

Information and records relating to environmental assessments are available on the EAO website at www.eao.gov.bc.ca. Questions or comments can be directed to:

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Acronyms and Abbreviations

AAC:	Annual Allowable Cut
AADT:	Average annual daily traffic volume
AAQOs:	Ambient Air Quality Objectives
ABCPF:	Association of BC Professional Foresters
AIA:	Archaeological Impact Assessment
AIR:	Application Information Requirements
ALR:	Agricultural Land Reserve
AMP:	Access Management Plan
AOA:	Archaeological Overview Assessment
ARD:	Acid Rock Drainage
BA:	Benefits Agreement
BC:	British Columbia
BCTS:	BC Timber Sales
CACs:	Criteria Area Contaminants
CAS:	Climate Action Secretariat
CCME:	Canadian Council of Ministers of the Environment
CCZ:	Critical Cultural Zone
CEAA:	Canadian Environmental Assessment Agency
C&E:	Compliance and Enforcement
CEMP:	Construction Environmental Management Plan
CEPA:	<i>Canadian Environment Protection Act</i>
CGL:	Coastal GasLink Pipeline Project
CMP:	Compliance Management Plan
CMT:	Culturally Modified Trees
CLUDI:	Coast Land Use Decision Implementation
CN:	Canadian National Railway
CNC:	College of New Caledonia
COFI:	Council of Forest Industries
COSEWIC:	Committee on the Status of Endangered Wildlife in Canada
CPD:	Certified Project Description
CRA:	Commercial, Recreational and Aboriginal
CSA:	Canadian Standards Association
CSCD:	Ministry of Community, Sport and Cultural Development
CTS:	Culture and Traditions Study
CWS:	Canadian Wildlife Service
dBA:	A-weighted decibel
DFO:	Fisheries and Oceans Canada
EA:	Environmental Assessment
EAO:	Environmental Assessment Office

EMC:	Environmental Management Committee
EMP:	Environmental Management Plan
EPA:	Environmental Protection Agency
ePIC:	Electronic Project Information Centre
EPMR:	Environmental Protection and Management Regulation
ESI:	Environmental stewardship initiative
FLNR:	Ministry of Forests, Lands, and Natural Resource Operations
FRPA:	<i>Forest and Range Practices Act</i>
FSR:	Forest Service Road
FTE:	Full Time Equivalent
GBAA:	Grizzly Bear Assessment Area
GBPU:	Grizzly Bear Population Unit
GHG:	Greenhouse Gas
GGRTA:	<i>Greenhouse Gas Reduction Targets Act</i>
GLLUP:	Gitanyow Lax'yip Land Use Plan
HAPs:	Hazardous Air Pollutants
HCA:	<i>Heritage Conservation Act</i>
HDD:	Horizontal Directional Drilling
HHRA:	Human Health-Related Assessment
HSDA:	Health Service Delivery Area
IPCC:	Intergovernmental Panel on Climate Change
ISO:	International Organization for Standardization
ISQG:	Interim Sediment Quality Guidelines
IUP:	Investigative Use Permit
KP:	Kilometer Post
LAA:	Local Assessment Area
LNG:	Liquefied Natural Gas
LRMP:	Land and Resource Management Plan
LSA:	Local Study Area
MAMP:	Monitoring and Adaptive Management Plan
MARR:	Ministry of Aboriginal Relations and Reconciliation
MEM:	Ministry of Energy and Mines
ML/ARD:	Metal Leaching/Acid Rock Drainage
MNGD:	Ministry of Natural Gas Development
MOE:	Ministry of Environment
MOH:	Ministry of Health
MOTI:	Ministry of Transportation and Infrastructure
MOU:	Memoranda of Understanding
MPB:	Mountain Pine Beetle
NCD:	Non-classified Drainages

NEB:	National Energy Board
NFA:	Nisga’a Final Agreement
NHA:	Northern Health Authority
NLC:	Northern Lights College
NLG:	Nisga’a Lisims Government
NOAA:	National Oceanic and Atmospheric Administration
NPA:	<i>Navigation Protection Act</i>
NTFP:	Non-Timber Forest Product
NVC:	No Visible Channel
NWA:	Nass Wildlife Area
NWCC:	Northwest Community College
OGC:	Oil and Gas Commission
OGAA:	<i>Oil and Gas Activities Act</i>
OGMA:	Old Growth Management Area
OGWR:	Oil and Gas Waste Regulation
PAG:	Potentially acid-generating
PCDD/Fs:	Polychlorinated dibenzo-p-dioxins and furans
PNW LNG:	Pacific NorthWest LNG Project
ppm:	parts per million
PRGT:	Prince Rupert Gas Transmission Project
PRPA:	Prince Rupert Port Authority
PRRD:	Peace River Regional District
PSL:	Permissible Sound Level
PY:	Person Years
RAA:	Regional Assessment Area
RDBN:	Regional District of Bulkley-Nechako
RDFFG:	Regional District of Fraser-Fort George
RDKS:	Regional District of Kitimat-Stikine
RISC:	Resources Information Standards Committee
RMF:	Risk Management Framework
RMZ:	Resource Management Zone
ROV:	Remotely Operated Vehicle
ROW:	Right-of-Way
RSA:	Regional Study Area
SARA:	<i>Species at Risk Act</i>
SCADA:	Supervisory Control and Data Acquisition
SEEMP:	Socio-Economic Effects Management Plan
SIL:	Survey Intensity Level
SQCRD:	Skeena-Queen Charlotte Regional District
SRMP:	Sustainable Resource Management Plan

TAC:	Technical Advisory Committee
TC:	Transport Canada
TDR:	Technical Data Report
TEK:	Traditional Ecological Knowledge
TEM:	Terrestrial Ecosystem Mapping
THLB:	Timber Harvesting Land Base
TOC:	Table of Conditions
TRV:	Toxicological Reference Values
TSA:	Timber Supply Area
TSS:	Total suspended solids
TLU:	Traditional Land Use
TLUS:	Traditional Land Use Study
TUS:	Traditional Use Study
UNBC:	University of Northern British Columbia
UWR:	Ungulate Winter Range
VC:	Valued Component
VOCs:	Volatile Organic Compounds
VQOs:	Visual Quality Objectives
VSU:	Visual sensitivity unit
WCGT:	Westcoast Connector Gas Transmission Project
WHA:	Wildlife Habitat Area
WHO:	World Health Organization
WMU:	Wildlife Management Unit
WTRA:	Wildlife Tree Retention Areas
ZOI:	Zone of Influence

PART A – INTRODUCTION AND BACKGROUND

1 Purpose of the Report

The purpose of this Report is to summarize the procedures and findings of the Environmental Assessment (EA) conducted on the application (Application) by the Proponent for an Environmental Assessment (EA) Certificate for the proposed Project.

The Environmental Assessment Office (EAO) is required to prepare this report for provincial Ministers who are responsible for making a decision on the proposed Project under Section 17 of the British Columbia *Environmental Assessment Act*. For natural gas pipeline projects, the deciding Ministers are the Minister of Environment and the Minister of Natural Gas Development.

The report:

- Describes the proposed Project, provincial EA process, and consultations undertaken during the EA;
- Documents work undertaken by EAO to consult and accommodate Aboriginal Groups in keeping with the Supreme Court of Canada's direction in *Haida v. Minister of Forests* and related case law;
- Describes EAO's requirements under the Nisga'a Final Agreement (NFA) and EAO's assessment pursuant to those requirements;
- Identifies the potential environmental, economic, social, heritage and health effects of the proposed Project and how the Proponent proposes to mitigate effects;
- Identifies the residual effects after mitigation;
- Identifies the conditions proposed by EAO; and
- Sets out conclusions based on the proposed Project's potential for significant adverse residual effects.

This Report does not replicate the content presented in the Application. The Application and supplemental information provided by the Proponent, and other information received during the EA process from Working Group members, Aboriginal Groups, Nisga'a Lisims Government (NLG), and members of the public have all been considered in the preparation of this Assessment Report and are posted to EAO's electronic Project Information Centre (ePIC).

2 Project Overview

2.1 Proponent Description

The proposed Prince Rupert Gas Transmission Project (proposed Project) would be designed, owned and operated by Prince Rupert Gas Transmission Ltd. (Proponent), a company formed for the purpose of pursuing the proposed Project on behalf of TransCanada PipeLines Ltd. (TransCanada).

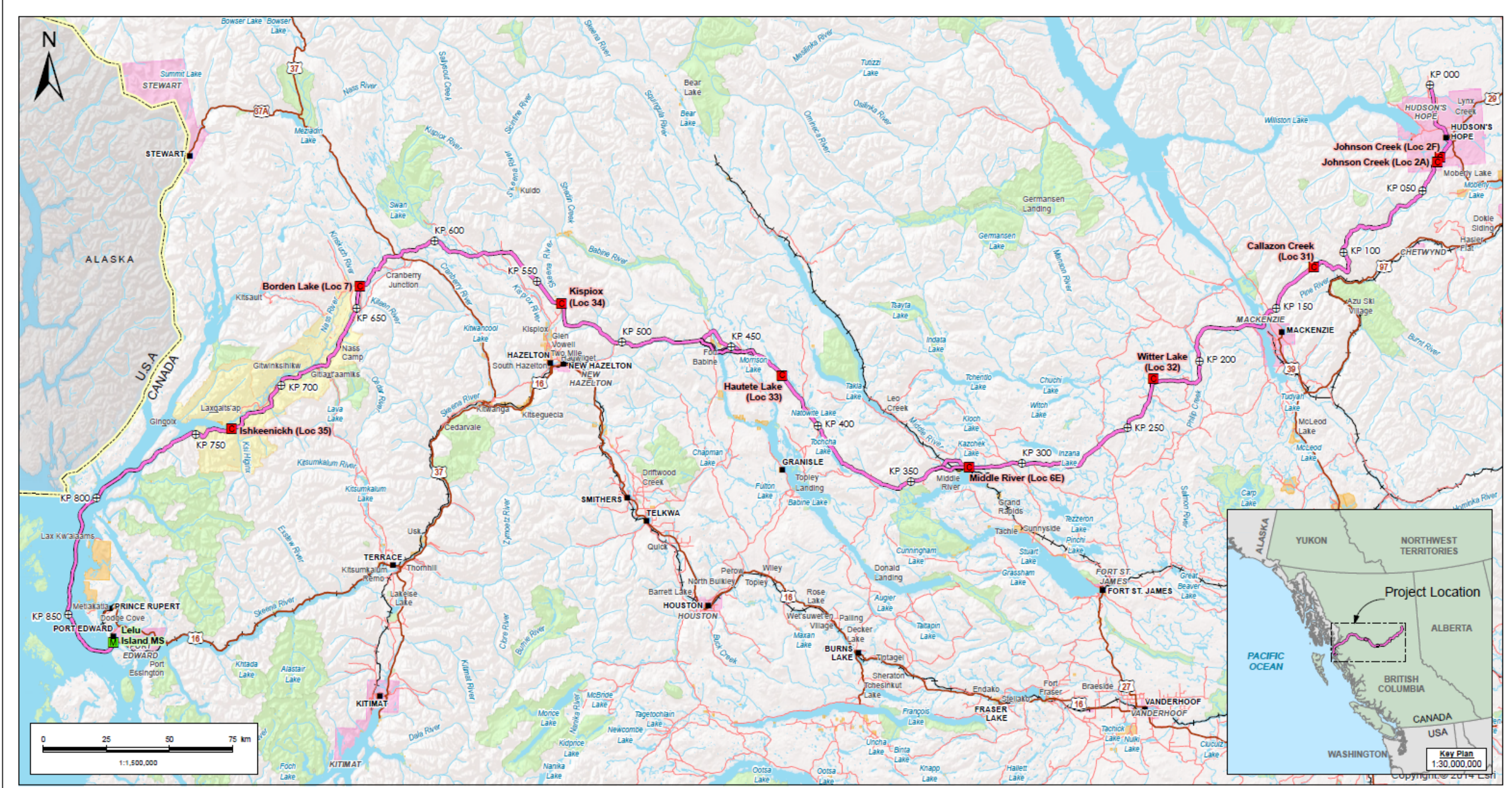
TransCanada operates a network of about 65,000 km of wholly owned, and 11,500 km of partially owned, natural gas pipelines in North America and transports 15 billion cubic feet per day (bcf/d) of natural gas, which is about 20% of the natural gas consumed in North America.

2.2 Project Description and Scope

2.2.1 Project Description and Location

The proposed Project would involve the construction and operation of an approximately 900 kilometre (km) sweet natural gas pipeline from near the District of Hudson's Hope in northeastern BC to the proposed Pacific NorthWest liquefied natural gas (PNW LNG) export facility on Lelu Island, within the District of Port Edward. The Project consists of both land and marine based sections of pipeline. Depending on the final route, the Project could include up to 780 km of 48 inch in diameter (1,219 mm) of land based pipeline and up to 120 km of twin 36 inch (914 mm) diameter of marine based pipeline.

The location of the proposed Project is outlined in the Proponent's Application for an EA Certificate (submitted May 16, 2014) and is depicted in Figure 2-1 below. An addendum was submitted on July 31, 2014 to amend specific portions of the corridor (Addendum).



Prince Rupert Gas Transmission Project			
PROJECT LOCATION			
ASSESSMENT REPORT			
DATE: 07-NOV-14	PROJECTION: BC ENVIRONMENTAL ALBERS	DRAWN BY: R. COATTA	FIGURE NO: 2-1
FIGURE ID: 123110628	DATUM: NORTH AMERICAN DATUM 1983	CHECKED BY: K. MURPHY	

Figure 2-1: Location of the Proposed Prince Rupert Gas Transmission Project

The proposed pipeline route would originate approximately 20 km northwest of Hudson's Hope and run south to cross the Peace River between the Peace Canyon Dam and Highway 29. The route would continue southwest, cross the Williston Lake north of Mackenzie, and proceed approximately 20 km west before heading southwest to cross the Middle River, north of Trembleur Lake. From Middle River, the route would run for approximately 22 km west before heading northwest to Fort Babine, then continue northwest to cross the Skeena River and on to Cranberry Junction. After Cranberry Junction, the route would head southwest through the Nass Area and Nisga'a Lands to Nasoga Gulf and transition to a marine pipeline heading south through Portland Inlet and Chatham Sound to Lelu Island.

The proposed Project would include three compressor stations, with provision for up to five additional compressor stations to allow for future expansion, and the installation of associated above-ground facilities, including mainline valves at specific locations within the designated right-of-way (ROW), a meter station, cathodic protection measures to protect the pipeline, and launchers and receivers to enable pipeline inspection with inline tools. The proposed Project would also require the construction of new permanent and temporary access roads and other temporary infrastructure, such as construction roads, temporary bridges, stockpile sites, borrow sites, contractor yards and construction camps.

The proposed Project would have an initial capacity of approximately 2 bcf/d (56 million cubic metres per day [mmcm/d]) with the potential for expansion up to approximately 3.6 bcf/d (102 mmcm/d).

If an EA Certificate is issued, and other regulatory approvals are received, construction of the proposed Project would be scheduled to start in 2015. The proposed Project would be expected to be commissioned by late 2018.

2.2.2 Project Components

Pipeline Right-of-Way

Dimensions of the construction ROW would vary depending on the terrain, construction techniques, access, and the extent and nature of adjacent existing ROWs being paralleled. Where feasible, the pipeline route would use existing disturbed areas.

The construction ROW on level, flat terrain would be approximately 50 m wide to accommodate the proposed pipeline activities, construction materials and equipment. Figure 2-2 details a typical pipeline construction footprint. The actual width would vary along the route according to terrain, environmental constraints, and need for additional

temporary construction workspace. Where additional temporary workspace is required, the width may extend to up to 300 m, depending on site characteristics and specific construction activities. The specific ROW corridor widths would be established at permitting. The pipeline would be fully buried to a typical depth of 0.9 m, with the exception of pipeline within compressor and meter station yards.

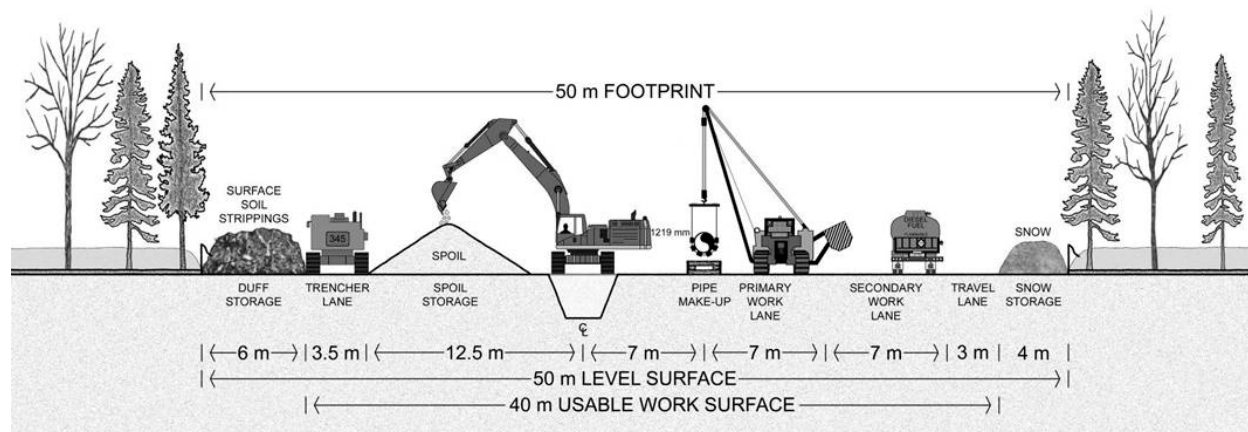


Figure 2-2: Typical Pipeline Construction Footprint

Areas disturbed by construction would be reclaimed and allowed to naturally revegetate, where appropriate, after construction.

The final permanent ROW would be approximately 32 m with approximately 5 m on either side of the pipeline centreline maintained clear of large woody vegetation. Larger grasses and other smaller vegetation would be allowed to grow over top of the pipeline. The ROW would be clearly marked with sign and post markings at public roads, railroad and navigable water crossings, and other areas, as required, to reduce the possibility of damage or interference resulting from the activities of third parties.

In the marine environment, it is anticipated that the width of the construction ROW and that required for major repairs would be approximately 300 m. This would accommodate both pipes with a maximum separation of 50 m between the two pipes. In addition, the temporary anchors associated with an anchor moored construction vessel may extend outside the construction ROW. It is anticipated that a permanent marine pipeline ROW of approximately 200 m wide would be required.

Compressor Stations

Compressor stations increase the pressure of, or compress, the natural gas, allowing it to move through the pipeline. They are placed at relatively even intervals along a

pipeline to maintain consistent compression. Figure 2-3 shows a typical compressor unit building.



Figure 2-3: Typical Compressor Unit Building

The proposed Project would include the installation of compressor stations at up to eight locations (shown in Table 2-1), each of which would include up to two 33 megawatt (MW) natural gas powered compressor units and would require new all-season access roads. The initial build-out for the Project would include three compressor stations (Johnson Creek, Middle River and Borden Lake) with provisions for up to five additional compressor stations to allow for future expansion. Each compressor station would require 9.5 ha to 20 ha of land and would include discharge gas coolers for each unit and other auxiliary equipment, including high-pressure yard piping, isolation valves, electrical control and gas systems, storage facilities, offices, and if necessary, temporary living quarters.

Table 2-1: Proposed Compressor Station Locations

Location (maximum ha)	Compressor Configuration
Johnson Creek 2A, KP 36, 55.912391 N, -122.063532 E (9.5 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Johnson Creek 2F, KP 34 55.928544 N, -122.044904 E (9.5 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Callazon Creek, KP 126, 55.562325 N, -122.875059 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units

Location (maximum ha)	Compressor Configuration
Witter Lake, KP 227, 55.18897 N, -123.904507 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Middle River, KP 322, 54.89014 N, -125.059591 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Hautete Lake (formerly Morrison Lake), KP 426, 55.218528 N, -126.219518 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Kispiox, KP 536, 55.463414 N, -127.604057 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Borden Lake, KP 641, 55.50217 N, -128.870337 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units
Ishkeenickh, KP 733, 54.977153 N, -129.630936 E (20 ha)	Up to two 33 MW natural gas fired turbo-compressor units

Note: The proposed Johnson Creek compressor station 2A was included in Application and the Proposed Johnson Creek compressor station 2F was included in Memo to EAO dated on October 20, 2014. Only one compressor station would be developed.

The Proponent's ongoing consultation with Aboriginal Groups led to the identification of an alternative location for the Johnson Creek compressor station 2A, relocating it to a site approximately 2 km northeast along the Application Corridor. EAO has included the Johnson Creek compressor location proposed in the Application, as well as the compressor station location proposed in the memo dated October 20, 2014 from the Proponent, in the proposed Certified Project Description (CPD). Only one compressor station location would be developed.

Meter Station

Meter stations measure the volume of all natural gas entering or exiting the natural gas system. The proposed Project is designed to include one meter station at the proposed Pacific Northwest LNG (PNW LNG) facility on Lelu Island (KP 878.2). The meter station footprint would be a maximum of 0.8 ha. Figure 2-4 shows a typical meter station site.



Figure 2-4: Typical Meter Station Site

Other Facilities

To enable isolation of pipeline sections and to facilitate system operations and maintenance, mainline valves would be installed within the footprint of the meter station, compressor stations and at other locations along the pipeline ROW route, as necessary, in accordance with CSA Z662-11. Mainline valves allow pipeline sections to be isolated and facilitate system operations.

In-line inspection launchers and receivers would be installed approximately every 200 km along the pipeline to facilitate pipeline inspection activities, as required by the integrity management plan. The selected locations would be beside existing facilities or accessible from adjacent roadways, where practicable.

Cathodic protection would be used to protect the pipeline and facilities from electrochemical corrosion. A cathodic protection system, including anode beds, rectifiers and associated facilities, would be designed and installed. A Supervisory Control and Data Acquisition (SCADA) system would be installed to link pipeline and compressor facilities to the existing TransCanada Operations Control Centre in Calgary, Alberta. The pipeline control system would remotely monitor and control pipeline flows, pressures, temperatures and equipment status on a continuous basis. The SCADA system would alert the control centre operator of significant operational changes in the pipeline system.

The proposed Project would include communication links to service compressor stations, the meter station and other pipeline facilities. In some cases, electrical power would be supplied by third-party power providers. Where commercial power is not available, the facilities would generate sufficient electrical power with natural gas fueled generators to meet the station loads for pumps, fans, instrumentation and lights. It is anticipated that up to 20 temporary and/or permanent communication towers may be required along the proposed corridor. The exact number and location of the towers has not been determined. To the greatest extent possible they would be located within the Project footprint.

Construction Camps

The Proponent proposes to operate up to approximately 12 temporary, self-contained construction camps to support pipeline construction and facilities construction. The camps are needed due to the remote work site locations. Camps also increase worker safety by minimizing travel and reducing potential interaction with local communities and pressure on local infrastructure. Their approximate locations are shown on Figure 2-5.

Early construction camps would be required to house up to 400 people involved in early works such as clearing, grading, constructing camps and building access roads. Early construction camps, approximately 2.5 ha in area, may be expanded to stationary camps for the main construction of the pipeline. Early construction camps would be ready for occupation within three to six months, after receipt of appropriate regulatory approvals.

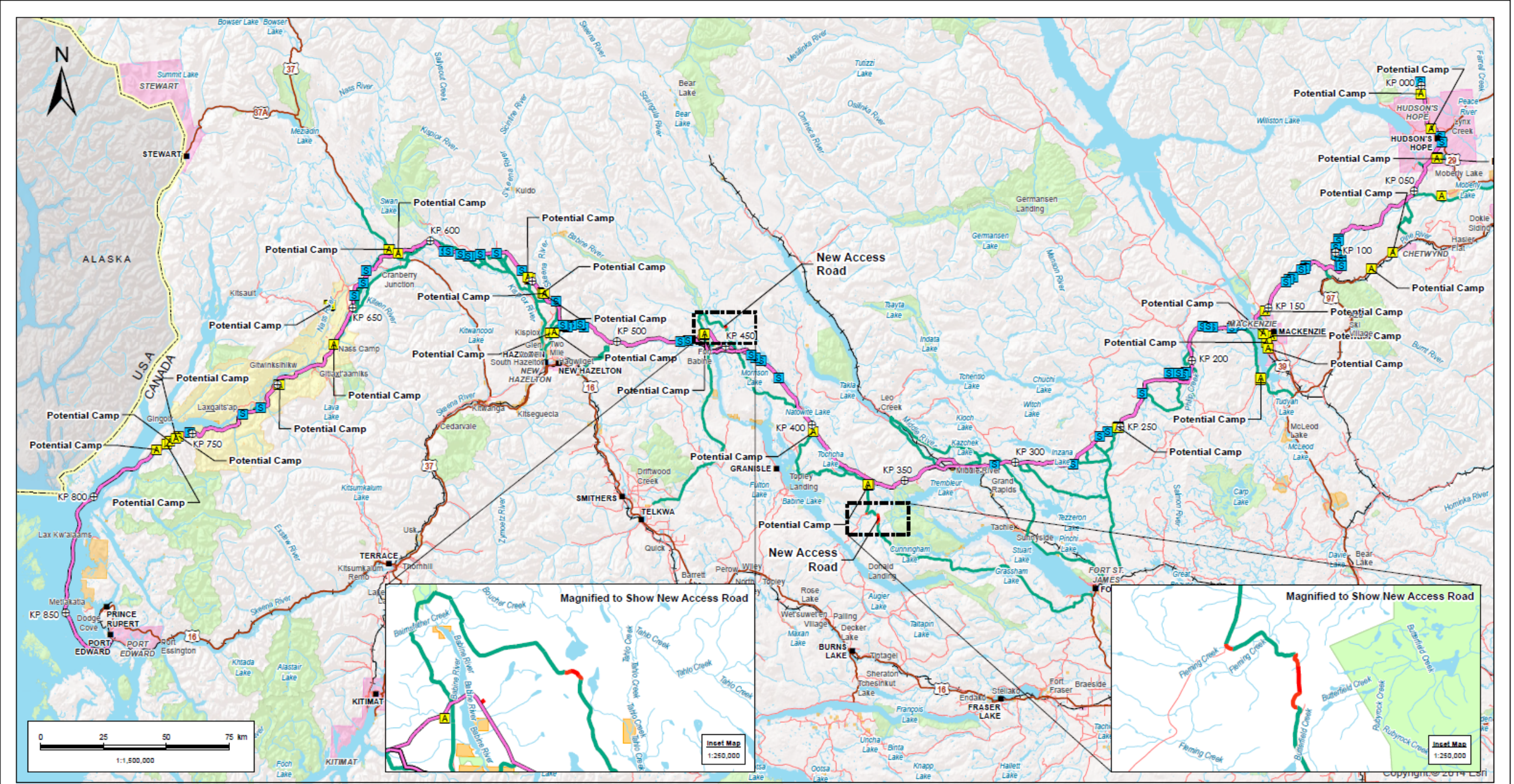
Camps would be required along the pipeline route for 18 months to 42 months, depending on construction timelines and activities. There would be nine main spread camps with up to 1,100 beds each and three compressor station camps with up to 225 beds each. The main construction camps would occupy up to 26.5 ha and compressor station camps would occupy a maximum size of 4 ha per camp. The campsite layout and size would be finalized after the prime contractor has been selected.

Start-up of the camp would involve site preparation and mobilization of supplies and material. About six months would be required to prepare the land and to supply and fully construct the camp. An early construction portion of the camp may be in service sooner. Identification of water sources, power supply and waste disposal requirements for camps would be finalized during construction planning.

The largest element of campsite operations would be catering and housekeeping for camp residents. Other activities would include:

- Maintenance of the camp;
- Restocking of fuel and supplies by truck; and
- Daily transport of personnel between the camp, muster areas and worksites by multi-passenger vehicles.

Each camp would have medical facilities and personnel available to provide basic medical and health services. Security would be onsite to ensure orderly conduct.



Prince Rupert Gas Transmission Project			
ACCESS ROADS AND ANCILLARY SITES			
ASSESSMENT REPORT			
Legend: - City, Town, Village, or District Municipality - Highway - Road - Railway - International Boundary - Watercourse - Indian Reserve - Nisga'a Lands - Park, Protected Area, Ecological Reserve, or Conservancy - District Municipality - Waterbody - Pipeline Alignment KP - Pipeline Alignment - Potential Ancillary Site - Shoo-fly - New Construction Access Road - Existing Access Road Data Sources: DataBC, Government of British Columbia (GovBC); Terrain Resource Information Management, GovBC; National Topographic System, GovBC; BC Stats, GovBC; BC Oil & Gas Commission, GovBC; CanVec V12, Government of Canada (GC); National Hydrology Network, GC; Atlas of Canada National Framework, GC; Fisheries and Oceans Canada, GC; Environmental Canada; Natural Resources Canada; TransCanada Corporation; UniversalPegasus International; IntecSea; Focus Corporation Disclaimer: Contains information licensed under the Open Government License – British Columbia, Canada. Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.	DATE: 07-NOV-14	PROJECTION: BC ENVIRONMENTAL ALBERS	DRAWN BY: R. COATTA
	FIGURE ID: 123110628	DATUM: NORTH AMERICAN DATUM 1983	CHECKED BY: K. MURPHY
			FIGURE NO: 2-3

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Figure 2-5: Access Roads and Ancillary Sites

Access

A preliminary pipeline construction access plan would be designed to establish access to the work areas. This would prioritize the use of existing roads where feasible, including several privately owned all-season and winter roads. Seismic lines and trails may also be used for access.

It is anticipated that approximately 850 km of existing forestry roads may require upgrading, which could include vegetation clearing, resurfacing, watercourse crossing upgrades and, in some cases, widening to allow for safe hauling of materials and travel of personnel. While some existing all-season roads would not require timber or vegetation clearing, others may require some clearing to improve access so they can be used safely. Project upgrades to private roads on Nisga'a fee simple land may be required.

In addition to using existing roads, the Proponent would use a temporary travel lane created within segments of the construction ROW. The surface of the travel lane would be prepared to safely accommodate the movement of construction vehicles and equipment. Maintenance of the travel lane would be required throughout the construction period.

Two new access roads would be required to connect the Cunningham Forest Service Road (FSR) and another short segment adjacent to Babine Lake. The total length of new road is anticipated to be approximately 6 km. In addition, the compressor stations would require all-season access from the nearest existing all-season road. In addition to new roads, tote-roads (shoo-flies) would be constructed to facilitate access between segments of the ROW where the grade of the travel lane is too steep.

Existing bridges would be used, where feasible, by construction vehicles and equipment. In the absence of existing bridges, other techniques, such as snow bridges, timber mats, culverts, and temporary clear-span bridges would be used to cross any watercourses with defined banks that may be encountered along the travel lane. The crossing method would be assessed and proposed by the contractor in the field and would reflect the conditions at the time of construction, subject to regulatory permits and approvals.

Disposal Sites

Disposal sites would be required for excess grade spoil material, primarily consisting of rock. These sites would be located in previously disturbed areas along the proposed route. Specific locations would be identified by the contractor and would be dependent

on site-specific conditions. A review of these sites would be completed during permitting, if an EA Certificate is issued, to ensure that any adverse effects on the environment, social, economic, heritage and health pillars of the site are avoided or appropriately mitigated.

Disposal sites for drilling mud excavated from trenchless watercourse crossings would be either located in existing disturbances on the proposed routes and other temporary workspace or hauled away to suitable disposal sites.

Temporary Storage Areas

Stockpile sites would be required to store pipe segments prior to installation. Temporary staging, equipment storage and contractor yards would be used as bases to support construction. Four to six rail siding sites would be required, likely to be located in Chetwynd, Mackenzie, Fort St. James, and either near New Hazelton or Terrace. Rail sidings would be used to store and transition pipe segments from rail to trucks for transfer to stockpile sites and ultimately the ROW. The Proponent's current intention is to use existing siding or industrial sites where practical and feasible.

Borrow Sites

For the land based pipeline, the Proponent expects to use excess rock materials removed from the ROW and facility sites as fill material. If, at a later date, it is determined that fill is required from outside the Project footprint for the land based pipeline route, borrow sites would be assessed in accordance with BC Oil and Gas Commission (OGC) requirements. Borrow site locations would be dependent on the amount and type of material required. The sites could be pre-existing, owned and operated by others, or new developments. If required, a review of these sites would be completed through the OGC permitting process, which includes consideration and protection of environmental and archaeological resources.

Hydrostatic Testing

Hydrostatic test fill lines would be required to move water from water sources to the construction ROW for the hydrostatic pressure testing process. A hydrostatic test plan would be prepared during detailed design which would include all water source locations and disposal locations. Regulatory permits for hydrostatic test water sources and disposal locations would be secured as required. Water for hydrostatic testing would be drawn from approved sources and, after use, would be disposed of along the pipeline ROW in accordance with regulatory requirements.

It is anticipated that untreated seawater would be used for hydrostatic testing for the marine segments of the proposed route. Withdrawal and return of water for hydrostatic

testing would be undertaken with the approval of appropriate regulators, including Fisheries and Oceans Canada (DFO), Environment Canada, OGC, BC Ministry of Environment (MOE), and NLG. The Proponent would comply with all applicable regulations, guidelines and codes of practice relating to water withdrawal and discharge.

2.2.3 Project Activities

Construction – Terrestrial

Construction of the proposed Project and facilities would last three to four years. The main pipeline construction work would be divided into construction spreads (ranging in length from 15 km to 76 km) to allow multiple construction crews to operate concurrently at various locations along the construction ROW. The construction of each compressor station is expected to take approximately one year and the meter station would take approximately six months.

The general sequence of pipeline construction activities is illustrated in Figure 2-6, and includes the following steps and durations:

- Surveying (step 1);
- Site preparation (steps 2-5) – approximately one year;
- Pipeline installation (steps 6-17) – about 4-6 months per spread;
- Pressure testing (step 18); and
- Clean-up and reclamation (step 19) – begins immediately following construction and continues over the first two growing seasons.

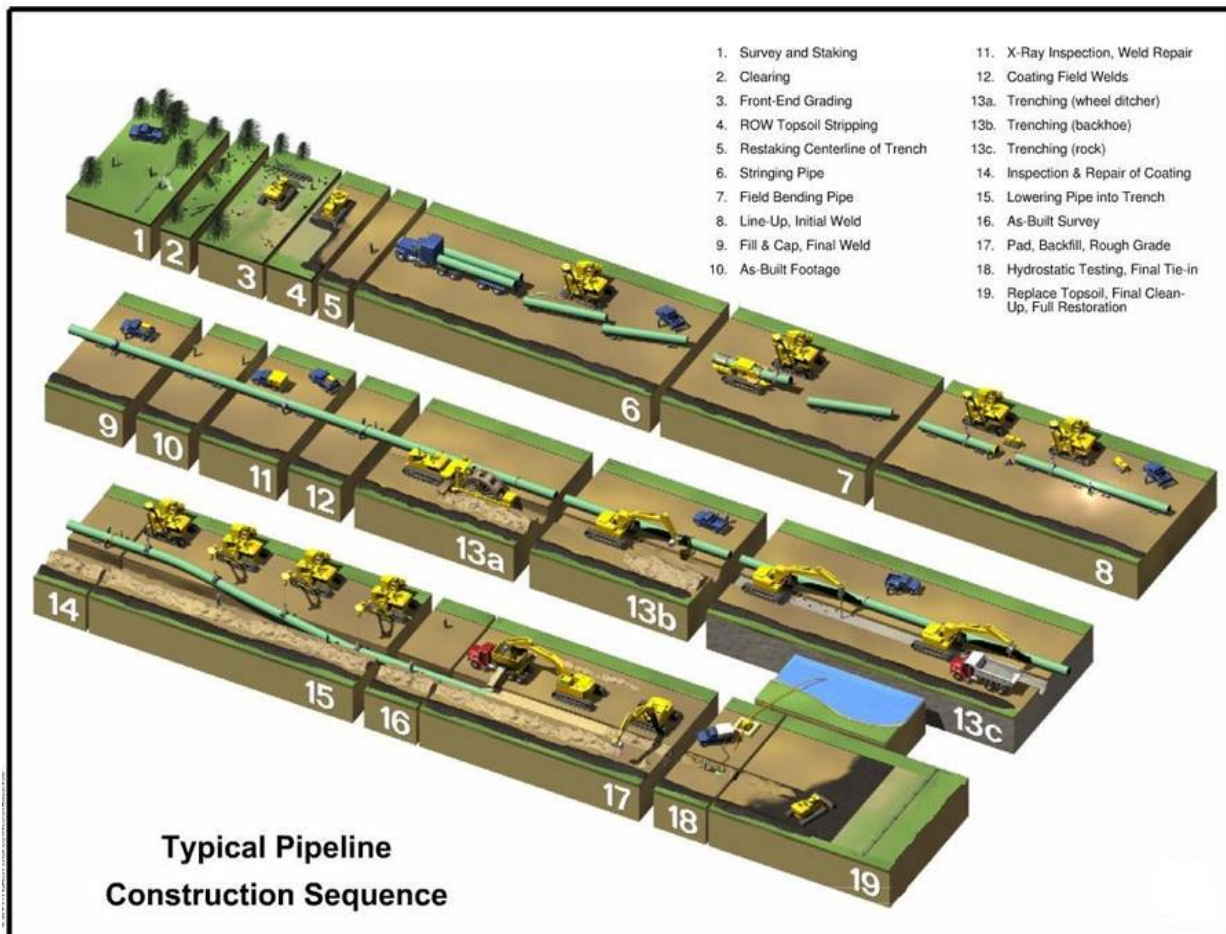


Figure 2-6: Typical Pipeline Construction Sequence

Construction – Watercourses

The proposed Project would cross approximately 1,360 watercourses. The majority of the watercourses are either known or assumed to be fish-bearing. Depending on the methodology chosen and the nature of the watercourse crossing, the duration of an individual crossing can range from five to seven days for a small crossing to four months or more for a horizontal directional drill (HDD) crossing. Instream activities would be minimized, and would typically occur in one to two days.

The Proponent selected watercourse crossing locations and techniques based on industry-accepted design and installation practices. They reflect site-specific assessments and anticipated potential effects to fish and fish habitat. The criteria that the Proponent considered in selecting a pipeline crossing method included:

- Fisheries, habitat, hydrology and water quality issues;

- Approvals, codes and regulations;
- Design and constructability issues; and
- Operational requirements.

Streams and rivers with narrow channels and lower flow rates may be suitable for trenched crossings. In certain conditions, trenched techniques could also be applied to large river crossings. An isolated crossing method establishes a dry construction area for trench excavation within a watercourse by isolating it from the natural stream flow. Isolation methods are proposed for small to medium sized flowing watercourses, unless they have technical considerations that preclude this method or at some watercourses where high fish and fish habitat sensitivity has been identified. The stream bed is then stabilized, and stream flow is allowed to return to the bed of the watercourse. The two main methods of diverting stream flow in an isolation type crossing are:

- Dam the stream and convey the water across the site by pumping
- Dam the stream and install a culvert (flume).

Figure 2-7 below shows a typical isolated trench crossing using a dam and pump. The majority of fish-bearing watercourse crossings would be constructed using an isolated trench method with mitigation measures to avoid and minimize potential effects to fish and fish habitat.

Where watercourse crossings by isolated trench are not required, appropriate or feasible, either an open cut or a number of trenchless methods would be considered. An open cut crossing method allows for excavation of the pipeline trench without isolation of the instream workspace from the rest of the channel. Open cut installations are selected for situations where the stream is dry or frozen, the conditions do not allow for an isolation to be installed, or where a watercourse is not fish-bearing.

HDD is a widely used underground trenchless installation technique that uses specialized equipment to drill a long deep path underneath a watercourse. This method is used to cross sensitive and large watercourses to avoid disturbances to instream habitat and riparian vegetation between the drill entry and exit locations. Figure 2-8 below shows a typical HDD crossing. The other underground trenchless methods include auger boring and microtunnelling.

Aerial crossing (pipeline bridges) are structures built to support a pipeline above a sensitive watercourse for which a conventional buried crossing method is not appropriate (e.g., steep narrow ravines) or for which habitat disturbance must be reduced.

The crossing methods are described in greater detail in section 1 of the Application.

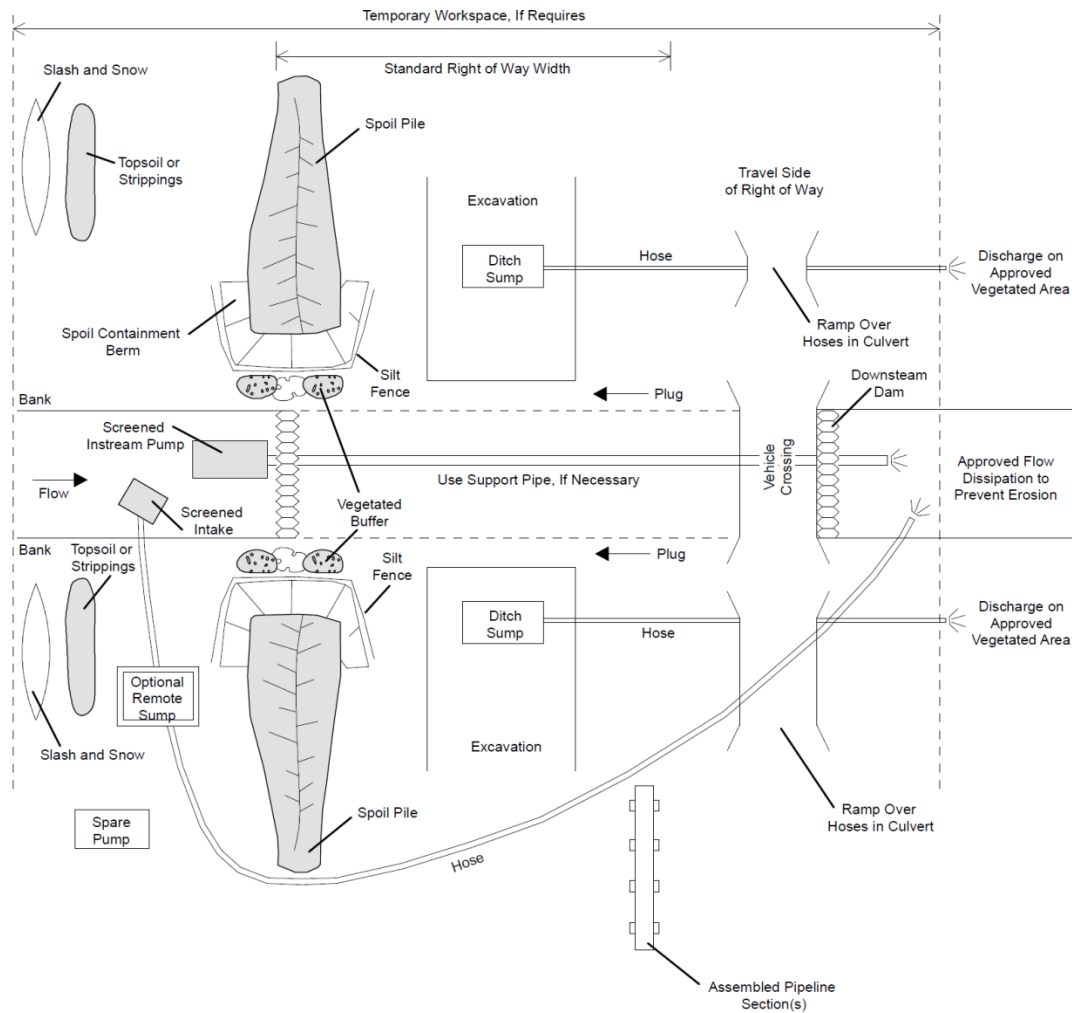


Figure 2-7: Typical Isolated (Dam and Pump) Watercourse Crossing

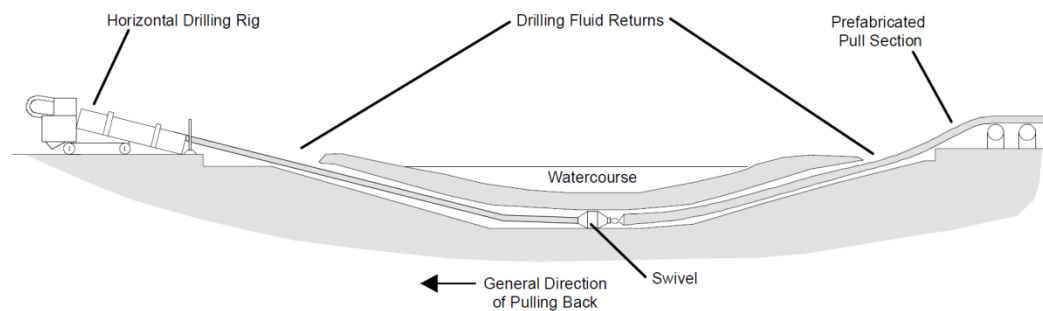


Figure 2-8: Typical HDD Watercourse Crossing

Construction – Marine

The two 36 inch marine pipelines would be installed by a specialist marine contractor. There are a limited number of specialized contractors in the world with the appropriate equipment and experience required to install large diameter marine pipelines. Installation of the marine pipeline would be completed using the S-lay method from a barge or ship (Figure 2-9).

The pipelines would generally rest on top of the seabed floor or settle into soft, seabed sediments. Extra work space may be required in areas where the seabed requires preparation to accommodate the pipe, pipe lay ship and shoreline approaches. Extra work space may be required due to side slope, longitudinal slope, lay barge access, anchor patterns or other site specific conditions.

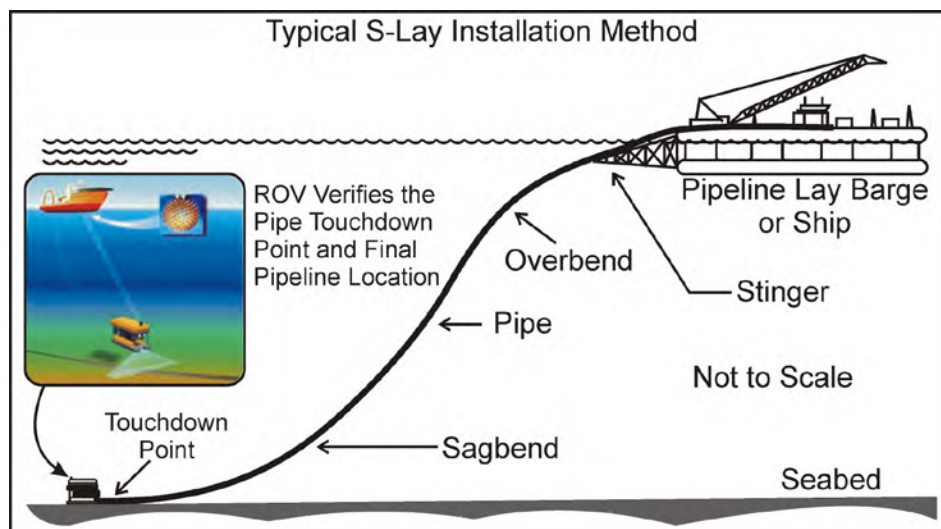


Figure 2-9: S-lay Installation Using a Barge or Ship

The main marine construction activities are as follows:

- Marine surveys – Hydrographic, geophysical and investigative surveys;
- Seabed preparation – Preparation of sea floor in some locations would be required prior to pipelay to ensure stable placement and minimize free spanning. Pre-lay activities may include excavation (trenching), rock breaking, blasting and bedding (placement of fill);
- Pipelay – Joints of pipe brought from port to the pipelay vessel by barge, welded in a continuous string and lowered onto the seafloor;
- Pipe Burial or Cover – In locations where it is determined that the pipeline needs to be lowered into the seabed, either pre-lay or post-lay ploughing or jetting

- would be utilized. Protective cover may be required in specific locations;
- Tie-Ins – Segments of the pipelines that are installed separately would be connected together; and
 - Pressure Testing – The completed pipeline would be pressure tested using seawater as a medium.

At the shore crossing a trench excavation would be used to transition the proposed pipeline from the marine to the terrestrial environment. HDD may also be considered where it would reduce the effect on marine habitats and would be technically suitable. Trench material would be sidecast adjacent to the trench, followed by pulling the pipeline string from the pipelay vessel (likely a barge in the nearshore environment) offshore to onshore. The excavated sediment and/or rock would then be used to backfill the trench.

Marine pipeline construction activities are expected to take approximately two years in total.

Transportation

Transportation of goods, materials, equipment and personnel would be required to support pre-construction and construction activities. Equipment and materials to transport would include:

- Pipe segments;
- Valve assemblies;
- Diesel fuel;
- Heavy construction equipment;
- Directional drilling equipment;
- Compressors;
- Camp components; and
- Other materials and consumables.

Project-related supplies such as water, food, fuel, materials and equipment would be transported from major distribution centres by rail or truck using existing infrastructure, or by ship from coastal ports. Offloading facilities and barge landings would be constructed or upgraded as necessary.

Rail transport would be the primary transportation mode for pipe segments and valve assemblies. Pipe for the marine portions of the pipeline would be transported by barge from one of the port facilities (i.e., Stewart, Squamish or Surrey) to the deepwater pipelay vessel.

Truck transport would be required to deliver pipe segments from the rail siding sites to stockpiles or to work sites. It is also expected that diesel fuel, goods, materials, and equipment would be transported by truck.

In addition to transportation of goods, daily transport of personnel between the camps, muster areas, and work sites would be by multi-passenger vehicles.

For nearshore and marine construction activities, it is expected that pipe would be stacked in pipe yards and then loaded onto material transport vessels for delivery to the pipelay vessel. Supply vessels would also refuel the larger construction vessels at sea. Engineered materials such as rock, gravel and concrete mats would also be stored locally until loaded onto the appropriate vessel for placement.

Operations

Once construction is complete, the proposed Project would be commissioned and the operations phase would begin. The life of the proposed Project is estimated to be in excess of 40 years.

The ROW would be clearly marked with sign and post markings at public roads, railroad and navigable water crossings, and other areas, as required, to reduce the possibility of damage or interference resulting from the activities of third parties.

Prior to commissioning the pipeline, the Proponent would develop an Access Management Plan and incorporate it into the Environmental Management Plan (EMP). The Access Management Plan would consider current and ongoing discussions with regulatory agencies, Nisga'a Nation, Aboriginal Groups, stakeholders, and community groups to ensure consideration of local needs such as use of and access to the ROW or restrictions of such use. Pipeline components and aboveground facilities would be properly secured and protected by suitable fences to prevent tampering by unauthorized parties. The fenced areas would be maintained to ensure safety and an acceptable appearance.

Vegetation would be managed along the permanent ROW and at facilities sites. Brush cover would be allowed to regenerate naturally up to 5 m on either side of the pipeline centreline; however, a tree-free corridor must be maintained directly over the pipeline to allow for line-of sight inspection of the ROW.

The SCADA system would be used to continuously monitor and control pipeline operation. Regular preventative maintenance programs would be conducted on the

pipeline, compressor stations, meter station and associated facilities. Facility sites such as compressor and meter stations would be visited weekly. Repairs may be required periodically, which would be accomplished within the permanent footprint.

Regular aerial patrols would be undertaken to monitor conditions on the ROW. Ground-based patrols may be performed along the permanent ROW by walking, all-terrain vehicle or motor vehicle as appropriate for the conditions and land use. The purpose of surveillance and monitoring activities is to assess the general condition of the ROW, and to look for evidence of natural gas leaks, construction or third party activities on or near the ROW, loss of vegetative cover on the pipeline route, un-authorised vehicular traffic, exposed pipe, and erosion and bank stability at river crossings.

The marine pipelines would be marked on the nautical charts issued by the Canadian Hydrographic Service so that other marine users would be aware of their presence. Notices to mariners would also be provided.

Regular internal and external (where not buried) inspections of the marine pipelines would be conducted. The pipeline route would be patrolled at regular intervals to observe for:

- Surface conditions along the route;
- Evidence of leaks, construction, or unusual marine activity; and
- Other factors that can affect the safety and operation of the pipelines.

Internal inspections would be conducted by in-line inspection tools (“pigs”) with a baseline survey established before commissioning and regular inspections completed over the life of the Project. ROV inspections, controlled by a support vessel, would be conducted during start-up, immediately after start-up, and periodically to examine deviations to the installed materials and seabed from the baseline survey (e.g., pipeline position, pipeline damage, free spans, and hazards).

Decommissioning and Abandonment

As specified in the Reviewable Projects Regulation, the decommissioning and abandonment phase is not included in the EA of natural gas transmission pipelines. Decommissioning and abandonment would be required to adhere to any applicable legislation or regulatory processes at that time. The timing of the decommissioning would be such that the Proponent determines the economic life of the proposed Project is complete.

Generally, it is anticipated that any one of the following three decommissioning and abandonment options (or some combination of them) would occur:

- Pipeline removal;
- Abandonment-in-place; or
- A combination of abandonment-in-place and pipeline removal.

The physical activities associated with decommissioning and abandonment would generally include:

- Purging and cleaning the pipeline with in-line tools pushed by compressed air;
- Physically separating the pipeline from any in-service piping and cutting, capping and sealing it below grade; and
- Reclaiming any land disturbed by physical activities.

Any land disturbance activities related to the removal of the pipeline or associated facilities would be reclaimed to the appropriate land use at that time.

2.3 Project Setting

The proposed Project would cross the boundaries of the Peace River Regional District, Regional District of Fraser-Fort George, Regional District of Bulkley-Nechako, Regional District of Kitimat-Stikine, and Skeena-Queen Charlotte Regional District.

The proposed route would cross provincial Crown land, Nisga'a Lands, and a small percentage would traverse some private (freehold) lands. The proposed Project would overlap the traditional territories of a number of Aboriginal Groups, as discussed in Part C of this Report.

The proposed Project would cross ten Land and Resource Management Plan (LRMP) areas (Bulkley, Dawson Creek, Fort St. James, Fort St. John, Kalum, Kispiox, Lakes District, Morice, Mackenzie, and North Coast) which provide management direction for various resource values within their boundaries. The proposed Project would also cross five Sustainable Resource Management Plan (SRMP) areas (Bulkley Valley, Cranberry, Kispiox, Nass South, and Peace Moberly Tract) as well as the Coastal Land Use Decision Implementation area (CLUDI). The proposed Project would also fall under the Central and North Coast Order Boundary and Agricultural Development Areas and Settlement Reserve areas within four Forest Districts.

Local government zoning is guided by Official Community Plans (OCPs); the Project footprint would cross the OCPs of the Districts of Mackenzie and Hudson's Hope. The activities of the proposed Project would be compatible with the current zoning of these plans (industrial development in the District of Hudson's Hope and utility corridors in the District of Mackenzie). A number of Aboriginal Groups and Nisga'a Nation have also developed land use plans that overlap the proposed Project.

The proposed corridor would traverse Nisga'a Lands and would require appropriate authorizations from NLG. The Nisga'a Land Use Plan provides guidance on land use consistent with the autonomous governance of NLG.

The Nisga'a Memorial Lava Bed Park would be crossed by 12.1 km of the route. Construction of the pipeline route across the Park would first require a Park Boundary Adjustment that involves legislative action by the Province and the Wilp Si'ayuukhl Nisga'a (the Nisga'a legislature). On October 29, 2014, Wilp Si'ayuukhl Nisga'a (the Nisga'a legislature), by resolution, consented to the amendment to the boundary of the Nisga'a Memorial Lava Bed Park in relation to the construction of the proposed Project. On October 30, 2014, the Province announced Bill 8-2014 – the *Protected Areas of British Columbia Amendment Act (No. 2), 2014*, which if passed and brought into force by regulation, would confirm the removal of 63.5 hectares of land from the Park.

Section 7.3 of this Report assesses the impacts of the proposed Project on current land and resource use, and presents additional detail on the areas overlapped by the proposed Project.

2.4 Alternative Means of Undertaking the Proposed Project

Alternative means are the various ways that are technically and economically practical to implement and carry out the proposed Project. The Proponent's Application demonstrated consideration of alternative routes for the pipeline route or locations for the facility sites, as well as methods of construction and mitigation.

During pipeline route planning, the Proponent made use of existing disturbances where practical, including existing and proposed pipeline, railway, and power line ROWs, previously disturbed areas and cutblocks within the route selection area to reduce the amount of clearing required and overall proposed Project effects. The Proponent's process of selecting an appropriate pipeline route and facility site involved collaborating with experts from various disciplines, including land, environmental, engineering and construction, and considering input from potentially affected Aboriginal Groups, Nisga'a Nation, provincial and federal regulators, municipalities, landowners and the public. The

Application identified a number of criteria considered by the Proponent when evaluating pipeline routing options, such as:

- Control points;
- Land and marine use;
- Parks and protected areas;
- Terrain;
- Constructability;
- Environmental constraints (e.g., ungulate winter range, old growth management areas);
- Visual sensitivity areas;
- Crossings;
- Access;
- Heritage and archaeological resources;
- Construction timeframe;
- Future system expansion;
- Aboriginal group input;
- Stakeholder input;
- Cost; and
- Existing disturbances.

The Proponent considered various alternatives for the pipeline route (Application sections 1.5.3.2 and 1.5.3.3).

Based on comments provided by the Working Group and the public during the pre-Application stage, as well as more detailed design and engineering work, the Proponent made several changes to the proposed Project design to minimize or avoid potential adverse effects on the environment and Aboriginal Interests. These changes were incorporated into the proposed Project design presented in the Application.

A summary of some of the major route refinements is provided below (refer to section 1 of the Application, Tables 1-10 and 1-11, for further details):

- Peace River Crossing Alternatives – addresses geotechnical and constructability issues and incorporate Aboriginal input (West Moberly First Nations and Sauteau First Nations);
- Williston/Moberly Alternative – chosen as a result of consultation with West Moberly First Nations and Sauteau First Nations. Avoids culturally sensitive areas, known archaeology sites, high elevation winter range within the Moberly caribou herd range, and reduces total number of watercourse crossings

(However, during Application Review West Moberly First Nations and Saulteau First Nations identified that their concerns with this route have not been resolved and they do not support the currently proposed the Williston/Moberly Alternative);

- South Central Alternative – avoids crossing Lake Babine, Lake Babine Indian Reserve, and Rainbow Alley Provincial Park; avoids crossing Wolverine caribou herd range, and more known archaeological sites than the conceptual corridor;
- East Kispiox Valley Alternative – similar to above; also avoids all residences and private parcels in the Kispiox Valley;
- PRGT/Gitanyow Alternative – reflects outcomes of routing workshops with Gitanyow Hereditary Chiefs; minimizes impacts to ecosystem network and minimalizes impacts to wildlife and other resources used by Gitanyow for hunting, fishing, and botanical plant gathering;
- Nisga’a Highway Lava Bed Alternative – parallels the Nisga’a Highway ROW, avoids potential effects to culturally important historic villages and spiritual sites, community watersheds, wetlands and key fish spawning habitats and technically challenging crossing of the Nass River; would require a Park Boundary Adjustment; and
- Nasoga Gulf Alternative (and sub-alternatives) – shorter marine pipeline than other alternative routes, reduces trenching requirements and minimizes sediment transfer, routes around environmentally sensitive features.

On July 31, 2014 the Proponent submitted an Addendum to the Application (Addendum), which identified twelve pipeline route amendments, expanded areas for watercourse crossing pull-back and laydown areas, new access roads and shoo-flies, and a compressor station relocation. Some of the key amendments included:

- Nasoga Gulf – Identification of a single route to Nasoga Gulf, and the removal of the Nasoga Tunnel, Nass Bay Shoreline and Nass Bay Nearshore Alternative route options;
- Mackenzie Route – Route proposed in direct response to concerns raised by residents of the Gantahaz subdivision in Mackenzie, to locate further from the Gantahaz subdivision. New route would eliminate the Williston Bay crossing on Williston Lake, and goes through the Mugaha Marsh Sensitive Area;
- Nation River Route – Route proposed in direct response to concerns raised by Nak’azdli Band regarding the proximity of the pipeline route to Nation River. Decreases the magnitude of the proposed Project effects on Nak’azdli Band’s habitation and sacred area Interests;
- Sasklo Dome Route – Route proposed in direct response to concerns raised by Nak’azdli Band regarding the proximity of the pipeline route to the Sasklo Dome area. The proposed Sasklo Dome Route alternate would take the pipeline 0.7

kilometers further away from the Sasklo Dome area. Decreases the magnitude of the proposed Project effects on Nak'azdli Band's habitation and sacred area Interests;

- Grostete Creek Route – Route proposed in direct response to concerns raised by the Tl'azt'en Nation regarding the relocation of the pipeline route to an existing bridge for a common pipeline and access location;
- Middle River Route – Route proposed in direct response to concerns raised by Tl'azt'en Nation to avoid traditionally important fisheries, archaeological and cultural areas. Decreases in the portion of the proposed Project crossing map reserves and mineral tenures, decreases the magnitude of proposed Project effects on Tl'azt'en Nation's trapping interests and fishing interests, as the route would be farther away from the Trembleur Lake spawning grounds and the Tl'azt'en community;
- Natlan to Shegunia Route – New route would allow for a trenchless crossing (aerial) of the Natlan River and a trenchless crossing HDD of the Shegunia River;
- Ksi Mat'in River Route – Water flow rates prohibit the use of a conventional crossing method. The new alignment is designed to support a HDD crossing; and
- Middle River Compressor Station Relocation – As a result of concerns raised by Tl'azt'en Nation, the Proponent proposed a 12.0 km re-route to avoid traditionally important fisheries. The proposed Middle River Compressor Station was moved approximately 5 km east of the location in the Application. The relocation decreases the portion of the proposed Project crossing LRMPs, Resource Management Zones (RMZs), wildlife management units, guide outfitter tenures, trapline tenures, timber supply areas, and timber cut blocks.

The Proponent identified two additional alternatives as a result of their ongoing consultation with Aboriginal Groups:

- Routing alternatives at Nilkitkwa Lake and Morrison Headwaters in response to concerns raised by Lake Babine Nation about the proposed route in the Application; and
- An alternative location for the Johnson Creek compressor station in response to concerns raised by West Moberly First Nations and Saulneau First Nations about the proposed Johnson Creek (2A) compressor location in the Application.

EAO considered these two latter alternatives based on information provided by the Proponent and Aboriginal Groups. To inform its consideration, EAO requested additional information about the alternatives being examined, the results of technical studies, the identification of any outstanding studies, and a summary of consultation with the affected Aboriginal Groups.

As a result of EAO's request, the Proponent provided a memo to EAO and Lake Babine Nation (*Response to Information Request Regarding Proposed Crossing of Nilkitkwa Lake and Morrison Headwaters*) on October 10, 2014. EAO requested that Lake Babine Nation provide EAO with any comments on the memo, and particularly identify how Lake Babine Nation's concerns and interests were considered in the proposed route changes. In addition, EAO offered to meet with Lake Babine Nation to discuss how to best consider the information in the EA for the proposed Project. Lake Babine Nation did not provide EAO with any specific comments on the proposed alternative routing. However, Lake Babine Nation verbally informed EAO that they would like to continue to consider other alternative route options in the area, and that they would like additional time within the EA to do so.

EAO included the route proposed in the Application, as well as the route alternatives proposed in the October 10, 2014 memo in the proposed CPD. Only one route option would be allowed to be developed. EAO determined that the route alternative proposed by the Proponent was in response to impacts of the proposed Project on Lake Babine Nation's Aboriginal Interests and is a reasonable accommodation of Lake Babine Nation's concerns in this regard.

EAO also proposes a condition that would require the additional studies identified in the October 10, 2014 memo to be completed, a report to be shared with EAO, Lake Babine Nation and OGC, and EAO's approval of the report, including any additional mitigation measures, prior to construction in the area.

The Proponent provided a memo dated October 20, 2014 (*Information Regarding Johnson Creek Compressor Station Relocation*), which was provided by EAO and the Proponent to Doig River First Nation, Halfway River First Nation, McLeod Lake Indian Band, Saulteau First Nations, and West Moberly First Nations. EAO requested that these five Aboriginal Groups provide EAO with any comments on the memo, and particularly identify how their Treaty rights were considered in the proposed compressor station relocation. EAO offered to meet with the Aboriginal Groups to discuss how to best consider the information in the EA for the proposed Project. The five Aboriginal Groups did not provide EAO with any specific comments on the proposed alternative compressor location.

EAO has included the Johnson Creek compressor location proposed in the Application, as well as the compressor station location proposed in the October 20, 2014 memo, in the proposed CPD. Only one compressor station location would be allowed to be developed. EAO determined that the compressor station location alternative proposed by the Proponent provides a reasonable accommodation of potential impacts to

Aboriginal Interests in this area, particularly in relation to West Moberly First Nations and Saulteau First Nations. EAO has determined that a condition is not required to allow for either location to be developed.

2.5 Project Benefits

This section summarizes the estimated benefits during construction and operations, as reported in the Proponent's Application.

Economic Benefits from Project Construction

The Proponent expects that capital costs related to initial Project capacity would be \$5.0 billion spread over the three-to four-year construction period from 2015 to 2018. This would be expected to include \$3.5 billion of direct capital expenditures in Canada, representing 70% of total capital costs, of which \$1.5 billion would be spent in BC.

Table 2-2 summarizes economic benefits that would be generated from Project construction in BC and other Canadian provinces, mainly Alberta. Total construction costs are estimated at \$5.0 billion, \$1.53 billion of which is estimated to be spent in BC. Construction would generate almost 8,500 person-years (PY) of direct employment, and support almost 37,000 PY. The Proponent estimates that workers from BC would account for 39% of the direct BC-based construction workforce, 57% would be residents of other parts of Canada (4,485 PYs) and 4% would be foreign workers. The number of local hires for pipeline construction is estimated at 340 PYs of construction labour, an average of 85 PYs per year, which represents 10% of the onsite pipeline construction workforce expected to be from BC, and 4% of the overall BC-based direct construction workforce.

Table 2-2: Summary of Economic Benefits from Project Construction

Summary of Benefits from Project Construction	BC	Other Canada	Total
Project Construction Costs	\$ million		
Spent in BC/ Canada	\$1,525	\$1,983	\$3,508
Imported goods and services			\$1,492
Total construction costs			\$5,000
Gross Domestic Product (GDP)	\$ million		
Direct, indirect and induced	\$1,250	\$2,645	\$3,895
Employment	Person Years of Employment		
Direct	3,370	4,845	8,215
Indirect	4,865	8,595	13,460
Induced	2,895	12,060	14,955
Total	11,130	25,500	36,630

Government Revenues (Direct, Indirect and Induced)	\$ million		
Municipal and Regional Governments	\$37		
BC Government	\$442	(over the 3-4 year period)	
Federal Government	\$500		
Total	\$978		

Economic Benefits from Project Operations

During the 40 years or more of operations, the primary benefit of the proposed Project would be to support the natural gas exploration and production sector in northeastern BC (upstream activities), and the proposed PNW LNG export facility to be located on Lelu Island, in Port Edward (downstream activities).

Table 2-3 summarizes the benefits that would be generated in BC and other Canadian provinces, specific to the proposed Project during operations.

Table 2-3: Summary of Annual Project Benefits from Project Operations (at initial build out)

	BC	Other Canada	Total
Effects from Direct Operations	\$ million per year of operation		
Annual operating expenditures	\$14.7	\$28.2	\$42.9
Cost of natural gas used in compressor stations			\$28.2
Total operating expenditures including natural gas			\$71.1
Effects on Employment	Full Time Equivalent		
Direct	23		23
Indirect	34	79	113
Induced	11	34	45
Total	68	113	181
Effects on Government Revenues	\$ million per year of operation		
	BC	Federal	Total
Annual municipal/ regional taxes	\$24.5		\$24.5
BC carbon taxes	\$12.3		\$12.3
BC compressor fuel taxes	\$5.1		\$5.1
Other BC Government levies / lease payments	\$2.0		\$2.0
Direct corporate income taxes	\$25.4	\$34.6	\$60.0
Personal income taxes (direct, indirect and induced)	\$0.30	\$1.60	\$1.9
Total	\$69.6	\$36.2	\$105.8

During operations the Proponent estimates that the proposed Project would employ 23 full-time equivalent (FTE) positions. Estimated annual property taxes of \$24.5 million per year are not broken down by Regional District/ municipal government, and in most instances would be paid to the provincial government in lieu of municipal taxes, before

being re-allocated to each region. This tax estimate also excludes any payments to Nisga'a Nation as these remain under negotiation.

Table 2-3 provides a summary of annual economic benefits from proposed Project operations assuming three compressor stations and a 2 bcf/ day production level. At full build-out, the Project would have up to 8 compressor stations and a production level of 3.6 bcf/day, which would generate additional employment and proportionally more spending on goods and services. The Proponent estimates that at full build-out, the proposed Project would generate \$51 million per year in carbon taxes and \$21 million per year in fuel taxes to be paid to the BC Government (compared to approximately \$17.4 million in carbon and fuel taxes at initial production levels).

Project Contributions to Business Development

The proposed Project is expected to create employment opportunities for Regional Assessment Area (RAA) residents and procurement opportunities for RAA businesses.

Direct labour income from Project construction is estimated at \$1.1 billion, of which \$407 million is expected to be earned in BC. Construction service contracts are expected to be valued at \$2.3 billion, and would offer a broad range of opportunities relating to pipeline and associated facility construction.

In addition to the construction service contracts, \$800 million in goods and services are expected to be purchased from BC companies for engineering, procurement and construction management services (\$181 million), other engineering construction services (\$158 million), transportation services (\$89 million), machinery (\$85 million), construction camp services (\$84 million), and other goods and services such as concrete, pipe coating and other materials and services (\$206 million).

Community and Social Benefits of Proposed Project

In addition to general economic benefits, the proposed Project is expected to generate social benefits to local and Aboriginal communities, such as training and education and employment opportunities for unemployed and underemployed individuals, and increased availability of funds for government programs. The proposed Project would also be expected to provide important economic opportunities for Nisga'a Nation and Aboriginal Groups, including capacity-building initiatives to support employment, contracting and business development. Socio-economic benefits for Aboriginal Groups are discussed in greater detail in Part C of this Report. Socio-economic benefits for Nisga'a Nation are discussed in Part D.

2.6 Applicable Permits

The primary regulator for construction and operation of a natural gas pipeline in BC is the Oil and Gas Commission (OGC), pursuant to the *Oil and Gas Activities Act* (OGAA). Various licences, permits or approvals are required for field programs, construction, operations, and decommissioning and abandonment of the proposed Project under federal, provincial and local jurisdiction.

EAO established a Memorandum of Understanding (MOU) with OGC in 2013 to manage a single, predictable regulatory regime for liquefied natural gas (LNG) projects and to improve engagement with Aboriginal Groups, communities and the public. Regulatory agencies for many of the required authorizations participated in the EA and are members of EAO's Working Group (see section 3.4).

Table 2-4 provides a list of municipal, provincial and federal licences, permits and/or approvals that may be required for the planning, construction, and operation of the proposed Project.

Table 2-4: Authorizations Which May be Required for the Proposed Project

Responsible Authority	Legislation	Permit/Authorization	Planning	Construction	Operations
Federal					
Environment Canada	<i>Canadian Environmental Protection Act, 1999</i>	Section 122(1): Authorizes the disposal of material at sea		X	
	<i>Species at Risk Act (SARA)</i>	Section 73: Authorizes activity affecting a listed wildlife species		X	X
DFO	<i>Fisheries Act</i>	Section 35(2): Issue authorizations for serious harm to fish		X	
		Section 35: Letter of Advice for marine geophysical and geotechnical programs	X		
	<i>Fishery (General) Regulations</i>	Scientific Fish Collection Permit	X	X	
Industry Canada	<i>Radio Communication Act</i>	Section 5: Radio Licence		X	X
Natural Resources Canada	<i>Explosives Act</i>	Ammonium Nitrate and Fuel Oil Order: Ammonium Nitrate Fuel Oil Permit		X	
		Section 7(1): Temporary Magazine Licence		X	
		Section 63: Explosives Transportation Permit		X	
Transport Canada	<i>Navigable Waters Protection</i>	Issues approvals for structures on, over, under, through or across navigable waters		X	X

Responsible Authority	Legislation	Permit/Authorization	Planning	Construction	Operations
	<i>Act/Navigation Protection Act</i>	Approval of scientific instruments	X		
Canadian Transportation Agency	<i>Coasting Trade Act</i>	Section 4: Licence for a foreign ship		X	
Employment and Social Development Canada/Service Canada	<i>Immigration and Refugee Protection Act</i>	Section 30(1): Temporary foreign worker authorization		X	
Provincial					
OGC	<i>Oil and Gas Activities Act</i>	Section 25(1): Permit to carry out oil and gas activities		X	X
		Section 31(1): Pipeline Permit Amendment Application			X
		Prescribed roads (private land)	X	X	
	<i>Land Act</i>	Section 14 (1): Licence of Occupation	X	X	
		Section 38: Lease (for facilities)		X	X
		Section 40(1): Approval for right-of-way or easement		X	X
	<i>Water Act</i>	Section 8(1): Approval for Short-Term Use of Water	X	X	
		Section 9: Approval for Changes In and About a Stream	X	X	X
	<i>Forest Act</i>	Section 47.4: Master Licence to Cut	X	X	X
		Section 117: Road Use Permits for Industrial Use	X	X	X
	<i>Heritage Conservation Act</i>	Section 12 – site alteration permit	X		
Agricultural Land Commission	<i>Agricultural Land Commission Act</i>	Section 20(3): Application to place fill or remove soil		X	X
		Approval to use land in the Agricultural Land Reserve for non-farm use (for facilities)	X	X	
MOE	<i>Environmental Management Act</i>	Section 6(5)(a): Waste Disposal		X	X
		Section 6(5)(b) Waste Incinerator		X	
		Section 14: Permit authorizes the introduction of waste into the environment		X	X
		Section 7(2) Hazardous Waste Confinement		X	X
		Section 10(1)(c)(ii) Transportation of Hazardous Waste		X	X
	<i>Integrated Pest Management Act</i>	Integrated Pest Management Regulation (for herbicide applications)		X	X
	<i>Park Act</i>	Park Boundary Adjustment	X		

Responsible Authority	Legislation	Permit/Authorization	Planning	Construction	Operations
		Section 20: Park use permit authorizing activity on or in a park	X		
FLNR	<i>Wildlife Act</i>	Section 19(1): General Permit	X	X	X
		Fish collection permit	X	X	X
	<i>Wildlife Act Permit Regulation</i>	Application to capture fish or wildlife	X	X	X
	<i>Forest Act</i>	Burning permits		X	X
	<i>Heritage Conservation Act</i>	Section 14: Heritage Inspection and Investigation Permit	X		
Ministry of Transportation and Infrastructure	<i>Commercial Transport Act</i>	Section 8: Oversize-Overweight Vehicle Permit		X	X
	<i>Commercial Transport Regulations</i>	Division 6: Non-Resident Commercial Vehicle Permit		X	X
	<i>Transportation Act</i>	Section 62: • Use of occupancy permit to cross or use highway right- of-way; • Work notification; • Lane closure; • Sign permit; and • Development approval.	X	X	X
		Section 48: Controlled Access Highway Permit		X	X
Regional					
Northern Health	<i>Public Health Act</i>	Food – Operating Permit	X	X	X
		Sewerage System Permit	X	X	X
	<i>Drinking Water Protection Act</i>	Drinking Water – Construction Permit and Operating Permit	X	X	X
	<i>Industrial Camp Regulation</i>	Industrial Camp Permit	X	X	X
Prince Rupert Port Authority	<i>Port Authorities Operations Regulations</i>	Dive Permit		X	X
		Transportation of Dangerous Goods		X	X
		Hot work permit		X	X
	<i>Canada Marine Act and Regulations</i>	Port Authority approval to conduct marine geophysical program	X		
Regional districts and municipalities	<i>Municipal bylaws</i>	Various zoning permits		X	X
Nisga'a					
NLG	<i>Nisga'a Forest Act</i>	Nisga'a Public Lands Licence	X	X	X
		Timber Harvesting Licence	X	X	X
		Timber Harvesting Permit		X	
		Road Permit	X	X	X
		Road Use Permit		X	X

Responsible Authority	Legislation	Permit/Authorization	Planning	Construction	Operations
	<i>Nisga'a Land Act</i>	Special Use Permit	X	X	X
		Investigative Permit	X		
		Licences of Occupation	X	X	X
		Permits of Occupation	X	X	X
		Statutory Rights of Way		X	X
		Leases		X	X
Nisga'a Village Government(s)	<i>Nisga'a Village Government laws and regulations</i>	Various zoning and development permits		X	X

3 Assessment Process

3.1 Strategic Context

The BC Government has spoken about the importance of LNG exports as an important economic development opportunity.

In February 2013, two LNG related projects were in the early stages of assessment by EAO. By February 2014, there were 10 LNG-related pipeline and export facility projects in BC in various stages of review by EAO. In this context, EAO initiated a strategic approach to the review of LNG Projects, aiming to deliver:

- 1) Early identification and resolution of strategic and operational policy issues;
- 2) Effective Aboriginal, stakeholder and public engagement;
- 3) An efficient, robust and neutral regulatory regime;
- 4) A seamless approach to permitting by the OGC (if an EA Certificate is issued); and
- 5) Appropriate government resourcing to support the high volume of projects.

The results of the approach are:

- A dedicated team within EAO to coordinate the review of LNG projects, to provide greater consistency of reviews and to identify cross-project issues to be addressed in a strategic manner;
- An MOU between EAO and the OGC intending to:
 - o Prevent duplication between EA and OGC application information requirements;
 - o Provide the opportunity to proponents to use “synchronous permitting” – a mechanism to run both the EA and permitting review processes at the same time for timely permit issuance (if an EA Certificate is issued);
 - o Coordinate engagement with Aboriginal Groups, to the mutual benefit of Aboriginal Groups and government; and,
 - o Design highly effective, legally enforceable conditions and a robust compliance and enforcement regime including a delegation from EAO to OGC staff to carry out inspections.
- An LNG Regulatory Working Group representing most ministries across government to assist with issue identification and policy advice to EAO;
- A Pipeline Corridor Analysis tool developed to enable early identification of multiple project effects and a visual aid to assist with consultation;
- A Stewardship Strategy developed in partnership with Ministry of Forests, Lands and Natural Resource Operations (FLNR) to manage for multiple proposed

- project effects on wildlife, old growth forests and timber utilization; and,
- An organized approach to community and provincial service providers readiness to address infrastructure, health, safety and social services demands in BC's north to address major industrial development.
- A common set of conditions proposed for proposed pipeline projects (e.g. the proposed Project, the proposed Westcoast Connector Gas Transmission Project, and the Coastal GasLink Project), which will inform future projects and will enable the management of the potential cumulative effects to a variety of values (e.g. timber, wildlife (caribou, grizzly bear, moose), and old growth forests).

EAO has placed an emphasis on planning ahead and organizing events requiring Aboriginal Groups, community and stakeholder participation so that all parties had opportunities to contribute to the reviews.

It is in this context that the proposed Project was assessed by EAO.

3.2 Major Milestones of the BC Environmental Assessment

- The EA process started on June 6, 2013, when EAO issued an Order to this effect under Section 10 of the Act.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_35706.html
- On November 8, 2013, EAO issued an Order under Section 11 of the Act which defined the scope of the proposed Project, as well as the procedures and methods for conducting the review.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_36251.html
- On February 13, 2014, EAO approved and issued the Application Information Requirements (AIR) to the Proponent.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_doc_list_403_p_tor.html
- On April 2, 2014, and May 21, 2014 EAO issued Orders under Section 13 of the Act which added or changed Aboriginal Groups to be consulted and changed the scope/boundaries of the proposed Project.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_37448.html
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_37584.html
- On April 3, 2014, the Proponent submitted an Application for an EA Certificate for the proposed Project. From April 3, 2014 to May 2, 2014, EAO evaluated the Application against the AIR, and determined that the Application met the AIRs.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_37537.html
- On May 16, 2014, the Proponent submitted the copies of the Application and the Application Review period began.

http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_37577.html

- On November 12, 2014, EAO referred the proposed Project to Ministers for decision.

3.3 Federal Assessment

On October 24, 2013, the federal government amended the *Regulations Designating Physical Activities* under the *Canadian Environmental Assessment Act, 2012*, removing non-National Energy Board-regulated pipelines. Therefore a federal EA is not required for the proposed Project.

3.4 Role of the Advisory Working Group

EAO established a Working Group for the proposed Project, which was made up of provincial, federal and local government agency staff with the mandates and skill sets relevant to the review of the proposed Project and representatives of potentially-affected Aboriginal Groups as set out in the Section 11 Order issued for the EA for the proposed Project. See Appendix 1 for a list of Working Group members.

During the course of the EA, EAO sought and considered advice from the Working Group in order to understand and assess the potential adverse effects associated with the proposed Project.

Working Group members were responsible for providing timely advice to EAO on:

- Key EA documents including, but not limited, the Proponent's Valued Component Selection Document, the AIR, Application and EAO's Assessment Report and proposed conditions;
- Government policy direction and/or gaps that could affect the conduct of the EA;
- Potential conflicts with the policies, legislation and/or regulations of their organizations; and,
- Technical issues that may be raised by the public during the public consultation process.

During Pre-Application and Application Review, Working Group members provided thousands of comments to EAO about the Project and Application, and participated in many general and technical meetings. EAO reviewed the adequacy of the Proponent's responses to all comments received from Working Group members in the Issues

Tracking Table (Appendix 2 Application Review Working Group Tracking Table).¹ EAO required the Proponent to update the Issues Tracking Table and supporting Technical Memos as appropriate. EAO considered all comments and issued raised during the EA, in development of its Assessment Report.

3.5 Aboriginal Groups Consultation

On November 8, 2013 EAO issued a Section 11 Order which specified the consultation activities that both EAO and the Proponent would undertake with all Aboriginal Groups potentially affected by the proposed Project.

At the initial stages of EA for the proposed Project, EAO relied primarily on the proximity of the proposed Project to an Aboriginal Group's asserted traditional territory to determine whether an Aboriginal Group would be included on Schedule B or C:

- Those Aboriginal Groups with Aboriginal Interests within 2 km of the proposed Project were listed in Schedule B; and
- Those within 30 km of the proposed Project were listed in Schedule C.

Aboriginal Groups in Schedule B of the Order were consulted at the deeper end of the consultation spectrum, and provided the following opportunities:

- Participation in the Working Group;
- Participation in meetings to identify and discuss both Aboriginal Interests that may be affected by the proposed Project and potential measures to avoid, mitigate, address or otherwise accommodate impacts;
- Review and comment on key documents, including draft Application Information Requirements, the Proponent's Application for an EA Certificate, and EAO's draft proposed conditions and Assessment Report, including Aboriginal Consultation Report;
- Submission of a document outlining the Aboriginal Group's views on the Assessment Report to be included in the package of materials sent to Ministers when the proposed Project is referred for decision;
- Notification of key milestones – such as the issuance of the AIR, acceptance of the Application for review, timing of public comment periods (including open houses) – when the final Assessment Report is referred to Ministers and the resulting decision; and,

¹ The Working Group Comment Tracking Table on the draft AIR is available here:
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_37437.html

- Invitation to meet with EAO to discuss any Aboriginal Interests in the proposed Project area.

Aboriginal Groups in Schedule C of the Order were consulted at the lower end of the consultation spectrum, and provided the following opportunities:

- Notification of key milestones – such as the issuance of the AIR, acceptance of the Application for review, timing of public comment periods (including open houses) – when the final Assessment Report is referred to Ministers and the resulting decision;
- Invitation to meet with EAO to discuss any Aboriginal Interests in the proposed Project area; and,
- Invitation to review and comment on EAO's draft Assessment Report, including Aboriginal Consultation Report.

Consideration of the areas where Treaty 8 rights were historically exercised and initial assessments of the strength of the Aboriginal rights and title claims were conducted and discussed with Aboriginal Groups identified on Schedules B and C starting in the winter of 2013. As a result of these discussions, or new information relating to an Aboriginal Group, including route amendments, several modifications to the Section 11 Order were made during the EA:

- Gitanyow Wilp Luux Hon was moved from Schedule B to Schedule C (April 2, 2014);
- Gitxsan Wilp Haiwaas was added to Schedule C (April 2, 2014);
- Gitxsan Wilp Wiigyat was removed from Schedule C (April 2, 2014); and
- Doig River First Nation was moved from Schedule C to Schedule B (May 21, 2014).

On June 26, 2014, the *Tsilhqot'in Nation v. British Columbia* (*Tsilhqot'in*) decision was released by the Supreme Court of Canada. The decision clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation at 1846 (the time of assertion of European sovereignty). In addition, the case set out considerations for government when consulting Aboriginal Groups regarding potential impacts on asserted Aboriginal title claims.

As a result of the *Tsilhqot'in* decision, EAO examined the decision implications on this proposed Project, and specifically:

- Reassessed the strength of claimed Aboriginal title overlapping the proposed Project on the basis of the tests set out in the *Tsilhqot'in* decision, for the purpose

- of confirming appropriate level or depth of consultation;
- Included the results of that reassessment in this Report as it relates to each Aboriginal Group with asserted title claims overlapping the proposed Project;
- Sought Aboriginal Group's perspectives on both the preliminary assessments of strength of Aboriginal claims and seriousness of impacts, as well as proposed accommodations, through the provision of a draft version of this Report; and
- Considered other approaches being taken by government that may be relevant to the accommodation for potential impacts to Aboriginal Interests.

Table 3-1 shows the final list of Aboriginal Groups on Schedules B and C for the proposed Project.

Table 3-1: Aboriginal Groups on Schedule B and C for the Proposed Project

Aboriginal Groups		
Aboriginal Groups consulted at a deeper level (i.e. on Schedule B of the Section 11 Order)	Treaty 8 Aboriginal Groups	• Halfway River First Nation • McLeod Lake Indian Band • Sauteau First Nations • West Moberly First Nations • Doig River First Nation
	Non-Treaty Aboriginal Groups	• Lake Babine Nation • Takla Lake First Nation • Tl'azt'en Nation • Kitselas First Nation • Yekooche First Nation • Lax Kw'alaams Band • Metlakatla First Nation • Kitsumkalum First Nation • Nak'azdli Band • Gitxaala Nation • Gitxsan (Huwilp): - o Delgamuukw - o Geel - o Gitludahl - o Gitgwinuxw - o Gwii Yeehl - o Gyetm Galdoo - o Kliiyeem Lax Ha - o Luutkudziiwus - o Mauus - o Wii Eelast - o Wii Mugulxw - o Wosimlaxha - o Yagosip • Gitanyow:

Aboriginal Groups		
		- o <i>Wilp</i> Gamlakyeltxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chief's Office) - o <i>Wilp</i> Malii (as represented for the purposes of consultation by the Gitanyow Hereditary Chief's Office) - o <i>Wilp</i> Gwaas Hla'am (as represented for the purposes of consultation by the Gitanyow Hereditary Chief's Office) - o <i>Wilp</i> Watakhayetsxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chief's Office)
Aboriginal Groups consulted at a notification level (i.e. on Schedule C of the Section 11 Order)	Treaty 8 Aboriginal Groups	• Blueberry River First Nations • Fort Nelson First Nation • Prophet River First Nation • Treaty 8 Tribal Association
	Non-Treaty Aboriginal Groups	• Carrier Sekani Tribal Council • Office of the Wet'suwet'en • Tsay Keh Dene First Nation • Gitxsan: - o Antguulilbisxw - o Gaxsbgaba - o Gwis Gyen - o Hanamux - o Kyooluugyat - o Luus - o Miluulak - o Nii Kyap - o Nikateen - o Sakum Higookxw - o Spookw - o Ts'ogashlee - o Wii Gyet - o xGwoimtxw - o Haiwaas • Gitanyow: - o <i>Wilp</i> Luux Hon

3.5.1 Ensuring the Crown's Duties to Consult and Accommodate Aboriginal Groups

EAO is required to ensure that the honour of the Crown is discharged by ensuring appropriate consultation and accommodation of potential impacts of the proposed Project on the exercise of Treaty rights, proven Aboriginal rights, and asserted Aboriginal rights and title (Aboriginal Interests) in respect of the decision by Ministers as to whether to issue an EA Certificate. Aboriginal Groups' comments and interests in

terms of consultation and specific consideration of the Crown's duty to consult and accommodate Aboriginal Interests are specifically factored into the analysis in Part C of this Report.

There is often considerable overlap between the interests of Aboriginal Groups and the assessment of environmental, economic, social, heritage and health effects. Aboriginal Groups' comments and interests that directly relate to the environmental, economic, social, heritage and health assessments are discussed in Part B of this Report.

3.6 Nisga'a Nation Consultation

During the EA of the proposed Project Nisga'a Nation, (as represented by NLG) participated in EAO's Working Group. NLG was kept fully informed of the progress of the EA, was provided with all information that was sent to the Working Groups, and participated in both Working Group meeting and government-to-government meetings.

During the EA of the proposed Project, EAO consulted with the Nisga'a Nation through a number of activities including, but not limited to:

- Development of the Section 11 Order, and the language specifying the Proponent's requirements in relation to Nisga'a Nation;
- Development of AIRs regarding the 8(e) and 8(f) assessments;
- Participation in Working Group meetings and comment periods during pre-Application and Application Review;
- Government-to-government meetings;
- Participation in the screening of Application;
- Hosting public open houses in Nisga'a Villages during Application Review;
- Participation in the review and comment on EAO's draft referral material (i.e. draft Assessment Report, including 8(e) and 8(f) assessments, draft conditions, and draft Certified Project Description); and
- Opportunity to make submissions directly to ministers regarding the Assessment Report.

On July 31, 2014, the Province and NLG entered into a Dispute Resolution Settlement Agreement to resolve issues over the implementation of environmental assessment and consultation obligations under the Nisga'a Treaty including those related to the Kitsault molybdenum mine. This included Guiding Principles and an Appendix C, outlining the process for collaboration in EAs. That Appendix outlined how EAO and NLG would collaborate and strive to reach consensus at key decision points through the course of future EAs, including regarding relevant aspects of EAO's direction to the Proponent,

the screening of the Application related to 8(e) and 8(f) requirements, and the Assessment Report analysis and conclusions related to the 8(e) and 8(f) assessments. The Appendix further outlines that EAO and NLG will collaborate and attempt to conclude a compliance and enforcement framework, as well as specifying additional detail on what would be included in the 8(f) effects assessment.

3.7 Public Consultation

Context

For the purposes of conducting an EA, public consultation requirements are set out in the Section 11 Order dated November 8, 2013. The requirements are intended to provide multiple opportunities for the public to provide input into the process. Shortly after the issuance of the Section 11 Order, the Proponent was required to prepare a Public Consultation Plan, which laid out their consultation objectives and activities. The Proponent submitted multiple Public Consultation Reports to EAO during the course of their EA: the first Public Consultation Report was submitted during pre-Application, the second with their Application, and the third near the end of Application Review.²

In addition to the Proponent's public consultation activities, EAO required public comment periods and open houses during the pre-Application and Application Review stages of the EA. The following provides a summary of those activities.

Summary of Proponent Activities

At time of writing this Report, the Proponent had completed the following activities:

- Engaged with 5 regional districts, 14 municipalities and 2 unincorporated hamlets, responding to concerns/questions and resolving where appropriate;
- Engaged with 212 landowners, sharing Project information and updates as well as following up with those who have questions or express concerns;
- Contacted 414 Crown tenure holders and several other stakeholders, including commercial fisheries, tour operators and recreational land users;
- Hosted 21 open houses (including one community update meeting) along the proposed route;
- Launched a Project website that features Project information, updates, photos, maps, an event calendar, a question submission form, a vendor sign-up form;

² The Public Consultation Plan and all Public Consultation Reports are available on the proposed Project EAO website: http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_403.html

- Developed and implemented a community investment program that considers input received from local governments and communities on local interests and priorities;
- Distributed a monthly letter to local governments, interested stakeholders and Aboriginal Groups, listing field and engagement activities for the coming month;
- Participated in job fairs in Hazelton hosted by Gitksan Education Society, in Terrace hosted by University of Northern British Columbia and in Terrace hosted by Northwest Community College.

In over a year and a half of public engagement, the Proponent has demonstrated to EAO that it has a good understanding of, and has managed for, public interests.

Summary of EAO Activities

- EAO hosted two public comment periods on the proposed Project: one 30-day public comment period during the pre-Application stage on the draft AIR; and, a second 49-day public comment period during the Application Review stage on the Proponent's Application;
- The public comment period on the AIR was held from November 19 to December 18, 2013:
 - o Open houses were held in Mackenzie, Hudson's Hope, New Hazelton and Port Edward from November to December 2013;
 - o There were 75 public comments submitted. These comments and the Proponent's response are on EAO's website³; and
 - o Public comments and consultation during pre-Application informed the development of the final AIR.
- The public comment period on the Proponent's Application was held from May 26 to July 14, 2014:
 - o Open houses were held in Port Edward (approximately 38 attendees), Terrace (50), Hazelton (87), Fort St. James (15), Mackenzie (25), Hudson's Hope (28), Smithers (45), Gitlaxt'aamiks (60), and Laxgalts'ap 80) in June 2014;
 - o There were approximately 31 public comments submitted. These comments and the Proponent's response are on EAO's website³; and
 - o Public comments and consultation during Application Review has informed the development of this Report and EAO's proposed conditions.
- Some of the key issues raised by the public during these open houses and through the online public comment periods included:

³ http://a100.gov.bc.ca/appsddata/epic/html/deploy/epic_document_403_37437.html

- o Interest in economic opportunities for the community including, local training programs and employment benefits;
- o General curiosity about the Project (timeframes and decisions);
- o Effects on wildlife and wildlife habitat and fish and fish habitat (specifically, salmon, the Skeena River estuary, Lelu Island, and fishing sites at the northern end of Lake Babine [rainbow alley]);
- o Effects of the proposed Project on water quality and quantity;
- o Concerns about the social impacts including construction effects on community infrastructure, such as housing, health services and recreation services, especially as a result of an anticipated influx of temporary workers including and increased industrial traffic;
- o Concerns about noise and greenhouse gas (GHG) emissions from compressor stations;
- o Concerns about upstream gas activities;
- o Effects of multiple proposed projects (cumulative effects);
- o Pipeline safety; and
- o Concerns about impacting Nisga'a memorial lava bed park.

Results of Public Engagement

Some of the key issues discussed in the Proponent's third Public Consultation Report included the following:

- Concerns raised during Aboriginal and public consultation activities resulted in the Proponent adopting a new corridor for the eastern and central sections of the pipeline route;
- Concerns raised by residents of the Gantahaz subdivision in Mackenzie resulted in the Mackenzie Route Alternative. This route alternative is located further from the Gantahaz subdivision, eliminates the Williston Bay crossing on Williston Lake, but would pass through Mugaha marsh;
- Concerns regarding recycling, which were raised by the Regional District of Kitimat-Stikine (RDKS) and Skeena Queen Charlotte Regional District (SQCRD) and resulted in the Proponent committing to provide a specific plan for recycling once the prime contractors are awarded;
- Concerns raised by RDKS surrounding Temporary Use Permit application (for camp location, stockpile site and laydown area) and process resulted in the Proponent committing to working with RDKS on the Temporary Use Permit application requirements;
- Concerns regarding potential project impacts on timber, future impacts to forest operations, reduction in annual allowable cut, and extra costs due to the need to

amend the Forest Stewardship Plan and Site Plans raised by Community Forest (Mackenzie) resulted in the Proponent's commitment to negotiate an agreement to address their concerns surrounding the crossing of a community forest;

- A guide outfitter in the vicinity of Moberly River raised concerns regarding potential negative impacts to visitors' "Pristine Wilderness" experience, proximity to their main camp, proximity to animal salt licks, future access created by the pipeline, and length of time that construction would take, which resulted in the Proponent agreeing to either move or compensate the outfitter for a new base camp;
- In response to significant stakeholder input along the proposed route, the Proponent has developed a Skills Training and Education program which focuses on investment in the development of essential and foundational skills, trades preparation programming including the delivery of core tickets, and other investments which are aimed at the development of a skilled workforce and maximizing employment of people who live along the proposed pipeline routes; and
- As a result of input by private landowners, part of the proposed route was moved east to avoid a residential area in the Kispiox Valley.

PART B - ASSESSMENT OF POTENTIAL ADVERSE EFFECTS

4 Environmental Assessment Methodology

4.1 General

4.1.1 Background

In this Assessment Report, EAO assesses whether the proposed Project is likely to have significant adverse environmental, economic, social, heritage and health effects, including cumulative effects, having regard to the mitigation measures proposed in the Application or otherwise developed through the EA process.

In order to conduct this assessment EAO follows the methodology outlined in EAO's *Guideline for the Assessment of Valued Components and Assessment of Potential Effects* (2013). This section provides a brief summary of the methodology.⁴ Note that this methodology differs only slightly from the methodology described in the AIR for the proposed Project, as the AIR was approved before the Guideline was finalized. However, the differences are not material. The general methodological steps in the EAO's environmental assessment process are depicted in Figure 4-1.

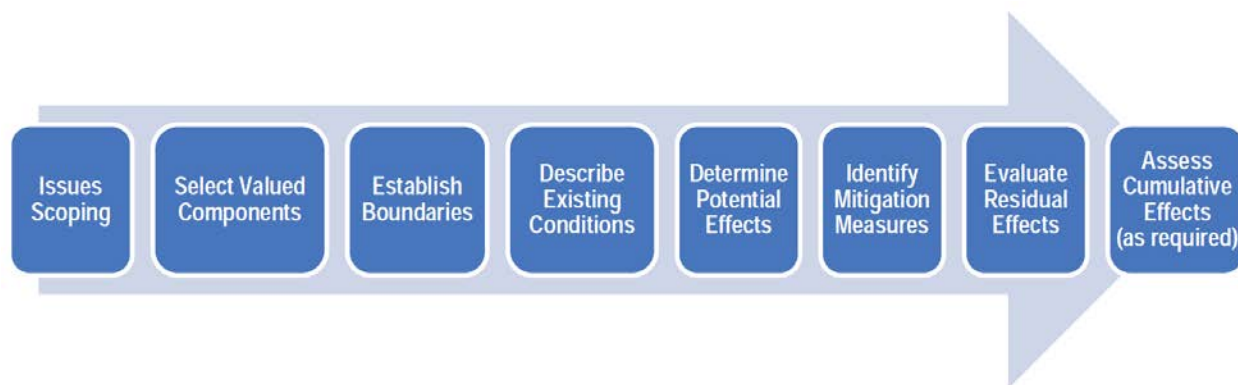


Figure 4-1: Environmental Assessment Methodological Steps

Environmental assessment in BC uses a values-based framework to support a comprehensive, yet focused, understandable, and accessible assessment of the potential effects of proposed Projects. This framework relies on the use of Valued Components (VC) as a foundation for the assessment. VCs are components of the

⁴ The Guideline is available at http://www.eao.gov.bc.ca/pdf/EAO_Valued_Components_Guideline_2013_09_09.pdf.

natural and human environment that are considered by the proponent, public, Aboriginal groups, scientists and other technical specialists, and government agencies involved in the assessment process to have scientific, ecological, economic, social, cultural, archaeological, historical, or other importance.

Appropriate VCs are identified and selected during the pre-Application phase of the EA. Ultimately the VCs that are required to be included in the Application are established by EAO upon issuance of the AIR. Much of the early part of the pre-Application phase is focussed on consultation on the VCs, key indicators, study area boundaries and technical requirements, with Working Group members, including Aboriginal Groups, NLG, and the public.

4.1.2 Study Boundaries

Assessment boundaries serve to define the scope or limits of the assessment. They encompass the areas within and times during which the proposed Project is expected to interact with the VCs (spatial and temporal boundaries), as well as reflecting constraints that may be placed on the assessment of those interactions due to political, social, and economic realities (administrative boundaries) and limitations in predicting or measuring changes (technical boundaries). These boundaries are discussed in the Application for each VC.

Spatial boundaries encompass the areas within which the proposed Project is expected to have potential effects on the selected VCs. The study areas generally include the:

- Project footprint – the area directly disturbed by the proposed Project's physical works and activities;
- Local Assessment Area (LAA) – the area varies by VC, and is based on the zone of influence within which the VC is most likely to be affected by the proposed Project construction and operations; and
- Regional Assessment Area (RAA) – the area provides context for the assessment of potential project effects, and is typically based on a natural transition (e.g., watershed boundary, ecological zone) or an artificial delineation (e.g., political or economic district or zone) that is relevant to the VC, and is often, but not always, used as the spatial boundary for the assessment of potential cumulative effects.

Temporal boundaries encompass the periods during which the proposed Project is expected to have potential effects on the selected VCs. The temporal phases discussed

under each VC are construction and operation, and the effect is assessed for as long as it would persist.

Spatial, temporal, administrative and technical boundaries are discussed in detail for each VC in the Application. In this Assessment Report, spatial boundaries are presented for each VC and other boundaries are discussed as relevant.

4.1.3 Assessment of Valued Components

For each selected VC, the Application describes the existing conditions within the study area in sufficient detail to enable potential project-VC interactions to be identified, understood, and assessed. The description of existing conditions includes, as relevant, natural and/or human-caused trends that may alter the environmental or socio-economic setting irrespective of the changes that may be caused by the proposed Project or other projects and activities in the local area.

The assessment must then consider the potential interactions of the proposed Project with the VC, and the potential effects that could arise. These potential effects are identified, described and an analysis is presented of the potential adverse effects resulting from the proposed Project.

The assessment then describes the mitigation measures that would be incorporated into the proposed Project, including site and route selection, project scheduling, project design (e.g., equipment selection, placement, emissions abatement measures), and construction and operation procedures and practices. Consistent with MOE's Environmental Mitigation Policy and Procedures, EAO considers mitigation to be any practical means or measures taken to avoid, minimize, restore on-site, compensate, or offset the potential adverse effects of a project. Standard mitigation, best management practices, environmental management plans, environmental protection plans, contingency plans, emergency response plans, and other general practices assumed or proposed to be implemented by the proponent are also described in the assessment.

The residual effects to each VC are then identified. Residual effects are those effects remaining after the implementation of all mitigation measures, and, therefore are the expected consequences of the reviewable project for the selected VCs. To inform the determination of the significance of a residual (adverse) effect, it is necessary to characterize the residual effect. Residual effects are usually described using standard criteria: context, magnitude, extent, duration, reversibility, and frequency. These criteria are summarized in the following box:

Summary of Criteria for Characterizing Residual Effects

Context refers primarily to the current and future sensitivity and resilience of the VC to change caused by the project. Consideration of context draws heavily on the description of existing conditions of the VC, which reflect cumulative effects of other projects and activities that have been carried out, and especially information about the impact of natural and human-caused trends in the condition of the VC.

Magnitude refers to the expected size or severity of the residual effect. When evaluating magnitude of residual effects, consider the proportion of the VC affected within the spatial boundaries and the relative effect (e.g., relative to natural annual variation in the magnitude of the VC or other relevant characteristic).

Extent refers to the spatial scale over which the residual effect is expected to occur.

Duration refers to the length of time the residual effect persists (which may be longer than the duration of the physical work or activity that gave rise to the residual effect).

Reversibility pertains to whether or not the residual effect on the VC can be reversed once the physical work or activity causing the disturbance ceases.

Frequency refers to how often the residual effect occurs and is usually closely related to the frequency of the physical work or activity causing the residual effect.

Likelihood refers to whether or not a residual effect is likely to occur. It may be influenced by a variety of factors, such as the likelihood of a causal disturbance occurring or the likelihood of mitigation being successful. Generally speaking, the residual effects described in the assessment comprise the best prediction of what is likely to occur as a result of a proposed project, assuming a suite of proposed mitigation is implemented.

The identification of whether a proposed Project has significant adverse residual effects is a requirement of the *Environmental Assessment Act*. It is therefore important to ensure the determination of significance is clearly documented and explained in the assessment. In particular, the assessment should transparently present how 'significance' has been defined in relation to each VC.

When defining significance for each VC, consideration should be given as to how each of the criteria for characterizing residual effects would inform a determination of significance. Significance may be determined based on a quantitative or qualitative threshold that describes the point beyond which a residual effect would be considered

significant. In some instances, thresholds established for some VCs by legislation, regulation, or regulatory standard may be used.

Once the residual effect prediction has been described in terms of significance and likelihood, it is important to explain the level of confidence in each prediction. The level of confidence is typically based on expert judgment, and should characterize the level of uncertainty associated with both the significance and likelihood determinations. Specifying the level of confidence associated with these determinations allows the decision-maker to better evaluate the risk associated with the proposed Project. The assessment also describes the need for and scope of monitoring or other follow-up programs, including adaptive management programs, to address any identified uncertainty.

Significance is usually determined for both the residual effects of a proposed Project and the cumulative effects. This is critical to enable an informed decision about the project. It is important to understand the characteristics and significance of the potential project-specific residual effects in order to also understand the relative contribution of the project to cumulative effects. The cumulative effects assessment is discussed further below.

4.1.4 Cumulative Effects Assessment

If a proposed Project is expected to result in any residual adverse effects on a VC, the need for a cumulative effects assessment must be considered. It is important to note that this consideration must be made for all residual adverse effects, not only those predicted to be significant.

Where there is a residual adverse effect, the assessment of cumulative effects for reviewable projects should consider other past, present, and reasonably foreseeable projects and activities, which were identified in the AIR. The general steps for a cumulative effects assessment are outlined in Figure 4-2. Considerations regarding the likelihood of a cumulative interaction with other projects and activities, and the proposed Project's contribution to the overall cumulative effect should inform the cumulative effects assessment undertaken.

The Application contains maps and a list and description of all projects and activities considered in the cumulative effects assessment. These projects and activities were specified in the AIR.

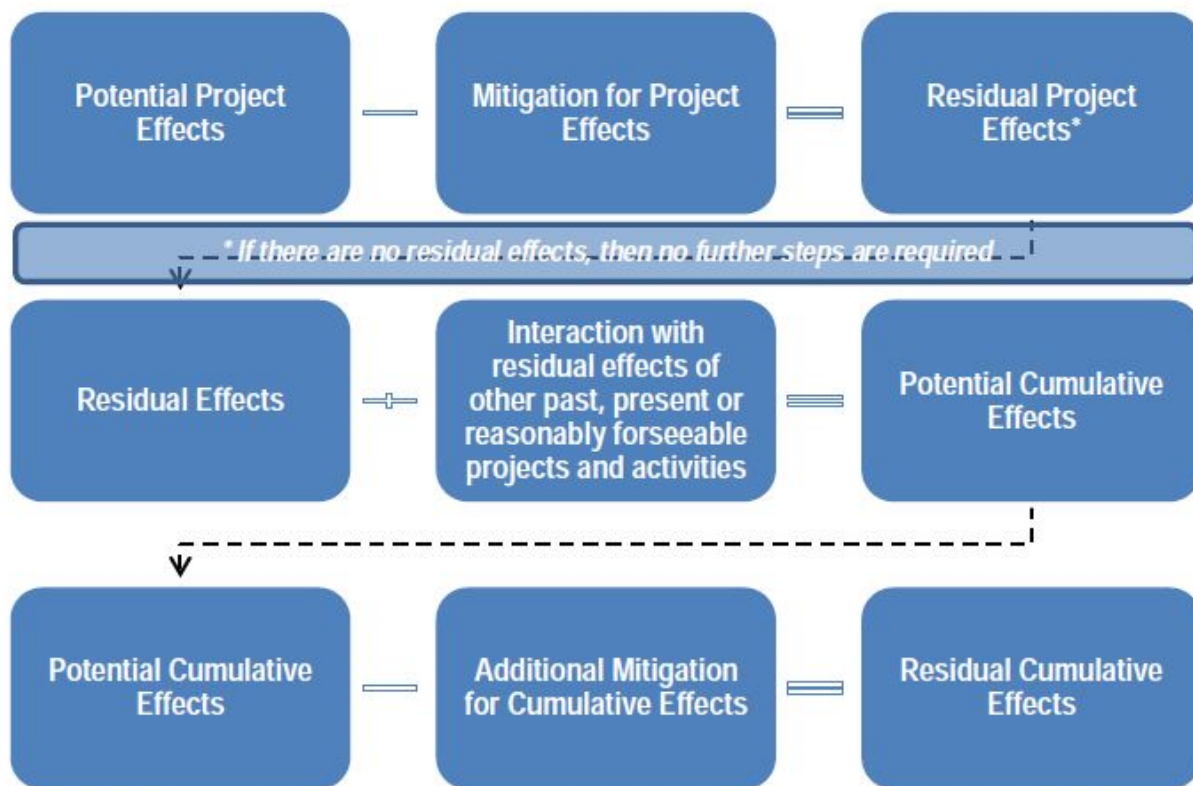


Figure 4-2: Steps to Determine Residual Effects and Cumulative Effects

4.1.5 Environmental Assessment Certificate Documentation

If an EA Certificate is issued, the EA Certificate would include a Certified Project Description (CPD) and Table of Conditions.

The CPD describes what is certified by an EA Certificate. It primarily consists of a description of the components of the Project and describes all of the essential elements of the Project proposed by the Proponent, taking into account any changes to the project that occurred during the EA. If a Certificate is issued for the Project and the Proponent subsequently proposes to vary from the CPD, an amendment to the EA Certificate would be required.

If the ministers decide to issue an EA Certificate, they may attach legally binding conditions to it, under Section 17(3)(c)(i) of the *Environmental Assessment Act* (Act). A “condition” is a legally binding requirement set by ministers to which a holder of an EA Certificate must adhere. The Table of Conditions (TOC) is provided to ministers as part of the referral package. As part of their decision regarding whether or not to grant an EA Certificate, ministers determine which conditions would be attached to an EA Certificate.

The EAO's goal is to ensure that the conditions are clear, measurable and enforceable. In general, conditions are based on mitigation measures identified by the EAO, Working Group, Aboriginal Groups, NLG or the public to prevent or reduce potential adverse environmental, economic, health, heritage or social effects. Conditions may also serve the purpose of preventing or reducing potential infringements to treaty rights or adverse impacts to asserted Aboriginal rights.

4.1.6 Compliance and Enforcement

EAO has a Compliance and Enforcement (C&E) Program, with the primary responsibility for compliance oversight and enforcement for EA conditions on all projects subject to the Act in BC. EAO's C&E Program builds on the expertise and resources of other agencies, including the C&E Branch of FLNR, Ministry of Energy and Mines, OGC, Conservation Officer Service and the Environmental Protection Division of MOE.

EAO conducts extensive planning to ensure effective, risk-based compliance oversight. The two key plans prepared by EAO C&E staff are:

- Compliance Management Plans (CMP): After a project has been certified, the EAO C&E staff prepares a CMP in collaboration with partner agencies (e.g., OGC, FLNR and MOE). The CMP outlines the general approach to compliance oversight for the project and clarifies inter-agency responsibilities for inspecting and enforcing the certificate conditions. This plan is updated as the Project progresses; and,
- Annual Inspection Plans: Each fiscal year, the EAO plans its administrative (i.e., desk-based) and field-based inspections for the year in keeping with risk-based criteria developed by the EAO and the targets specified in MOE's Service Plan. Unplanned inspections are also conducted in response to new information received by the EAO, public and Aboriginal group complaints or in follow-up to previous inspections.

When information from an inspection, Certificate holder self-report, public or Aboriginal Group complaint or partner agency indicates that a Certificate requirement may have been breached, EAO C&E staff conducts an investigation to collect the evidence necessary to determine if enforcement action is warranted. Investigations vary in effort and length of time depending on the nature and complexity of the non-compliance. Often, partner agencies are involved in the investigations.

Throughout the life of a project, EAO and compliance partners collaborate to ensure the project is constructed and operated according to the EA Certificate.

5 Assessment of Environmental Effects

5.1 Acoustics

5.1.1 Background

This section presents an assessment of the potential noise effects from construction and operations on human receptors. Noise effects on wildlife are assessed under the wildlife and wildlife habitat section 5.8 of this Report and noise effects on the marine species are assessed in section 5.9.

The LAA is defined as a 1.5 km band centered on the proposed route, which is consistent with OGC's *Noise Control Best Practices Guideline* which specifies noise level thresholds at 1.5 km if no human receptors are found within 1.5 km. The RAA is defined as an area extending 5 km from the Project footprint.

The framework for the effects assessment on the acoustic environment is provided by OGC and Health Canada, each of which uses a different assessment methodology. OGC's *British Columbia Noise Control Best Practices Guideline* is receptor based, guiding the control of noise during Project operations. It prescribes a maximum cumulative permissible sound level at dwelling units (receptors) located at standard distances from the noise source. Health Canada's guidance is used to inform noise management during construction activities based on international standards and technical publications. The guide uses an adjusted day-night sound level (L_{dn}) and a percentage highly annoyed (%HA) parameter. Noise effects during the construction phase are compared to the Health Canada's guidelines for Mitigated Noise Level (MNL) for L_{dn} and change in %HA.

Acoustic modeling was conducted in accordance with the International Organization for Standardization (ISO) calculation standards. The acoustic modeling considered information from the proposed Project as well as assumptions made in relation with other projects, where detailed assessment information was not available.

5.1.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Construction

Potential sources of noise from the proposed Project identified in the Application include construction activities associated with helicopter traffic, blasting, drilling, grading, pipe delivery, installation and backfilling. During construction, potential adverse effects would

be expected to be localized to where the activity is taking place and to last only for the duration of the construction activity. The potential adverse effects would be reversible once construction of each section of the pipeline is completed and the severity of the effect would decrease with distance away from the source.

Because most of the proposed Project is located in remote and unpopulated areas, the Application states that few human receptors would be affected by construction noise along the ROW and that noise from construction and operations would be at or below provincial thresholds, even in “worst-case” conditions. Six specific locations were identified within 500 m of the construction activity as areas with potential human receptors that could be impacted by construction noise above Health Canada’s suggested MNL threshold of 57 dBA. Any exceedance, would only last for a few days before the distance between receptor and the construction activity increases as pipeline construction progresses. The Application states that additional mitigation measures would be designed once the final selection of construction equipment has been made to bring these areas in to compliance.

During HDD activity at watercourses, the L_{dn} is below MNL at receptors 780 m or further from the ROW.

There is only one human receptor that is located within 1.5 km from the proposed marine pipeline route. The only predicted Project noise contribution from the shallow water pipe-laying activity would meet the Health Canada guidance limit of 57 MNL L_{dn} (dBA) when at the closest distance to the receptor.

Mitigation measures discussed in the Application include:

- Construction activities would be scheduled during daytime hours, to the extent practical;
- Where practical, equipment would be turned off when not in use;
- Where applicable, temporary buildings or material stockpiles would be used as noise barriers; and
- Nearby residents would be notified in advance of substantial noise-causing activities. In the event of a noise complaint during construction, the Proponent would work with the complainant to resolve the concern.

Operations

Under the OGC *Noise Control Best Practices Guideline*, acoustic impacts were assessed at the nearest residence or at 1.5 km from the proposed Project boundary, whichever is closer.

Operational activity noise would be primarily generated by proposed compressor stations. Gas turbine exhaust and aerial coolers have noise emissions with low-frequency components, so low-frequency noise effects could be present. Of the eight proposed compressor stations, two have a total of six receptors identified within the RAA, but all were outside of the LAA. No impact assessment was required for these receptors, as they were not within 1.5 km of the compressor stations; however the Application included these receptors in the assessment for information purposes.

Table 5-1 considers the combined noise effects of the proposed Project with the noise contribution of the existing facilities within the RAA, taking into account ambient sound level. Compliance with the OGC recommended PSLs are expected for all compressor stations and at all receptors.

Table 5-1: Modelled Sound Level Results From Compressor Station Operation

Compressor Station	Description	Baseline Sound Level (dBA)		Project Only Sound Level (dBA)		Cumulative Sound Level (dBA)		Meets Noise Control Guideline Limit? (Day = 50) (Night = 40)
		Day	Night	Day	Night	Day	Night	
Johnson Creek 2A*	1.5 km boundary	45.0	35.0	36.6	36.6	45.6	38.9	Yes
	Receptor 102	45.0	35.0	21.0	21.0	45.0	35.2	Yes
Johnson Creek 2F*	1.5 km boundary	45.0	35.0	37.7	37.7	45.7	39.6	Yes
	Receptor 102	45.0	35.0	25.3	25.3	45.0	35.4	Yes
Callazon Creek	1.5 km boundary	45.0	35.0	36.8	36.8	45.6	39.0	Yes
Witter Lake	1.5 km boundary	45.0	35.0	35.1	35.1	45.4	38.1	Yes
Middle River	1.5 km boundary	45.0	35.0	37.6	37.6	45.7	39.5	Yes
	Receptor 146	48.0	38.0	27.2	27.2	48.0	38.3	Yes
	Receptor 147	45.0	35.0	21.9	21.9	45.0	35.2	Yes
	Receptor 221	48.0	38.0	30.1	30.1	48.1	38.7	Yes
	Receptor 222	48.0	38.0	28.1	28.1	48.0	38.4	Yes
	Receptor 223	45.0	35.0	26.4	26.4	45.1	35.6	Yes
Hautete Lake**	1.5 km boundary	45.0	35.0	36.8	36.8	45.6	39.0	Yes
Kispiox	1.5 km boundary	45.0	35.0	37.5	37.5	45.7	39.4	Yes
Borden Lake	1.5 km boundary	45.0	35.0	35.5	35.5	45.5	38.3	Yes
Ishkeenickh	1.5 km boundary	45.0	35.0	36.2	36.2	45.5	38.7	Yes

* The proposed Johnson Creek compressor station 2A was included in Application and the Proposed Johnson Creek compressor station 2F was included in Memo to EAO dated on October 20, 2014. Only one compressor station would be developed.

** In the Application the Hautete Lake compressor station was called Morrison Lake

5.1.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During their review of the Application, the Working Group raised several issues on noise effects. The key issues and the Proponent's responses are summarized below.

Several Aboriginal Groups, including Metlakatla First Nation, Sauteau First Nations, West Moberly First Nations and Gitxaala Nation expressed concern that the Application considered the absence of residential properties to imply an absence of human receptors and ignored potential Aboriginal Group presence near compressor stations. West Moberly First Nations and Sauteau First Nations identified that the proposed Johnson Creek compressor station would be located within an area of frequent use by their members for many traditional land use activities, as well near registered traplines belonging to their members.

The Proponent considered receptors, as defined in the OGC *British Columbia Noise Control Best Practices Guideline*, in the noise impact assessment. The LAA boundary was chosen to coincide with the OGC distances for compliance assessment in remote areas. Outside of the LAAs, noise levels would comply with OGC requirements. Some residual noise effects within the LAA may be present. If the LAA would overlap with areas held as sacred or particularly sensitive by Aboriginal Groups, additional mitigation measures could be proposed. The Proponent would continue to engage with Aboriginal Groups to further refine mitigation measures.

In response to concerns from West Moberly First Nations and Sauteau First Nations about the proposed Johnson Creek compressor station, the Proponent provided a memo to EAO dated October 20, 2014 (*Information Regarding Johnson Creek Compressor Station Relocation*). The proposed Johnson Creek 2F compressor station's acoustic environment LAA would not overlap with the previous LAA submitted in Application, therefore the Proponent conducted an additional acoustic analysis, summarized in the memo. No residences were identified within Johnson Creek 2F compressor station LAA (within 1.5 km from fence line) and the proposed compressor station would be in compliance with OGC *Noise Control Guidelines* and Health Canada recommendations.

Gitxaala Nation sought clarification on noise emissions that would be produced from ancillary facilities, primarily construction camps, laydown/staging areas and temporary access roads.

The Proponent clarified that generally noise emissions from construction camps are not assessed. Accommodation camps would be used by workers to rest and as such are generally quiet during the late evening and nighttime hours. During the daytime hours, not much activity within the camp takes place as crews are out on sites. Health Canada and OGC provide no guidance on assessing the temporary access roads and does not recommend any noise thresholds. Health Canada recommends that access routes to sites be laid out through consultations with potentially affected residents.

The Proponent responded that noise emissions from laydown/staging areas are considerably lower than those from construction activities, and explained that fuel consumption of mobile diesel equipment has consistently been found to be considerably lower at the laydown/staging areas than that at pipeline or facility construction sites. Noise emissions are directly related to the equipment horsepower, and fuel consumption is a prime indicator of the amount and power of equipment present and its use.

Yekooche First Nation identified approximately a dozen dwellings within three kilometers of the Middle River compressor station site, not all of which were included as receptors within the RAA.

The Proponent acknowledged the new information regarding potential receptors, and confirmed that during the analysis, sound level predictions were made over the entire RAA and it is ensured that the noise effects are acceptable (i.e. within guidelines) at every location outside of the LAA. Therefore, any additional receptors (e.g., dwellings or other noise sensitive receptors found within the RAA) are automatically accounted for in the effects assessment and compliance at those receptors is assured.

Yekooche First Nation expressed concern that the maximum predicted cumulative noise level along the LAA boundary at Middle River is near the OGC *Noise Control Guideline* threshold. Yekooche First Nation is concerned about the potential effects of noise disturbance, especially during nighttime hours as the community is situated 2.5 km from the proposed Middle River compressor station.

The Proponent responded that at 2.5 km from the proposed Middle River compressor station (1 km from the LAA boundary) the expected facility noise level would be below the ambient sound level and that noise emissions from the facility are not expected to be audible.

A member of the public expressed concerns that potential adverse noise effects from helicopter traffic could surpass the RAA of 5 km from compressor station fence lines.

The Proponent responded that neither the Application nor OGC guidelines required the consideration of transportation noise associated with access to the facilities; therefore a noise assessment from helicopter flyovers was not performed. It is noted that most of the flights would be limited to daytime hours and during the Project construction phase.

Potential noise effects from helicopter flyovers and sound disturbance to wildlife is considered in section 5.8 of this Report.

5.1.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on the acoustic environment:

- Increase in ambient noise levels.

EAO's characterization of the expected residual effects of the proposed Project on the acoustic environment is summarized below, as well as the EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low to moderate sensitivity	The acoustic environment is generally of a low sensitivity, as the receiving environment is relatively undisturbed and generally not sensitive to noise. However, some human receptors may be sensitive to additional noise disturbance, given the relatively undisturbed context.
Magnitude	Low to moderate	The magnitude of potential adverse effects is generally predicted to be low. Noise from pipeline and compressor station construction and compressor station operations is perceptible, but predicted to be within <i>OGC Noise Control Best Practices Guideline</i> or Health Canada's MNL guideline. The exception is noise from construction for six receptors within 500 m of the Project, where the magnitude of effects would be moderate. The Proponent would design additional mitigation measures during permitting to bring these areas into

Criteria	Assessment Rating	Rationale
		compliance.
Extent	Local	The facilities of the proposed Project would comply with the OGC <i>Noise Control Best Practices Guideline</i> and potential effects would generally not be detectable outside the LAA of 1.5 km.
Duration	Short term to long term	Construction and testing activities for the pipeline would temporarily affect the area's acoustic environment; however, once these activities end, the acoustic environment would return to its original state with no residual effects. Construction activities would be generally limited to 12 hours a day, except during HDD at watercourse crossings, which would be conducted 24 hours a day. Potential noise effects from drilling, testing and servicing would be short term. Construction of compressor stations and meter stations is expected to take up to two years. There would be a long term increase in ambient noise levels during operation of the proposed compressor stations.
Reversibility	Reversible	The potential adverse effects would be fully reversible upon cessation of construction or operational activity.
Frequency	Construction – Semi-continuous Operations – continuous	Potential adverse effects are expected to be occasional or semi-continuous for construction, and continuous during operations at compressor station locations. Construction activities would take place during daytime hours (with the exception of HDD and marine pipeline construction), while proposed compressor stations would operate 24 hours a day.
Likelihood	The likelihood of residual effects to the acoustic environment is high.	
Significance	EAO is satisfied that the proposed Project is not likely to have significant residual adverse noise effects, as adverse effects would be highly localized, and the effects assessments predict compliance with the OGC's <i>Noise Control Best Practices Guideline</i> and the Health Canada guidance at all compressor stations and during pipeline construction.	

Criteria	Assessment Rating	Rationale
Confidence	High confidence	High confidence – EAO has a high confidence in the prediction of significance and likelihood taking into consideration the medium to high confidence in the noise prediction model and that the Proponent would be required to implement mitigation controls to meet the noise thresholds under the OGC's <i>Noise Control Best Practices Guideline</i> .

5.1.5 Cumulative Effects Assessment

The Application determined that past, present, and reasonably foreseeable future projects and activities within the RAA would not overlap with the proposed Project-related changes in ambient sound levels in a way that the regulatory thresholds would be exceeded on a persistent basis. The interaction between the proposed Project and past, present and likely future projects and activities would be negligible.

Considering the negligible interaction with past, present and reasonably foreseeable future projects, the mitigation proposed, and the requirement for other projects and activities to comply with regulatory standards, EAO is satisfied that cumulative effects on the acoustic environment are not likely to be significant.

5.1.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on the acoustic environment.

5.2 Air Quality

5.2.1 Background

Air quality was identified as a Valued Component and included in the assessment due to emissions produced from the proposed Project during construction and operations and potential impacts to human and ecological health and vegetation resources. The Application presents findings of the assessment carried out by the Proponent on the potential air quality effects from construction and operation of the proposed pipeline. Air quality effects on human health are assessed in section 9 of this Report.

Predicted emissions associated with pipeline construction were assessed within 1 km and 5 km bands centered on the proposed pipeline ROW, delimiting the local and regional assessment areas, respectively. Predicted emissions associated with the operation were assessed for the eight proposed compressor stations. The LAA was represented by a 20 km by 20 km square centred on each proposed compressor station, while the RAA was expanded to a 50 km by 50 km square. The air quality RAAs for the Kispiox, Hautete Lake (formerly Morrison Lake) and Middle River compressor stations fall within the Bulkley Valley - Lakes District Airshed, which is managed by an official Airshed Management Plan.

5.2.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Background ambient air quality was determined using air quality monitoring data available from representative continuous air quality monitoring stations in the region and is consistent with MOE guidance. In general, the baseline ambient air quality within the region of the proposed pipeline was considered good, with concentrations of Criteria Air Contaminants (CACs) below the applicable Ambient Air Quality Objectives (AAQOs).

Proposed construction and operational CACs emissions were estimated and included in a technical report appended to the Application. Air dispersion modelling was conducted for CACs associated with the operation of each proposed compressor station in accordance with the *Guidelines for Air Quality Dispersion Modelling in British Columbia* (MOE, 2008) and the Application notes that dispersion modelling for the assessment was conservative. The air quality assessment applied the most stringent of provincial and national AAQOs for the following CACs of interest:

- Nitrogen oxides (NO_x);
- Sulphur dioxide (SO₂);
- Carbon monoxide (CO);

- Respirable fine particulate matter (PM_{2.5}); and
- Respirable coarse particulate matter (PM₁₀).

BC is currently developing Interim AAQOs for NO₂ and SO₂, which were not available at the time of the Application submission. At the request of MOE, EAO directed the Proponent to consider specific objectives from other jurisdictions, to be used as interim objectives. As a result, the air quality assessment considered the objectives from the US Environmental Protection Agency (US EPA) and the World Health Organization (WHO) for 1-hour SO₂ and 1-hour NO₂ objectives.

Proposed construction and operational Hazardous Air Pollutants (HAPs) emissions were estimated in the Application. As BC does not have AAQOs for HAPs, the Proponent's assessment used the Alberta AAQOs for the following HAPs of interest:

- Polycyclic aromatic hydrocarbons;
- By products of diesel combustion;
- Benzene;
- Toluene;
- Ethylbenzene; and
- Xylene.

Benzene, toluene, ethylbenzene and xylenes are a sub-set of total Volatile Organic Compounds (VOCs) and are included as HAPs, owing to their toxicity.

The Application notes that baseline ambient air quality data is considered representative of rural environments, collected from areas away from large populations or large industrial developments. The locations of the eight proposed compressor stations would be away from highly populated and industrial areas, with the exception of the Johnson Creek and Witter Lake compressor stations, which do have other industrial operations with notable emissions within the RAA.

The Application identified that adverse air quality effects would result from activities associated with different Project components.

Emissions from construction

Construction activities for the Project would occur over a period of four years; however, construction activities at any specific location (terrestrial and marine) would last several months or less. During construction, Project activities that would release air contaminants include vehicle and equipment operation, and ROW clearing activities including biomass burning. The Application qualitatively estimated total emissions of

CACs and HAPs from construction in order to evaluate the air quality effects associated with the proposed Project. Air dispersion modelling was not conducted for construction CAC and HAP emissions, which were considered comparably smaller than potential emission impacts on ambient air quality from Project operations.

Emissions of CACs from heavy equipment (including marine vessels) and fugitive (windblown) road dust emissions would be dispersed across the Project footprint. With mitigation, ambient concentrations of CACs, including particulate matter, are expected to be low to moderate within a 2.5 km distance from the Project footprint.

Emissions from operational activities

During operations, the primary source of air quality impacts would be from the operation of up to eight compressor stations (at full build-out), each with natural gas-fired generators, boilers, and turbine compressors. Minor sources of emissions associated with operation include vehicle traffic, maintenance work and fugitive emissions.

The maximum ground-level concentrations for all CACs from proposed compressor stations predicted through dispersion modelling were below the applicable AAQOs.

The potential effects of HAPs are considered in the human health assessment (see section 9 of this Report for more information). Air dispersion modelling HAP emissions was only conducted for the proposed Johnson Creek compressor station, as this had the highest density of human receptors within the RAA.

The Application has proposed the following mitigation for potentially elevated concentrations of all CACs and HAPs and of particulate matter during construction and operations phases:

- Procedures to control road dust through application of water;
- Implement techniques to limit smoke production from burning piles;
- Reduce idling of vehicles and equipment, where practical;
- Maintenance of equipment and vehicles, and reduction of vehicle idling;
- Use multi-passenger vehicles to transport crews; and
- Use of low-sulphur diesel fuel.

5.2.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During their review of the Application, the Working Group raised several key issues on air quality. The issues raised and the Proponent's responses are summarized below.

Two technical memos were provided to EAO (July 18, 2014) in response to questions from MOE on the assessment of air quality effects. The information provided a clarification of NO_x emission calculations and additional information on CALMET (a diagnostic 3-dimensional meteorological model) and CALPUFF (an air quality dispersion model) models' default values used in the air quality assessment. An additional memo was provided on October 20, 2014 (*Information Regarding Johnson Creek Compressor Station Relocation*) regarding the proposed Johnson Creek 2F compressor station. For this proposed location, the Proponent conducted a desktop analysis of regional data collected by MOE monitoring stations. The analysis determined that the baseline air quality values presented in the Application would still be applicable and the air quality model predicted no exceedances for ambient air quality objectives. The characterization of residual adverse effects from construction and operation of the Johnson Creek 2F compressor station would be consistent with the Application and mitigation measures would be unchanged.

West Moberly First Nations, Saulteau First Nations, McLeod Lake Indian Band and Doig River First Nation sought clarification on monitoring that would be conducted to determine the release of CACs, what the mitigation would be for such releases, as well as concerns about the use of water to control fugitive dust.

The Proponent responded that the air emissions monitoring requirements for operation would be determined in consultation with the regulatory authorities during the project permitting phase. The proposed mitigation measures to reduce residual Project effects on air quality are in line with standard industry best practices. The Proponent noted they would continue to engage with Aboriginal Groups and regulatory agencies to refine mitigation measures.

Yekooche First Nation and Halfway River First Nation asked whether the deposition of fugitive dust on vegetation and lichen (i.e. in areas of high forage habitat suitability for culturally important wildlife such as moose or caribou) could be monitored and used as criteria for dust mitigation. As identified in the Application, monitoring would be based primarily on identified concerns or complaints from local inhabitants. However, as much of the area is remote, public feedback and comments regarding air quality are unlikely.

The Proponent responded that no monitoring of the effects of fugitive dust on vegetation or wildlife is proposed at this time. Air quality complaints would be handled on a case by case basis during construction.

Yekooche First Nation and Halfway River First Nation requested that the known atmospheric concentration thresholds for lichen and plant tissue damage be stated and that potential effects be reported and compared against the air dispersion modeling results and asked if monitoring would be conducted for the health of vegetation species proposed for areas in close proximity to compressor stations.

The Proponent responded that the annual predicted concentration of SO₂ for the Middle River compressor station is 1.4 µg/m³ (millionth of a gram per cubic metre). For the other seven compressor stations the maximum predicted annual SO₂ concentration was 2.3 µg/m³. These values are well below the WHO critical level of 10 µg/m³ for ecosystems containing lichens. The critical level indicated for lichen is lower than that for forests and natural vegetation (20 µg/m³). Monitoring is not planned for the areas in close proximity to the compressor stations to determine potential effects for tissue damage from the SO₂ emissions.

5.2.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on air quality:

- Increase in ambient concentrations of CACs and HAPs.

EAO's characterization of the expected residual effects of the proposed Project on the air quality is summarized below, as well as the EAO's level of confidence in the effects determination (including likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	High resilience and low sensitivity	The airsheds affected by the proposed Project are remote and have minimal disturbance at present. The current baseline ambient air quality in the region is considered good and therefore is considered resilient to additional disturbance (up to relevant air quality objectives).
Magnitude	Low to moderate	Project construction and operational activities are predicted to result in low to moderate increases of CACs and HAPs for a limited extent. The maximum predicted ground level concentrations for all CACs and HAPs at all proposed compressor stations are below the

Criteria	Assessment Rating	Rationale
		applicable ambient air quality objectives. The predicted ground level concentrations for NO ₂ and SO ₂ at all proposed compressor stations are below supplemental BC interim objectives.
Extent	Local and regional airshed	Residual effects from construction are not expected to extend beyond LAA. Although the maximum predicted ground level concentrations for CACs and HAPs would be mostly limited to local areas there would be low increases of CACs and HAPs within the regional study area as indicated by the air dispersion modelling.
Duration	Construction: short-term Operations: long-term	The duration of residual effects on air quality from construction activities would occur over four years, but construction activities at any specific location would last only several months or less. The duration of residual effects on air quality from operational activities would be for the life of the proposed Project (40 years).
Reversibility	Reversible	Effects of the proposed Project are considered reversible upon completion of construction and following closure, for construction and operational effects, respectively.
Frequency	Construction: Semi-continuous Operation: Continuous	The frequency of residual adverse effects are considered semi-continuous because the effects on air quality from construction activities would occur only very regularly during construction at specific construction areas. Effects on air quality from the operation of compressor stations would be continuous.
Likelihood	It is certain that residual air quality effects would occur throughout construction and operation.	
Significance Determination	The air emissions associated with the proposed Project would result in residual adverse environmental effects, although these residual adverse effects would not be significant, as the identified objectives and thresholds	

Criteria	Assessment Rating	Rationale
		would not be exceeded, with one exception which was marginally exceeded. EAO concludes that the proposed Project would not have significant residual effects on air quality.
Confidence		High Confidence – Confidence is based on the use of current base available Project design information, monitored background air quality information, and emissions estimation and air modelling methods that have been deemed to be appropriate.

5.2.5 Cumulative Effects Assessment

The Application noted that RAAs of three proposed compressor stations also include other current and reasonably foreseeable projects that have the potential to interact with residual air quality effects of the proposed Project. During Application Review the Proponent acknowledged that the proposed Morrison mine would also have the potential to interact with residual air quality effects of the proposed Project, and produced a supplemental technical memo (September 19, 2014).

The Gething coal project is located 7 km from the proposed Johnson Creek compressor station 2A. The Torwood Lodge Expansion project is located near Hudson's Hope and within the RAA of the Johnson Creek compressor station. The community of Hudson's Hope is also located within the LAA of the proposed Johnson Creek compressor station 2A. Quantitative air quality effects estimates for both of these projects are not currently available. However, since there is no potential for exceedance of cumulative maximum concentrations a detailed cumulative effects assessment was not completed.

The proposed Westcost Connector Gas Transmission Project's (WCGT) K2 compressor station would be located 23 km from the proposed Callazon Creek compressor station and would have the potential to interact cumulatively. However, a cumulative effects assessment was not conducted, as the Proponent stated that information on air quality emissions was not available at the time.

The Mount Milligan mine is within the RAA for the Witter Lake compressor station. Mount Milligan reported exceedance of ground-level concentrations for 24-hour PM₁₀ and annual SO₂ and NO₂ immediately outside of the active mining area. These areas of exceedance are not accessible to the public.

The Application included an initial assessment to determine whether plume overlaps from the Mount Milligan project and the proposed Witter Lake compressor station would result in an exceedance of the applicable ambient air quality objectives. The cumulative predicted maximum concentrations did not exceed any of the objectives for any of the CACs in the regional area.

The proposed Morrison Mine tailings pond is located approximately 1.2 km away from the proposed Project at its closest location to the tailings pond. Cumulative air quality and human health effects from the proposed Morrison Mine project were evaluated in combination with the proposed Project's Hautete Lake (formerly Morrison Lake) compressor station. At the location of maximum impact associated with emissions from the compressor station, the cumulative effect of emissions from the proposed Morrison Mine resulted in only a small increase in the maximum predicted CAC concentrations. Maximum cumulative concentration predictions remained below the BC and Canada ambient air quality objectives. The evaluation of cumulative effects associated with emissions from the proposed Morrison Mine did not result in a change to the conclusions presented in the Application.

5.2.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of the EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on air quality.

5.3 Greenhouse Gas Emissions

5.3.1 Background

Greenhouse gas (GHG) emissions were selected as a VC due to their importance for the global climate and their regulatory requirements in BC. GHG emissions would be released during the construction and operation of the proposed Project. The Application assessed GHG emissions in the context of provincial, national, and global emissions.

There are four major gases or groups of gases that are influenced by human activities that are of interest with respect to GHG emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and, synthetic (not naturally occurring) fluorinated gases (i.e. sulphur hexafluoride (SF₆), hydro-fluorocarbons (HFCs) and perfluorocarbons (PFCs)). Total GHG emissions are reported in this Report as carbon dioxide equivalents (CO₂e), where emissions of each specific GHG are multiplied by their global warming potential.

Regulatory Context

Both the federal and provincial governments have indicated a desire to address GHG emissions and have created strategic-level plans. The Government of Canada has set a target of reducing Canada's total GHG emissions by 17% from 2005 levels by 2020. At present, with respect to GHG emissions reporting, Environment Canada requires that any facility emitting more than 50 kilotons (kt) CO₂e report their annual GHG emissions.

In 2007, the Government of British Columbia passed the *Greenhouse Gas Reduction Targets Act*, legislating provincial GHG reduction targets of 33% below 2007 emission levels by 2020 and 80% below by 2050. Interim reduction targets of 6% by 2012 and 18% by 2016 have been set in policy to guide and measure progress. An Oil & Gas Climate Action Working Group, including representatives of provincial agencies and the oil and gas industry, was established in 2008 to develop strategies to reduce GHG emissions within the industry.

BC's 2012 CO₂e emission levels were reported at 61,500 kt, 4.4% below 2007 levels, in the Province's most recent Greenhouse Gas Inventory Report.

In order to achieve the legislated GHG reduction targets, BC has designed and implemented a suite of policy measures to reduce emissions, including:

- A provincial carbon tax, introduced in 2008 through the *Carbon Tax Act*;
- A carbon-neutrality mandate for all public sector operations (Carbon Neutral Government Regulation), largely achieved through the sourcing of province-

- based offsets via the Pacific Carbon Trust (Emissions Offset Regulation);
- Mandatory GHG reporting program (Reporting Regulation); and
- A potential cap-and-trade program and compliance offset scheme for large final emitters.

EAO recognizes that the impacts of GHG emissions must be addressed globally, and that it is not possible to estimate the impacts of an individual project's emissions on global climate change. However, EAO also recognizes that BC's GHG reduction targets were established in the context of the best science regarding the necessary reductions to global GHG emissions to address impacts to global climate change, and BC's responsibility to contribute to the global reduction. As such, individual projects are assessed against their estimated impacts to provincial GHG emission levels.

The Intergovernmental Panel on Climate Change (IPCC) is an international scientific body under the United Nations, whose role it is to assess available scientific information related to climate change. The IPCC reports that scientific consensus is that anthropogenic sources of GHG emissions are altering the global climate, and that concentrations above 450 parts per million (ppm) of CO₂ in the atmosphere would result in a 50% chance of increasing average global temperatures by 2°C over the pre-industrial average.⁵

The IPCC has developed scenarios (called "Representative Concentration Pathways") to support the development of global policy, mitigation and adaptation measures in response to a changing climate. These scenarios are presented in Figure 5-1 below, with the image on the left showing the projected global CO₂ emissions, and the image on the right showing the associated trends in the atmospheric concentrations of CO₂.

These scenarios provide some information on the global context for GHG emissions. In three of the scenarios GHG emissions are expected to begin declining between 2020 to 2060. In one scenario, this would result in atmospheric concentrations of GHGs starting to decline around 2050, while the growth in concentrations would begin slowing down mid-century. All scenarios would result in atmospheric concentrations exceeding 450 ppm.

⁵ Intergovernmental Panel on Climate Change. 2013. Working Group I Contribution to the IPP Fifth Assessment Report Climate Change 2013: The Physical Science Basis. IPCC. Geneva, Switzerland.

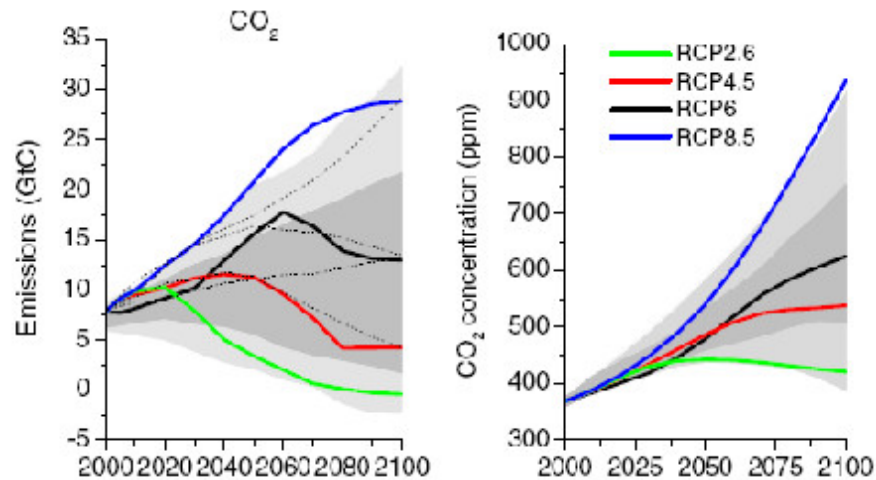


Figure 5-1: IPCC CO₂ Emissions and Concentration Projections

5.3.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

The primary source of GHG emissions during construction would be due to land clearing, while the primary source of GHG emissions during operations would be from the combustion of natural gas to power compressor stations and transport natural gas through the pipeline.

The proposed Project would require natural gas to be extracted, processed and transported to its point of commencement, and it would then transport the sweet natural gas to a proposed liquefaction facility. The extraction, processing, liquefaction, and final use of the natural gas were out of scope of the assessment, as they are not part of the proposed Project. There has also been suggestion that use of exported natural gas may displace the use of coal or other fuels for electricity generation. This was also out of scope of the assessment of the proposed Project.

The proposed Project would have an initial pipeline and compression capacity of approximately 2.0 bcf/d, with the potential to expand to approximately 3.6 bcf/d with full compression. The Proponent estimated the proposed Project's estimated GHG emissions under full build-out (Table 5-2).

The total estimated emissions during construction would be 4.387 megatonnes (Mt) of CO₂e for the construction of the pipeline and all facilities required for full build-out. Approximately 53% of the total emissions would be due to land clearing, 38% the result of biomass burning, 1% from marine vessels, and the remaining 8% from the operation of (terrestrial) construction equipment.

Table 5-2: GHG Emissions Estimates

Scenario	Construction (total CO ₂ e Mt)	Operations (CO ₂ e Mt/year)
Full Build Out (<i>Eight compressor stations, each with two compression units</i>)	4.387 ⁺	1.918

⁺ Estimates updates based on revised estimates provided during Application Review (memo of September 3, 2014)

Land clearing required to create the pipeline ROW would involve the removal of trees and other vegetation, giving rise to GHG emissions. Biomass burning of unmerchantable timber and other vegetation would occur during construction. Residual emissions would occur over the next 20 years as a result of biomass decomposition. While actual land clearing along the ROW is expected to be approximately 50-60 m, land clearing emissions were estimated assuming a 100 m wide construction ROW. This conservative assumption was made to account for not including direct estimates of other cleared areas outside the ROW, such as temporary camps and roads. The percentage of salvageable merchantable timber was estimated to vary by ecoregion, from 68% in the North East and 67% in the Omineca, to 34% in the Skeena.

The final permanent ROW would be approximately 32 m for the pipeline, with approximately 5 m on either side of each pipeline maintained clear of large woody vegetation. If an initial cleared corridor of 50 m would be a better reflection of the actual clearing required, then construction CO₂e emissions would be approximately 45% lower than the construction estimate presented in Table 5-2.

Lost sinks of CO₂ sequestration would result from the clearing of trees and vegetation along the proposed route, at compressor station sites, and on temporary or permanent access roads. Some of these lost sinks would persist for more than 30 years because of maintenance needs along the pipeline ROW and the required permanent compressor station sites and access roads. Some of the lost sinks would be re-established through natural or planned re-vegetation after the construction phase.

At full operational capacity, the proposed Project is estimated to release 1.918 Mt/year of CO₂e, which would be a 0.004% increase in global emissions, a 0.3% increase in national emissions, or a 3.2% increase in provincial emissions. At initial capacity, the proposed Project is estimated to release 0.81 Mt/year of CO₂e. At full build-out 94.7% of annual emissions would be from combustion at compressor stations, 2.9% from fugitive emissions (97% of which would occur at compressor stations), and 2.4% from venting.

The Proponent committed in the Application to undertake mitigation measures to address potential effects of GHG emissions, including to:

- Use provincially accepted guidelines for controlled open burning to maximize burning efficiency;
- Ensure compliance with British Columbia's *Carbon Tax Act*;
- Optimize system design including pipeline diameter, pipeline coating and efficient utilization of compression and station spacing;
- Land clearing of the project footprint would generally be 50 m, with increased space only where required for construction or safety;
- Use an aero-derivative gas turbine, such as GE LM2500+, RR RB211, or equivalent, to reduce fuel usage and GHG emissions from combustion;
- Implement TransCanada's program to manage fugitive emissions;
- Incorporate isolation valves to reduce vented emissions during maintenance, inspection and emergencies; and,
- Reduce vented emissions by utilizing a pull down compressor to transfer gas from affected pipeline sections to unaffected sections or during maintenance activities, where possible.

5.3.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the review of the Application, comments on GHG emissions were raised by MOE's Climate Action Secretariat (CAS), FLNR, Kitsumkalum First Nation, Lax Kw'alaams Band, McLeod Lake Indian Band, West Moberly First Nations, Sauteau First Nations, Doig River First Nation and members of the public. These issues and the responses of the Proponent and/or EAO are summarized below.

Kitsumkalum First Nation requested additional information on the Proponent's proposed GHG Management Plan.

The Proponent noted that the GHG Management Plan is described in the Application and would include details about the mitigation measures being implemented for the proposed Project, as well as discussion on items such as policy updates, emission source categories, effectiveness of mitigations, activity specifications, as well as descriptions of the data management system and quality control/quality assurance procedures.

EAO proposes a condition that would require the Proponent to develop a Greenhouse Gas Emissions Management Plan, with guidance from the Ministry of Natural Gas Development (MNGD) and CAS.

FLNR raised concerns that the calculations for land clearing and biomass clearing were incorrect in the Application.

EAO, the Proponent, and FLNR met to further discuss this issue, and the Proponent submitted revised calculations in a memo dated September 3, 2014. This memo resolved FLNR's request, and was used in the calculations earlier in this section. The revisions resulted in a 32% increase in the estimated total CO₂e emissions during construction from what was presented in the Application; for clarity, these revised numbers were presented in Table 5-2.

CAS had comments of clarification to ensure compliance with the BC Reporting Regulation, as well as questions about the methodology used to estimate and assess GHG emissions. Following the Proponent's response and a meeting with EAO and the Proponent, CAS confirmed that both issues were adequately addressed by the Proponent.

Several members of the public and Working Group raised concerns that the proposed Project's assessment did not include a detailed cumulative effects assessment and that the Application concluded that the residual effects were not significant.

The Proponent responded that they followed required provincial and national methodologies.

EAO has considered the cumulative GHG emissions in the global context of this value component, including the scenarios developed by the IPCC. EAO's conclusion on the significance of the residual effect is discussed below.

5.3.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on GHGs:

- Increase in GHG emissions during construction and operation.

EAO's characterization of the expected residual effects of the proposed Project on GHG emissions is summarized below, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Moderate to High Sensitivity	The IPCC has confirmed that GHG emissions are at levels that are impacting the global climate.
Magnitude	High	The majority of emissions would arise during operations. At full build-out, the proposed Project would increase provincial GHG emissions by 3.2% from 2012 levels. The proposed Project would also increase national GHG emissions by 0.3% from 2012 levels, and global GHG emissions by 0.004% from 2010 levels.
Extent	Global	The geographic impact of GHG emissions from the proposed Project is cumulative globally.
Duration	Long term	CO ₂ constitutes the majority of the proposed Project's GHG emissions (as a share of CO ₂ e). CO ₂ remains in the atmosphere for 100 years or more.
Reversibility	Irreversible	Given current technology and the persistence of CO ₂ in the atmosphere, the effects of the GHG emissions are effectively irreversible.
Frequency	Continuous	GHG emissions would occur continuously for the life of the proposed Project.
Likelihood	It is certain that the proposed Project would emit GHG emissions. However, GHG emissions may be reduced over time due to changes in technology and/or regulatory requirements.	
Significance	After considering all relevant mitigation measures identified in the Application, EAO has determined that the proposed Project would have a significant residual adverse effects on GHG emissions, particularly in consideration of the magnitude of the proposed Project's GHG emissions in relation to BC's reduction targets.	
Confidence	High confidence – EAO is of the view that the estimates presented in the Application are a conservative estimate of potential GHG emissions during construction and operation, and therefore EAO is confident that emissions are likely to be no greater than estimated. The technical approach for estimating GHG emissions has a high level of confidence.	

5.3.5 Cumulative Effects Assessment

EAO did not require the Proponent's Application to include a cumulative effects assessment for GHG emissions.

GHG emissions are a global issue, and the IPCC has produced several scenarios projecting potential global GHG emissions trajectories and the potential impacts associated with these emissions levels.

5.3.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO concludes that there would likely be significant residual adverse effects of the proposed Project related to GHG emissions.

5.4 Soils and Terrain

5.4.1 Background

The proposed Project would cross a variety of soil and terrain conditions. The Application included a soils assessment that considered soil capability and related factors potentially affecting soil productivity and plant growth. Key soils indicators studied in the Application were:

- Agricultural land capability (agricultural soils) – assessed based on a land capability classification system developed for agricultural lands in BC; and
- Reclamation suitability (agricultural and forest soils) – assessed based on the relative quality of soil materials for use as a growth medium.

The Application did not include a separate terrain integrity VC, but included a terrain assessment that considered terrestrial and marine geohazards and their potential effects on the proposed Project, as well as the resulting potential effects on the environment. Terrestrial geohazards such as mass wasting events and seismic events are presented, as well as marine-based geohazards such as subsea mass wasting events, rockfalls and seismic events.

This section considers the proposed Project's potential impacts on soil capability and terrain integrity. EAO's assessment of the potential effects of the environment on the proposed Project, including slope stability and seismic events, is in section 10.3 (Effects of the Environment on the Proposed Project) of this Report.

5.4.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Soil Capability

The Proponent conducted a soil survey along portions of the proposed pipeline route in 2013 to assess baseline conditions for soils within the Agricultural Land Reserve (ALR) and on non-ALR lands. A desktop review of baseline soil conditions was also conducted using existing data sources and literature for forested soils, agricultural soils and soils located within the ALR.

The agricultural land capability of soils within the ALR ranges from Class 3 to Class 7. Class 4 soils make up the majority of the soils within the ALR along the proposed pipeline route. Overall, the agricultural land capability of the soils surveyed within the ALR is considered low due to a climatic heat deficiency limitation. Other observed

limitations include aridity, wetness, inundation and topography. The reclamation suitability of material in the root zone of soils throughout ALR lands was rated fair to poor. On non-ALR lands, the reclamation suitability was rated poor and poor-to-fair.

The Application states that the majority of the soils within the ALR have a moderate to high water erosion risk for topsoil and subsoil. This is due to a higher proportion of fine-textured materials at the surface. Where slopes are steeper, erosion risk is greater, especially on the valley sides of watercourses and other steep areas. Wind erosion risk in topsoil was found to be moderate throughout the LAA, due to the generally fine and organic textures of the soils.

Compaction ratings along the pipeline route, where it crosses ALR lands, were low to moderate in the topsoil and high in the subsoil. Soils with fine textures and poor drainage conditions had higher compaction ratings.

The Application indicates that 31.6 km of the proposed pipeline route would cross ALR lands. Land use within the ALR crossed by the proposed Project is predominantly forested (59%), with the remaining uses consisting of hay, improved pasture, crop, creek and non-rated lands. Outside the ALR, approximately 90% of the land is forested along the proposed pipeline route.

The proposed Project activities associated with clearing, construction and restoration, including blasting, drilling, grading, trenching, soil storage, infilling, slope stabilization, trenching, operations and maintenance have the potential to impact soil quality as a result of admixing, compaction, rutting and contamination and to impact soil quantity due to wind and water erosion.

The Proponent identified mitigation measures to address potential effects on soil capability, including the following:

- Implement site-specific topsoil stripping depth and handling procedures;
- Re-contour the project footprint and areas around facilities to be compatible with surrounding drainage patterns;
- Replace topsoil as soon as possible following construction;
- Employ erosion control measures, such as wind barriers or tackifiers, as required whenever soils are exposed; and
- Initiate re-vegetation as soon as possible after machine clean up.

The Proponent also indicated that an Environmental Management Plan (EMP) and related contingency plans (Soil Handling, Soil Erosion, Wet Soils, Spills and Adverse

Weather Conditions) would be developed and implemented to mitigate effects on soil quality and quantity throughout the proposed Project. These plans were provided in the EMP which was submitted to EAO on September 30, 2014.

Terrain Integrity

The Application presented terrain mapping within a 2 km wide corridor centered on the centerline of the proposed pipeline route. LiDAR data was utilized where available. In marine sections, remotely operated vehicle (ROV) surveys were conducted to characterize the sea floor to the extent possible. Terrain information was also compiled through a desktop review of existing data sources and literature.

The Proponent indicated that the pipeline route's terrain would be further refined during final detailed engineering design, as part of the OGC permitting process. OGC regulates for most terrain aspects for natural gas pipelines situated entirely in BC.

A detailed assessment of geophysical hazards and a marine pipeline risk assessment would be conducted by the Proponent during ongoing engineering design to evaluate areas of potential instability along the proposed route. Information on the frequency of geohazards occurrence, vulnerability, geotechnical properties and mitigation strategies would be thoroughly considered. After completion of the geotechnical program and assessments, a detailed grade plan would be developed with the pipeline construction Contractor before construction starts, to safely install the pipeline, re-establish slopes to a stable profile and implement any additional surface stabilization measures.

The Proponent identified mitigation measures to avoid or reduce the potential effects of geophysical hazards (both terrestrial and marine) on the proposed Project, as well as the resulting potential effects on the environment, which include:

- Conducting detailed terrain studies and geotechnical assessments;
- Slope monitoring, stabilization measures, protective ditch covers, burial of the pipeline, deflection berms, catchment structures, surface water control, and re-vegetation to stabilize exposed banks;
- Regular inspection and maintenance to prevent, identify, and correct (where required) conditions where infrastructure may be compromised;
- Conducting liquefaction and slope instability studies and probabilistic seismic hazard analysis to inform project design;
- Routing the pipeline to avoid (where possible) potentially unstable seabed features (e.g., faults, potential liquefaction zones); and
- Burying the pipeline along most portions of the marine pipeline route.

5.4.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During their review of the Application, the Working Group, including Aboriginal Groups, and the public raised several key issues on soil capability. These issues and the responses of the Proponent and/or EAO are summarized below.

Soil Capability

FLNR raised concerns that there could be residual effects on forested soils within the LAA, including permanent long-lasting changes in inherent soil productivity. They raised an example where grass patches would grow instead of trees, due to changes in soil structure.

The Proponent responded that with the implementation of mitigation measures (e.g., appropriate soil handling), any residual effects are expected to be minor in nature, and unlikely to impact other activities taking place in the area and should re-establish equivalent capability within the Project footprint. Implementation of the post-construction monitoring plan would ensure that any problem areas are identified and addressed.

FLNR noted that reclamation is a corrective measure to return disturbed lands to an improved state and does not necessarily relate to preserving or conserving forest productivity.

The Proponent responded that reclamation suitability ratings incorporated both physical and chemical soil properties. For non-ALR lands, a residual environmental effect on reclamation suitability within a soil map unit is considered significant when the reclamation suitability rating is irreversibly reduced by two or more rating classes from baseline conditions. As reclamation suitability uses thresholds to establish ratings, a change of two rating classes is required to measure significance, to avoid minor variations in soil properties. Appropriate soil handling procedures during construction and reclamation followed by post-construction monitoring and follow-up amelioration of potential problem areas would mitigate long-term residual adverse effects to not significant levels.

The Project would comply with the applicable sections of the Environmental Protection and Management Regulation (EPMR) of the OGAA. The EPMR outlines specific requirements for soil conservation and restoration that the Proponent would be required to follow.

Yekooche First Nation requested additional detail regarding soil handling and mitigation measures for specific type of soils in different moisture conditions, for example, specific mitigation for admixing.

The Proponent indicated that site-specific details for soil handling during construction would be supplied with the alignment sheets for the proposed Project at permitting and would include specific soil handling methods for individual soil units requiring special handling, including shallow and highly erodible soils.

Yekooche First Nation expressed concern that the Application did not specify mitigation to restore soil structure if compaction occurred and suggested that an on-site soil specialist and/or environmental inspector be available to identify areas of high impact soils and to design remedial measures for specific problems encountered.

The Proponent responded that the Environmental Inspector(s) hired for the proposed Project would be supported by appropriate Resource Specialists (including soils specialists) who would be available on site or consulted, as necessary. EAO is proposing a condition that would require the Proponent to retain Environmental Inspectors, as described in the Application.

Terrain Integrity

West Moberly First Nations, Saulneau First Nations, McLeod Lake Indian Band and Doig River First Nation requested further information on the geotechnical hazard identified in the Peace River area on the original route and expressed concern regarding the proximity of the wetland feature at EAKP027 on the alternative route.

The Proponent responded that unstable soils and a potential slide were identified on the south slope of the Peace River in the original proposed pipeline route. On July 31, 2014, the Proponent submitted an Addendum to the Application which relocated the proposed route to the southeast, thereby avoiding this geohazard. The new proposed route is located at a buffer distance (+/- 125 m) from the wetland and in a suitable crossing of the BC Hydro power lines.

FLNR expressed concern over the lack of detailed geohazard mapping data presented in the Application and indicated that more information would be required to support the claim of an overall low risk rating pertaining to terrestrial and marine geophysical hazards.

The Proponent indicated that pipeline risk assessment and design would be addressed as part of the OGC permitting process. A geotechnical assessment of geophysical hazards and marine pipeline risk assessment would be used to inform site-specific engineering design in accordance with regulatory requirements, design codes and standards.

NLG expressed concerns about geohazards should the pipe be laid within the Nass Bottomlands, and about potential lateral erosion that could occur.

The Proponent indicated that pipeline risk assessment and design would be addressed as part of the OGC permitting process. EAO proposes a condition that would require additional geotechnical and risk assessment and the identification of mitigation measures for the Nass Bottomlands prior to construction.

5.4.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on soil capability:

- Loss of soil and topsoil; and
- Change in soil quality due to admixing and compaction.

Based on the analysis detailed in the Application and having regard for the Proponent's proposed mitigation measures, EAO concludes that the proposed Project would not have any residual adverse effects on terrain integrity.

EAO's characterization of the expected residual effects of the proposed Project on soil capability is summarized below, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low to high sensitivity	Through ALR lands, the water erosion risk is generally rated high and the wind erosion risk is considered moderate. Where slopes are steeper, the erosion risk rating is greater, especially on valley sides of watercourses. Poor drainage conditions of some soils may result in a high susceptibility to soil compaction and rutting. The susceptibility of soils to degradation

		from soil mixing varies depends on the textures and depths of the soils involved. In non-ALR lands, the topography, drainage conditions and soil types are highly-variable. Forested soils with high coarse fragment content are considered to have a low sensitivity and high resilience to disturbance. Conversely, poorly-drained silty or clayey soils have a high sensitivity to disturbance.
Magnitude	Low	The effects would be expected to be well within environmental variability and resilience, after the proposed mitigation.
Extent	Localized	Effects would be confined primarily to the Project footprint.
Duration	Short to medium-term	With appropriate site restoration, it would generally take less than one year following final cleanup and reclamation to establish stable vegetation cover to prevent wind and water erosion, and to reverse adverse effects from compaction or rutting (short-term). Residual adverse effects from topsoil loss or degradation during handling could take several years to reverse (medium-term).
Reversibility	Reversible	The residual adverse effects are considered to be reversible.
Frequency	Once and occasional	Potential adverse effects would be largely confined to the construction phase with some occasional, localized occurrences possible throughout operations and maintenance.
Likelihood	There is a high likelihood of residual effects to soil quality and quantity.	
Significance	In consideration of the low magnitude, short to medium-term duration and reversibility of the anticipated residual effects, and the Proponent's proposed mitigation measures, EAO concludes that the proposed Project would not likely result in significant adverse effects on soils.	
Confidence	High confidence – The significance determination and likelihood rating for residual effects are determined with high confidence.	

5.4.5 Cumulative Effects Assessment

In consideration of the spatial and temporal extent of the residual effects of the proposed Project, it is not expected that they would accumulate with residual effects of other past, present or reasonably foreseeable future projects and activities on soil capability. It is not likely that there would be the potential for a significant cumulative residual adverse effect on soil capability.

5.4.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on soil capability, and would not have any residual effect on terrain integrity.

5.5 Freshwater Fish and Fish Habitat

5.5.1 Background

This section provides an assessment of potential effects of the proposed Project on freshwater aquatic resources (freshwater fish and fish habitat). Potential effects of the proposed Project on marine fish and fish habitat for the marine portion of the pipeline route are assessed in the marine resources section of this Report (section 5.9).

Key indicators associated with the freshwater aquatic resources VC include fish species and fish habitat that are important for commercial, recreational or Aboriginal (CRA) fisheries, as well as fish species at risk. Key indicator species associated with CRA fisheries include all five species of Pacific salmon, trout, char, sturgeon, Arctic grayling, northern pike, eulachon, and whitefish. There are nine fish species at risk within watercourses crossed by the pipeline route, including bull trout, eulachon (Nass River and Skeena River), green sturgeon, goldeye, pearl dace, northern red belly dace, spottail shiner, white sturgeon (Nechako River population) and Williston watershed arctic grayling.

The Application assessed the Project's effects on freshwater aquatic resources in the LAA which spans an area extending 100 m upstream and 300 m downstream of disturbed instream or riparian habitat. At larger, more sensitive watercourses, the assessment includes areas up to 1 km downstream, depending on site-specific conditions. The RAA extends ≥ 1 km downstream from the disturbed instream or riparian habitat.

The assessment of effects on freshwater aquatic resources is linked to several other VCs, including surface water quality and hydrology (section 5.6), marine resources (section 5.9), wildlife (section 5.8) including birds, and wetlands/vegetation (section 5.7).

Regulatory Context

The following is a brief overview of federal and provincial legislation, regulations, guidelines and permitting requirements that provide important context for understanding and assessing the potential impact to fish, fish habitat and the aquatic environment. Potential effects and mitigation measures for pipeline construction and operations on the aquatic environment are generally well understood and subject to compliance with federal and provincial regulatory requirements. Authorizations for the proposed Project would be determined by regulatory agencies following the review of permitting applications only if an EA Certificate is granted, and after the Proponent finalizes the

proposed pipeline route, engineering design details and any relevant management or mitigation plans.

Key federal and provincial legislation applicable to the proposed Project activities includes:

- *Fisheries Act* (federal);
- *Species at Risk Act* (federal);
- *Navigation Protection Act* (federal);
- *Oil and Gas Activities Act* (provincial);
- *Water Act* (provincial);
- *Environmental Management Act* (provincial);
- *Fish Protection Act* (provincial); and
- *Forest and Range Practices Act* (provincial).

A summary of the requirements of the legislation that are most applicable to the proposed Project activities that have the potential to affect freshwater aquatic resources is provided below.

Fisheries Act – Unless authorized by DFO, the *Fisheries Act* prohibits any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Serious harm to fish is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat.”

Based on following a *Self-Assessment Process and Measures to Avoid Causing Harm to Fish and Fish Habitat*, proponents are required to ensure their projects avoid serious harm to fish and comply with the *Fisheries Act*. Based on final project design details, watercourse crossings or other proposed Project activities that result in serious harm to fish would require a request for review, or Application for Authorization under paragraph 35(2)(b) of the *Fisheries Act*, for DFO to confirm authorization and offsetting requirements. Offsetting is defined as “measures to counterbalance serious harm to fish by maintaining or improving fisheries productivity after all feasible measures to avoid and mitigate impacts have been undertaken”.

Oil and Gas Activities Act (OGAA) – The EPMP, under OGAA, includes requirements related to protection of the aquatic environment, such as design of watercourse crossings in accordance with best management practices, and mitigation measures in accordance with the *Environmental Protection and Management Guide*. The guide also specifies that, in general, timing windows established for fish and wildlife apply to oil and gas activities in known areas of wildlife sensitivity, or for activities known to have high

potential to cause disruption to wildlife during critical life stages. The guide further notes that, typically, on fish streams, most in-stream works are subject to timing windows.

A site-specific review process is required during permitting to assess all proposed structures on fish streams where critical or important fish habitat has been identified, and to assess all open cut trenched pipeline crossings or closed bottom structures where marginal fish habitat has been identified.

Where proposed stream crossing methods and activities cannot follow the requirements in the EPMR and *Environmental Protection and Management Guide*, an application that includes specific measures to minimize effects on fish and fish habitat must be submitted to OGC for approval.

Water Act – The *Water Act* regulates the allocation and management and use of surface water and establishes protective measures for groundwater and wells. For example, Section 8 of the Act regulates the withdrawal of water from a surface water source during hydrostatic testing of the pipeline, and Section 9 allows for changes in and about a stream in accordance with regulations under the Act. These regulations include timing windows that represent least risk to fish and fish habitat. EAO notes that the *Water Act* will be repealed when the new *Water Sustainability Act* is brought into force, which is expected in 2015.

Environmental Management Act – The *Environmental Management Act* regulates industrial and municipal waste discharge, pollution, hazardous waste and contaminated site remediation. The Oil and Gas Waste Regulation established under the Act authorizes discharge of specific wastes to the environment from oil and gas operations, including water and water/chemical mixes utilized for hydrostatic testing of pipelines. The Regulation does not authorize the release of hydrostatic test water to surface waterbodies or surface watercourses, but it does authorize the discharge of hydrostatic test fluid onto land provided the requirements outlined in Section 7(2)(e) are met.

5.5.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Background

To characterize baseline conditions, existing information was reviewed and then augmented by conducting fish and fish habitat surveys at 2,065 watercourse crossings within the Project footprint from June to October of 2013, including various route options that were considered and not included in the Application's proposed pipeline route. To characterize the minimum area within the definition of the LAA, and to facilitate small adjustments in the pipeline alignment, surveys were conducted at six

transects from 100 m upstream to 300 m downstream of each watercourse crossing. Watercourses with larger zones of influence (ZOI) (i.e., >300 m downstream from the crossing location), were identified for further surveys.

The proposed Project route would cross a total of 1,360 watercourses (including pipeline ROW and new access road crossings) within five major watersheds, including the Peace, Fraser, Skeena, Nass, and Coastal watersheds (see Table 5-3). The Proponent took a conservative approach to classification of watercourses and assumed watercourses were fish-bearing where fish species distributions are unknown. Of the total number of watercourse crossings, 588 occur on fish-bearing, classified watercourses (i.e., S1-S4 fish stream classifications). The other crossings occur on watercourses that are either non-classified drainages (NCDs), no visible channel (NVC) or non-fish bearing and are not considered fish habitat. Based on the information below, approximately 30% of the fish-bearing watercourse crossings occur in the Peace River watershed, 20% in the Fraser River watershed, 26% in the Skeena River watershed, 24% in the Nass River watershed, and less than 1% in Coastal watersheds.

Table 5-3: Summary of Watercourses by Watershed

Major Drainage	Watershed Group	Confirmed Watercourse Crossings		NVC/NCD	Total Watercourses
		Fish-bearing	Non-fish-bearing		
Peace	Upper Peace	55	14	98	167
	Pine River	46	27	21	94
	Parsnip Arm	36	22	23	81
	Nation River	37	12	73	122
Fraser	Lower Trembleur Lake	28	17	36	81
	Middle River	11	6	16	33
	Upper Trembleur Lake	26	8	32	66
	Takla Lake	51	16	38	105
Skeena	Babine Lake	58	6	41	105
	Bulkley River	37	36	9	82
	Kispiox River	60	16	62	138
Nass	Nass River	10	7	22	39
	Lower Nass River	132	24	90	246
Coastal	Work Channel	1	0	0	1
TOTAL		588	211	561	1,360

Note: Data are based on the Conceptual Fish Habitat Offsetting Plan.

The Application identified 62 fish species present within the five major watersheds crossed by the pipeline route. Of the total number of species, 19 are sport fish and 43 are forage fish species. Pacific salmon (chinook, chum, coho, pink, and sockeye) and steelhead occur in 60 watercourses intersected by the pipeline route. As noted above,

fish that comprise or support CRA fisheries, as well as nine designated species at risk, are the indicator species used in this assessment.

Of the nine species at risk within watercourses crossed by the pipeline route, White sturgeon (Nechako River Population), which has been listed on the *Species at Risk Act* (SARA) Registry as Endangered and is red-listed provincially, occurs in the Fraser River Watershed. Due to the current limitations of understanding sturgeon-habitat relationships, and in consideration of the endangered status of the Nechako population of white sturgeon, all habitats within the assessment were assumed by the Proponent to be valuable. Green sturgeon, which is classified as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and red-listed provincially, occurs in the Nass River Watershed. Bull trout have been ranked by COSEWIC as Special Concern and is provincially blue-listed. Bull trout are known to occur in a number of streams crossed by the proposed route in the Peace, Fraser, Skeena and Nass Watersheds. In addition to the above, there are two provincially red-listed species (Williston watershed arctic grayling and spottail shiner) and four provincially blue-listed species (eulachon,⁶ goldeye, pearl dace, and northern redbelly dace) within the RAA.

The Application identified the following potential adverse effects to freshwater aquatic resources, mainly associated with the construction of pipeline and new road crossings:

- Change in fish habitat (both instream and riparian habitat);
- Change in fish health (e.g., harm to fish species through physical injury) or mortality; and
- Change in water quality (addressed in the water section 5.6 of this Report).

The potential for the Project to cause a change in fish habitat, a change in fish health or mortality, or a change in water quality for indicator species (i.e. CRA fish species, and fish species at risk) was evaluated within the effects assessment on freshwater aquatic resources.

Change in Fish Habitat

Localized alterations of fish habitat could occur at fish-bearing watercourse crossings where an open-cut or isolated crossing method is proposed. Potential effects of pipeline construction on fish habitat include alteration of substrate and bank contours, and loss of riparian vegetation and instream habitat. Potential effects at permanent vehicle crossings include permanent loss of riparian vegetation within the road ROW, and re-contoured banks where grading of approach slopes is required.

⁶ Eulachon are currently COSEWIC listed as Special Concern and going through the listing process under SARA.

For trenched watercourse crossings, early stage riparian revegetation is expected to be functional after 5 years following post-construction restoration. The clearing of riparian vegetation within the ROW at watercourse crossings would be reduced to the construction footprint in order to minimize riparian habitat loss/alteration. The loss/alteration of mature riparian function from removal of mature riparian trees in forested areas could extend greater than 30 years (throughout the operations phase) due to long-term vegetation management required to prevent establishment of large riparian trees near the pipeline (i.e. for pipeline protection).

HDD trenchless construction methods (proposed at 9 large watercourse crossings) are not expected to result in any instream habitat alterations, although inadvertent release of drilling fluids into watercourses may occur (see section 10.2 Accidents and Malfunctions). Drilling fluids can cause prolonged sediment load and deposition and may smother aquatic plants and animals, and fish and their eggs. HDD crossings are not expected to result in riparian habitat alteration, except in locations where drill pads or equipment staging areas may be required within the riparian zone.

Table 5-4 shows the estimated riparian and instream disturbance areas and percentage within each watershed as presented in the Conceptual Habitat Offsetting Plan (discussed further below). The estimated total riparian disturbance area from all watercourse crossings within the aquatic environment RAA would be 271,000 m². The estimated total instream disturbance area from all watercourse crossings within the RAA would be approximately 12,778 m². The Lower Nass River watershed contains the greatest share of the proposed Project's estimated instream (46%) and riparian (38%) disturbance.

Table 5-4: Estimated Affected Instream and Riparian Areas by Watershed Group

Major Drainage	Watershed Group	Estimated Affected Area (m ²)	
		Instream	Riparian
Peace River	Upper Peace River	861	19,000
	Pine River	233	5,000
	Parsnip Arm	652	16,000
	Nation River	357	15,000
Fraser River	Lower Trembleur Lake	1,767	9,000
	Middle River	282	7,000
	Upper Trembleur Lake	88	3,000
	Takla Lake	770	16,000
Skeena River	Babine Lake	204	9,000
	Bulkley River	298	16,500
	Kispiox River	933	34,000

Major Drainage	Watershed Group	Estimated Affected Area (m ²)	
		Instream	Riparian
Nass River	Lower Nass River	5,749	100,000
Coastal Watersheds	Work Channel	584	21,500
Totals		12,788	271,000

Note: Based on the Conceptual Habitat Offsetting Plan (July 2014)

The Proponent applied the DFO Risk Management Framework to assess the sensitivity/ risk associated with crossing sites. Streams are assigned a risk rating based on this analysis. From this analysis, 41 high risk, 17 borderline high risk, and 29 medium risk watercourse crossings were identified where Project works have the potential to result in a permanent alteration or destruction of fish habitat (Table 5-5). For these crossings, based on the Proponent's preliminary assessment, an authorization under the *Fisheries Act* and accompanying habitat offsetting plan may be required.

Other than the Coastal Watershed where there is only one crossing and it is rated border-line high, the largest proportions of watercourse crossing with high sensitivity ratings are located in the Nass River and Skeena River watersheds (28% and 26% respectively), whereas 9% of the Peace River watershed watercourses and 4% of the Fraser watershed watercourses are rated as having high sensitivity. This relates to the greater diversity of fish species, locations of the proposed route within the watersheds (upper watershed vs. lower watershed), and a higher occurrence of salmonids and species of concern found in the Skeena and Nass River watersheds.

Table 5-5: Number of Watercourse Crossings by Watershed and Risk Ranking

Major Drainage	Watershed Group	High	Border-line High	Medium
Peace River	Upper Peace River	3	1	1
	Pine River	1	1	1
	Parsnip Arm	4	1	-
	Nation River	-	2	7
Fraser River	Lower Trembleur Lake	-	1	3
	Middle River	2	-	-
	Upper Trembleur Lake	1	-	1
	Takla Lake	1	1	3
Skeena River	Babine Lake	1	2	-
	Bulkley River	5	2	1
	Kispiox River	7	2	4
	Lower Nass River	16	3	8
Coastal Watersheds	Nasoga Gulf	-	1	-
Totals		41	17	29

Effects on Change in Fish Health or Mortality Risk

The Proponent considered the effects of grading, vegetation clearing, excavation, structure removal, use of industrial equipment, use of explosives, placement of material or structures in water, in-water trenching, and water extraction on fish health or mortality risk. The effects identified included: change in sediment concentrations; displacement or stranding of fish; potential mortality of fish-egg-ova from equipment; change in water temperature; lethal or sub-lethal effects on fish; and, incidental entrainment, impingement; or mortality of resident fish species.

Measures proposed by the Proponent to mitigate change in fish health or mortality risk included: avoidance; mitigation within project design; measures and best management practices to be included in an EMP for aspects such as use of industrial equipment, dredging for in-water trenching and water extraction.

Localized fish mortality through disturbance to instream habitat and burial of alevin or eggs embedded within substrates may occur at fish-bearing watercourse crossings where an open-cut or isolated crossing method is proposed. The Proponent has stated that past experience with pipeline watercourse crossings has shown that risk of increased fish mortality can be reduced to very low levels through diligent application of fish salvage measures, construction monitoring, and other mitigation measures.

Although loss of an individual fish is a permanent loss, the reduced fitness or loss of a small number of fish that are part of a secure population would be a reversible effect with respect to the local population. In watercourses that would be crossed by the pipeline, increased risk of mortality to fish would be confined to the LAA, and replacement of the individuals could be expected within one or two generations (i.e., short- to medium-term duration). The Proponent predicted that numbers of dead or moribund fish at watercourse crossings as a result of proposed Project activities would be very low, such that there would be no measureable effects to species at a population level.

Mitigation Measures

Mitigation measures of potential effects were developed by the Proponent in consideration of DFO's hierarchy of preferences as described in their *Fisheries Protection Policy Statement*. These measures, in order of preference, are avoidance, mitigation and offsetting. The Application provides additional detail on potential effects and proposed mitigation measures for the construction of pipeline and vehicle watercourse crossings. Some of the key mitigation measures proposed in the Application include the following:

- Pipeline crossings would be constructed or installed as outlined in the EMP and according to typical drawings provided in the EMP;
- Pipeline crossing method selection process, as described in section 10.5.1.3 of the Application, to be based in part on sensitivity of fish habitat and species present in order to minimize potential effects (e.g., HDD trenchless crossings);
- Adherence to instream construction timing windows of least risk where possible;
- Development and implementation of a project-specific EMP that includes standardized mitigation measures, best management practices and monitoring requirements to ensure fish habitat during construction is protected. Relevant components to be developed as part of the EMP include but are not limited to: a site-specific Watercourse Crossing Mitigation and Inspection Plan; Directional Drilling Procedures and Instream Drilling Mud Release Contingency Plan; Erosion and Sediment Control Plan; and Water Quality Monitoring Plan;
- Conduct isolated crossings of watercourses in accordance with the applicable DFO Letter of Advice or authorization and/or additional conditions and measures provided by DFO, resulting from their case-specific review;
- Clearing of temporary workspace would be prohibited within 10 m of a watercourse to protect riparian areas, where possible;
- For isolated crossing methods at fish-bearing watercourses, conduct a fish salvage led by an aquatics specialist (i.e., Qualified Professional);
- Ensure water and pump intakes reduce or avoid disturbance of the streambed and are screened following DFO's *Freshwater Intake End-of Pipe Fish Screen Guidelines*; and
- No sediment laden water would be permitted to enter a watercourse at any time.

Additional mitigation measures for watercourse crossings are provided in the Proponent's Application (section 10) and section 8.4 of the draft Construction EMP.

Fish Habitat Offsetting Plan

A Conceptual Fish Habitat Offsetting Strategy was provided as an appendix to the Application. At the request of EAO at the time of the screening decision on the Application, a Conceptual Habitat Offsetting Plan was developed by the Proponent and submitted in July 2014. This plan provides further details with regards to the Proponent's plans for offsetting impacts of the Project on fish habitat, and is discussed under section 5.5.3 below.

5.5.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the Application Review, the Working Group, including Aboriginal Groups, and public raised concerns about the potential effects of the proposed Project on fish and fish habitat. Concerns were raised in relation to the following:

- Limited baseline information;
- Habitat effects from watercourse crossings;
- Suspended sediment and water quality;
- Increased access to fish harvesting and overfishing;
- Lack of information on requirements for *Fisheries Act* authorizations and habitat offsets;
- Potential fish mortality and implications for Aboriginal fish harvesting; and
- Potential effects to species at risk and salmon sub-populations.

An overview of concerns raised and the response of the Proponent is presented below.

Limited Baseline Information

Concerns were raised by several Aboriginal Groups and regulatory authorities over limitations of the baseline data used to characterize the relevant environment and as a basis for analysis and conclusions on nature and significance of predicted effects.

Examples of concerns raised were:

- A single sampling event between June 2013 to January 2014 may not be sufficient for or representative of the construction timing at specific sites;
- Insufficient information was provided on fish species expected to occur at each watercourse or within each basin; and
- Insufficient value was given to habitat used by forage/coarse fish, regionally important species, and areas of cultural importance in the categorization of habitat sensitivity.

The Proponent noted that information on all fish species occurring in the RAA, by watershed group, is provided in the Freshwater Aquatic Resources Technical Data Report. The Proponent acknowledged that the fish and fish habitat surveys for the proposed Project represent a snapshot in time at each crossing. With regard to habitat sensitivity categorization, the Proponent clarified that non-fish-bearing streams are those for which fish-absence (all species) has been confirmed, or the minimum habitat requirements to support fish were found to be not present. All watercourses were assumed to be fish-bearing unless definitive

information confirming absence of fish was available. During construction, least risk timing windows would be followed, unless otherwise authorized.

In the technical memo developed by the Proponent addressing concerns over potential effects to white sturgeon, the Proponent has committed to conducting additional field surveys on all watercourses (including side-channels) that would be crossed or otherwise encountered through Project-related activities. As of the time of writing this memo (July 21, 2014), these surveys were in progress, with additional watercourses slated to be surveyed in the 2014 field season.

The Proponent has also noted that additional pre-construction fish population surveys may be required at high sensitivity watercourse crossings to provide baseline abundance estimates of fish species at the crossing location.

Habitat Effects from Watercourse Crossings

Numerous concerns were raised during Application Review with regard to watercourse crossings and potential adverse effects to fish habitat. For example, further details were requested by FLNR in relation to potential substrate changes at watercourse crossings, quantification of habitat area lost (and how this was estimated). Questions were raised by FLNR, MOE, and Aboriginal Groups regarding the Proponent's assertion that the riparian zone would recover within 5 years of disturbance.

The Proponent has acknowledged that fish habitat loss is expected at watercourse crossings where an open cut or isolated crossing method is proposed at fish-bearing watercourses rated as high or medium high sensitivity within the Assessment. The majority of fish habitat loss would be temporary and would occur only during construction. Important fish habitat lost as a result of watercourse crossing construction may require an offset under the *Fisheries Act*. Details on the quantification of fish habitat loss and watercourse crossings requiring offsetting are described within the Conceptual Fish Habitat Offsetting Plan (described further below). The final offsetting plan would be developed through consultation with participating Aboriginal Groups and DFO.

With regards to watercourse substrates, the Proponent clarified that notable changes are not expected at watercourse crossings. If notable changes are identified at critical habitat locations during construction and compliance monitoring, the Proponent has committed to implement corrective actions.

The Proponent acknowledged that riparian vegetation would not be fully functional after 5 years; however, shrub layers would provide shading

(temperature mitigation) and fish cover within 5 years. Trees would be permitted to naturally re-establish to within 5 m each side of the ditchline along the ROW, and where practical across the full width within the riparian reserve zone at watercourse crossings.

Suspended Sediment and Water Quality

Concerns were raised over potential changes in water quality and the time required for recovery is presented. The likelihood that all substrates (particularly clays and silts) at crossings would settle within the LAA was questioned by FLNR and Aboriginal Groups. Threshold values and management response were also raised by MOE.

The Proponent responded that the majority of sediments are anticipated to settle within the LAA (≤ 1 km) downstream, depending on stream characteristics. The potential for settlement of fine sediments to extend beyond the LAA was acknowledged.

To protect aquatic life and habitats, total suspended solids (TSS) in water entering a drainage course from construction areas would meet MOE Water Quality Guidelines. The final EMP would provide for turbidity and sediment guidelines based on the current MOE *Water Quality Guidelines for Freshwater Aquatic Life*. TSS in water entering a drainage course from construction areas would meet criteria, and no sediment laden water would be permitted to enter a watercourse at any time.

EAO proposes a condition requiring the Proponent to develop and implement a Freshwater Water Quality Monitoring Program associated with the construction phase of the proposed Project at stream crossings. This Program would include onsite water quality monitoring, including turbidity and TSS, and appropriate provisions for managing potential exceedances of Water Quality Guidelines.

Increased Access and Potential Overfishing

Concerns were raised by Aboriginal Groups and FLNR over the potential for increased fishing pressure and potential overfishing as a result of access opened up by the proposed Project to previously inaccessible areas.

The Proponent noted that during working hours and while housed in construction camps Project personnel would be prohibited from fishing on the work site and using recreational vehicles on the pipeline footprint and access routes. Access controls would limit public access to the ROW and otherwise remote fish areas.

Details of the access control plans have been developed as part of the Proponent's recently drafted EMP, submitted to EAO on September 30, 2014.

EAO proposes a condition which would require the Proponent to prepare an EMP, consistent with commitments made in the Application and with the draft EMP. This EMP would be reviewed by appropriate regulatory agencies prior to being finalized and approved by EAO. EAO also proposes a condition which would require the Proponent to develop a no-hunting, no-trapping, no-fishing, and no-plant gathering policy for employees and contractors.

Lack of Information on Requirements for Fisheries Act Authorizations and Offsets

Numerous questions and concerns were raised by FLNR and Aboriginal Groups related to potential effects of the Project on fish and fish habitat that may require authorization under the *Fisheries Act*, and associated habitat offsets. Key issues raised are as follows:

- Offsetting plans for harm at watercourse crossings are not included in the Application, and must involve the interests of Aboriginal rights and title holders (raised by Lax Kw'alaams Band);
- Uncertainty as to which crossings may or may not require authorization and offsetting, pending confirmation with DFO in permitting;
- The probability of success for a medium to high risk crossings that could require a habitat offset was questioned (FLNR);
- Uncertainty about the assessment of effects due to an unknown construction schedule and the potential for some crossings to be constructed outside least risk timing windows.

A conceptual habitat offsetting strategy was submitted with the Application. In order to better understand the potential effects on fish and fish habitat, in consideration of mitigation measures identified in the Application, EAO requested that the Proponent provide a Conceptual Fish Habitat Offsetting Plan. The Proponent indicated the watercourses rated high, borderline high, and medium risk had the potential to require authorization under the *Fisheries Act* and potential offsetting. It is expected that a no-net-loss objective for fish habitat productive capacity could be achieved with effective design and implementation of habitat offsetting.

The Proponent's Conceptual Habitat Offsetting Plan identifies high sensitivity/high risk watercourse crossings within each watershed that would potentially require *Fisheries Act* authorization by DFO and offsetting measures

for proposed Project activities resulting in serious harm to fish (due to permanent alteration and destruction of fish habitat).

As noted in the Conceptual Habitat Offsetting Plan, the Proponent has committed to the development of a final Offsetting Plan in consultation with DFO and Aboriginal Groups. Details of offsetting measures would accompany *Fisheries Act* authorization applications. Implementation of habitat offsetting measures, if and as required by DFO for *Fisheries Act* authorizations, would also include a monitoring program to confirm offsetting features are constructed in accordance with the final offsetting plan and conditions of the *Fisheries Act* authorization and to confirm offsetting measures are successful.

The Proponent would also be required to comply with the EPMR, under OGAA, which includes requirements for implementing mitigation measures for pipeline watercourse crossings and riparian management areas in accordance with the *Environmental Protection and Management Guide*.

Potential Fish Mortality and Implications for Aboriginal Groups Fish Harvesting

Concerns were raised by Aboriginal Groups and regulators over the potential for fish mortality and related implications for Aboriginal fish harvesting. For example, concerns were raised in relation to mortality to incubating redds/expected egg mortality. Additional detail was requested on how blasting activity, noise and vibration have been addressed in the assessment of fish mortality, as well as how fish salvage would occur.

The Proponent noted that potential mortality to incubating eggs was considered within the effects assessment since eggs, larvae, and juvenile stages of fish embedded within the substrate are included within the *Fisheries Act* definition of a fish. Fish mortality numbers as a result of crossing construction, with mitigation, are expected to range from none to a small number of mortalities. Estimates of dead and moribund fish would be enumerated during construction where open-cut or isolated crossing methods are proposed, and in conjunction with post-monitoring species abundance surveys, be used to determine if predictions of the Application were accurate. The majority of ancillary pipeline facilities are sited away from fish-bearing watercourses, and therefore operational impacts of noise and vibrations are not anticipated.

Additional avoidance, mitigation measures, guidelines, and best management practices to reduce potential effects of blasting, noise, and vibrations on important fish and fish habitat would be provided in the final EMP. The EMP would include specific measures on least risk construction windows to avoid or

minimize potential effects on fish eggs or alevin in substrates. Details on fish salvage methods and water quality monitoring at watercourse crossings during construction would be included in the final EMP.

The Proponent has committed to continue to engage with Aboriginal Groups in the development of the EMP.

Potential Effects to Species at Risk and Salmon Sub-Populations

Reviewers raised issues surrounding the importance of considering species at risk and genetically distinct sub-populations of salmon in the assessment. Some of the key issues raised were:

- Several Aboriginal Groups raised issues surrounding the need to assess proposed Project effects on salmon sub-populations, referencing the DFO *Wild Salmon Policy* which emphasizes the need for conservation measures at the level of genetically unique sub-populations, referred to as Conservation Units;
- The proposed compressor station and stream crossings through the Middle River confluence into Trembleur Lake could impact downstream fish habitat values and into Trembleur Lake, which include critical habitat for the Nechako population of white sturgeon;
- FLNR raised concerns with regards to residual effects for watercourse crossings that support unsecure, sensitive fish populations; and
- FLNR and Aboriginal Groups raised concerns about the proposed pipeline crossing at Callazon Creek. FLNR noted that the crossing site is located within a section of Callazon Creek that contains confirmed bull trout spawning habitat, and that this section of Callazon Creek is deemed to be important to maintaining the Pine River watershed's bull trout population productive capacity. FLNR also highlighted that MOE is in the early stages of considering designating this section of Callazon Creek as a bull trout WHA. In their Application Review comments, the McLeod Lake Indian Band reiterated the importance of Callazon Creek in providing bull trout habitat. Questions were raised by numerous Aboriginal groups as to how the pipeline trench would impact subsurface flow to the creek, given the importance of upwelling zones for bull trout redd viability.

The Proponent developed a separate technical memo regarding potential Project effects on white sturgeon. The Proponent noted that additional information would be required to mitigate site-specific effects on white sturgeon, including species utilization and dependency. The Proponent committed to avoiding impacts to white sturgeon, and to conducting additional field studies to inform and meet the requirements of DFO and further consult with Nak'azdli Band. The Proponent

further commits to develop and implement comprehensive monitoring plans intended to validate predictions of Project effects. Special consideration of white sturgeon and the recovery plan for this species would be incorporated in these monitoring plans.

The Proponent acknowledged that there may be distinct salmon sub-populations spatially isolated in some watercourses. This was considered in the assessment of effects.

The importance of fish and fish habitat values of the Middle River and confluence into Trembleur Lake was acknowledged by the Proponent. Mitigation measures to be implemented to minimize effects on salmon, Nechako white sturgeon and other fish species are provided in the Application and would be expanded upon in the final EMP.

Several watercourses support unsecure or sensitive fish populations (e.g., the Middle River, Skeena River, Babine River) and these are accounted for in conclusions on levels of residual effects of watercourse crossings. Where an isolated or open-cut method of crossing is proposed at crossings containing sensitive fish populations, mitigation measures, such as timing of works and fish salvage, would be implemented to avoid harm to large numbers of fish. Residual impacts to fish habitat may be predicted at some of these crossings, and a *Fisheries Act* Authorization and accompanying habitat offset would be required.

During Application Review, the Proponent met with EAO and FLNR to discuss the Callazon Creek crossing. They indicated that they have selected their crossing route between areas of known redds. The Proponent has also completed additional analysis and proposed amending their preferred crossing method from isolated trench to HDD (isolated trench would be the contingency method). Their anticipated timing for construction would be Q3 2015, within least the risk timing window. Based on the proposed changes, along with an appropriate level of monitoring at this location (to be described in, and implemented in accordance with, the EMP), FLNR was satisfied with the proposed approach at Callazon Creek.

5.5.4 Characterization of Residual Project Effects

Considering the potential for effects once the proposed mitigation is applied, EAO concludes that the proposed Project is likely to result in the following residual adverse effects to fish and fish habitat during construction:

- Alteration and loss of instream and riparian habitat; and
- Increased fish mortality and injury.

During operations, the proposed Project has a very low likelihood of having a residual effect on fish and fish habitat given the implementation of standard management practices and mitigation measures. Any impacts that may arise from accidents and malfunctions are considered in section 10.2 of this Report.

Summarized below is the EAO's assessment of the expected residual effects of the proposed Project on freshwater fish and fish habitat, as well as the EAO's determination of significance based on the residual effects characterization.

Criteria	Assessment Rating	Rationale
Context	Habitat and Mortality: Undisturbed; variable sensitivity	Habitat: Habitat sensitivity is considered in the risk rankings of watercourses. Critical habitat (e.g., spawning habitat) for fish species of conservation concern has a higher sensitivity to disturbance. Mortality: Fish species of conservation concern have a higher sensitivity and lower resilience to disturbance.
Magnitude	Habitat and Mortality: Low-Moderate	Habitat: The total area of instream and riparian habitat impacted by proposed Project is relatively small on a watershed scale. However, within some watercourses there is the possibility that the Project may impact moderate or high sensitivity fish and fish habitat which may result in "serious harm" to fish, requiring authorization under the <i>Fisheries Act</i> , and habitat offsetting. With effective construction mitigation and post-construction habitat restoration, temporary residual effects from instream and riparian habitat alteration would be limited at each watercourse crossings. Mortality: The proposed Project has the potential to result in injury and mortality to fish during construction of isolated trenched watercourse crossings, but would not affect local population levels.
Extent	Habitat and Mortality: Local	Potential residual effects to fish habitat and fish mortality risk would be within the LAA (primarily 100 m upstream and 300 m downstream, but potentially further downstream on site specific or larger watercourses).
Duration	Habitat: Medium-term to long-term	Habitat: The duration of the effects depend on the instream habitat characteristics, timing and extent of disturbance, effectiveness of mitigation, post-

	Mortality: Short-term	construction reclamation, habitat restoration (and offsetting, if required), and natural stream channel and riparian restoration. However, considering the existing regulatory regime and past practice, the measureable effect is anticipated beyond construction, but material effects would generally not be present beyond a few years. The duration of effects to riparian habitat would depend on the re-establishment of riparian vegetation following construction. Early stages of riparian revegetation (e.g., small shrubs) would take approximately 3-5 years to provide bank stabilization and restore some riparian function. Restoration of full riparian function in some area could take up to 10 years, and at some watercourses may extend for the duration of the proposed Project due to lack of large trees and mature riparian function (e.g., stream cover, shade) along the ROW. Mortality: Potential for fish mortality or injury would be limited to the duration of instream construction activities at each watercourse crossing.
Reversibility	Habitat and Mortality: Reversible	Habitat and Mortality: The residual effects on fish habitat and mortality are expected to be reversible with reclamation, and in some cases offsetting.
Frequency	Habitat and Mortality: Once	Habitat and Mortality: Frequency of fish mortality and habitat disturbance would occur one time, during instream construction activities.
Likelihood	Habitat: The likelihood of residual effects to instream and riparian habitat would vary from low to high, depending on the watercourse and crossing method. The likelihood of impacts to riparian habitat would generally be higher (with the exception of some trenchless crossings). Mortality: The likelihood of residual effects to fish mortality would generally be low to moderate, but would somewhat depend on watercourse crossing method and fish presence at time of construction. Predicted numbers of dead or moribund fish at watercourse crossings as a result of project activities are very low, such that there would be no measureable effects to species at a population level.	
Significance	Taking into consideration the magnitude of the potential effects, as well as their short duration and reversibility, EAO concludes that the residual effects of the proposed Project on fish and fish habitat are not likely to be significant.	
Confidence	The significance determination and likelihood rating for residual effects are determined with high confidence, based on the proposed mitigation measures,	

	particularly existing federal and provincial regulatory requirements, as well as well-developed industry best management practices and compliance with the proposed EA Certificate conditions.

5.5.5 Cumulative Effects Assessment

The Application included a cumulative effects assessment of the combined residual effects that the proposed Project, existing projects and reasonably foreseeable future projects could have on a change in fish habitat and fish mortality or injury, including blockage of fish movement within each watershed. The Proponent considered existing, past, and future activities that included forestry, agriculture, recreational land use, oil and gas, mining, energy, linear infrastructure, and other industrial projects within the RAA. Potential cumulative effects for freshwater aquatic resources were assessed within the RAA and watershed groups.

With respect to a potential change in fish habitat, with effective construction and reclamation works, as well as the implementation of project-specific offsetting measures, a net gain in productive capacity is anticipated. It is anticipated that residual adverse effects to fish and fish habitat could be avoided at most pipeline watercourse crossings with the successful implementation of the proposed mitigation measures, including post-construction fish habitat restoration and monitoring. Offsetting measures (e.g., habitat offsetting), if and as required by DFO for *Fisheries Act* authorizations for serious harm to fish at specific watercourse crossings would further reduce the effects on fish and fish habitat. It is expected that other project proponents within the RAA would be required to adhere to similar regulatory practices and offset any serious harm to fish habitat incurred by their respective project activities.

Potential changes in fish health or mortality risk from construction activities for the Project could also interact cumulatively with the effects of other industrial activities within the watershed. However, proposed Project effects are considered low in magnitude and short term.

In relation to potential effects to both fish habitat and fish health/mortality risk, it is expected that other project proponents within the RAA would be required to adhere to similar regulatory practices, follow similar established guidelines and best practices, and offset any serious harm to fish habitat incurred by their respective project activities. In BC, there are well established best management practices and guidelines that address many of the adverse effects typically encountered on projects where works occur in or near streams. These practices and guidelines include:

1. *Environmental Protection and Management Guide (OGC);*

2. *CAPP Pipeline Associated Watercourse Crossings*, 3rd Edition;
3. *Fish-Stream Crossing Guidebook*, 2012 (Forest Practices Code of BC);
and
4. *Standards and Best Practices for Instream Works* (MOE, DFO).

The environmental objectives common to all of these guides include:

1. Protecting fish and fish habitat, including riparian areas;
2. Providing for fish passage;
3. Preventing impacts on fish eggs and alevin that are present in the gravel, or on adult and juvenile fish that are migrating or rearing; and,
4. Reducing the risk of sediment release and other deleterious substances during work at stream crossings.

The abovementioned objectives and measures for protecting fish habitat and fish health/mortality risk would be applicable to other project proponents in the RAA, there is no reasonable expectation that the proposed Project would contribute to cumulative effects affecting the viability or sustainability of freshwater aquatic resources. For the Coastal GasLink Pipeline Project (CGL) and WCGT Projects, EAO has proposed similar conditions regarding potential effects to fish and fish habitat.

Many Aboriginal groups that participated in the Application Review, as well as FLNR, raised concerns over the cumulative effects assessment. Some of these concerns related to the number of past, present and reasonably foreseeable future projects that were included. The Proponent re-iterated its conclusion that residual impacts to fish and fish habitat would be offset, if and as required by DFO for *Fisheries Act* authorizations, therefore a more detailed cumulative effects assessment was not warranted.

EAO, having considered all of the information and concerns raised about the cumulative effects assessment, as well as standard mitigations and best practices proposed by the Proponent and assumed to be implemented by other project proponents within the RAA, concludes that the residual cumulative effects to fish and fish habitat were assessed as having a low magnitude with mitigation and offsets where required, and are considered not significant.

5.5.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on fish and fish habitat.

5.6 Water

5.6.1 Background

The VCs considered in this section are surface water hydrology, water quality (in the freshwater environment), metal leaching and acid rock drainage (ML/ARD). Key indicators that were assessed in the Application include ML/ARD potential using pH as a proxy, surface water quality including TSS, temperature, turbidity, metals and organic pollutants, as well as surface water flows and drainage patterns.

Changes in flows and drainage patterns that may affect wetland function were included in the hydrology section of the Application. Other wetland parameters are discussed in the vegetation and wetlands section (section 5.7) of this Report. Marine water quality and sediments are discussed in the marine resources section (section 5.9) of this Report.

The hydrological and water quality assessment LAA encompassed watercourses that would be crossed by the Project footprint, extending 100 m upstream and 300 m downstream of the watercourse crossing, depending on channel width and other watercourse characteristics. At a minimum, the RAA in freshwater extended from 100 m upstream to a minimum of 1,000 m downstream of watercourse crossings.

5.6.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Maintenance of water quality and hydrological function is important for aquatic and terrestrial habitat, as well as for domestic water supply and maintenance of community watershed values. This subsection outlines the key aspects of the Application's assessment on surface hydrology, water quality, and potential for ML/ARD.

The proposed Project route would cross a total of 1,360 watercourses within the following five major watersheds: the Peace River, Fraser River, Skeena River, Nass River, and Coastal Watersheds. The proposed route crosses four BC hydrologic zones:

- Southern Rocky Mountain Foothills;
- Nechako Plateau;
- Northern; and
- Coastal.

Drainage patterns and flows are generally undisturbed by human activity in the majority of watercourses crossed by the pipeline, with the exception of the Peace River.

Measurements for pH, electrical conductivity, temperature, dissolved oxygen, and turbidity were collected for watercourses. A preliminary surface water quality baseline program was completed at Williston Lake and eight large rivers: Chambers Creek, a tributary to Chambers Creek, Flewin Creek, Ksgyukwsa'a Creek, Monkley Creek, Morfee Creek, Moberly River, and Peace River, where in situ and analytical water chemistry data were collected. These nine locations were selected based on an analysis of areas that have the potential for existing contaminants given proximity to industrial or communities' activities. Water and sediment samples were also collected from the Parsnip Reach of Williston Lake.

Baseline surface water quality data collected by the Proponent was compared with the Canadian Council of Ministers of the Environment's (CCME) *Water Quality Guidelines* and MOE's *Water Quality Guidelines*.

Baseline hydrology characterization relied on a desktop regional-scale analysis incorporating selected long-term Water Survey of Canada (WSC) data sets from within the hydrologic zones crossed by the Project.

Surface Hydrology

During construction, temporary reductions in streamflow could potentially occur during construction of watercourse crossings. Construction of crossings is expected to have a temporary effect on hydrology for locations where a trenched crossing method is selected. Land clearing and hydrostatic testing are anticipated to have an effect on hydrology. Land clearing removes soil stabilizing vegetation and has the potential to result in erosion. Hydrostatic testing involves the short-term use of water to fill and pressurize the pipeline. These activities may cause changes to surface water flow or local drainage patterns. However, standard mitigation measures are anticipated to effectively manage potential effects of the Project on surface hydrology.

Distinct regional relationships were derived by the Proponent for each of the four hydrologic zones along the project route. Flow statistics for the approximately 1,360 watercourses crossed by the pipeline route were estimated using these relationships.

The Proponent identified several key mitigation measures to avoid or minimize Project effects on surface water hydrology. These measures include the following:

- Field identification of drainage paths prior to construction;
- Re-establishment of original contours and drainage patterns by re-grading the project footprint during site clean-up and reclamation;

- Site-specific mitigations would be applied as necessary to ensure local conditions are reflective of pre-construction conditions pertaining to surface water flow and maintenance of local flow paths;
- Managing rill erosion, by stabilizing exposed soil and implementing additional on-site management as per the Soil Erosion Contingency Plan and Wet Soils Contingency Plan;
- Preventing surface water flow along the trench line (e.g., using ditch plugs and diversion trenches);
- Development and submission of a management plan for short-term water use in relation to hydrostatic testing, for meeting OGAA and *Water Act* requirements as part of OGC permitting; and
- Conducting all watercourse crossing works in accordance with the *BC Standards and Best Practices for Instream Works*. At trenched watercourse crossings, the crossing construction method would incorporate flow management approaches consistent with channel characteristics.

Fresh Water Quality

Construction of roads and watercourse crossings (trenched or trenchless methods), including required grading and clearing activities, if not mitigated would result in the release of sediment into watercourses. This sediment may contain contaminants. Clearing of riparian vegetation may also adversely affect water quality.

Potential effects to water quality downstream of the crossings during the construction phase may result from:

- An increase in suspended sediment caused by site preparation, as well as road and pipeline construction;
- A release of existing contaminants when contaminated sediment is disturbed during construction of watercourse crossings or laying of the pipeline;
- A change in water temperature due to clearing of riparian vegetation at watercourses; or
- A release of contaminants as a result of fuel spills, oil leaks, hydraulic line ruptures or similar accidental spills of hazardous materials.

For watercourse crossings, turbidity and TSS guidelines have been established for instream activities, including CCME guidelines as well as MOE water quality guidelines for aquatic life. Short-term, localized sedimentation may occur within the LAA during construction trenching activities at watercourse crossings where an open-cut or isolated crossing method is proposed. The Proponent has committed to regular TSS monitoring during construction, and for any rise in TSS levels above background levels that exceed

the guidelines for the protection of aquatic life the Proponent would undertake measures to remedy the factors producing the exceedances, in consultation with OGC.

Localized changes in water temperature may occur during the initial period after riparian clearing for pipeline water crossing construction, but due to the relatively small area of riparian vegetation cleared for each crossing, the changes are predicted to be negligible. Vegetation would be allowed to naturally regenerate along stream banks, and active planting would occur where sensitive habitats and conditions require. It is expected that regenerated riparian vegetation would be functioning within 5 years.

For the terrestrial portion of the pipeline, hydrostatic test water would be released to land in accordance with Section 7(2)(e) of the *Environmental Management Act*, Oil and Gas Waste Regulation. Hydrostatic test water to be used for the terrestrial portion of the pipeline would not contain any added chemicals (with the exception of methanol, as required during winter months) and would be re-used as much as possible within the pipeline system to reduce fresh water use.

For both the freshwater and marine environment, hazardous materials would be controlled according to the EMP and using best management and codified practices.

Key mitigation measures for preventing or limiting the effects of the Project on surface water quality as proposed in the Application, include but are not limited to the following:

- Designing crossings of flowing, fish-bearing streams using either trenchless or isolated crossing techniques (i.e., dam and pump or flume) to reduce sediment introduction. For larger watercourses where isolated crossing is not feasible, additional erosion and sediment control measures would be applied downstream of the crossing;
- Developing and implementing an erosion and sedimentation control management plan, spill contingency plan, and direction drilling procedures and instream drilling and mud release contingency plan as part of the EMP;
- Implementing a sediment and water quality monitoring program as per the EMP, including monitoring for sediment events during instream construction activities and placement of in-water structures as required by the applicable regulatory approvals;
- Visual directing grading away from watercourses, wetlands and waterbodies; and
- Conducting water withdrawal and hydrostatic testing activities in accordance with OGAA, the Oil and Gas Waste Regulations under the *Environmental Management Act* and the *Water Act*.

Metal Leaching/Acid Rock Drainage

The proposed Project has some potential to cause ML/ARD due to exposure of rock with high sulphide mineral content during construction activities (e.g., drilling of bedrock), which could result in reduced pH levels (acidification) and increased levels of metals in water.

The desktop ML/ARD study identified ten areas along the preferred route with potential for sulphide mineralization and ML/ARD, three with moderate potential and seven with high potential:

- Kilometer Post (KP) 21-28 – moderate potential (molybdenum anomaly)
- KP 230-255 – high potential (pyrite areas, soil and silt copper anomaly)
- KP 268-285 – high potential (high sulphide content at KP 269.5, with pyrite and other minerals; undefined characteristics at KP 285)
- KP 285-290 – high potential (anomalous lake sediment at KP 287 with high copper levels, geochemical samples at KP 280 with anomalous copper, molybdenum and gold levels)
- KP 330-340 – moderate potential (large chromite body at KP 331; magnetite, chromite and pyrite at KP 335; gold, silver, mercury, and arsenic anomalies in soil samples at KP 340)
- KP 356-359 – high potential (scattered anomalous values for molybdenum and copper at KP 357; molybdenite, pyrite, and chalcopyrite at KP 358)
- KP 400-429 – high potential (high sulphide content pyrite and chalcopyrite at KP 401; zinc and lead sulphide veins and anomalous copper levels in soil samples at KP 401; minor pyrite, chalcopyrite, and malachite at KP 412); porphyry copper gold at KP 422; various minerals at KP 428)
- KP 441-445 – high potential (various minerals at KP 441, 443, 442)
- KP 507 – high potential (sulphide mineralization at KP 507)
- KP 515-527 – moderate potential (coal at KP 516 and KP 526; various minerals at KP 523.5)

Where possible, areas with ML/ARD potential would be avoided. Where pipeline construction would occur in rock formations with high sulphide content, well understood mitigation measures (e.g., use of covers to decrease drainage infiltration and/or air ingress, blending of potentially acid-generating (PAG) with non-PAG or acid neutralizing materials (e.g., limestone), segregation, underwater storage) for managing ML/ARD potential would be implemented to avoid generating metals and reducing pH at crossings. The Application further noted that, prior to construction, ARD locations would be identified by a desktop study of available information from provincial databases and

geological mapping. These sites would then be investigated through visual screening and field sampling programs (note that, since filing of the Application, the Proponent has completed these additional studies). If PAG material is encountered during construction, recommendations on how to reduce ARD impacts on the surrounding environment would be suggested based on site specific conditions.

In the Application the Proponent committed to the development of a Metal Leaching and Acid Rock Drainage Management Plan as part of the EMP, and a preliminary plan was included as part of the Application. A draft of this management plan was developed and submitted to EAO during Application Review. Acid rock assessment and mitigation information would also to be provided to OGC to support its decision making on relevant operation permits with respect to PAG rock along the proposed pipeline route.

5.6.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the Application Review, the Working Group and the public raised concerns about the potential effects of the proposed Project on hydrology, water quality and ML/ARD. Some of the key issues raised included the following:

- Adequacy of the baseline water quality and hydrology programs;
- Potential for elevated levels of tss/turbidity;
- Maintenance of surface drainage patterns;
- Effects from the construction and use of access roads;
- Effects on drinking water sources;
- Clarification about ML/ARD risk;
- Hydrological and water quality effects associated with the Williston Lake crossing; and
- Follow-up monitoring.

Adequacy of the Baseline Water Quality and Hydrology Programs

A number of Aboriginal Groups raised questions about the lack of multi-season, multi-year sampling at all watercourses, and expressed that a full calendar year of sampling at each site is required to establish an adequate baseline. Lake Babine Nation, for example, noted that in-situ water quality samples (turbidity, pH, dissolved oxygen, temperature) were collected only once at each water quality site. Numerous concerns were raised by Aboriginal Groups and regulatory agencies with the fact that the Application does not include a description on the methodology employed for the hydrology baseline program.

In response to concerns raised by the Working Group, the Proponent provided the supplemental *Hydrology Technical Data Report* (July 2014), which included a summary of background information, methods, and results of baseline hydrological studies conducted for the Project.

The Proponent noted that the types of interactions with water quality that could occur do not indicate a need for an extensive baseline dataset in order to assess effects. This is because the Project effects are related to short term, localized disturbances associated with the construction phase. The Proponent has also committed to the collection of upstream and downstream data for turbidity and/or TSS at the time of construction to support monitoring and mitigation programs.

Potential for Elevated Levels of TSS/Turbidity

FLNR, MOE and Aboriginal Groups raised questions regarding sedimentation and predicted increases in TSS/Turbidity. FLNR questioned the prediction that all substrates (particularly clays and silts) at crossings would settle within the LAA. Questions related to sediment threshold values and planned management responses were also raised. MOE commented that the projected TSS concentration has not been thoroughly predicted and assessed, and inquired as to the typical TSS concentrations associated with open cut crossings, as well as how far downstream effects of elevated TSS would be expected to be observed.

The Proponent clarified that the substantial majority of sediments would settle within the LAA (≤ 1 km) downstream, depending on stream characteristics, and the potential for downstream settlement (i.e., clays and silts) to extend beyond the LAA was acknowledged. To protect aquatic life and habitats, the Proponent committed to ensuring TSS in water entering a drainage course from construction areas would meet established criteria (25 mg/L above background in dry weather; 75 mg/L above background in a storm event). No sediment laden water would be permitted to enter a watercourse at any time. The EMP provides for turbidity and sediment guidelines based on the current MOE *Water Quality Guidelines for Freshwater Aquatic Life*.

Increases in TSS associated with isolated crossing techniques are predicted to be less than 25 mg/L above background levels and limited to short term peaks during installation and removal of the isolation structures. Peak TSS concentrations at flowing open cut crossings are expected, on average, to be between 3 and 20 times greater than at isolated crossings; however, the duration of these increases would be considerably shorter for open cut crossings.

TSS and turbidity concentrations at open cut crossings would vary depending on terrain, soil conditions, the riparian and upland vegetation community, and the discharge volume of the watercourse at the time of construction. The downstream distance of elevated levels of TSS would vary, largely dependent on streamflow and sediment composition.

The Proponent also noted that standard sediment and erosion control measures for mitigating TSS and turbidity effects (e.g., reducing the extent and duration of disturbance, protecting exposed soil by diverting runoff to stabilized areas, installing temporary and permanent erosion control measures, establishing an inspection and maintenance program) would be in place and monitored to limit the magnitude, duration and geographic extent of effects. Monitoring studies from past pipeline watercourse crossings demonstrate short term (i.e. <1 year) or no effects on fish abundance, community structure, or the abundance or diversity of benthic invertebrates in the area downstream of the crossing location. Monitoring of construction activities at freshwater crossings to maintain acceptable TSS and turbidity levels would be the main approach to protecting water quality, as described in the Freshwater Water Quality Monitoring Program (referred to as Sediment and Related Water Quality Monitoring Plan in the Application) to be developed prior to construction.

EAO proposes a condition requiring the Proponent to develop and implement a Freshwater Water Quality Monitoring Program for streams with a Riparian Class of S1, S2, or S3 that includes onsite environmental water quality monitoring, including field monitoring of turbidity, and that is consistent with BC *Water Quality Guidelines*, for the protection of aquatic life, with respect to turbidity, TSS, benthic sediments, and pH, associated with the construction phase of the Project at fish-bearing stream crossings.

Maintenance of Surface Drainage Patterns

FLNR and Aboriginal Groups raised questions on how natural drainage patterns could be altered. Concerns were raised with the fact that the Proponent did not seem to address one of the two stated measurable parameters identified for hydrology: the integrity of existing flow paths measured as a percentage of the watershed area affected by changes in drainage patterns.

The Proponent responded that, based on current mitigation techniques, coupled with construction and post-construction monitoring programs, natural drainage patterns are not anticipated to be altered following construction. In the event that the re-establishment of natural drainage patterns is limited (e.g., where the

restoration of the pre-construction grade is not feasible due to risk of failure of fill on slopes), slopes would be re-contoured as directed by the Proponent in consultation with the appropriate regulatory agency.

With regards to effects to existing flow paths measured as a percentage of the watershed area affected, the Proponent clarified that a change to the integrity of surface drainage patterns (flow paths) would result from the diversion of water from one creek to another. This would only result if water was not allowed to cross the ROW (i.e., it was diverted along the ROW). Following construction, drainage patterns would be re-established as part of the final grading of the ROW. In addition, the trench would be managed to prevent water from travelling along the trench line. As a result, no effects to the drainage pattern of the watersheds crossed by the proposed Project are expected.

Effects from the Construction and Use of Access Roads

Lake Babine Nation raised questions about the potential effects from the construction and use of access roads on both hydrology and water quality.

The Application (Table 9-6) provides specific mitigation measures for construction activities, operation activities and physical works (including access roads and pipeline crossings). More detailed, spatial assessment of these facilities would be completed and the information would be provided to regulatory authorities during permitting. During Application Review the Proponent clarified that all watercourse crossing associated with roads (new and upgraded) would employ clearspan bridges to cross waterbodies and would follow the measures outlined in the former DFO operational statement for construction of clearspan structures. No work would occur below the high water mark for these crossings.

The Proponent developed and submitted a draft EMP to the EAO on September 30, 2014. EAO proposes a condition which would require the proponent to prepare an EMP, consistent with commitments made in the Application, and with the draft EMP.

Effects on Drinking Water Sources

Both the Ministry of Health and MOE raised concerns with regards to lack of detail provided in the Application related to effects of the Project on drinking water sources.

The Proponent noted that the potential for drinking water effects from Project development was considered within the Human Health-Related Assessment

(HHRA), but because no health effects were anticipated in relation to drinking water, a survey of water users was not required. The potential effects on drinking water quality are also considered implicitly in section 8 of the Application (Water Quality) because water quality guidelines for the protection of aquatic life are more stringent than those for drinking water, with the exception of turbidity. The potential for release of contaminants already present in sediment was assessed through desktop review of potential contaminant sources (MOE effluent permits) and did not identify any stream crossings of concern.

Although monitoring and communication plans for drinking water are not specifically proposed by the Proponent, commitments were made to several mitigation measures that would manage impacts to surface and groundwater which may be used as drinking water. These measures are outlined in section 36 of the Application, and would be part of the EMP.

Clarification about ML/ARD Risk

A number of questions and comments were provided by MOE and Aboriginal Groups regarding further characterization of and mitigation for ML/ARD associated with pipeline construction. The principal concerns were related to the following:

- Use of a single parameter (pH) as a proxy to represent ML/ARD processes;
- Time lag between ML/ARD occurrence and observation of the problem;
- Details about ongoing field studies for ML/ARD characterization; and
- Mitigation measures for managing ML/ARD.

The Proponent clarified that pH was selected as a proxy for ML/ARD processes for the EA because it can reliably be measured through relatively simple means (field meters) and would provide a similar indication of ML/ARD processes without the time delays associated with laboratory analysis of metal concentrations in water. Furthermore, although a single proxy parameter (pH) is identified as the indicator, the assessment recognizes and considers metals and other contaminants when addressing ML/ARD concerns.

The characterization of ML/ARD potential is a well understood and iterative process addressed in the EA. Following the desktop review, which identified ten areas of ML/ARD potential (three moderate and seven high) within 2 km of the proposed pipeline route, further field studies consisting of bedrock outcrop mapping and sample collection at priority sites were conducted in 2013 and 2014. These samples were also assessed for metal leaching potential, under both acid and neutral conditions. Preliminary results indicate that widespread

deposits of acid generating rocks are unlikely along the pipeline route, although there are localized areas where PAG material would have to be managed. Four areas identified in the desktop study contain rock classified as PAG. One site is located west of Williston Lake and three are located closer to the coast.

From a management perspective, the Proponent acknowledged during Application Review that it is essential to identify and respond to any potential for metal leaching in a timely manner. Because of the time lag involved in recognizing whether leaching is occurring, the emphasis is on prevention, through appropriate management of disturbed rock and soil, and effectiveness monitoring of the management methods. A ML/ARD Management Plan has been developed by the Proponent. Where ML/ARD is known to occur, a site-specific management plan would be developed and implemented during pipeline construction.

EAO proposes a condition requiring the development of a ML/ARD Management Plan as part of the EA Certificate.

Hydrological and water quality effects associated with the Williston Lake Crossing

Lake Babine Nation raised concerns regarding the applicability of stated hydrological indicators and parameters to the assessment of potential project-related effects at lake crossings. FLNR recommended that bottom depth water condition of Williston Lake Bay be monitored to ensure the pipe is laid when pH/redox/oxygen conditions favour arsenic/chromium remaining in sediment bound form. FLNR further enquired as to when silt curtains would be used. Further questions were posed during the Application Review regarding supplemental sediment quality results for Williston Lake.

The Proponent clarified the proposed pipeline route has been revised in the vicinity of lake crossings since filing the Application. During ongoing construction planning and engineering design it was determined that a trenched crossing would be required at the Williston Lake crossing and the Williston Bay crossing would be avoided. An addendum was submitted by the Proponent that provided details regarding the proposed changes, including the Williston Lake crossing.

Additional sediment and water quality samples were collected by the Proponent in August 2014, including shallow depth sediment cores, along the proposed pipeline corridor, in addition to the five sediment and three water samples collected in 2013 (reported in section 8.3 of the Application). Results of this additional sampling were reported in a technical memo (October 17, 2014).

The majority of metal concentrations associated with water quality samples obtained in August 2014 were below water quality guidelines. Turbidity and TSS levels were also low. Sediment quality results from the August 2014 sampling showed arsenic, manganese, and nickel concentrations consistently higher than Interim Sediment Quality Guidelines (ISQG), but below probable effects levels. However, the elevated concentrations of metals in Williston Lake sediment were consistent across the sampling area and with depth, and were therefore considered by the proponent to reflect naturally elevated metal concentrations in soils of the surrounding watersheds.

Levels of dioxins and furans measured in surface sediments collected in the August 2014 sampling program were notably higher than those measured in October 2013. In light of the elevated levels of dioxins and furans measured in sediments from 0 to 0.6 m depth, the Proponent committed to the implementation of mitigation measures, such as the use of silt curtains, during construction to reduce the dispersal of sediments away from the immediate vicinity of trenching activities. However, the Proponent noted that short term suspension of dioxins and furans during construction is not expected to adversely affect aquatic life.

With regards to the use of silt curtains, the Proponent noted that they are most effective when water velocities are relatively small (i.e., likely not during times of large drawdown of the reservoir), and would be used whenever possible. Sediment plume modeling conducted for construction in the marine environment indicates that the sediment plume and subsequent deposition would be limited in extent. While similar modeling has not been done for Williston Lake, it is reasonable to expect that predictions would be similar, and that the amount of metals in disturbed sediment would also be small. The Proponent also committed to water monitoring during construction that would include turbidity measurements in the water column (previously correlated against TSS levels).

EAO proposes a condition that would require the Proponent to develop a Freshwater Water Quality Monitoring Plan and to monitor water quality at major watercourse crossings.

Follow-up Monitoring

Aboriginal Groups, MOE and FLNR had various comments during the Application Review period emphasizing the importance of a follow-up monitoring program. Sedimentation and erosion, for example, was identified as a particular area requiring post-construction monitoring.

The Proponent has developed a Post-Construction Monitoring Plan for evaluating the effectiveness of environmental protection and mitigation during construction. Issues identified and additional mitigation actions taken within the first year following final clean-up and reclamation would be assessed and any residual outstanding issues would be managed during subsequent years as necessary including implementing further remedial action and monitoring where warranted. The Proponent would continue to engage with appropriate regulatory agencies, including OGC, on the development of water quality-related management and monitoring plans.

5.6.4 Characterization of Residual Project Effects

Considering the potential for effects once the proposed mitigation is applied, EAO concludes that the proposed project would have the following residual effect:

- Change in water quality due to increased TSS.

Changes in hydrology due to water withdrawals and potential disruption or alteration of drainage patterns and stream flows are not considered further. Potential residual effects are considered negligible with mitigation. Potential residual effects to wetlands, including hydrological function, are addressed in the vegetation and wetland resources section of this Report.

Potential residual effects to groundwater are not considered further. Pathways for groundwater interaction are not anticipated due to physical separation from deep aquifers, and given standard mitigations that would be employed for protecting groundwater in the unlikely event of a spill.

The use of well understood mitigation measures for managing ML/ARD potential, as outlined in the ML/ARD Management Plan, would be sufficient to avoid ML/ARD risk at areas where pipeline construction would occur in PAG rock. As a result, no residual effect is expected to water quality due to ML/ARD.

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on water quality, as well as the EAO's determination of significance based on the residual effects characterization.

Criteria	Assessment Rating	Rationale
Context	Undisturbed; variable sensitivity	Some variability in the sensitivity and resilience of watercourses to sedimentation is expected, depending

Criteria	Assessment Rating	Rationale
		upon sensitive receptors to which it is associated, as well as a variety of site- and watershed-specific factors.
Magnitude	Low	Water quality, including TSS, would be monitored regularly during construction. For any rise in TSS levels above background levels that exceeds the guidelines for the protection of aquatic life, the Proponent would undertake measures to remedy the factors producing the exceedances, in consultation with OGC.
Extent	Local	Substantive impacts beyond the LAA are not anticipated.
Duration	Short-term	Short-term sedimentation may occur during construction trenching activities; however, TSS levels would be monitored regularly during construction, and for any rise in TSS levels above background levels that exceed the guidelines for the protection of aquatic life, the Proponent would undertake measures to remedy the factors producing the exceedances, in consultation with OGC.
Reversibility	Reversible	Once the cause is addressed, the residual effects are considered reversible.
Frequency	Once	At any one location the effect would primarily be caused by a single event during construction.
Likelihood	The likelihood of residual effects to water quality would vary from low to high, depending on the watercourse, crossing method, and success of mitigation measures.	
Significance	Taking into consideration the magnitude of the residual effect, as well as the very short duration and reversibility, EAO concludes that the residual effects of the proposed Project on water are not likely to be significant.	
Confidence	High Confidence – The significance determination and likelihood rating for residual effects are determined with high confidence. Based on the proposed mitigation measures, industry best management practices, and compliance with the EA Certificate conditions, federal and provincial guidelines and permitting requirements, there is high confidence that the residual effects would not be significant.	

5.6.5 Cumulative Effects Assessment

Potential cumulative effects on water quality include both spatial and temporal effects; disturbance associated with the Project as a result of sediment transport may overlap (spatially and temporally) with other projects.

Potential changes in surface water quality from construction activities for the Project may interact cumulatively with the effects of other industrial activities within the watershed. Surface water quality degradation from multiple point-source discharges, surrounding land use, and sedimentation into watercourses from multiple sources of soil erosion caused by road construction, forestry practices, and agriculture within a watershed may also interact cumulatively with residual effects on surface water quality from the Project.

Other projects and activities occurring within the RAA would be required to implement standard mitigation measures to reduce effects on surface water quality. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to water quality. Given this, and the fact that residual effects from the Project are anticipated to be both low in magnitude and very short-term in duration, EAO considers that the residual cumulative effect would not be significant.

5.6.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on water.

5.7 Vegetation and Wetlands

5.7.1 Background

Vegetation and wetlands were selected as a Valued Component (VC) because of their cultural and ecological importance. The key indicators assessed in the Application were:

- Plant species at risk;
- Traditional use plants and pine mushrooms;
- Invasive plants;
- Ecological communities;
- Old forests; and
- Wetlands.

The vegetation and wetlands LAA is a 340 m wide band centered on the proposed pipeline ROW. The RAA is a 2 km wide band that fully encompasses the Project footprint used to assess regional and potential cumulative effects.

The Application Corridor would cross a range of habitat types. Forest ecosystems dominate the assessment areas, although other ecosystems such as wetlands, water, estuaries, floodplains, alpine areas and grasslands can also be found within the LAA and RAA.

The proposed route would cross multiple biogeoclimatic zones:

- Boreal White and Black Spruce;
- Sub Boreal Spruce;
- Englemann Spruce-Subalpine Fir;
- Interior Cedar Hemlock;
- Mountain Hemlock; and
- Coastal Western Hemlock.

5.7.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

The Proponent used baseline data collection for the assessment of vegetation and wetlands consisting of desktop studies, literature reviews, Terrestrial Ecosystem Mapping (TEM), and field surveys for plant species and communities of interest. Surveys (TEM Survey Intensity Level 5) were conducted from July to November 2013.

The proposed Project would likely directly affect vegetation and wetlands as a result of vegetation clearing and ground disturbance, and may indirectly affect these resources

as a result of microclimatic changes (i.e., edge effects) and the potential for introduction or spread of invasive plant species. Permanent facilities, such as compressor, meter stations and valve locations, have the potential to alter wetland drainage patterns through redirecting exiting flow paths and reducing localized infiltration rates.

Potential adverse effects of the proposed Project on vegetation and wetlands include

- Change in abundance of plant species of interest; and
- Change in abundance or condition of ecological communities of interest (including wetlands).

Plant Species of Interest

Plant species of interest include those that are tracked by federal and provincial conservation agencies (i.e. plant species at risk), traditional-use plant species (including pine mushrooms), and invasive plant species. Activities related to pipeline construction such as site preparation for the Project footprint, temporary ancillary features, meter station, and compressor stations, including survey, clearing topsoil salvaging, and grading are the primary mechanisms that could affect the local abundance of plant species of interest.

A total of 352 rare plant species were determined to have some potential to occur in the Project area, with 82 of those having a higher probability of occurrence. Nine rare plant historic element occurrence polygons were noted in the Application as having the potential to occur within the RAA, including a lichen species (Cryptic Paw (*Nephroma occultum*)) that is listed as a species of concern under SARA, as well as two provincially red-listed species (Sprengel's sedge (*Carex sprengelii*) and Nuttall's sunflower (*Helianthus nuttallii* spp. *Rydbergii*)).

Five rare plant species were identified at seven locations within the RAA during the rare plant surveys, including three species within the element occurrence list. One is red-listed (mountain moonwort (*Botrychium montanum*)), and was found outside the LAA but within the RAA. Two provincially blue-listed species (Crested wood fern (*Dryopteris cristata*), and Northern bog bedstraw (*Galium labradorium*)) were observed within the Project footprint and LAA.

Six commonly used species were selected by the Proponent to represent traditional use of plants in the RAA: black huckleberry, devil's club, Labrador tea, pine mushroom, soopolallie, and large western redcedar. Black huckleberry has the greatest amount of suitable habitat within the RAA and LAA, followed by large western redcedar. Potential

suitable habitat for the remaining four species is generally uncommon across the RAA. Identified suitable pine mushroom habitat was all located west of Babine Lake.

Based on historic records, invasive plants within the RAA include 661 occurrences across 20 species. Seventeen of these species are classified as noxious either provincially or regionally under the *Weed Control Act*. Oxeye daisy (*Chrysanthemum leucanthemum*) and common tansy (*Tanacetum vulgare*) are the invasive species most frequently recorded within the RAA. An additional 48 records of invasive plants were collected during vegetation field surveys along the pipeline route. A total of 15 species were identified, seven of which are classified as noxious in BC. Oxeye daisy and Canada thistle (*Cirsium arvense*) were the two most frequently observed noxious species with the LAA.

Ecological Communities of Interest

Ecological communities include wetlands, old forest, wildlife tree retention areas (WTRA), and provincially red or blue listed communities. These communities and structural vegetation types often have a limited distribution within the province and provide valuable habitat for various wildlife and plant species. In addition to the abovementioned ecological communities, the proportion of treed wetland habitat within the Project footprint relative to that available within the RAA was used by the Proponent to predict potential Project effects on wetland ecological function.

Site preparation of the Project footprint and facilities would result in vegetation removal and would therefore have a direct effect on the ecological communities that are located within the Project footprint.

Ecological Communities including Wetlands

Wetland communities encompass a wide range of ecosystems, from semi-terrestrial fens, bogs, and swamps, to semi-aquatic marsh and shallow open water complexes. Of all vegetated ecosystem types identified within RAA by ecosystem mapping, estuary and grassland types are the most limited. Identified wetland classes include bog, fen, marsh, swamp, and shallow water.

A total of 7,841 ha of wetlands occur in the RAA, equating to 5% of the RAA overall (Table 5-6). Approximately 1,160 ha of wetlands occur in the LAA, with almost half classified as swamps.

Table 5-6: Wetland Classes Identified in the Assessment Areas

Wetland Class	LAA		RAA	
	Area (ha)	% of Total LAA	Area (ha)	% of Total RAA
Bog	348	1.1%	3,017	1.8%
Fen	215	0.7%	1,784	1.1%
Marsh	7	<1%	116	<1%
Swamp	539	1.7%	2,479	1.5%
Wetland Shallow	48	<1%	413	<1%
Estuary	3	<1%	31	<1%
Total	1,160	3.6%	7,841	4.7%

Thirty eight wetland communities were identified in the RAA by ecosystem mapping. Of the 38 wetland community associations, 10 are classified as forested wetlands. Only bog and swamp wetland types have forested wetland communities. A total of 2,178 ha of treed wetlands occur in the RAA, while the LAA contains 401 ha of treed wetlands.

A total of 32 listed communities were identified in the RAA using ecosystem mapping, and consist of eight red-listed and 24 blue-listed ecological communities. Of these, 24 occur within the LAA (seven red-listed and 17 blue-listed), and 17 occur within the Project footprint (four red-listed and 13 blue-listed). Of these, three are red-listed wetland communities and three are blue-listed wetland communities.

The proposed Mackenzie Route Alternative was presented in an addendum to the Application. The Mackenzie Route Alternative would intersect the southeastern portion of the Mugaha Marsh Sensitive Area for approximately 1.3 km and would cross an area of vegetated wetland. The Mugaha Marsh Sensitive Area is situated on Crown Land in the Provincial Forest east of Williston Lake, approximately six km northwest of Mackenzie. This area was designated in 2001 given its local importance for wildlife habitat values and wildlife viewing opportunities.

Old Forests and wildlife tree retention areas (WTRAs)

The pipeline route would cross 13 planning units that have established or proposed spatially defined and non-spatially defined old growth retention targets. Two planning units have interior old forest retention targets (Mackenzie and Prince George TSAs).

Potential direct effects to old growth forests in the Project footprint would range from 0 to 465 ha within each planning unit. The total area of old forest located within the Project footprint is 1,450 ha, representing 5% of available old growth within the RAA.

A total of 87 old growth management areas (OGMAs) are located partly or wholly within the RAA, with 45 intersected by the Project footprint. Potential direct effects of

construction within the Project footprint on OGMAs range from 0.1 ha to 65 ha. One small, 5.3 ha OGMA is entirely located within the LAA and 59% of its area is located within the Project footprint. Four other OGMAs have 16-17% of their area within the Project footprint, while the remaining OGMAs that would be intersected have 10% or less of their area located within the Project footprint. The area of indirect effects due to edge effects ranges from 0.7 to 114 ha, or <0.1% to 69% of each OGMA.

A total of 279 WTRAs are located within the RAA: 66 of these occur within the Project footprint and 107 occur within the LAA. The area of direct loss of WTRAs that would result from Project clearing would be 62.8 ha, which is 6% of that available within the RAA. The area of WTRAs within the Project footprint ranges from 0 ha to 17.8 ha (an average of 3.1 ha).

Proposed Mitigation and Monitoring

Routing the pipeline to avoid plant species and ecological communities of interest and minimize the potential impact on wetlands, OGMAs and WTRAs, where practical, is the primary mechanism proposed by the Proponent for mitigating adverse effects of the proposed Project. Where avoidance is not practical, other key mitigation and monitoring measures identified by the Proponent include but are not limited to:

- Development and implementation of an Invasive Species Management Plan and Plant Species and Ecological Communities of Concern Discovery Contingency Plan;
- Pre-construction surveys to confirm the locations of red and blue listed plant species and ecological communities of interest;
- Where translocation of a species at risk population is judged to be feasible, a translocation plan would be developed;
- Vegetation removal only within the approved construction ROW and temporary workspace; the clearing width would be reduced to the minimum required for construction to avoid plant species of interest;
- Reduction or exclusion of temporary work space from OGMAs and wetlands, to the extent feasible;
- Limiting removal of vegetation in wetlands;
- Use of ground-level cutting, mowing or mulching of wetland vegetation rather than grubbing to protect wetland habitat;
- Re-establishment of surface drainage patterns; installation of drainage and erosion control measures and completing the installation of sedimentation control measures at all watercourse crossings; and
- Post-construction monitoring for effectiveness of applied mitigation measures and

application of adaptive management as required based on monitoring results.

5.7.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the review of the Application, additional issues, potential project effects and proposed mitigations were raised by regulatory agencies and Aboriginal Groups. A non-exhaustive list of key issues and comments, specific to vegetation and wetlands included the following:

- Lack of sufficiently detailed baseline data;
- Effects to wetlands and wetland function;
- Impacts to the Mugaha marsh sensitive area;
- Vegetation management during operations, invasive species management and pesticide use;
- Clarification regarding post-construction environmental monitoring program;
- Potential project effects to OGMAs, WTRAs, and Old Forest;
- Indirect effects of vegetation clearing;
- Potential impacts to SARA-listed species; and
- Potential effects from ancillary facilities (including increased access).

Lack of Sufficiently Detailed Baseline Data

FLNR and several Aboriginal Groups expressed concern that baseline data on vegetation and wetland resources within the Project area was insufficient, resulting from inadequate sampling intensity, inappropriate survey timing, and gaps in survey coverage following route changes.

The Proponent completed further vegetation and wetland resources surveys in 2014 to support the assessment with respect to route revisions as well as ancillary features. The Proponent committed to conducting a number of pre-construction investigations to further characterize baseline conditions and inform the development of detailed mitigation measures. These include surveys in areas with identified potential effects for red and blue listed plants and ecological communities, invasive species, OGMAs, WTRAs, old forest, and wetlands. The Proponent would also implement a Post Construction Monitoring Plan, which would include areas with identified residual effects on listed ecological communities, OGMAs, WTRAs, and wetland communities in consultation with regulatory authorities. Should further action be required, the Proponent would implement an adaptive management approach.

EAO proposes a number of relevant conditions. One condition would require the development and implementation of an EMP, which includes mitigation and monitoring for invasive species, as well as plant species and ecological communities of concern. A second condition to require the Proponent to adhere to any orders under provincial legislation which apply to an Old Growth Area, and where an OGMA cannot be avoided, to prepare a proposal for replacement or recruitment of that area. A third condition that would require site habitat assessment surveys to be conducted prior to construction for red and blue listed species within the pipeline corridor, and mitigation to be proposed to address adverse effects to those plants and ecological communities.

Effects to Wetlands and Wetland Function

Several concerns were raised by FLNR, Aboriginal Groups and Environment Canada with regards to the potential impacts of the Project on wetlands and wetland function. FLNR highlighted the overlap of Witter Lake compressor station with swamp wetland polygons. Environment Canada noted that the *Federal Policy on Wetland Conservation* may apply to portions of the proposed Project. Environment Canada also stressed the importance of consulting with other federal departments and Aboriginal Groups regarding traditional use in the development and implementation of the draft wetland compensation plan. Lake Babine Nation highlighted concerns over cumulative impacts to wetlands, as well as impacts from vegetation management during operations on wetland communities overlapping the Project footprint.

Further wetland field verification was undertaken by the Proponent in 2014 to classify all wetlands within 100 m of the proposed Project centreline that were not classified to site association in 2013. The Proponent has also committed to undertake pre-construction surveys for delineation of wetland boundaries, to implement the *Federal Policy on Wetland Conservation* for all wetlands, including the Mugaha Marsh Sensitive Area and provincially listed wetland communities. If unavoidable effects to wetland function are identified, the Proponent would discuss suitable compensation with FLNR, Aboriginal Groups and other affected parties. The Proponent has also committed to engaging Environment Canada regarding impacts to wetland function on Lelu Island and any compensation measures that may be necessary.

The Proponent clarified that all wetlands would be allowed to re-vegetate naturally following construction. The exception would be trees and tall shrubs within approximately 5 m of the centreline that would require control to allow for

aerial visual inspections. Given the implementation of the project EMP (including the Invasive Plant Species Management Plan), and mitigation measures for plant species and ecological communities of interest (including wetlands), the Proponent asserted that effects of vegetation control would be reduced to acceptable levels.

EAO proposes a condition that would require the Proponent to develop a wetland management plan that would include a “no net loss” objective for wetland function. This proposed condition would require mitigation and compensation measures to address any loss of wetland area and function. Other conditions proposed by EAO would require the Proponent to 1) develop and implement an EMP, which includes mitigation and monitoring for invasive species, as well as plant species and ecological communities of concern, and 2) continue to engage with relevant regulatory authorities and Aboriginal Groups in the development and implementation of EMPs.

Impacts to Mugaha Marsh Sensitive Area

FLNR and Environment Canada provided comments on the Route Alternative Addenda (July 31, 2014) in relation to the Mackenzie Route change, and potential interactions with Mugaha Marsh Sensitive Area. Questions arose with regards to mitigation of impacts in this area, as well as proposed approach to meeting objectives established for the Mugaha Marsh Sensitive Area. Environment Canada advised that re-routing the proposed Project to avoid the Mugaha Marsh Sensitive Area would reduce risks to the high habitat values and would be consistent with the direction of the *Federal Policy on Wetland Conservation*. Environment Canada advised that if re-routing is not feasible then HDD methods should be used to reduce potential harm. If conventional trench installation is used, Environment Canada advised that measures should be identified to ensure compensation for any permanent loss and degradation in habitat.

The Proponent acknowledged that the Mugaha Marsh has been established as a Sensitive Area under the *Forest Practices Code of British Columbia Act* and is identified as an area with important values for wildlife. The Proponent also committed to a number of mitigation measures as highlighted in the supplemental technical memo regarding Mugaha Marsh Sensitive Area, including but not limited to installation of the pipe during frozen conditions and outside the restricted activity period for migratory birds, and prohibiting the clearing of timber, stumps, brush, or any other vegetation outside Project boundaries. Further, the Proponent committed to implement the *Federal Policy on Wetland Conservation* for the Mugaha Marsh Sensitive Area, as well as for other provincially-listed wetland ecosystems.

EAO proposes a condition requiring the Proponent to adhere to the objectives of the Sensitive Area Plan for Mugaha Marsh (2001), and to either construct during winter or using underground trenchless methods. EAO also proposes a condition that would require the Proponent to develop a wetland management plan as described above.

Vegetation Management during Operations, Invasive Species Management and Pesticide Use

Several concerns were raised by Aboriginal Groups and other Working Group members with regards to vegetation management during operations and the potential introduction and/or spread of invasive plant species as a result of the proposed Project. Several Aboriginal Groups raised concerns about the use of pesticides for vegetation and invasive plant species management.

The Proponent acknowledged the importance of controlling and managing the establishment and spread of invasive plant species within the RAA. The Proponent has committed to the development and implementation of an Invasive Plant Management Plan would be prior to construction in accordance with the applicable legislation and in consultation with the appropriate regulatory authorities. The plan would be prepared taking into account identified concerns and sensitive locations and outline site specific measures. As the Proponent develops its Invasive Plant Management Plan, consideration would be given to other options of vegetation control.

EAO proposes a condition that would require the development and implementation of an EMP, which includes mitigation and monitoring for invasive species and vegetation management, as well as the implementation of reclamation measures. EAO proposes additional conditions that would require the implementation of reclamation measures, and development of an Invasive Plant Management Plan, which would require consultation with Aboriginal Groups and private land owners regarding options for vegetation control prior to the use of pesticides.

Post-Construction Environmental Monitoring Program

FLNR requested clarity with regards to the methods and timelines associated with environmental monitoring related to vegetation and wetlands. FLNR further noted that mitigation measures should include long term monitoring to determine the success of mitigation measures and should extend to all impacted ecosystems regardless of status.

Others requested further details with regards to post-construction monitoring, inspection and auditing for vegetation and wetlands.

The Proponent committed to effectiveness monitoring of mitigation measures for re-vegetation, invasive species, wetland function and plant species at risk (i.e., translocations). This would form part of the Proponent's post-construction monitoring program.

EAO proposes a condition that would require the development and implementation of an EMP, including post-construction monitoring.

Potential Effects to OGMAs, WTRAs, and Old Forest

FLNR expressed concerns regarding a lack of detail on mitigation measures for minimizing impacts to OGMAs and requested additional consideration of potential Project impacts on values considered in the establishment of OGMAs that are not directly related to old growth forests. FLNR clarified that, as small as some of the incursions in individual management units may be, cumulatively there is considerable impact to old growth and some aspatial units may be close to their threshold. FLNR also requested additional information regarding old interior forest condition.

The Proponent provided supplemental technical memos with additional clarification with regards to potential effects to OGMAs, WTRAs, and interior old forest. The Proponent committed to continue to seek opportunities to avoid OGMAs, WTRAs, and interior old forest during ongoing construction planning and engineering design. As construction planning and detailed engineering design advance, incursions into OGMAs and WTRAs would be more precisely identified. At that time, the Proponent would consult with FLNR and OGC to identify an appropriate approach to further refine spatial information to include other values captured in OGMAs and WTRAs. Upon finalization of the pipeline ROW, the Proponent would engage forest licensees regarding potential effect and mitigation measures to old growth targets.

EAO is proposing a condition to require the Proponent to adhere to any orders under provincial legislation which apply to an Old Growth Area, and where an OGMA cannot be avoided, to prepare a proposal for replacement or recruitment of that area.

Indirect Effects of Vegetation Clearing

During the Application Review period, the Proponent received several comments related to indirect effects on vegetation. FLNR and the Metlakatla First Nation

expressed concerns regarding how indirect Project effects on vegetation were considered in the Application.

In a supplemental technical memo, the Proponent noted that potential indirect effects were described within the Application and that the 120 m width of the LAA on either side of the Project footprint adequately captures and most likely overestimates most potential indirect effects.

Potential Impacts to SARA Schedule 1 Species

Comments were made by FLNR during Application Review regarding the potential occurrence of whitebark pine within the RAA. Environment Canada also flagged this species, as well as Red Knot *rosalari*, as SARA Schedule 1 Species for which species-specific assessments of potential Project effects should be undertaken.

Whitebark pine was identified as a focal species for rare plant surveys for the proposed Project. In particular, it was considered a high-priority species for all vegetation field crews. This species was not encountered in the field during baseline field surveys. The Proponent is committed to working with Environment Canada to explore the occurrence of any high-quality habitat for whitebark pine within the RAA and developing mitigation strategies wherever necessary.

EAO proposes a condition to require the development and implementation of an EMP, including Plant Species and Ecological Communities of Concern Discovery Contingency Plan. EAO proposes an additional condition that would require site habitat assessment surveys to be conducted prior to construction for red and blue listed species within the pipeline corridor, and mitigation to be proposed to address adverse effects to those plants and ecological communities.

Further Details Regarding Ancillary Facilities and Associated Effects

Further details were requested by FLNR and other reviewers regarding the potential effects of ancillary sites on vegetation and wetlands. There was concern that these sites could potentially result in additional impacts to OGMAs, old forest, WTRAs and wetlands.

The Proponent completed further vegetation and wetland surveys in 2014 to support the assessment with respect to route revisions as well as ancillary features. The Proponent would provide further detail on temporary ancillary facilities to OGC during permitting, and would adhere to the requirements of the OGAA and regulations, as well as the *Environmental Protection and*

Management Guidelines. The Proponent has committed to undertaking surveys for red and blue listed plant species and ecological communities prior to permitting, and to the development and implementation of several management plans that include mitigation measures to reduce the potential effects of construction and maintenance of access roads on vegetation and wetlands. The Proponent has also committed to continue discussions with OGC and FLNR to clarify expectations and direction with respect to the appropriate plans for its activities in OGMAs and WTRAs.

EAO proposes conditions requiring the development and implementation of the Wetlands Management Plan and an EMP, which includes an Invasive Plant Species Management Plan and Plant Species and Ecological Communities of Concern Discovery Contingency Plan, would include consideration of all Project components, including ancillary sites.

5.7.4 Characterization of Residual Project Effects

Considering the potential for effects once the proposed mitigation is applied, EAO concludes that the proposed Project is likely to result in the following residual adverse effects to vegetation and wetlands:

- The clearing and disturbance of ecological communities of interest, including wetlands, and plant species of interest; and
- Alteration of ecological communities of interest and plant species of interest from the introduction or spread of invasive plants.

EAO's characterization of the combined residual effects of the proposed Project on ecological communities and plant species of concern is summarized below, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low to High Sensitivity	The resilience of plant species at risk, traditional use plants and pine mushrooms, and ecological communities including old forests and wetlands, varies along the proposed route by species and community. For example, upland forests are expected to be resilient and regenerate well. Other communities such as grassland or certain wetland ecosystems (e.g., peatlands) are expected to be less resilient.

Criteria	Assessment Rating	Rationale
Magnitude	Low to Moderate	The magnitude of effects depends on the extent and rarity of ecological communities and plant species at risk occurrences. The magnitude is low for most ecological communities, but moderate for plant species at risk, wetland function (effects of wetland hydrologic alteration would be detectable until natural flow patterns were restored, while loss of treed habitat is considered moderate in magnitude), as well as for red or blue listed ecological communities. Magnitude of the effects from invasive species is considered low with the implementation of mitigation measures to control any invasive species that may be on-site. In some cases, translocation of plant species at risk may be successful at mitigating effects to plant species at risk. Compensation may also be required to achieve “no net loss” of wetland function.
Extent	Local	The effects of the proposed Project are expected to be confined to the Project footprint with the exception of potential for indirect effects on windthrow, microclimate, hydrology, light penetration, and susceptibility to invasive species, extending into the LAA.
Duration	Short- to Long-Term	The regeneration of vegetation and wetland resources varies by species or type of ecological community and site-specific conditions. Residual effects to species at risk are medium-term in duration, due to the possible need for translocation. Residual effects in old forests, pine mushroom habitat and some ecological communities at risk (e.g., climax communities), would not be reversible until the long term. Residual effects from invasive species are also anticipated to be long-term in duration. Re-establishment of other types of vegetation such as shrubs and forbs would occur in the short- to medium-term. Wetland habitat is generally expected to recover over the short-term, but effects to treed wetland habitat would take longer to recover and habitat

Criteria	Assessment Rating	Rationale
		may not fully re-establish until after decommissioning, making the effects long-term.
Reversibility	Reversible/Irreversible	Residual effects to terrestrial vegetation are expected to be reversible, with the exception of the potential for irreversible effects to some grassland communities and ecological communities at risk. For any areas with permanent loss of wetland (e.g., due to location of compressor or meter stations) the impacts at the site would be irreversible, but these areas would be subject to compensation and therefore the impact to wetland function is considered reversible.
Frequency	Once to Periodic	The main disturbance would occur during the construction phase, and repeated periodic disturbance would occur during operations from vegetation management on the ROW.
Likelihood	The proposed Project is highly likely to result in residual adverse effects to vegetation and wetlands.	
Significance	Residual adverse effects are considered significant when there is a long-term or irreversible residual adverse effect with a magnitude that is predicted to exceed an acceptable biological threshold or standard, or is predicted to affect the indicator population such that stated management or conservation objectives might not be attainable. EAO considered the low to moderate magnitude effect to vegetation and wetlands, the short to long term duration and the reversibility to some communities and the potential for permanent and irreversible effects to other communities. EAO considered the mitigation and monitoring measures identified by the proponent and proposed conditions requiring site assessment surveys for red and blue listed species, the development of a Wetland Management Plan and the development of the EMP which includes development and implementation of a Plant Species or Ecological Communities of Concern Contingency Plan and an Invasive Plant Species and Vegetation Management Plan, and post-construction effectiveness monitoring. EAO concludes that the proposed Project would not have significant residual effects on vegetation and wetlands.	
Confidence	Moderate Confidence – The level of confidence is determined by the understanding of the Project VC interaction, the level of information relevant to the project area and the understanding of the effectiveness of mitigation. The significance determination and likelihood for vegetation and wetland resources is determined with moderate confidence. EAO believes there is a	

Criteria	Assessment Rating	Rationale
		good understanding of Project-VC interactions and effectiveness of mitigation. EAO took into consideration the TEM survey intensity level of 5 and considered the information provided with respect to the Project area to be sufficient to provide a moderate level of confidence in determining the significance and likelihood of residual effects.

5.7.5 Cumulative Effects Assessment

The cumulative effects assessment was completed in the context of relevant objectives of the numerous LRMPs, SRMPs and other higher-level management plans, including the Nisga'a Land Use Plan, encountered along the proposed route.

Existing activities and reasonably foreseeable projects or activities in the vegetation RAA include agriculture, forestry, linear infrastructure, as well as industrial land use and marine use. There is potential for cumulative effects resulting from site preparation when combined with other existing or proposed projects, which fall into one of the following three categories:

- Industrial Land and Marine Use;
- Linear Infrastructure; and
- Forestry and Agricultural Land Use.

The total area of the RAA is 166,466 ha and the total area of existing disturbances within the RAA is estimated at just over 48,000 ha, the vast majority of which is associated with forestry and agricultural land use. The sum of proposed projects over the lifetime of this Project is estimated to be 34,700 ha for a total of 83,063 ha. The proposed Project would result in approximately 11,120 ha of disturbance, which accounts for 13.6% of the existing and proposed disturbance within the RAA.

The proposed Project would have a residual adverse effect on wetlands at site-specific locations; however, as discussed above, it is not expected that the proposed Project would cause a change that would adversely affect the viability or sustainability of wetland communities within the RAA.

It is expected that future forestry activities in the vegetation and wetland resources RAA would be guided by LRMP and SRMP objectives and subject to similar regulatory guidelines to that identified for the proposed Project. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to vegetation and wetlands.

Residual adverse cumulative effects are considered significant when there is a long-term or irreversible residual adverse cumulative effect with a magnitude that is predicted to exceed an acceptable biological threshold or standard, or is predicted to affect the indicator population such that stated management or conservation objectives might not be attainable.

In determining the potential significance of cumulative adverse effects to vegetation and wetlands, EAO has considered the residual effects from the proposed Project, the cumulative disturbance to the RAA from the Project and reasonably foreseeable projects, including consideration of the history of forestry in the RAA and continued disturbance due to forestry and future forestry activities, as well as the reversibility of potential adverse effects to vegetation and wetlands in the medium to long term. EAO considered that the residual cumulative adverse effects to less resilient communities (e.g., grassland communities), and ecological communities at risk may be irreversible, but that the magnitude of these effects is low to moderate. EAO concludes that the cumulative residual adverse effects to vegetation and wetlands within the RAA are not likely to be significant.

5.7.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on vegetation and wetland resources.

5.8 Wildlife and Wildlife Habitat

5.8.1 Background

The Application assessed how the proposed Project could affect wildlife habitat, wildlife mortality risk and wildlife movement under the Wildlife and Wildlife Habitat VC. The key indicators chosen include terrestrial wildlife (e.g., mammals, birds, and amphibians), marine birds (e.g., waterfowl and seabirds), and their habitats (see Table 5-7). Marine mammals and fish are discussed in section 5.9 of this Report, while freshwater fish are discussed in section 5.5.

Table 5-7: Key Indicators for Wildlife and Wildlife Habitat Valued Component

Mammals	Terrestrial birds
Grizzly bear Marten Fisher Caribou Moose Mountain goat	Northern goshawk Band-tailed pigeon Old forest songbird community Young forest songbird community Grassland and shrubland songbird community Western screech-owl Common nighthawk Great blue heron Marbled murrelet Canada warbler Olive-sided flycatcher Rusty blackbird Wetland songbird community
Amphibians	Marine birds
Pond-dwelling amphibians Western toad Coastal tailed frog	Diving ducks Dabbling ducks Loons and cormorants Alcids (e.g., murres, murrelets, auklets)

The wildlife LAA is a 2 km corridor centred on the proposed route, and the RAA is a 30-km corridor. Exceptions are:

- Where the pipeline enters or exits the marine environment, the marine bird LAA is a 4 km width that encompasses up to the high-tide line;

- Grizzly Bear Assessment Area: Landscape units and third-order watersheds intersected by the Project footprint that include portions of Grizzly Bear Population Units (GBPU) intersected by, or close to, the Project footprint; and
- Caribou Assessment Area: The range boundary of each herd intersected by the Project footprint to include the Moberly/*Klinse-Za*, Kennedy-Siding, Scott and Takla herds.

5.8.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Vegetation clearing is expected to result in the direct loss or alteration of habitat. Following construction, and throughout operation, habitats within temporary work space would be permitted to regenerate. Only vegetation within the pipeline footprint would be maintained in an early seral stage. Indirect effects to habitat would occur during construction and may persist throughout operation (e.g., reductions in suitability resulting from noise disturbance). Vegetation clearing could result in increased habitat fragmentation, reduced patch size, and reduced connectivity. The proposed Project's potential effects on specific Wildlife Key Indicators are discussed below.

The following project-specific effects are assessed:

- *Change in habitat*: Habitat loss and alteration can cause displacement of wildlife through direct loss of habitat or, indirectly, through disturbance that causes wildlife to avoid an area. The Proponent used habitat suitability models to estimate the amount of effective habitat for many of the key indicator species and estimated the change in effective habitat from construction and operation of the proposed Project;
- *Change in mortality risk*: The creation of corridors, including for the pipeline ROW and access roads, could increase human and predator access to wildlife habitat. Maintaining early seral stages of habitat along the pipeline ROW may also attract some species to the corridor. This would increase the risk of wildlife mortality by predators as well as by hunters, trappers and poachers. Construction and operation of the Project could also cause mortality through vehicular collisions with wildlife and direct human–wildlife conflicts; and
- *Change in movement*: The alteration or disturbance of habitat from the construction and operations of the pipeline, compressor station, and ancillary sites could reduce habitat connectivity and create barriers or filters to wildlife movement.

Wildlife baseline conditions were characterized by means of literature review, desktop analysis, field surveys, habitat suitability modelling, and consultation and engagement

with regulatory agencies, Aboriginal Groups, municipalities, landowners, and public stakeholders.

Grizzly Bear

Grizzly bears are blue-listed (special concern) and have a Conservation Framework Priority rating of 2 in BC because they are particularly sensitive or vulnerable to human activities. They are also federally-listed as a species of special concern because their range and population have been greatly reduced as a result of development-related habitat fragmentation and increased human conflicts. Grizzly bears are sensitive to human disturbance, and potential cumulative effects of human disturbance are identified as the greatest threat to grizzly bear populations.

The LAA transects ten GBPU's (Table 5-8). All GBPU's that would be crossed by the proposed Project are considered viable; however the Moberly GBPU is closed to hunting because the population is less than 100 bears. The Khutzymateen is also closed to hunting as a special no hunting area, and not because of population level concerns. MOE has identified objectives for viable GBPU's in BC, including maintaining current population abundance and distribution, and providing sustainable harvest and viewing opportunities where appropriate.

Table 5-8: Grizzly Bear Population Unit Population Estimates

GBPU	Population Estimate
Babine	313
Bulkley-Lakes ¹	439
Cranberry	349
Hart ¹	244
Khutzymateen	280
Moberly	71
Nation	170
Omineca	402
Rocky	538
Stewart	358

¹GBPU would not be crossed by the Project footprint, but would overlap with the LAA.

Grizzly bear assessment areas (GBAAs) were used in the Proponent's assessment and are meant to capture the typical distance that a female grizzly bear would travel within its home range (i.e., 30-50 km), and therefore provide a suitable scale for assessing change in mortality risk. The proposed Project would cross the following GBAAs:

- Rocky GBAA (within the Rocky GBPU);

- Cranberry GBAA (within Cranberry GBPU);
- Khutzeymateen/Stewart GBAA (within the Khutzeymateen and Stewart GBPUs);
- Moberly/Hart GBAA (within the Moberly and Hart GBPUs);
- Nation GBAA (within the Nation GBPU);
- Omineca East GBAA (within the Omineca GBPU); and
- Omineca/Babine GBAA (within the Omineca and Babine GBPUs).

The proposed Project would result in clearing and disturbance of grizzly bear foraging habitat. The proposed Project is predicted to increase the overall availability of effective grizzly bear spring feeding habitat by 5.6% (1,133 ha) within the portion of the LAA that occurs within the GBAA. The proposed Project is predicted to decrease the overall availability of effective grizzly bear summer feeding habitat by 7.6% (5,259 ha) and of fall feeding habitat by 7.4% (5,380 ha) within the portion of the LAA that occurs within the GBAA.

In nearly all regions of BC, the primary mortality risk for grizzlies is direct human-related causes (illegal and legal hunting, collisions, and human-bear conflicts). Operations of the proposed Project would be the primary effect mechanism for change in mortality risk for grizzly bear. More specifically, the Project footprint would increase human access opportunities within the GBAA for the duration of the operation phase and potentially beyond, depending on factors such as rate of succession and access controls. Where the ROW is expected to traverse remote or minimally developed areas, human-bear encounters and hunting pressure may increase, thereby increasing the potential for human-caused grizzly bear mortalities. During construction, loss of individual bears could occur as a result of bears being destroyed or relocated due to bear-human conflicts.

The assessment of change in mortality risk on grizzly bear used two metrics: 1) change in habitat suitability as a function of linear feature density and 2) change in core security habitat.

Change in habitat suitability as a function of linear feature density starts with habitat suitability ratings (with class 1 being the highest and class 6 being nil) and then uses the linear feature density to apply an adjustment or “step-down” to those ratings. Four incremental linear feature density thresholds were used, the lowest threshold that causes a step down in habitat suitability is 0.6 km/km², and the highest threshold that renders any habitat unsuitable, regardless of its initial rating, is 2.4 km/km². For individual GBAA, the proposed Project would cause a decrease in habitat suitability as a function of linear feature density by less than 1%, ranging from less than 0.1% (36 ha) to 0.9% (4,585 ha) across GBAA.

Core security habitat provides grizzly bears with large areas of suitable habitat that reduces the potential for encounters with humans (i.e., lower mortality risk). The Proponent identified core security habitat as an area greater than 10 km² (1,000 ha) that is more than 500 m from linear access features. The Proponent adopted a 68% minimum threshold for availability of secure habitat based on literature from other jurisdictions (a core security habitat threshold has not been identified in BC). The area of core security habitat is above 68% for all GBAs at existing conditions and if the proposed Project proceeds. For individual GBAs, the proposed Project would decrease core security habitat by less than 5% (with reductions from 5,400 ha to 1,900 ha). The total decrease over the Project area would be 1.2% (or a reduction of 23,600 ha).

Habitat suitability as a function of linear feature density and core security areas are considered better estimates of mortality risk to grizzly bears than linear density alone; however, it is useful to look at linear density to identify areas of potential concern for grizzly bear. The Proponent used a threshold for linear density of 0.6 km/km² to identify potential concerns for grizzly bears. The Cranberry GBA is just below the precautionary threshold at base case and is just over the threshold if the proposed Project proceeds. Five of the seven GBAs (Rocky, Moberly/Hart, Omineca East, Nation and Omineca/Babine) have linear feature densities that exceed the precautionary threshold at base case with the Rocky exceeding the threshold by more than 3 times. The proposed Project would increase in linear feature density by less than 5%, ranging from 0.1% to 4.9%.

Table 5-9: Linear Density by Grizzly Bear Assessment Area

Grizzly Bear Assessment Area	Base Case (km/km²)	Proposed Project (km/km²)	Change (km/km²)	Change (%)
Rocky	2.16	2.17	0.01	0.1
Moberly/Hart	0.78	0.79	0.01	1.3
Omineca East	0.94	0.96	0.02	1.6
Nation	0.83	0.85	0.02	1.7
Omineca/Babine	0.66	0.67	0.01	2.7
Cranberry	0.59	0.61	0.02	3.0
Khutzymateen/Stewart	0.35	0.36	0.02	4.9

Mitigation measures in the Application include the development and implementation of an Access Management Plan as part of the EMP that would outline access management measures to reduce/prevent motorized access, and include measures to

prevent any direct grizzly bear mortalities associated with the construction and operations of the Project.

Caribou

The Application Corridor would encounter four northern ecotype woodland caribou herds: Moberly/*Klinse-Za*, Kennedy-Siding, Scott and Takla. Northern ecotype caribou are blue-listed (special concern) by the Province and have a Conservation Framework Priority rating of 2. The federal government defines the southern mountain caribou population to include some of BC's northern ecotype, including all four herds within the caribou RAA. The southern mountain population is listed as threatened under SARA.

The federal government released the *Recovery Strategy for the Woodland Caribou, Southern Mountain population (Rangifer tarandus caribou) in Canada* on June 3, 2014. The recovery strategy identifies critical habitat for the southern mountain population which includes high and low elevation winter and summer range, as well as matrix range that provides connectivity between seasonal ranges, security from disturbance and low predation risk. The Recovery Strategy identifies unsustainable predation as the most significant, immediate, direct threat to southern mountain caribou recovery or survival. Increased predator abundance has resulted from habitat alteration and increased access due to industrial activities such as oil and gas exploration and development, which remove or destroy caribou habitat (mature and old forests) and create habitats favoured by other prey species such as moose and deer.

The Moberly/*Klinse-Za* and Kennedy-Siding herds are in decline, while the trends for the Takla and Scott herds are unknown (Table 5-10).

Table 5-10: Caribou Population Estimates and Status

	Population Estimate	Current Population Trend
Takla	122	Unknown
Moberly/ <i>Klinse-Za</i>	22	Decreasing
Kennedy-Siding	30	Decreasing
Scott	22	Unknown

¹Some population estimates vary from what is presented in the Application as estimates have been updated since the Application was submitted.

The Moberly/*Klinse-Za*, Kennedy-Siding, and Scott herds are managed by the Province as South Peace Northern Caribou. The Province announced goals for management of the South Peace Northern Caribou in late 2012, including increasing the population to 1,200 or more animals within 21 years across their range. In 2013, the *Implementation Plan for the Ongoing Management of South Peace Northern Caribou (Rangifer tarandus caribou pop. 15) in British Columbia* was released. Objectives include protecting 90%

or more of identified High Elevation winter habitat in most herd ranges, including all of the South Peace Northern Caribou herds affected by this proposed Project.

The Scott herd is part of the Recovery Action Plan for Northern Caribou Herds in north-central BC. Goals of the Action Plan include recovery or stabilization of populations to identified targets (density, distribution, and numbers), maintaining sufficient critical habitat to support local population goals, and public support for recovery actions.

The Proponent considered effective habitat for caribou to be all forested habitats within the herd ranges. The proposed Project is predicted to decrease effective habitat within the LAA by 5.2% (1,397 ha) for the four herd ranges (Table 5-11). The change in effective habitat considered direct disturbance from the proposed Project. The proposed Project would also intersect 0.8 ha of WHA 9-052 for the Moberly/*Klinse-Za* caribou herd.

Table 5-11: Change in Effective Woodland Caribou Habitat

Herd	LAA	Project Disturbance	Reduction
Moberly/ <i>Klinse-Za</i>	12,024 ha	661 ha	5.5%
Kennedy Siding	4,206 ha	237 ha	5.6%
Scott	6,805 ha	336 ha	5.4%
Takla	3,652 ha	133 ha	3.6%
Total	26,687 ha	1397 ha	5.2%

Linear feature densities of 0.8 km/km² and 1.2 km/km² were considered by the Proponent to be the precautionary and critical thresholds, respectively, for Project effects on caribou mortality risk for this assessment. The Moberly/*Klinse-Za* Caribou Herd Range is above the precautionary threshold but below the critical threshold at baseline and if the proposed Project proceeds. The proposed Project would increase linear feature density in the herd range by 1.2%. The other herd ranges are below the precautionary threshold at baseline; however the Scott herd is approaching the precautionary threshold. The proposed Project would not cause the threshold to be exceeded in any of the herd ranges.

Mitigation measures proposed in the Application include: avoiding the creation of new access by utilizing existing roads and linear corridors within caribou range, particularly within Ungulate Winter Ranges (UWR) and Wildlife Habitat Areas (WHA) designated for caribou. All temporary construction access would also be deactivated and reclaimed within caribou range.

Clearing, construction and maintenance activities (during operation) would be avoided where feasible during critical or cautionary periods, within designated WHA and UWR. In addition, the Proponent committed to develop a Caribou Habitat Restoration Plan.

Moose

Moose populations in BC are generally considered healthy. However, recent declines in the central Omineca, Skeena and other regions have raised concerns among Aboriginal Groups, resident hunters and guide outfitters. Province-wide, the decline in some moose populations is not considered to be an immediate conservation concern, however, the reasons for the declines are not well understood and FLNR has initiated a five-year study to investigate causes of moose mortality. FLNR is also developing a provincial moose management framework and regional moose management plans.

Surveys in the Nass Wildlife Area have shown a decline from approximately 1,600 moose in 2001 to 500 moose in 2011. Hunting has been reduced since 2007 and closed since 2012, with a limited number of permits released by Gitanyow and Nisga'a Nation for traditional harvest.

Moose populations are considered more sensitive to human and predator-caused mortality than to habitat loss and fragmentation. The Application notes that increases in early seral vegetation associated with the Project ROW clearing may attract moose to the ROW, and that the linear corridors created by the proposed Project could increase wolf predation on moose, as well as increase hunting pressure.

The proposed Project is predicted to reduce the overall availability of effective moose winter feeding habitat in the LAA by 5.9% (1,646 ha), and reduce the overall effective winter shelter habitat in the LAA by 6.9% (3,331 ha). The greatest percentage impact on moose winter feeding habitat in the LAA would be on the western portion of the proposed Project: Kispiox LRMP (10.3%), Nass South draft SRMP (9.0%), Cranberry SRMP (7.6%), and Nisga'a Lands (6.7%). The greatest percentage impact on moose winter shelter habitat in the LAA would also generally be on the western portion of the proposed Project: Kalum LRMP (11.3%), Nisga'a Lands (9.4%), Kispiox LRMP (9.0%), and Dawson Creek LRMP (7.5%).

Mitigations related to moose include development of a Traffic Management Plan to reduce the risk of vehicle collisions with wildlife, an Access Management Plan to reduce potential adverse effects on mortality risk from increased access, as well as line of sight management and reclamation of native vegetation.

Mountain Goat

The Application identified direct and indirect disturbance to mountain goat habitat by determining overlap with mountain goat UWR. Since the filing of the Application, the Proponent is no longer considering the route alternative that would cause a direct reduction of 2 ha in designated mountain goat UWR habitat within the LAA. Therefore, no designated UWR for mountain goat occurring in the LAA is predicted to be affected. No WHAs for mountain goats are identified in the LAA.

The Project has the potential to cause habitat changes in access and disturbance that displace mountain goats from preferred habitat. Activities such as helicopter overflights may cause disturbance to goats.

Mitigation proposed for mountain goats include the establishment of a 500 m setback for all identified mountain goat habitat (e.g., winter range, kidding or early rearing, mineral licks, and trails) during winter months (November 1 to April 30) and kidding or early rearing and mineral lick use periods (May 1 to July 15), where feasible. New roads would be placed at least 3 km from known goat trails and occupied mountain goat habitat, whenever feasible, and would not be developed within mountain goat UWR. Construction activities in mountain goat UWR would be avoided from November 1 to June 14, where feasible. However, as stated above, the proposed Project route would not intersect mountain goat UWR.

The Proponent would develop and implement a Mountain Goat Helicopter Mitigation Plan in consultation with the appropriate regulatory agencies.

Marten and Fisher

Marten and fisher are considered environmental indicators as they are sensitive to change, have human (subsistence, cultural) and conservation importance, and have potential to interact with the proposed Project. Marten is not a species of conservation concern provincially or federally. Fisher is blue-listed (special concern) in the Province. Fisher populations are declining and the primary long-term threat to fisher is habitat loss.

The Project is predicted to decrease availability of effective year-round marten habitat in the LAA by 9.6% (7,675 ha), and overall availability of effective fisher natal denning habitat in the LAA by 9.6% (5,921 ha). Using provincially defined habitat mapping from the Boreal White and Black Spruce zone, the proposed Project is predicted to have direct effects on both rearing and resting habitats. These effects range from a loss of 2.2% (41.7 ha) resting-white spruce stands to 2.8% (78.1 ha) of resting-cavity habitat.

Mitigation for marten and fisher include conducting pre-construction wildlife surveys to identify habitat features that require mitigation and reduced grubbing near watercourses, wetlands and other wet areas to facilitate reclamation of shrub communities, and redistributing large-diameter slash (rollback) over select locations on the ROW (e.g., where high levels of coarse woody debris is present prior to construction) to provide cover and facilitate the movement of marten and fisher.

Bats

Bats were not assessed in the Application, as there is limited information available regarding bat habitat, movement, population status, trends and threats, and there is limited potential to interact with the proposed Project. However mitigation measures for bats were proposed in the Application. Identified bat roosts and hibernacula would be protected from disturbance (e.g., blasting, rock removal, and construction of new roads) and a 125 m setback would be implemented from bat hibernacula (from October 1 to April 31) or maternity roosts (from May 1 to August 31), where feasible. Where disturbance is unavoidable, the Proponent would consult with the appropriate regulatory agency. Where feasible, blasting would not occur within 1 km of Keen's long-eared myotis maternity roosts from May 15 to September 30 or hibernacula from October 1 to May 31.

Mitigation with respect to bats is focused on protecting and reducing disturbance to identified hibernacula or maternity roosts and general measures to identify important habitat features such as old growth or potential roosts / hibernacula. Pre-construction wildlife surveys are proposed in the Application to identify habitat features that warrant site-specific mitigation.

Birds

The Application assessed the potential effect of the proposed Project to four terrestrial bird community types, four marine bird communities and nine species of concern. Factors that could alter bird habitat include vegetation clearing, anthropogenic noise and artificial night time light.

Vegetation clearing would result in direct habitat loss, fragmentation and the creation of forest edge. Negative and positive responses to these habitat effects have been documented in literature for a variety of bird species. The effects of nest predation on marbled murrelet appear to be decreasing substantially as recent clearcuts transition to regenerating forests.

Proposed Project activities may also result in a change in habitat for marine birds through habitat displacement and sensory disturbance during the construction phase. During marine pipeline installation at marine entry and exit locations, there is expected to be a small and temporary reduction in the availability of foraging, resting and movement habitats as a result of the physical presence of Project equipment and associated sensory effects.

The proposed Project is predicted to decrease overall availability of effective marbled murrelet breeding habitat in the LAA by 12.7% (331 ha). Within the Nass South SRMP and Kalum LRMP no habitat was identified within the LAA, and therefore no effects are predicted. Within the LAA on Nisga'a Lands and coastal areas, the change in effect breeding habitat for marbled murrelet is 11.3% and 14.9%, respectively.

Proposed mitigation includes development and implementation of a Bird Nest Mitigation and Management Plan for the Project as part of the EMP. The plan would include mitigation measures for all birds protected under legislation, and would provide a framework for describing methods and mitigation measures to reduce potential adverse effects as a result of clearing and construction activities. The plan would include all restricted activity periods and setbacks for birds. Where feasible, Project activities would be avoided in areas where marine bird colonies are present during the breeding season.

Setbacks would be established near known breeding colonies or congregations of marine birds on water or on land. If access within setbacks is essential, the appropriate regulator would be contacted for approval.

Amphibians

Amphibians are particularly sensitive to habitat loss, fragmentation, creation of forest edge, and reductions in habitat connectivity due to limited dispersal abilities, restricted habitat requisites and vulnerability to increased light exposure. Pipeline and facility construction and operations activities have the potential to affect amphibians by causing changes in amphibian habitat effectiveness, movement and mortality risk.

The Project is predicted to decrease overall availability of effective breeding habitat for western toad in the LAA by 2.5% (198 ha), and for pond-dwelling amphibians in the LAA by 2.0% (152 ha). Coastal tailed frog is unlikely to occur within the LAA, based on evidence of distributional limits and a lack of confirmed presence from historical and field surveys.

Mitigation proposed for amphibians include avoiding breeding locations for species of conservation concern where feasible. When not feasible, the Proponent would consult

with the appropriate regulatory agency. When required, amphibian salvage would be conducted prior to commencing heavy equipment activity at known sensitive breeding locations during the amphibian breeding season; the appropriate regulatory agency would be contacted for permitting requirements related to amphibian salvage. In larger wetlands where no eggs, tadpoles, or adults are moved, the work area would be isolated (e.g., exclusion fencing) to restrict amphibians in adjacent parts of the wetland from moving into the construction site. An amphibian handling and relocation protocol would also be developed by the Proponent and pre-clearing surveys would be undertaken to identify pond-dwelling amphibian breeding locations within the Project footprint.

Proposed Mitigation and Monitoring

In addition to the mitigation measures identified above for the various key indicators, the Application identifies a number of key measures to generally mitigate adverse effects to wildlife. In particular, the proposed route and site selection would be the primary mechanism for avoiding or reducing potential adverse effects on wildlife. Other key mitigation and monitoring measures include:

- Pre-clearing wildlife surveys would be completed to identify habitat features that require mitigation;
- All temporary construction access roads and shoo-flies would be deactivated and reclaimed to pre-construction conditions. Newly created access points would be blocked unless otherwise directed by the appropriate regulatory agency;
- Landscape connectivity would be preserved and habitat would be protected by allowing regrowth of native vegetation in accordance with the guidance outlined in OGAA;
- Line-of-sight management would be implemented at selected locations along the pipeline route. Input from pre-clearing wildlife surveys and consultations with FLNR would be used to determine locations for site-specific measures. Measures would be implemented in the field by the Environmental Inspector(s);
- A Wildlife Species of Concern Discovery Contingency Plan would be developed by the Proponent. The plan would address steps to take if species of conservation or management concern or important wildlife habitat features are discovered during construction. The intent of the plan would be to avoid or reduce potential adverse effects on those species or features that are discovered; and
- Noise abatement equipment would be maintained in good working order to reduce wildlife disturbance.

5.8.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the review of the Application, the Working Group and public raised several key issues on wildlife and wildlife habitat. The key issues and the responses of the Proponent and/or EAO are summarized below.

Detail of Survey intensity Level (SIL) 5

FLNR commented that the number of field full plots and visual plots in the Application appear to be below the minimum Resources Information Standards Committee (RISC) Terrestrial Ecosystem Mapping (TEM) standard, and noted that they believed that survey intensity level 5 (SIL 5) would be relatively low for a Project of this nature, particularly considering the uses of the TEM mapping (i.e., prediction of effects on wildlife, vegetation and wetlands). The Proponent was asked to provide some justification of the use of SIL 5, and comment on the consequent accuracy of the TEM mapping products.

The Proponent responded that TEM was completed according to the Standard for Terrestrial Ecosystem Mapping in British Columbia at 1:15,000 scale and SIL 5, which indicates 5-10% of the polygons would be inspected in the field to confirm mapping accuracy, and that where practicable, full Ecosystem Field Assessment plots were completed in rare ecosystem types (red or blue-listed communities in a climax structural stage).

Subsequent sampling in 2014 has increased the sampling intensity within the RAA, to over 11% and the field inspection density is within the recommended density for SIL 4 at 1:20,000 according to the BC TEM standards. Proponent ecologists are confident in the methodology, which was based on standard accepted protocols, and in meeting RISC standards for SIL 5 survey intensity. The Proponent further noted that the survey density meets the standards for SIL 4. The level of survey intensity and density is suitable for drawing conclusions relating to the key indicators reported on in the Application.

Confidence in wildlife site specific features and assessment

Halfway River First Nation, Gitxaala Nation, Yekooche First Nation, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, Doig River First Nation, and FLNR identified concerns about the location of wildlife features (e.g., dens, nests, mineral licks, etc.) detected during field surveys, noting these features should be identified on maps prepared for environmental management and protection during construction and operation. Pre-construction surveys to identify wildlife features should

also be completed. Gitxaala Nation, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, and Doig River First Nation also noted that Aboriginal Group participation in environmental monitoring should be a firm commitment.

The Proponent responded that they would conduct pre-clearing surveys to identify habitat features that require mitigation. Locations detected would be identified on alignment sheets, and setbacks would be delineated in the field with flagging tape. If construction work is deemed necessary within a setback, the appropriate regulatory agency would be consulted for additional advice on mitigation measures. Engagement with Aboriginal Groups would continue regarding on-going field programs.

EAO proposes a condition requiring a plan that incorporates wildlife mitigation set out in the Application and the draft EMP, including pre-construction surveys. EAO proposes a condition requiring specific plans for caribou and grizzly bear that require effectiveness monitoring as a component of those plans, and an adaptive management approach. EAO proposes a condition requiring a Mitigation and Monitoring Plan for moose in the Nass Wildlife Area (NWA), and a condition requiring a monitoring program to assess the effectiveness of mitigation for moose along the rest of the proposed Project route. EAO also proposes a condition that would require the Proponent to implement a construction monitoring program for Aboriginal Groups that provides opportunities to monitor construction activities.

Yekooche First Nation, Halfway River First Nation, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band and Doig River First Nation expressed concerns about the level of assessment done for effects on mortality risk and change in movement to mountain goat, caribou, grizzly bear and moose from construction activities, and whether mitigation measures could mitigate these effects to a negligible or acceptable level.

The Proponent responded that during construction there would be no unauthorized access along the Project ROW, and several mitigation measures and EMPs would be developed and implemented to reduce mortality risk on wildlife during construction. It is expected that these mitigations and plans would be effective, as they are widely recommended and accepted as industry standards. Mortality risk for species such as caribou, grizzly bear, moose, and mountain goat is a concern during the operation phase, when access along the Project ROW would largely be uncontrolled without additional mitigation measures. The Proponent completed a comprehensive assessment of change in

mortality risk for all of these species, and a detailed cumulative effects assessment for caribou, grizzly bear and moose.

EAO proposes conditions requiring the Proponent to develop and implement an Access Control Management Plan, a Caribou Mitigation and Monitoring Plan, and Grizzly Bear Mitigation and Monitoring Plan.

Development and Review of Access Management and Caribou Habitat Restoration Plans

West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, and Doig River First Nation have identified that mitigation for cumulative effects on mortality risk for grizzly bear, caribou, and moose rely heavily on the implementation of currently undeveloped Access Management and Caribou Habitat Restoration Plans committed to in the Application. Given the high importance placed on the success of these plans those Aboriginal Groups requested that the plans be developed, reviewed and approved by the Working Group.

The Proponent responded that the Access Management Plan and Caribou Habitat Restoration Plans form key mitigation measures to reduce or avoid residual and cumulative effects on caribou and grizzly bear and that the plans would be prepared and submitted to OGC later in 2014 as part of the EMP for construction.

Draft plans were submitted to EAO on September 30, 2014 during Application Review for consideration by Working Group members.

EAO proposes conditions that would require the development and implementation of several wildlife plans:

- o A Post-Construction Monitoring Program as part of the EMP;
- o Specific mitigation and monitoring plans for grizzly bear, caribou and moose, which would require monitoring programs, reporting out on the effectiveness of mitigation, and an adaptive management approach; and
- o An Access Control Management Plan to provide specific information on how and when the mitigation measures would be implemented throughout the life of the Project, including an effectiveness evaluation of mitigation.

Moose

West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, and Doig River First Nation have identified concerns related to impacts to moose. Given the

uncertainty surrounding population declines, management objectives for BC and the high cultural value placed upon this species for many Aboriginal Groups, Treaty 8 First Nations have expressed that the residual effects characterization for change in mortality risk does not seem appropriate, and they requested that more information on moose populations be collected within Treaty 8 territory to better understand the population status, trends and potential impacts of the Project.

The Proponent responded that the proposed mitigation measures to reduce residual project effects on moose are consistent with BC's Policy for Mitigating Impacts on Environmental Values and consistent with standard industry practice and provincial and federal regulatory guidelines and recommendations. Mitigation measures are considered to be effective based on experience with past Projects, information from peer-reviewed literature, scientific certainty, and professional expertise. The Proponent would also continue to consider supporting regional initiatives related to change in moose populations and, although not in Treaty 8 territory, has provided support for the "Let's Protect the Moose" program that is a collaboration between the University of Northern British Columbia's John Prince Research Forest and the Tl'azt'en First Nation and Nak'azdli Band.

The Proponent acknowledges that moose are declining in some regions in BC, and although the reasons for decline are not well understood, they are likely attributable to multiple factors such as unregulated hunting, increased access, predator populations, habitat change resulting from mountain pine beetle infestation and salvage logging. The Proponent has completed an assessment of potential project effects on change in habitat, mortality risk and movement for moose and has made commitments to several mitigation measures intended to reduce adverse effects.

EAO proposes conditions requiring the development of a Mitigation and Monitoring Plan for moose in the Nass Wildlife Area (NWA), and a monitoring program to assess the effectiveness of mitigation for moose along the rest of the proposed Project route.

Several Working Group members, including FLNR, Halfway River First Nation and Yekooche First Nation sought clarification on how the Proponent's Caribou Habitat Restoration Plan would be beneficial to moose, considering that such a plan would be expected to focus on measures of primary benefit to caribou, with a goal to not increase alternate prey species (such as moose) within caribou habitat.

The Proponent's proposed Caribou Habitat Restoration Plan would aim to reduce access potential for predators and humans (e.g., line-of-site blocks, mounding,

vegetation screening), which are known causes of increased mortality risk for grizzly bear and moose. As a result, the plan would also benefit moose and grizzly bear, by reducing hunting or predation pressure placed upon them within caribou range. Where natural regeneration or planting would occur, the intent would be to limit preferred moose forage within caribou range.

Caribou

FLNR identified that effects on caribou habitat and mortality (i.e., linear density) are characterized as reversible in the Application. Given the rapid recent declines of the affected herds, there is concern that effects of the Project may not be reversible in a time frame appropriate to the recovery of southern mountain caribou. The Proponent was requested by FLNR to identify the time frame in which effects to caribou are expected to be reversible, and to identify the mitigation measures they are proposing to reduce this time frame.

The Proponent responded that they continue to apply the mitigation hierarchy and acknowledge the importance of avoidance in addressing adverse effects of the proposed Project. During the route selection identified habitat areas were avoided as much as possible. During construction planning and detailed engineering design, the Proponent would continue to seek opportunities to avoid environmentally sensitive areas.

Several mitigation measures are provided in the Application specific to caribou that describe how Project effects would be reduced. Furthermore, the Caribou Habitat Restoration Plan and the Access Management Plan would be key tools for further reducing Project effects, and follow-up programs within these plans would use an adaptive management framework to assess effectiveness.

EAO proposes a condition that would require the development of a Caribou Mitigation and Monitoring Plan, which would include the objectives of: avoidance of displacement and sensory disturbance of caribou; no net loss of caribou habitat; and, avoidance of increased predation of caribou. In addition, the Proponent would be required to participate in, and fund up to \$2 million for, a provincial caribou monitoring program.

Yekooche First Nation, Tl'azt'en Nation, West Moberly First Nations, Saulteau First Nations, McLeod Lake Indian Band, and Doig River First Nation expressed concern about the effects to caribou, given the context of woodland caribou and importance to Aboriginal Groups. West Moberly First Nations, Saulteau First Nations, McLeod Lake Indian Band, and Doig River First Nation noted particular concerns regarding the

Moberly/*Klinse-Za* caribou herd range, for which predicted effects would exceed the precautionary threshold for change in linear feature density. Concerns were also raised regarding the mitigation presented, given the Proponent's undeveloped Access Management Plan.

The Proponent responded that they fully recognize the conservation status of all caribou herds intersected by the Project and are aware of the recovery objectives specified in provincial and federal recovery planning documents. The Proponent responded that they are committed to reducing potential adverse effects of the proposed Project on caribou and to date have made routing refinements to avoid important caribou habitats (e.g., UWR, WHA, high-elevation winter range) and have committed to avoid critical timing windows in important habitat areas, to reduce the creation of new linear features, and to adopt specific construction techniques to facilitate rapid regeneration of natural vegetation. In addition, the Proponent has committed to develop and implement a Caribou Habitat Restoration Plan and an Access Management Plan, each of which have a monitoring and adaptive management component for assessing effectiveness.

The Proponent acknowledged the importance of the Moberly/*Klinse-Za* caribou herd to West Moberly First Nations, Saluteau First Nations, McLeod Lake Indian Band, and Doig River First Nation. The Caribou Habitat Restoration Plan would be developed in consultation with FLNR and affected Aboriginal Groups. In developing that plan, the Proponent would also consider additional documents and resources such as the Action Plan for the Moberly/*Klinse-Za* herd that has been developed by West Moberly First Nations, and would also consider the SARA Recovery Strategy.

During Application Review, EAO sought additional information on potential effects to caribou, including from the federal recovery strategy for southern mountain caribou, from the Implementation Plan for the recovery of South Peace Northern Caribou, and from FLNR. EAO recognizes that the Proponent has made efforts to determine and avoid important caribou habitat along the proposed route and proposed the development of a Caribou Habitat Restoration Plan. However, these measures alone are not sufficient to support caribou recovery as mortality risk also needs to be managed, including by measures that are beyond the authority and responsibility of the Proponent to implement. The complex issues related to caribou management and recovery are difficult and uncertain, and successful caribou management has been elusive in the past few decades.

Critical habitat mapping, as described by the federal recovery plan for southern mountain caribou has not yet been completed for the herds intersected by the proposed Project. The Proponent has made efforts to obtain critical habitat mapping from Environment Canada, but has indicated to EAO that to date the information has not been received, and therefore the Proponent indicates that the extent of overlap with critical habitat is unknown at this time. However, EAO understands that the existing mapping, as identified in the June 2014 federal recovery strategy, shows that the proposed Project may overlap a small section of critical habitat for the Kennedy-Siding herd around KP 132. EAO understands that the proposed Project would not traverse any provincially identified high elevation winter range, summer or calving range, or low elevation winter range. The route would have a small overlap with WHA 9-052, designated for connectivity in the Moberly herd and would be adjacent to, but not overlapping, WHA 9-053 designated for calving/rutting in the Moberly herd.

The proposed Project would cross areas that may potentially be used for caribou to travel between high elevation habitat areas, although no specific defined migration routes have been identified, telemetry data have shown caribou occurrence and potential movement throughout the area. These types of areas may be included in the definition of matrix habitat in the federal recovery strategy, which includes seasonal migration areas and areas of lower use compared to delineated seasonal ranges.

There is the potential for the proposed Project to contribute to declines in the amount and condition of matrix habitat present in the herd ranges; however, at present, matrix habitat has not been identified and therefore the existing state of matrix habitat in relation to the 65% retention threshold presented in the recovery strategy is unknown at this time.

As the Environment Canada recovery strategy has noted, many of the caribou herds that would be encountered along the proposed route have either unknown or declining population status and declines are generally attributed to predation as the immediate cause. Documented cases of predation causing herds' long-term decline or extirpation in the absence of human activity and development are rare, but human activities have been shown to increase predation pressures and precipitate population declines.

EAO understands that the level of certainty around baseline conditions for predation of caribou herds in proximity to the pipeline route is largely unknown, and for herds where predation is well-documented, a large amount of the predation occurs in the lower elevation habitat. The prevailing opinion is that declining caribou herds are experiencing serious cumulative predation effects and any additional risk that increases predation

would be additive and would contribute to a failure to meet recovery objectives related to stabilizing caribou populations as part of the recovery strategy.

There is generally a lack of available data related to caribou predation and the effectiveness of proposed mitigation to reduce alternate prey densities, predator access and efficiency. However, Environment Canada's recovery strategy identifies indirectly managing caribou predator density and distribution via direct habitat management as a key strategy. There is some work from Alberta addressing mitigation for boreal caribou on linear features; however, it is not clear how applicable this mitigation is to northern caribou, and on active pipelines. Caribou use of pipeline areas is not well-proven and therefore it is highly uncertain as to whether the proposed mitigation measures would be successful in not adding to the cumulative risk of predation. In addition, mitigation measures would require time to become potentially effective and therefore effects could remain unmitigated for several seasons.

As a result, EAO proposes a condition requiring the Proponent to develop a comprehensive Caribou Mitigation and Monitoring Plan. Furthermore, EAO proposes a condition requiring the Proponent to enter into an agreement with FLNR, and fund up to \$2 million, to support the ongoing recovery, conservation and management of impacted caribou herds, including activities that would be beyond the authority of the Proponent to implement.

Grizzly Bear

West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, and Doig River First Nation expressed concern about the sensitivity of grizzly bear to human disturbance, with the mitigation presented, and with the failure to meet management objectives outlined for grizzly bear in resource plan areas.

The Proponent responded that the Application provides information on the residual effect of change in habitat. Following construction, sensory disturbance on grizzly bear habitat is predicted to be reduced, and all temporary workspace would be left to regenerate. The mitigation measures proposed to reduce residual Project effects on grizzly bear and their habitat are consistent with provincial regulatory guidelines and best practices. The Proponent has committed to the development of an Access Management Plan, which they considered an important measure for reducing adverse effects on grizzly bear. Development of this plan would include consultation with regulatory agencies and Aboriginal Groups.

FLNR expressed concern that the Application's assessment of change in mortality risk did not collect enough baseline data to support monitoring. FLNR noted it is important that the Proponent commit to the implementation of mitigation and adaptive management with a follow-up comprehensive monitoring program.

The Proponent committed to develop and implement several mitigation measures and management plans to reduce potential project effects on change in mortality risk for grizzly bear. Specifically, the Access Management Plan, which includes an objective to reduce the change in mortality risk in core security habitat, includes a follow-up program to evaluate the effectiveness of mitigation measures.

EAO has proposed a condition that would require the development of a Grizzly Bear Mitigation and Monitoring Plan, developed in consultation with FLNR, and would include mitigation to address sensory disturbance and mortality risk to grizzly bears, and effectiveness monitoring. Another proposed condition would require the Proponent to participate in, and provide funding up to \$750,000 for, a Grizzly Bear Program to support the conservation and management of grizzly bears.

Mountain Goats

FLNR requested that the Proponent clarify that the mitigation identified in the Application for mountain goat applies to all habitat and not just the legally established habitats designated under the Government Actions Regulation. FLNR noted that draft polygons are available for many areas of the Project footprint not included as legal orders. West Moberly First Nations, Saúlteau First Nations, McLeod Lake Indian Band, and Doig River First Nation raised concerns that mountain goat habitat was underestimated in the assessment because only designated/proposed UWR was considered, and mountain goat habitat exists outside UWRs. Measures employed to mitigate impacts on mountain goat should be carried out in all mountain goat habitat that may be used during sensitive periods (gestation, kidding), and not just habitat that occurs in designated UWR.

The Proponent acknowledged that mountain goats are not restricted only to UWR areas; however, these areas have been identified by FLNR as particularly important for mountain goat and this has guided the Proponent's approach for implementing the mitigation measures as described in the Application. The Proponent stated that it welcomes additional information on the location of important mountain goat habitat from Aboriginal Groups.

Implementing these mitigation measures in other areas where goats occur is challenging in the absence of spatially-defined boundaries. The Proponent stated that it maintains a table of mountain goat records observed during field studies, and would be prepared to meet with FLNR to discuss these and other areas where they may need to implement practical and appropriate mitigation measures to reduce potential adverse project effects. The Proponent responded that they would take areas identified as draft polygons into consideration (pending availability of the spatial files) during development of site-specific mitigation.

Marbled Murrelet / Marine Birds

Environment Canada has identified the recovery strategy for marbled murrelet, including descriptions and targets for critical habitat. Environment Canada recommends avoidance of activities that may destroy critical habitat to ensure that critical habitat is protected in a manner consistent with SARA. Environment Canada also recommended utilizing the *Avoidance Guidelines on the Incidental take of Migratory Birds* to develop mitigation measures to avoid engaging in potentially destructive or disruptive activities in critical habitat or during breeding season that may affect marbled murrelet.

EAO proposes a condition that would require a mitigation plan to be developed, including monitoring, to avoid or minimize impacts of any Project-related incursions into Marbled Murrelet Critical Habitat.

Species at Risk

Environment Canada suggested that further surveys and information is needed on the effects to various federally-listed species at risk.

The Proponent has committed to the completion of pre-construction wildlife surveys where required to support site-specific mitigation and management planning.

5.8.4 Characterization of Residual Project Effects

Considering the potential for effects once the proposed mitigation is applied, EAO concludes that the proposed Project is likely to result in the following residual adverse effects to wildlife and wildlife habitat:

- Habitat loss, alteration and fragmentation;
- Sensory disturbance, particularly during construction and in the vicinity of

- compressor stations during operations; and
- Increased mortality risk from predators and humans.

Summarized below is the EAO's assessment of the expected residual effects of the proposed Project on wildlife, as well as the EAO's determination of significance based on the residual effects characterization.

Criteria	Assessment Rating	Rationale
Context	Grizzly bear: High	Grizzly bear are highly sensitive to human disturbance. Existing average linear disturbance within the GBAs in all but the westernmost GBAA currently exceeds or is approaching the recommended road density threshold of 0.6 km/km ² . The GBUs that would be traversed by the Project are not considered threatened.
	Caribou: High	Caribou herds that would be affected by the proposed Project are part of a population unit listed as threatened under SARA. Caribou have a high sensitivity and low resilience to human disturbance and some subpopulations have high levels of disturbance currently within their ranges.
	Moose: Moderate	Moose generally have a low sensitivity to habitat disturbance; however moose in the NWA have declined substantially in recent years and may have a higher sensitivity to disturbance. Moose are more sensitive to human and predator-caused mortality which may be facilitated by disturbance that facilitates increased access.
	Mountain goat: Moderate	Mountain goats are highly sensitive to human caused disturbance, however mountain goat populations in the regions that would be traversed by the route are considered stable.
	Marten: Low	Marten are not a species of conservation concern provincially or federally and have a low sensitivity to human caused disturbance.
	Fisher: Moderate	Fisher have a moderate to high sensitivity to human disturbance as they use mature and old forests, have large home ranges and low reproductive rates.
	Birds and amphibians: Low to high	The sensitivity of bird and amphibian species ranges from low to high depending on their ability to use disturbed habitat, their reliance on early or late seral stage habitat and their current population

Criteria	Assessment Rating	Rationale
		status.
Magnitude	Grizzly bear: Moderate	The magnitude of potential effects to grizzly bear is considered moderate because of the proposed Project's contributions to linear density and mortality risk to grizzly bear. Habitat suitability as a function of linear density would decrease by 0.2% to 0.9% in GBAA's, and core security area would decrease by 0.8% to 4.2% in GBAA's.
	Caribou: Moderate	The magnitude to caribou is considered moderate. EAO considered the location of the proposed Project and that it would not impact provincially identified seasonal ranges, or high use areas, but would still occur within herd boundaries and areas of potential lower use by caribou, resulting in a likely increase in mortality risk. The linear nature of the disturbance would create the potential for increased predation in these areas, a key threat to caribou. EAO also considered the current level of habitat disturbance and predation already occurring for caribou and that available mitigation to reduce impacts of increased predation are still unproven and cannot be relied upon to completely or greatly reduce those effects. Magnitude is considered in relation to recovery strategies and plans.
	Moose: Low to Moderate	The magnitude of residual effects to moose is considered low to moderate because, although there are impacts to moose habitat, moose are less sensitive than other species to habitat disturbance. Effects from access are expected to be mitigated to a low level with implementation of the Access Management Plan. Effects in the Nass Wildlife Area are considered to be moderate because of the substantial declines that have already occurred.
	Mountain Goat: Low	The magnitude of residual effects to mountain goat is considered low. There is no direct disturbance to mountain goat UWR.
	Marten and Fisher: Low	The magnitude of residual effects to marten and fisher is considered low because the mitigation proposed to minimize habitat disturbance and fragmentation and create rollbacks to provide cover are expected to reduce the potential effects.
	Amphibians: Low	The magnitude of residual effects to amphibians and birds is considered low because the mitigation

Criteria	Assessment Rating	Rationale
	Birds: Low/negligible	proposed to minimize habitat disturbance and fragmentation is expected to reduce the residual adverse effects.
Extent	Grizzly bear, caribou, moose, mountain goat, fisher, marbled murrelet: Regional Amphibians, birds, marten: Local	Residual effects of alteration of habitat, effects on movement and mortality risk would be limited to a local scale (LAA) for most indicator species, except for large mammals and fishers where residual effects for mortality risk and disturbance extend to a regional scale (RAA, GBAA for grizzly bear, and herd range for caribou).
Duration	Medium- to long-term	The duration of effects on wildlife are driven by the re-establishment of native vegetation along the ROW, in particular treed habitat, which would not occur until well after decommissioning and abandonment, The re-establishment of herbaceous, shrub land and grassland habitat for grassland, riparian and water / marine birds would occur in a shorter time frame, however, habitat alteration would be long term considering time for regeneration after reclamation. Residual effects on large mammals from increased access by humans and predators are expected to persist for the long-term.
Reversibility	Reversible	Effects to wildlife are expected to be reversible in the long term upon reclamation of the ROW.
Frequency	Isolated to periodic, continuous	Effects to habitat from vegetation clearing during construction would occur once and clearing for maintenance activities would occur periodically. Mortality risk from construction would occur once and from maintenance activities periodically; however, the primary causes of mortality risk (creation of access) would be ongoing and continuous due to the permanent ROW. Disturbance from permanent facilities such as compressor and meter stations would be continuous.
Likelihood	The proposed Project has a high likelihood of resulting in adverse effects by altering habitat, changing wildlife movement and increasing the risk of mortality.	
Significance	For wildlife, residual adverse effects are considered significant when there is a long-term or irreversible residual adverse effect that is predicted to exceed an acceptable biological threshold or standard, or is predicted to affect a population such that stated management or conservation objectives might not be attainable.	

Criteria	Assessment Rating	Rationale
		EAO considered the moderate magnitude of effects on grizzly bear, the sensitivity of grizzly bears to human caused disturbance and the long-term duration of these effects. EAO proposes a condition requiring mitigation to address sensory disturbance to grizzly bears and the risks of creating new access, including monitoring to determine the effectiveness of mitigation and adaptive management to address the results of monitoring. In consideration of the above, including the proposed condition, EAO concludes that residual Project effects to grizzly bear are not likely to be significant based on continued monitoring and adaptive management and the current status of grizzly bears. EAO considered the moderate magnitude, long-term duration of residual effects on caribou. An important aspect of EAO's consideration is the context of the caribou subpopulations, and the ongoing federal and provincial government efforts to support caribou recovery. EAO also considered the proposed condition requiring a mitigation and monitoring plan to address the potential mortality risk to caribou. It is also recognized that mitigation measures are not yet proven for caribou, and an adaptive management approach would be required as part of the plan. In consideration of the above, including the proposed condition, EAO concludes that residual Project effects to caribou are significant. EAO considered the low to moderate magnitude of residual effects on moose and potential long-term duration of the effect. With the Proponent's proposed mitigations, as well as conditions requiring development and implementation of management plans, and ongoing government efforts at moose recovery, EAO concludes that residual effects would be not significant. EAO considered the low magnitude of residual effects on mountain goat, and the potential long term duration of those effects. With the Proponent's proposed mitigations, as well as conditions requiring development and implementation of management plans and site-specific mitigation, EAO concludes that residual adverse effects would be not significant. EAO considered the low magnitude of residual adverse effects on the remaining wildlife species and short to long term duration. EAO concludes that residual effects would be not significant.
Confidence		The level of confidence is determined by the availability of data, the understanding of the project-VC interaction and effectiveness of mitigation. Low to Moderate Confidence – There is low to moderate level confidence in the significance determination for grizzly bear. It is likely that there would be adverse effects to grizzly bears resulting from the proposed Project, however there is considerable uncertainty regarding the magnitude these effects at the landscape or sub-population level, particularly on the eastern portion of the route where lower population densities and higher access densities mean populations are more at risk from further disturbance. There is also uncertainty regarding the effectiveness of mitigation, either proposed or yet to be developed. In light of this uncertainty, EAO has proposed conditions requiring

Criteria	Assessment Rating	Rationale
		the Proponent to develop a mitigation and monitoring plan for grizzly bear that includes an adaptive management strategy, and requiring the Proponent to participate in a program to support the conservation and management of regional grizzly bear populations. Low Confidence – There is a low confidence in the significance determination for caribou. There is a good general understanding that linear features in caribou ranges can contribute to the alteration of predator-prey dynamics and result in increased mortality risk to caribou, however the magnitude of effects to caribou from this proposed Project depends on caribou and predator movement on and around the ROW and are difficult to predict. In addition, the project impacts to overall retention and condition of matrix habitat are unknown at this time. There is low confidence in the effectiveness of mitigation related to controlling predator access and efficiency on linear corridors as it has not been proven to be effective and it is uncertain the degree to which mitigation may be successful. Moderate to High Confidence – There is moderate to high confidence in the significance determination for moose, based on a good understanding of the cause-effect relationship, but moderate confidence in the effectiveness of mitigation related to access management. To address this uncertainty, EAO proposes a condition requiring monitoring to assess the effectiveness of mitigation for moose, as well as a condition specific to mitigation and monitoring for moose in the NWA. An access management plan is proposed as a condition with requirements for monitoring the effectiveness of the plan. EAO also proposed a condition regarding development of a Plan to support the implementation wildlife mitigation measures identified in the Application. High Confidence – There is high confidence in the significance determination for mountain goat based on a good understanding of the cause-effect relationship and availability of data for the proposed Project area. High Confidence – There is high confidence in the significance determination for marten and fisher based on a good understanding of the cause-effect relationship and data pertinent to the proposed Project area. Moderate to High Confidence – There is moderate confidence in the significance determination for amphibians, except coastal tailed frog which has high confidence. There is good understanding of cause-effect relationships and data pertinent to the proposed Project area, except that there are limited data related to hibernation habitat for western toad and effects to hibernating pond-dwelling amphibians. High Confidence – There is high confidence in the significance determination for birds based on a good understanding of the cause-effect relationship and data pertinent to the proposed Project area.

5.8.5 Cumulative Effects Assessment

The Application finds that cumulative effects are expected to occur for some wildlife key indicators as a result of the impacts of this proposed Project together with existing and reasonably foreseeable future activities and disturbances. The Proponent's assessment concluded that adverse cumulative effects related to change in habitat and change in movement within the RAA were not anticipated. Adverse cumulative effects were anticipated for change in mortality risk to grizzly bear, caribou and moose key indicators and these three indicators were carried forward to a more detailed assessment of potential cumulative effects for change in mortality risk.

Cumulative effects on changes in mortality risk are driven largely as a result of linear feature development and the associated increase in human access potential and the change in predator-prey interactions. Linear features that facilitate motorized vehicle access, or permit predator travel and infiltration into previously inaccessible areas, are linked to the primary cause of adverse effects for large mammals. Resource road networks associated primarily with forest harvest activities have historically been the mechanism for increased access throughout the RAA. In the eastern portion of the RAA, seismic development has been attributed as a major contributing factor to improved access, as have oil and gas exploration roads. Existing pipeline and powerline projects, which are also largely restricted to the eastern portion of the RAA, also likely contribute to cumulative effects on mortality risk.

Similarly, the Northwest Transmission Line project, currently being constructed in the western portion of the RAA, could contribute to cumulative effects on mortality risk. The proposed WCGT pipeline follows a route between Fort St. John and Prince Rupert, similar in areas to the proposed Project's route. The potential effects from the WCGT pipeline are expected to be similar to this Project. The North Montney Project is a proposed natural gas pipeline located in northeastern BC in the Peace River Regional District. While the majority of the project lies outside of the RAA, a portion of the Aitken Creek section overlaps with this Project.

Within GBAs, Caribou Herd Ranges, and the RAA, Project-related residual increase in mortality risk for grizzly bear, woodland caribou and moose overlaps with similar effects from past and present industrial land use, linear infrastructure, forestry and agricultural land use, recreational activity, and residential land use. There is the potential for overlapping effects with reasonably foreseeable projects and activities.

Grizzly Bear

The cumulative increase in grizzly bear mortality risk in the GBAs is largely because of linear feature development and the associated increase in motorized vehicle access, particularly into previously inaccessible areas. Resource road networks, developed primarily for forest harvest activities, have been the primary mechanism for increasing human access throughout the GBAs. In the eastern GBAs, seismic development and oil and gas exploration roads have been identified as a major contributing factor to increased human access. Existing pipeline and powerline ROWs contribute to the cumulative increase in grizzly bear mortality risk.

For individual GBAs, Table 5-12 show that the estimated future cumulative decrease in the area of core security habitat (i.e., areas greater than 10 km² in size) would range from 0.8% to 9.4%. Depending on the GBA, the proposed Project would contribute 28% to 100% to this cumulative change.

Table 5-12: Cumulative Effects on Grizzly Bear Core Security Habitat

Grizzly Bear Assessment Area	Base Case (km²)	Project (km²)	Reduction (%)	Future (km²)	Reduction (%)
Rocky	705	676	4.2	639	9.4
Moberly/Hart	3,710	3,673	1.0	3,601	2.9
Omineca East	2,267	2,240	1.2	2,195	3.2
Nation	2,499	2,480	0.8	2,480	0.8
Omineca/Babine	3,892	3,838	1.4	3,821	1.8
Cranberry	3,448	3,412	1.0	3,323	3.6
Khutzeymateen/Stewart	2,636	2,604	1.2	2,447	7.2

For individual GBAs, the estimated future cumulative decrease in habitat suitability as a function of linear feature density would be 1.2%, ranging from 0.6% to 1.8% (Table 5-13). The Project would be the main contributor to the cumulative decrease in habitat suitability at future case for the Omineca East and Omineca/Babine GBAs (accounting for 56% and 90% of the decrease in area of suitable habitat, respectively) and the sole contributor to cumulative effects at future case for the Nation GBA.

Table 5-13: Cumulative Effects on Grizzly Bear Habitat Suitability as a Function of Linear Feature Density

Grizzly Bear Assessment Area	Linear Density		Habitat Suitability as a Function of Linear Density			
	Base Case (km/km ²)	Future (km/km ²)	Base Case (ha)	Future (ha)	Reduction (ha)	Reduction (%)
Rocky	2.16	2.21	150,854	148,318	2,536	1.7
Moberly/ Hart	0.78	0.81	469,560	465,641	3,919	0.8
Omineca East	0.94	0.97	330,711	326,642	4,069	1.2
Nation	0.83	0.85	359,406	357,396	2,010	0.6
Omineca/ Babine	0.66	0.68	537,570	532,496	5,074	0.9
Cranberry	0.59	0.64	461,627	453,517	8,110	1.8
Khutzeymateen/ Stewart	0.35	0.41	330,706	325,057	5,649	1.7
Total	-	-	2,640,432	2,609,066	31,366	1.2

One of the seven GBAs (Khutzeymateen/Stewart) has a linear feature density that is below the precautionary threshold (0.6 km/km²) in all cases (Table 5-13). The Cranberry GBA is just below the precautionary threshold at base case and is estimated to be just over the precautionary threshold in the future cumulative assessment. Five of the seven GBAs (Rocky, Moberly/Hart, Omineca East, Nation and Omineca/Babine) have linear feature densities that exceed the precautionary threshold at base case and one of these, Rocky, exceeds the threshold by more than three times. The cumulative increase in linear feature density ranges from 2.3% to 17.1%. The largest increase is in the GBA with the lowest linear feature density (Khutzeymateen/Stewart GBA). Two GBAs either fully or partially overlap GBUs that are closed to hunting (part of the Khutzeymateen/Stewart GBA, and most of the Moberly/Hart GBA).

The Application identified the Cranberry, Nation and Rocky GBAs as potential concerns based on linear feature density and human-caused mortality rates. The Proponent has committed to develop a comprehensive EMP that includes specific measures to reduce grizzly bear mortality risk, including an Access Management Plan that identifies minimizing grizzly bear mortality risk as an objective. The Proponent also states it could support the development of regional initiatives to address grizzly bear mortality risk.

Mitigation identified by the Proponent to address cumulative effects on grizzly bear mortality risk includes:

- During early pipeline routing, the Proponent adjusted a portion of the route

alignment to avoid a large portion of identified grizzly bear habitat in the Cranberry SRMP area. This adjustment was made through consultation and detailed discussion with Gitanyow First Nation;

- An Access Management Plan would be developed for the operation phase of the Project in consultation with the appropriate regulatory agency, Aboriginal Groups and stakeholders; and
- A Caribou Habitat Restoration Plan would be developed to address cumulative residual effects for woodland caribou herds, and is expected to benefit grizzly bear.

There is uncertainty around the effectiveness of mitigation measures, particularly in regard to access management. However, under an adaptive management framework where monitoring would be used to evaluate effectiveness, success in implementation is predicted by the Proponent to improve over time.

EAO has proposed a condition that would require the Proponent to develop a Grizzly Bear Mitigation and Monitoring Plan, with the objective of avoiding sensory disturbance to grizzly bear and avoiding incremental mortality risk to grizzly bear resulting from the project. EAO has also proposed a condition that would require the Proponent to participate in, and fund up to \$750,000 for, a Grizzly Bear Program that supports the conservation and management of grizzly bear populations.

The magnitude of residual cumulative effects to grizzly bear are considered moderate and effects of the proposed Project interacting with future projects and activities could extend throughout the GBAAs. The duration of effects on habitat are driven by the reestablishment of vegetation and could range from short to long term, the effects of increased access are considered long term. Residual effects are considered to be reversible provided that reclamation of disturbance takes place. It is likely that residual cumulative effects would occur. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to grizzly bears, including providing financial contributions. Taking into consideration the mitigation for the proposed Project and that similar mitigation would likely be applied for other similar projects, cumulative effects to grizzly bear are not considered to be significant.

Caribou

The federal Recovery Plan for the Southern Mountain Caribou population identifies increased predation resulting from habitat alteration due to industrial activities as the most significant, immediate threat to Southern Mountain caribou.

Increased predation is expected due to: habitat alteration within and adjacent to ranges from industrial activities (forest harvesting, mining, wind power projects) and infrastructure (pipelines, transmission lines) resulting in habitats favoured by other prey such as deer and moose, which in turn sustain higher numbers of predators; and facilitated access for predators into caribou ranges from expansion of roads and other linear infrastructure, and packed trails due to winter recreational activities. Natural disturbances such as wildfire can also alter habitat in a way that favors alternate prey.

The four caribou herds intersected by the Project have a conservation status of Threatened under SARA Schedule 1 and there are decreasing current and long-term population trends identified for at least two of the herds (Moberly/*Klinse-Za* and Kennedy-Siding). Environment Canada identifies the overall level of threat from the combined (cumulative) effect of all threats over the next 10 years as high for the Northern Group (Takla) and very high for the Central Group (Moberly/*Klinse-Za*, Kennedy-Siding, and Scott).

For the proposed Project assessment of effects on caribou mortality risk the Proponent considered linear feature densities of 0.80 km/km² and 1.2 km/km² to be the precautionary and critical thresholds, respectively. The Kennedy-Siding and Takla herds would be below the precautionary threshold in all cases (i.e. base case, with the proposed Project, and future cumulative effects), but the Scott herd range would be reaches the threshold in the future cumulative case. The Moberly/*Klinse-Za* herd range is above the precautionary threshold in all cases.

Table 5-14: Cumulative Effects on Linear Feature Density in Caribou Herd Ranges

Caribou Herd Range	Base (km/km²)	Future (km/km²)	Change (km/km²)	Change (%)
Moberly/ <i>Klinse-Za</i>	0.83	0.86	0.03	3.5
Kennedy-Siding	0.60	0.61	0.01	1.8
Scott	0.78	0.80	0.02	2.5
Takla	0.45	0.47	0.01	2.9

Mitigation identified by the Proponent to address cumulative effects on caribou mortality risk includes:

- The Proponent would consider guidance from *Recovery Strategy for the Woodland Caribou, Southern Mountain Population* in Canada released by the federal government in the development of the EMP and from the draft *Action Plan for the Klinse-Za Herd of Woodland Caribou (Rangifer tarandus caribou)* in Canada, released by West Moberly First Nation and in the final version when it becomes available, in the development of the EMP;

- The Proponent has considered guidance from Province's Implementation Plan for the Ongoing Management of South Peace Northern Caribou in British Columbia in routing (e.g., avoidance of high elevation winter range), and would consider further guidance in the development of the EMP;
- The Proponent is supportive of regional initiatives related to caribou mortality risk and would consider opportunities to participate in the future;
- A Caribou Habitat Restoration Plan would be developed in consultation with appropriate regulatory agencies and interested Aboriginal Groups and stakeholders; and
- An Access Management Plan would be developed to address cumulative residual effects for grizzly bear (see above) that would also benefit the woodland caribou herds intersected by the Project.

There is uncertainty in the effectiveness of mitigation measures, particularly in regard to access management. However, under an adaptive management framework where monitoring would be used to evaluate effectiveness, success in implementation is predicted by the Proponent to improve over time.

EAO is proposing a condition that would require the Proponent to develop a Caribou Mitigation and Monitoring plan to detail a site-specific mitigation, monitoring and adaptive management approach. The Proponent would be required to engage with Aboriginal Groups, Environment Canada, OGC and FLNR in the development of this plan. The Proponent would also be required to provide up to \$2 million to fund all or a portion of a program of activities that support caribou conservation and recovery of caribou ranges.

The residual effects to caribou from the proposed Project would likely interact with reasonably foreseeable future projects to create additional cumulative effects. As stated above, it is likely that cumulative effects on mortality risk are already significant. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to caribou, including providing financial contributions. Taking into account the effects from existing projects and activities to caribou, the status of caribou and the sensitivity of caribou to disturbance, cumulative effects to caribou are considered to be significant.

Moose

The Project would intersect portions of three areas with declining moose populations: central Omineca Region, Bulkley Valley-Lakes District, and the Nass Wildlife Management Area. Treaty 8 First Nations have noted that moose populations in their

territory have declined as well. At present, the Province does not consider these population declines to be an immediate conservation concern, but harvest levels have been adjusted in some areas. The primary mechanism for cumulative change in moose mortality risk is the interaction of the pipeline footprint with existing disturbance and future linear feature development and associated habitat alteration that may increase predation and hunting pressure on moose.

Linear feature density of 1.6 km/km² is considered by the Proponent as the cautionary threshold for cumulative effects on moose mortality risk in this assessment and GBAs were considered a suitable scale over which to assess moose mortality risk. Linear feature densities calculated for the seven GBAs supporting moose are evaluated against the threshold for moose.

Only the Rocky GBA has a linear feature density greater than 1.6 km/km². The other GBAs are well below the cautionary threshold for moose (Table 5-13). The cumulative future increase in linear feature density would range from 2.4% to 17.1%. The Project's incremental contribution is less than 4%, ranging from 1.3% to 3.4%.

Mitigation identified by the Proponent to address cumulative effects on moose includes:

- During early Project routing, the Proponent adjusted a portion of the route alignment to avoid a large portion of identified moose winter range habitat in the Cranberry SRMP area. This adjustment was made through consultation and detailed discussion with Gitanyow First Nation;
- The Proponent would consider guidance from the Nisga'a Fish and Wildlife Commission's *Nass Moose Recovery Plan* in the development of the EMP;
- The Proponent would consider guidance from draft *Provincial Framework for Moose Management in British Columbia* in the development of the EMP;
- The Proponent has provided funding to support the Khuda huwa'oodli (Let's Protect the Moose) Project. That project is a partnership between Tl'azt'en and Nak'azdli Band and John Prince Research Forest to better understand moose and moose habitat in the central interior and identify potential conservation measures;
- The Proponent is supportive of initiatives related to moose mortality risk and would consider other opportunities to participate in the future; and
- The Proponent expects the Access Management Plan and Caribou Habitat Restoration Plan described for grizzly bear and caribou, to also benefit moose.

There is uncertainty around the effectiveness of mitigation measures, particularly in regard to access management. However, under an adaptive management framework

where monitoring would be used to evaluate effectiveness, success in implementation is predicted by the Proponent to improve over time.

The residual effects from the proposed Project would likely interact with reasonably foreseeable future projects to create cumulative effects to moose. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to wildlife and wildlife habitat. However, taking into consideration the mitigation for the proposed Project and that similar mitigation would likely be applied for other similar future projects, cumulative effects to moose are not considered to be significant.

5.8.6 Conclusions

Taking into consideration the above analysis and having regard to the proposed conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), the magnitude of the effects from the proposed Project and the extent of habitat disturbance within the RAA from the proposed Project and reasonably foreseeable future projects, the residual adverse Project effects and cumulative adverse effects to wildlife and wildlife habitat are considered not significant, with the exception of residual Project and cumulative effects to caribou. EAO concludes that residual Project effects to caribou and cumulative effects to caribou are significant.

5.9 Marine Resources

5.9.1 Background

The potential for the proposed Project to adversely affect marine resources include the potential direct, indirect and cumulative effects on marine fish and fish habitat, marine mammals, and species at risk. Other marine related issues, such as marine birds, transportation/navigation, accidents and malfunctions, human health related to consumption of seafood, are discussed in section 5.8, section 7.2, and section 10, respectively, of this Report.

Key indicators were selected for the marine VC based on their potential to be affected by the proposed Project. A wide variety of marine values and species were assessed, and were organized around the following four marine indicators:

- Habitat-forming marine vegetation of cultural or ecological importance, or at-risk – i.e., kelp, seaweeds, seaweed mats and estuarine wetlands and saltmarshes;
- Fish species associated with commercial, recreational or Aboriginal (CRA) fisheries – i.e., benthic and demersal fish (e.g. cod, halibut, sardine), anadromous fish (e.g. pacific salmon, trout, eulachon), pelagic forage fish (e.g. herring), invertebrates (e.g. crab, abalone, mussels, sponges, squid);
- Marine mammals– i.e., pinnipeds (e.g. seals, sea lions), cetaceans (e.g. porpoise, killer whale, grey whale, humpback whale), other mammals (e.g. sea otter); and
- Species at Risk – i.e. fish, invertebrates, marine mammals federally listed under *Species at Risk Act* (SARA) or provincially listed under the *BC Wildlife Act*.

The assessment of marine water quality is included in this chapter, although it was presented under the water quality VC in the Application. The assessment of marine water quality includes the change in marine water quality related to toxicity including assessment of marine sediment re-suspension and disposal associated with trenching at landfalls and discharge of hydrostatic test water.

In marine environments, Project activities have the potential to affect fish habitats at several locations along the 120 km of the marine pipeline route, but are primarily expected in the nearshore environment where the pipe enters and exits the water and is in shallow water. These areas include Nass Bay, Iceberg Bay, Echo Cove, Nasoga Gulf and at the terminus on Lelu Island. Figure 5.2 shows the marine portion of the proposed pipeline route.

The marine pipeline route includes a total of 120 km in the marine environment, including:

- One 48 inch pipe for the Nass Bay Nearshore Marine (8km) and Iceberg Bay (3km) crossing along the route to Nasoga Gulf; and
- Two 36 inch pipes from Nasoga Gulf, through Portland Inlet and Chatham Sound to the marine terminal on Lelu Island (approximately 110 km total length).

The Application included several proposed route options near Nass Bay, Iceberg Bay to Nasoga Gulf. The July 31, 2014 *Addendum to the Application for an Environmental Assessment Certificate* eliminated multiple route options and identified a single route to Nasoga Gulf (shown in Figure 5-2), which includes the Nass Bay Connector, Nass Bay Nearshore Marine and Iceberg Bay crossing. The assessment in this section reflects current proposed marine route.

The LAA for marine resources includes an area approximately 120 km in length between Nass Bay / Nasoga Bay and Lelu Island, and 1 km wide centered on the marine pipeline route.⁷ This area encompasses the marine environment in which effects associated with project construction activities are most likely to occur.

The RAA encompasses the area within which the Project's contribution to cumulative effects is assessed. The RAA for marine resources encompasses channels within confined inlets and includes the adjacent marine riparian zone. For open water areas, the RAA encompasses the confined waters of Chatham Sound from Portland Inlet to as far south as Smith Island, which includes Nass Bay, Portland Inlet, Chatham Sound, Prince Rupert Harbour and the Skeena River estuary as far south as Porcher Island. The RAA is based on consideration of: presence and habitat of populations of fish, marine mammals, or species at risk that may be affected by the Project; and relevant fisheries and ecological unit management areas.

Regulatory Context

The key federal, provincial and Nisga'a legislation, regulations, guidelines and permitting requirements that provide important context for assessing the impacts on the marine environment are consistent with those presented in the Freshwater Fish and Fish Habitat section (section 5.5) of this Report.

The federal *Fisheries Act*, administered by DFO, is the main federal statute related to the conservation and protection of marine fish, fish habitat and marine mammals. Fish

⁷ The marine pipeline route incorporates twin parallel pipes.

and fish habitat protection and pollution control measures include a prohibition, if unauthorized, against serious harm to fish that are part of a CRA fishery, or to fish that support such a fishery (Subsection 35[1]); and a prohibition against the deposit of deleterious substances in water frequented by fish (Subsection 36[3]). SARA also provides protection of marine species at risk.

Of additional relevance to the marine environment is the *Canadian Environmental Protection Act* (CEPA) and *Disposal at Sea Regulations*, administered by Environment Canada, which regulates the disposal of material at sea (e.g. trench material). Disposal of sediment at sea requires a disposal at sea permit under CEPA. Schedule 5 of CEPA lists the type of substances that may be considered for a disposal-at-sea permit, which include dredged materials, inert inorganic geological matter, and uncontaminated organic matter of natural origin.

Other federal legislation of relevance to the marine environment is the *Navigation Protection Act* (NPA) which is administered by Transport Canada.

Management and protection of marine resources is partially regulated by BC through the *Environmental Management Act* and *Wildlife Act*.

OGAA and associated regulations, administered by OGC, includes requirements for land tenure on the seabed (within provincial jurisdiction), as well as pipeline safety and environmental protection for pipeline design, construction and operations in the marine environment.

The Prince Rupert Port Authority (PRPA) has federal jurisdiction regarding activities on land and water (including the seabed) within the Port Authority boundaries around Prince Rupert Harbour including the proposed Project marine pipeline terminal on Lelu Island.

5.9.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Existing Marine Conditions

The coastline in the vicinity of the Project is dominated by rocky shores (70%) interspersed with gravel and sandy beaches (25%). Estuaries, tidal mudflats, and salt marshes make up a small portion of the marine environment (5%); and are populated by communities of fish, invertebrates, and seaweeds. Rocky intertidal habitats (e.g., in Nasoga Gulf and Portland Inlet) shelter complex assemblages of sea stars, barnacles, crustaceans, and algae. Muddy estuarine and eelgrass habitats support diverse

communities of burrowing invertebrates and provide important nursery areas that support major CRA fisheries for salmon, eulachon, Pacific herring and Dungeness crab. Sandy intertidal habitats support numerous bivalve species that are of importance to CRA fisheries, such as razor clams, butter clams, and Nuttall's cockle.

The seabed of the RAA is dominated by mud. Complex benthic habitat features, including rocky reefs and sponge habitats that exist in deeper waters of Chatham Sound, are important habitats for fish and invertebrates. Many juvenile and adult marine fish and hundreds of species of invertebrates use rocky reefs as shelter and feeding areas. Coral mounds and reef-forming sponges provide important structure in low-relief deep-water environments, making them especially productive, relative to the surrounding seabed. These features serve as important productive habitat for marine animals including crabs, shrimp, prawns, krill, and rockfish.

Eelgrass beds are common throughout the RAA, especially around the Skeena River estuary and on Flora Bank, off the west coast of Lelu Island. Smaller eelgrass beds are also found along the coastal mainland and islands throughout Chatham Sound, and near estuaries within Portland Inlet, Nasoga Gulf, and Nass Bay. Kelp beds are found scattered throughout the RAA. Kelp and eelgrass beds are used as nursery grounds by various juvenile fish species of commercial importance, including herring, salmon, rockfish, and lingcod. Northern abalone and sea urchins depend on kelp habitat. Northern abalone (federally listed as Endangered on Schedule 1 of SARA) may be present within the RAA, although no longer harvested commercially, has a high level of cultural importance to coastal Aboriginal Groups.

The Nass and Skeena rivers are important for eulachon and salmon fisheries. The Nass/Skeena Rivers eulachon population is currently federally listed as Special Concern, and the species as a whole is on the provincial blue list. The RAA also falls within a migration corridor for salmon stocks from the Skeena River and from the central and southern coasts of BC. Inverness Passage, Flora Bank and areas around Lelu Island are recognized as important rearing and critical estuary habitat areas for salmon smolts. Salmon smolts, including pink, chum, sockeye, coho, and chinook occupy the Skeena River estuary beginning mid-May through to early July. The coastal inlets and estuaries of the Nass area are key staging and rearing grounds for both juvenile and adult salmonids, especially during juvenile migration in spring and summer months. Chatham Sound is important for Pacific herring as part of a major migration route from offshore feeding to inshore spawning grounds. Critical herring spawning and juvenile rearing locations are found in the waters surrounding Prince Rupert. Eight species of rockfish and three species of sharks, skates, and rays occurring in the RAA are listed as *Special Concern* or *Threatened* by COSEWIC.

Marine mammal species common within the RAA include: harbour porpoise, Pacific white-sided dolphin, Dall's porpoise, seven species of whales (northern resident killer whale, offshore killer whale, Bigg's transient killer whale, fin whale, grey whale, humpback whale, minke whale), harbour seal, and Steller sea lion. Uncommon species recorded in the waters near the RAA include sei whale, false killer whale, fin whale, sperm whale, and pilot whale. The RAA from Prince Rupert to the mouth of Nasoga Gulf is considered an important area for northern resident killer whales, and from Prince Rupert to the mouth of Work Channel is considered important for humpback whales.

Potential Effects of the Proposed Project

The proposed route was selected to avoid sensitive marine habitat and ecosystems, including avoidance of glass sponge reefs. With the exception of the effects of TSS on habitat-forming marine vegetation, which would extend to the RAA, the Proponent indicated that all effects would be restricted to the Project footprint or the LAA.

Project activities have the potential to adversely affect marine resources and habitats the following general ways:

- Alteration of marine habitat;
- Disturbance, injury or mortality to fish, marine mammals, or species at risk;
- Change in behaviour of fish, marine mammals or species at risk due to pressure waves or underwater noise; and
- Temporary effects to marine water quality due to the resuspension of contaminated sediments.

Sediment re-suspension and deposition impacts include sediment that may bury adjacent vegetation such as eelgrass and rockweed, have smothering effects on benthic invertebrates, and have an asphyxiation effect on fish, crabs and other marine species. Displacement of marine species would occur during excavation and backfilling as mobile species move away from the disturbance. Injury would be due to sediment accumulation or direct interactions with trenching equipment. Mortality would occur due to asphyxiation effects from suspended sediment, burial, or entrainment into a trench.

Alteration of Marine Habitat

The Application's assessment of marine habitats and ecosystems included analysis of habitat mapping and field surveys at each of the six proposed landfall sites (nearshore) and along the offshore seabed pipeline route within the LAA.

Alteration or loss of nearshore habitat within the landfall footprint would arise from removing habitat used by rearing salmon and crabs; removing benthic fauna; changing

the nature of the benthic and intertidal substrate which affects its use by marine fauna, including migrating species such as crabs. Alteration or loss of habitats adjacent to the pipeline footprint would occur due to sedimentation during excavation and backfilling the pipeline trench.

Pipeline placement of the two pipelines in deeper water offshore (i.e. greater than 20 m depth) would be lowered directly onto the seabed approximately 50 m apart using a deep water lay vessel. Pipe placement, including armouring will result in a permanent alteration of habitat in areas of soft bottom; however this change is expected to produce a net benefit to fisheries productivity as the pipeline is expected to be colonized by marine invertebrates and fish.

The total estimated area of permanent habitat alteration is expected to be approximately 220,000 m², based on the width of both pipes and total length of the marine route (approximately 120 km). However, the pipe placement would also result in the addition of at least 345,000 m² of hard substrate, based on the exposed curved surface areas of the pipe, assuming that 50% of the pipe settles into the seabed in areas of soft substrate.

Under-pipe support, using a mixture of rock and gravel fill, would be required in areas where natural seabed topography creates freespan (i.e. suspended) sections longer than approximately 50 m in order to prevent the pipe from buckling or failure due to fatigue. This may result in a change of habitat type in some area (i.e. from muddy to rocky); however it is expected to increase habitat complexity on the seabed and provide suitable habitat for colonization by marine invertebrates and fish. A preliminary conservative estimate of the area to be altered by under-pipe support is approximately 6,000 m² based on preliminary engineering predictions of the number and length of freespan areas.

The pipeline on the nearshore and offshore seabed habitats has the potential to act as a physical barrier, restricting movement of mobile benthic fauna, such as crabs. The marine pipeline route would go through important Dungeness crab breeding/nursery habitat and harvesting areas in Iceberg Bay, Nass Bay and Chatham Sound. The proposed pipeline routes in Chatham Sound would go through approximately 40 km of important area for Dungeness crab identified in the Pacific North Coast Integrated Management Area (PNCIMA).

At the landfalls at Nasoga Gulf and Lelu Island, the pipelines would be lowered into the seabed and buried in trenches approximately 3 m deep extending (up to a water depth of approximately 20 m) and would not, therefore, obstruct the movement of crabs at

these locations. In important crab habitats where burial of the pipeline is not carried out, monitoring and mitigation would be undertaken. The Application indicated the pipelines may also be buried in areas known to be important for crustaceans, primarily crab and shrimp, to mitigate potential obstruction of their movement

The Application provided information on research studies from the east coast that indicated the type of exterior coating on marine pipelines as well as the overall height of the pipe above the seabed can affect the ability of mobile benthic invertebrates to scale the exposed portions of the pipeline. The potential barrier effect may be greater for juvenile crab, as studies have shown that juveniles are not able to climb over pipes as easily as adults. One study concluded a fully exposed 32" (81 cm) pipeline was readily scalable by a variety of crab species, while another study on the east coast concluded that a 48" (122 cm) pipeline more than half exposed presented difficulty in scalability for lobster even with a rough textured surface.

The unburied sections of the pipelines in offshore waters (i.e. Portland Inlet, Chatham Sound, and Iceberg Bay) plus the rough concrete coating on each pipeline would sit a maximum of 44" (112 cm) above the seabed, which may obstruct crab movement in hard bottom substrate where the pipe does not settle if left unmitigated. Settling of up to three times the diameter of the pipe has been observed in other marine pipelines placed on soft, sandy substrate; however, the depth of natural burial depends on the substrate and oceanographic conditions. The Application identifies at least some settling is expected in areas of soft sediment which represents the majority (i.e., over 95%) of the proposed route based on benthic habitat mapping.

The single 48" diameter pipe (122 cm) proposed for Nass Bay is proposed to be fully buried below the seabed.

Blasting of rock may be required if the pipeline cannot avoid such areas, or if rocks are encountered in areas where pipeline burial is required. Approximately 0.3% of the deepwater pipeline (6000 m²) may traverse rocky substrates, some of which may require blasting or cutting. No areas are confirmed to require blasting at the time of submitting the Application.

Trenching (see section 2.2.3 for construction methods) could affect marine resources at marine shoreline landfalls. The nearshore approach to Lelu Island would involve trenching and excavating a trench past a large and ecologically important eelgrass bed on Flora Bank which is a major habitat concern. Vegetation management at landfalls would involve the clearing of vegetation for maintenance purposes, resulting in a change to riparian habitat as larger trees would not be allowed to re-grow. At each

landfall site, a permanently altered riparian area of approximately 100 m² to 140 m² would be maintained.

The area of temporary disturbance is expected to be approximately 96,000 m², and 84,000 m², excluding area disturbed by sidecast material, within Nass Bay Nearshore Marine, and Iceberg Bay. In Iceberg Bay there is a deep section, approximately 1,500 m long, where the pipe would be placed on the seabed and may be covered with rock and gravel or trenched into the seabed. In the Nasoga Gulf, trenching would result in a temporary disturbance of approximately 3,500 m². Once sediment is recovered, rock protection or concrete mattresses may be placed over the trench to protect the pipelines. If rock protection is used, it would be approximately 30 cm thick and extend for approximately 12 m wide over the pipes, resulting in approximately 850 m² of additional rocky habitat.

The proposed excavation for the approach and exit to Lelu Island is divided into two sections based on the depth limitations of the excavation equipment involved. For the nearshore component of this approach, a trench would be excavated approximately 2 km long, 10 m wide and 3 m deep. Offshore, the trench would be excavated for approximately 2.5 km and sediment would be side-cast alongside the trench where possible. This section of the trench could be up to 25 m wide, with a maximum estimated area of disturbance, for both trenches, is approximately 128,000 m². An estimated 300,000 m³ of sediment would need to be excavated to create the trenches for the Lelu Island approach. Where suitable, sediment may be recovered into the trenches to reinstate the seabed.

As shown in Figure 5-3, although eelgrass beds are extensive around the mouth of the Skeena estuary, where Lelu Island is situated, field surveys indicated that the current approach route to Lelu Island avoids all such beds. Sediment dispersion modelling predicts that no sediment from trenching would be deposited on the Flora Bank eelgrass beds. Intertidal seaweed mats may be lost if trenching is required through hard, intertidal substrates in Nass Bay, Nasoga Gulf or Lelu Island. Communities associated with hard intertidal substrates are expected by the Proponent to recover within 5 to 10 years following construction. If eelgrass is damaged by the proposed Project activities and is not expected to recover naturally within one year, it would be replanted to expedite habitat restoration.

Habitat losses and alterations are described more fully and addressed by the Conceptual Fish Habitat Offsetting Strategy (Appendix L-6 in the Application), and by the more recent Conceptual Fish Habitat Offsetting Plan (July 2014).

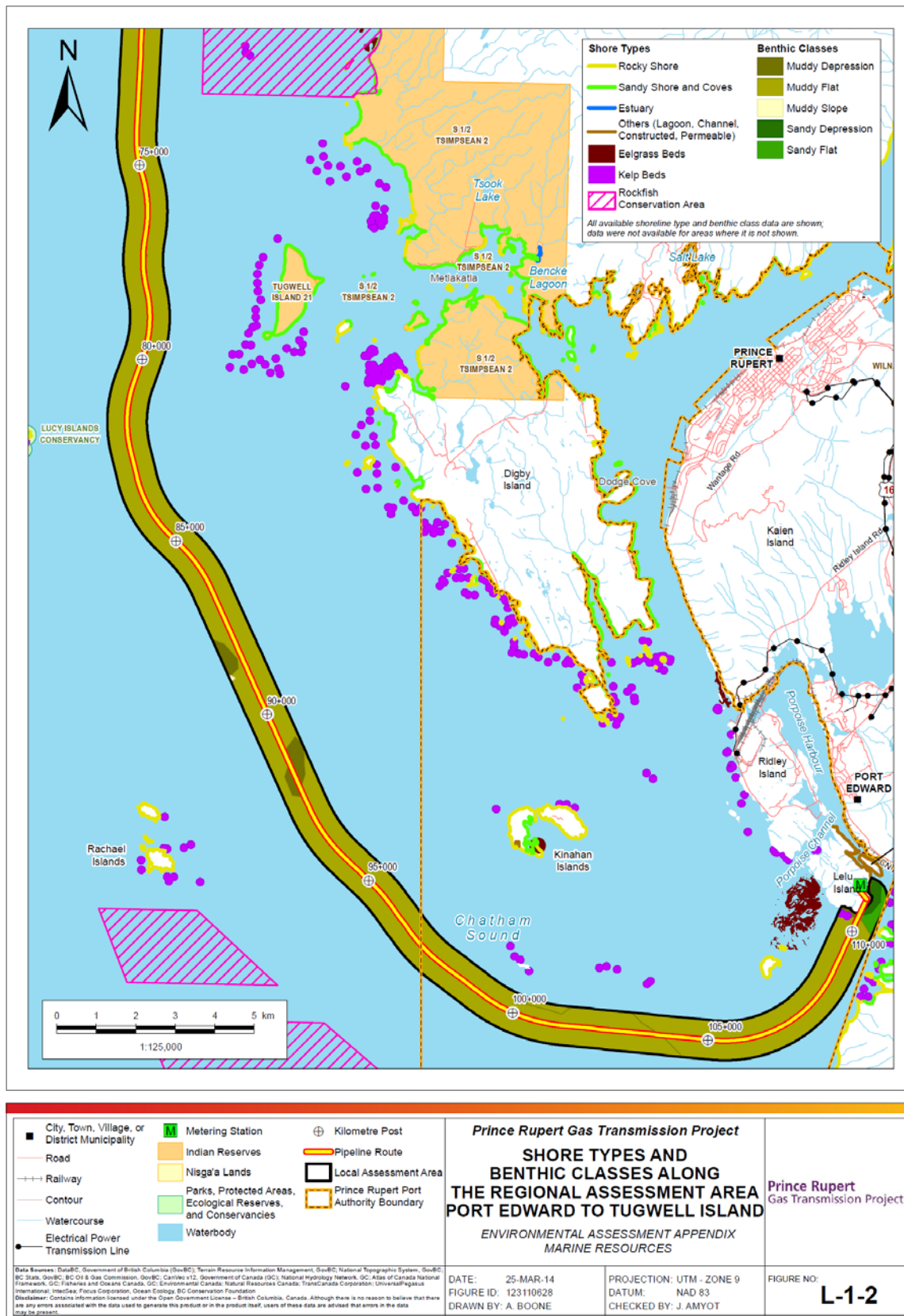


Figure 5-3: Marine Habitat Along the Approach to Lelu Island

The key mitigation for minimizing effects on important marine habitat features is avoidance through route selection. Habitat mapping that identified sponge and coral aggregations, rocky reef and bedrock habitat was used to revise proposed pipeline routing in order to avoid these areas. Pipeline route selection through Chatham Sound avoids sensitive glass sponge reefs and in Nasoga Gulf avoids the Nasoga Gulf Bivalve Harvesting Area. Where valued habitats cannot be avoided, the following mitigation measures would be implemented to reduce adverse effects to fish habitat:

- Displaced substrate would be recovered to bury portions of the pipeline, wherever technically suitable, to facilitate recovery of fish habitat;
- Eelgrass beds disturbed by Project activities and physical works would be seeded or replanted following cessation of construction if not expected to recover naturally within one year;
- In areas where Project activities are predicted to cause serious harm to fish via changes in fish habitat, including foreshore riparian habitat, offsetting measures would be implemented to maintain the ongoing productivity of CRA fisheries. A Habitat Offsetting Plan would be developed and implemented in consultation with Aboriginal groups, DFO, and other regulators;
- To minimize the obstruction to movement of crabs, the pipe would be fully buried in nearshore areas (approximately <20 m water depth) in trenches for landfall sites at Nasoga Gulf, Iceberg Bay and Lelu Island. The Nass Bay Nearshore Marine route is proposed to be fully buried in the seabed;
- In offshore areas where the pipe is not buried, obstruction to crab movement would be mitigated where the heavy pipe settles and is at least partially buried in soft bottom substrate (e.g. Iceberg Bay);
- Concrete coating on the pipelines required for pipe protection or stability may improve the ability for crabs to climb over the pipe, however there is still potential for barrier effect due to the exposed pipe diameter, particularly in areas where pipe is not buried or does not settle into the seabed; and
- Locations where potential obstruction may overlap with areas of concern for crab movement would be identified during detailed engineering design, and further mitigations (such as gravel bridges or concrete mattresses) would be developed for these areas through consultation with DFO during the permitting process.

Potential Disturbance, Injury, and Mortality to Marine Species

Trenching activities (e.g. dredging, side-casting and back-filling) are the primary mechanisms for direct and indirect mortality and harm. It is expected that most mobile fish species present in nearshore construction areas would be temporarily displaced and relocate to adjacent areas away from the elevated TSS plumes. Sediment

resuspension and potential effects from TSS and turbidity may affect marine fauna. Elevated levels of TSS above background levels have the potential to cause gill abrasion and mortality to fish. Sediment re-suspension is of greatest concern in shoreline approaches where eelgrass exists in soft sediment.

The shoreline approach to Lelu Island is near a large and ecologically important eelgrass bed on Flora Bank, which may affect juvenile fish and is also a major habitat concern. Iceberg Bay and Nass Bay also include important habitats for salmon and crab. Sediment plumes from both mechanical and hydraulic equipment used in trenching may extend as far as 1,200 m from the trench site in some cases and within the trench footprint. TSS levels generally drop rapidly with increasing distance. Depending on the rate of dispersion by tides and currents, these plumes may last anywhere from a few hours to a few weeks after trenching activity. Because of their location in the mouths of major rivers, dispersion rates are expected to be highest around Lelu Island and the mouth of Nass Bay.

The shoreline approach to Lelu Island will involve excavating a trench past a large and ecologically important eelgrass bed on Flora Bank. Preliminary models predicted that maximum TSS levels would occur in the immediate vicinity of trenching activities and drop to less than 25 mg/L above background, within 0.5 km of the trenching activity. The model indicated that the plume would dissipate quickly due to settling and dilution, with TSS values dropping to less than 5 mg/L above background levels after one day. The maximum deposition thickness was predicted to be 8 mm from trenching and 6 mm from backfilling, but this dropped to below 2 mm within 500 m of the trench. The model predicts no deposition on Flora Bank eelgrass beds (see Figure 5-4 below). During Application Review the Proponent submitted a *Detailed Cumulative Effects Assessment for Impacts of Sediment Dispersion and Deposition on Marine Species and Habitats around Prince Rupert and Lelu Island, Prince Rupert Gas Transmission Project* (July 15, 2014), which included updated model results that predict 23.4 mm deposition in total, after considering all trenching and backfilling activities. To validate the results of the sediment plume model, the Proponent proposes to conduct water quality monitoring during trenching activities. If CCME guidelines are exceeded, construction activities would be altered or halted until TSS drops below guideline levels.

Some invertebrates are likely to be crushed during construction and operational maintenance, or by equipment in the marine riparian and intertidal zone.

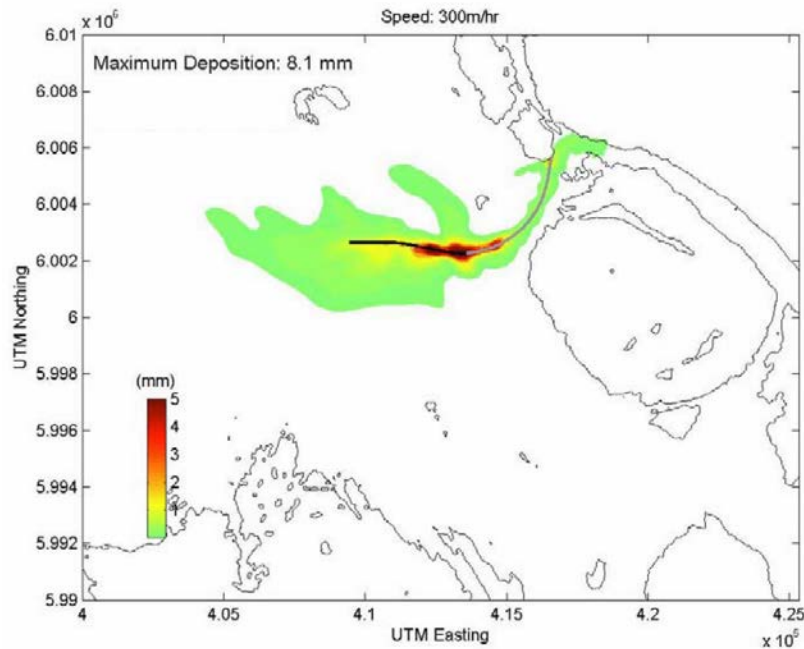


Figure 5-4: Modelled Total Sediment Deposition After Trenching

Artificial light would be produced at night by both marine and shore-based construction equipment. Artificial lighting at night may alter the suitability of marine habitats for different species, such as those that maximize foraging during darkness. Artificial light can also decrease the magnitude of daily migrations of plankton. In the Skeena and Nass River estuary, artificial lighting during juvenile migration periods for salmon and other fish could affect predation rates.

Change in Marine Species' Behaviour due to Pressure Waves or Underwater Noise

Nearshore blasting of rock may harm or kill marine fauna in proximity to blasts due to sound pressure waves and explosions. Fish that have swim bladders are more susceptible to harm from blasting than those that do not and may be susceptible to pressure waves.

During construction, noise from blasting and pipelay barge and support boats may also cause fish and marine mammals to avoid areas in proximity to the pipeline, particularly during construction, and blasting may harm marine mammals near construction sites.

It is possible that during operations the gas flow would result in an increase in underwater sound level of approximately 10 dB (above ambient within 200 m), which could be audible to marine mammals that have hearing sensitivity in the low frequency range. However, the noise produced by the pipeline is considered by the proponent to unlikely to cause a change in behaviour of marine mammals. The National Oceanic and

Atmospheric Administration (NOAA) threshold for marine mammal behavioural change to continuous (non-pulse) noise is 120 dB (NOAA 2013). Ambient sound levels in the RAA are unknown, but the Proponent considers that the addition of 10 dB to existing underwater sound levels in close proximity to the pipeline would not exceed this threshold, and the fact that the pipeline may also be buried in some areas to avoid interaction with fishing gear and anchors will further reduce noise from pipeline operation.

Interim behavioural noise thresholds for marine mammals are used by NOAA, and apply to all noise sources. Without mitigation, blasting noise from potential construction activities could exceed behavioural response criteria for pulse sound by 55-67 dB. Trenching noise could exceed the applicable NOAA interim behavioural response criteria for non-pulse sound by 4-65 dB, depending on sediment type. However, these effects would be reduced through mitigation. Duration of trenching and vessel activities would be short (i.e., a few weeks to months, and approximately one year, respectively), and least risk windows would be considered, in consultation with DFO.

Avoidance of ecologically and biologically sensitive marine areas has been a key strategy to determine the final marine pipeline route options. To reduce the likelihood of harm to fish species that are part of CRA fisheries, marine mammals, or species at risk, the following mitigation measures are proposed:

- Consultation with DFO, NLG and other Aboriginal Groups regarding least risk windows for sensitive life stages of fish during permitting for the Project, with particular attention paid to construction of the Lelu Island approach, Nasoga Gulf, Iceberg Bay and Nass Bay. OGC and other regulators would authorize the construction periods;
- At the shore crossings, sheet piles may be used to stabilize trench walls and reduce the amount of material needed to be excavated. Sheet piles may also help contain disturbed sediment to the Project footprint, therefore reducing the extent of increased TSS;
- Prior to excavation, trenching, plowing, or blasting in areas known to be important for Dungeness crabs, efforts would be taken to capture crabs with traps and release them to suitable areas nearby that would be unaffected by activities;
- Should temporary stockpiling of trench material be required, hard substrate would be avoided wherever feasible. If stockpiling on solid substrate is unavoidable, diver surveys would be conducted to confirm northern abalone are not present and alternative stockpiling locations would be identified if abalone are seen. If alternate stockpiling locations are unavailable, abalone would be removed and relocated to a suitable habitat and in accordance with the

necessary permitting requirements;

- Should blasting be required, it would be conducted in accordance with DFO's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters and Measures to Avoid Causing Harm to Fish and Fish Habitat*;
- A designated marine mammal observer would be present during blasting and would be responsible for monitoring an exclusion zone of 500 m to ensure that marine mammals are not present in the exclusion zone. Blasting would only be scheduled to occur during daylight hours and during periods of high visibility so that marine mammals can be observed;
- Discharge of ballast water from ships is viewed as a principle vector for the introduction of harmful aquatic organisms and pathogens. All ballast and bilge water management activities would comply with the Ballast Water Control and Management Regulations under the *Canada Shipping Act*;
- Serious harm to fish would be offset through implementation of a Habitat Offsetting Plan;
- Mitigation for pipeline noise during operation is primarily through design and pipeline placement. The concrete coating on the pipe attenuates noise, and most of the pipeline would be buried in nearshore areas;
- Based on preliminary geotechnical surveys, blasting is unlikely to be required for deep-water site preparation; however, if required, blasting would be a single event, and effects would be mitigated by:
 - o Where technically suitable, bubble curtains would be used to isolate blasting areas from fish and mammals and attenuate sound pressure levels.
 - o A designated marine mammal observer would be responsible for monitoring an exclusion zone of 500 m to ensure marine mammals are not present;
 - o Blasting would only be scheduled during periods of high visibility so that marine mammals can be detected; and
 - o Mitigation measures used to prevent marine mammal harm would also reduce adverse behavioural responses.

Sediment Resuspension and Water Quality

Nearshore construction activities could result in mobilization of sediment and elevated TSS in near shore marine waters, and eventually settle out onto the seabed. Where the pipeline is buried along portions of the route, either to mitigate potential habitat fragmentation or for pipeline security (e.g., protection from anchor or fishing gear interactions), the trenching, ploughing or jetting operations to lower the pipelines has the potential to re-suspend and re-distribute seabed sediments, with potential adverse effects on adjacent sensitive species and impacts to marine water quality. Historic

contaminants are present in some areas of the seabed that may become re-suspended and potentially affect marine water quality.

Modelling of TSS indicated that levels dropped below the CCME guidelines (less than 25mg/L) within 0.5 km of the trenching activity, and predicted maximum deposition of 8mm from trenching (slightly less from backfilling). The modelling assumed no mitigation. As mitigation measures associated with sediment would be designed to reduce TSS during construction, it is expected that sediment levels would remain within CCME guidelines.

Mitigation for water quality and sediment dispersion is primarily through application of best management practices, site specific engineering and sediment dispersion modelling that identifies problem areas. Mitigation measures include:

- Development of an EMP that describes erosion and sediment control procedures for activities in the near shore zone;
- Silt curtains and other containment methods would be used, where technically suitable, during excavation and related construction to reduce dispersion of suspended sediments;
- Monitoring of TSS concentrations during trenching at an appropriate location and depth, to be defined in the EMP. Construction activities would be altered or halted until TSS drops below permit guideline levels; and
- Where technically suitable, HDD would be used if it would reduce harm to fish species in intertidal and near shore areas.

Fish Habitat Offsetting Plan

A Conceptual Fish Habitat Offsetting Strategy was provided as an appendix to the Application. At the request of EAO at the time of the screening decision on the Application, a Conceptual Habitat Offsetting Plan was developed by the Proponent and submitted in July 2014. This Plan provides further details with regards to the Proponent's plans for offsetting impacts of the project on fish habitat, and is discussed in the following section.

5.9.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the review of the Application, additional issues, potential project effects and proposed mitigation measures were raised by regulatory agencies and Aboriginal Group representatives. Key marine issues were raised by NLG, Metlakatla First Nation, Lax Kw'alaams Band, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Lake Babine Nation, MOE, Environment Canada and Transport Canada. A non-exhaustive

list of key issues and comments, specific to the Marine VC and indicators, related to the following:

- Trenching and management of trench material (i.e. sediment);
- Potential effects of the pipeline on the movements of crab and other benthic species, and related potential impacts to CRA fisheries in Chatham Sound and Iceberg Bay;
- Scour risk on Flora Bank;
- Need for additional baseline data, assessment studies, and uncertainty of effectiveness of the habitat offsetting plan;
- Potential contaminant bioaccumulation (dioxins / furans) from trenching and historically contaminated sediment;
- Noise effects to marine mammals;
- Disposal of hydrostatic test water during pipeline testing; and
- Potential disposal of sediments at sea.

Trenching and Sediment Management

Regulatory agencies and First Nations had questions regarding the amount of trenching, and management of side cast material. Kitselas First Nation suggested that 300,000 m³ of delta sediments sidecast in strong currents would not remain available to re-instate the seabed. Environment Canada requested further information regarding trenching and proposed methods and equipment to be used to sidecast marine sediments during construction activities, and noted that a disposal at sea permit may be required if some material is taken off-site for disposal.

The Proponent prepared a technical memo to clarify construction methods in general, and respond to more specific concerns such as:

- o The extent of trenching, blasting, and duration of construction for each segment of the marine pipeline routes;
- o The potential for contamination and current-driven dispersal of sidecast sediments into nearby critical eelgrass habitats; and
- o Ensuring the material to be sidecast, backfilled, or otherwise added to the seabed has the characteristics appropriate for its intended purpose (e.g. Pipe protection).

The Proponent acknowledged that detailed marine engineering is ongoing and additional construction details would be presented to applicable government departments during the permitting stage of project planning, and would inform the final Habitat Offsetting Plan. The Proponent is committed to working with

Environment Canada to determine the need for a permit that would provide for disposal of marine sediments and any other marine discharges (e.g. hydrostatic test water).

EAO proposes that management of issues associated with trenching and sidecast material, including sedimentation and potential for contamination, would be accomplished through implementation of the Marine EMP. The Proponent developed and submitted a draft EMP to the EAO on September 30, 2014. EAO proposes a condition which would require the proponent to prepare an EMP, consistent with commitments made in the Application, and with the draft EMP. This EMP would be reviewed by appropriate regulatory agencies prior to being finalized and approved by EAO. EAO also proposes a condition which would require the management and monitoring of marine sediments during nearshore construction activities. Additional regulatory requirements are expected during the permitting processes, should an EA Certificate be issued.

Sediment Resuspension, particularly on Flora Bank and Skeena River Estuary

Concerns were raised by Working Group members about potential impacts to the ecology and productivity of the Skeena River estuary habitat. It was noted that LNG plants and export facilities are proposed for the mid and outer Skeena estuary. Up to 80- 90% of Skeena salmon juveniles congregate in the near vicinity of the two proposed LNG plants on Ridley and Lelu islands. The mouth of the Nass River and Skeena River are also noted as important aggregation areas for adult eulachon.

The Proponent noted that eulachon return to spawn in the Skeena and Nass Rivers between mid-February and mid-March, with a possible second spawning run in the Nass in early April. Prior to river entry they likely hold in the brackish waters of estuaries and may be expected within the river estuaries in January. The Proponent would work with DFO and the Working Group to determine least risk windows for the Skeena and Nass River estuaries. To the extent practicable, any blasting that may occur in important eulachon aggregation areas in the vicinity of Lelu Island, and Iceberg Bay, Nass Bay and Nasoga Gulf would also be scheduled when eulachon are unlikely to be present.

The Proponent indicated that disturbance to eelgrass beds resulting from Project construction activities is being avoided whenever possible. Where avoidance is not possible, and eelgrass beds are unlikely to re-grow within a single growing season, shoots may be removed and transplanted to another location or replanted at the site following construction. Through consultation, NLG and other Aboriginal Groups would continue to be involved in the development of fish

habitat offsetting measures including the planning for and replanting of eelgrass beds affected by Project activities.

An overview of the Project EMP was provided in the Application. The Proponent subsequently submitted a draft EMP to the EAO on September 30, 2014. EAO proposes a condition which would require the proponent to prepare an EMP, consistent with commitments made in the Application, and with the draft EMP. EAO also proposes conditions requiring a marine sediment management and monitoring plan during construction at landfall sites.

Potential effects of the pipeline on the movements of crab and other benthic species

Local fisherman, NLG and Aboriginal Groups raised concerns regarding the willingness and/or ability of Dungeness crab to scale obstacles and the potential for a pipeline to interrupt movement between critical habitats (i.e. create a barrier effect and habitat fragmentation). More information on the potential changes in crab distribution was sought. Chatham Sound, Iceberg Bay and Nass Bay are considered important areas for crab production and crab harvesting in commercial, recreational and Aboriginal fisheries.

The Proponent acknowledged that the size of the marine pipelines may impede movement of crabs and other crustaceans. It was also noted that in shallow nearshore areas known to be important for crab fisheries, the pipelines would likely be buried so as not to obstruct the movement of benthic organisms. While there may be settlement of the pipe into the seabed, and the coarse concrete pipe coating may facilitate climbing over the pipe, there is uncertainty about the ability of Dungeness crab, particularly juveniles, to climb over the two proposed pipelines (with possibly up to two pipes in Iceberg Bay and four pipes in Chatham Sound when combined with the proposed Westcoast Connector Gas Transmission Project). As reported in the Application (section 11.4.2.2), locations requiring additional mitigation to ensure the pipe does not act as a barrier to crab movement would be determined following detailed engineering design. This level of design is required to determine how the pipe would be installed (e.g. buried, placed on seabed etc.) and how it would behave following installation (e.g. likelihood and extent of sinking into the substrate). Specific locations where crab movement may be obstructed would be identified during detailed engineering design, and further mitigations (such as gravel bridges or concrete mattresses) would be developed for these areas through consultation with DFO, NLG and Aboriginal Groups during the permitting process.

Due to the level of uncertainty regarding the effect, EAO proposes a condition that would require the Proponent to develop and implement a Crab Movement Mitigation and Monitoring Plan designated to prevent material impacts to crab movement. In addition, the Proponent would be responsible for assessing the potential for the proposed Project to result in serious harm to fish, including permanent alteration of fish habitat, potentially requiring *Fisheries Act* authorization and offsetting.

Potential scour risk on Flora Bank

The hydraulic energy along the outlet channel of Inverness Passage results from the strong flood and ebb tides, and the discharge from the Skeena River. Members of the Working Group raised concerns that the concrete mats, caps, sheet pile, or other hard structures have potential to cause seabed scouring that persists beyond construction and may not be accounted for in Proponent modelling of effects.

The Proponent developed a technical memo related to Marine Construction Methods and addressed issues related to scouring (July 21, 2014). However, modeling has not yet been undertaken to consider the potential effects of pipeline protection (e.g., rock or concrete mats) to create points of scour.

The Proponent commits to developing a detailed engineering design that would include scour potential and mitigation for long term pipeline stability and environmental protection. The Proponent further commits to the development of a contingency plan during detailed engineering design, to be implemented in the event that the pipeline(s) are exposed due to scour. This plan would also consider potential for protection measures to generate scour.

EAO proposes a condition for the Nass Bottomlands and the approach to Lelu Island requiring detailed geotechnical and risk assessment and design of responsive mitigation to prevent scour from affecting environmental values.

Need for additional baseline data, assessment studies, and uncertainty of effectiveness of the habitat offsetting plan

Concerns were expressed by Working Group members with regards to baseline data gaps, leading to uncertainty in effects assessment and associated conclusions. Concerns were raised regarding uncertainty of predictions for sediment dispersion and transport and scouring related to models, lack of detailed habitat mapping for intertidal habitat baseline at landfalls, as well as site specific locations of glass sponges.

Lax Kw'alaams Band expressed a lack of confidence that the Proponent's habitat compensation plan would provide full or appropriate offset for marine intertidal and riparian marine impacts to changes in fish habitat.

At the time of EAO's screening decision on the Application, EAO requested various supplemental materials be provided including a Conceptual Habitat Offsetting Plan, report on the findings of the complete intertidal and subtidal field surveys for the Iceberg Bay and Nass Bay near shore route options, and a detailed cumulative effects assessment for impacts of sediment dispersion and deposition on marine species and habitat in the RAA around Prince Rupert and Lelu Island.

The Proponent indicated that since submission of the Application, they have continued to collect further information and they committed to continue with further data collection and field investigations prior to construction. Additional intertidal and subtidal studies were conducted in June 2014 to gather information in the Nass Bay area (Nass Harbour, Echo Cove, and Iceberg Bay). These results were submitted as a supplemental filing on July 15, 2014.

More detailed habitat mapping, current records and sediment/turbidity estimates would be developed to support permitting, specifically to support construction design and calculations of serious harm to fish (via habitat effects).

A Conceptual Fish Habitat Offsetting Strategy was provided as an appendix to the Application and provided a strategy to offset serious harm to fish that are part of or support a CRA fishery. The measures outlined in the strategy included fish habitat creation (such as eelgrass transplants), habitat restoration, and habitat banking, and would be developed further and refined through consultation with NLG, Aboriginal Groups, DFO and members of the Working Group. The Proponent noted that compliance and habitat effectiveness monitoring is regulated by DFO.

EAO proposes a condition which would require the Proponent to prepare an EMP, consistent with commitments made in the Application, and with the draft EMP. This EMP would be reviewed by appropriate regulatory agencies prior to being finalized and approved by EAO.

Contaminant Bioaccumulation and Effects to Marine Food Resources

During Application Review, comments were made by Working Group members relating to contaminant bioaccumulation and associated effects to marine food resources in the

Lelu Island area. The Ministry of Health, MOE, and several Aboriginal Groups have expressed concerns regarding potential Project impacts on the quality of marine food resources as they relate to human health.

In response to these concerns, the Proponent submitted a technical memo providing more detailed information on the potential effects to marine country foods. Based on sediment dispersion modeling that showed negligible deposition of sediment to local areas, and the small magnitude, extent, and duration of local sediment plumes that may contain TSS-bound dioxins and furans was considered negligible by the Proponent.

The Proponent acknowledged that sediment disturbance during construction would result in small increases in TSS, mainly adjacent to the construction area, as discussed in the technical memo Sediment Fate and Total Suspended Solids Levels. The use of silt curtains, where practical, would further reduce the dispersion of sediment.

The Proponent developed and submitted a draft EMP to EAO on September 30, 2014. EAO proposes a condition which would require the Proponent to prepare an EMP, consistent with commitments made in the Application and the draft EMP. This EMP would be reviewed by appropriate regulatory agencies prior to being finalized and approved by EAO. EAO also proposes a condition requiring a marine sediment management and monitoring plan during construction at landfill sites.

Noise Effects to Marine Mammals

Metlakatla First Nation, Gitxaala Nation and Lax Kw'alaams Band raised concerns related to pipelines generating low-frequency sounds and acting as a potential linear barrier to baleen whales, resulting in potential for avoidance, the need for monitoring avoidance behaviours and potential requirements for mitigation through alterations to operational throughput or flow to reduce audible low-frequency tones. Concerns were also raised about the potential cumulative effects of underwater noise on marine mammals due to multiple marine pipelines and citing research showing the waters off of Prince Rupert had high noise-density.

The Proponent noted that based on evidence from previous studies, and adoption of proposed mitigative measures, the marine pipelines are unlikely to make a significant contribution to underwater noise levels. However, the need for and value of characterizing the baseline underwater acoustic environment is understood and would be considered as engineering plans are finalized. Any

monitoring plans would be developed in consultation with the necessary regulatory authorities. Mitigation measures would be employed throughout construction activities to reduce noise effects on fish and marine mammals, including monitored marine mammal exclusion zones and use of bubble curtains, during construction, where appropriate.

EAO proposes a condition requiring marine mammal mitigation and monitoring during construction that would include identifying geographic areas and timing periods where marine mammals could be affected by construction activities. This condition would also require the Proponent to designate a marine mammal observer during construction.

Disposal of hydrostatic test water during pipeline testing

The disposal of waters and other matter at sea not derived from normal operation of ships within Canadian jurisdiction is prohibited unless authorized. Working Group members noted that more information would be needed to characterize the effluent (chemistry & quantity; treatment if necessary), the surrounding environment (water chemistry) and the potential aquatic effects (changes in water chemistry & biota potentially affected).

The Proponent noted that they are working with their pre-commissioning contractors to develop more specific dewatering plans that would be appropriate for the disposal of the hydrostatic test water from the finished line. The Proponent would meet with MOE and OGC to review the draft dewatering plans in order to obtain the necessary permits. The Proponent is committed to working with Environment Canada to determine the need for a permit and any associated information requirements; this would be done both for marine sediments and any other marine discharges (e.g. hydrostatic test water).

Potential Disposal of Sediments at Sea

Concerns raised by the Working Group included better assessment of the nature of marine sediments and waste waters to be disposed of, including source, volume, composition, treatment if necessary, disposal location, potential environmental effects, and monitoring. Alternatives to disposal, such as re-use, and alternatives to disposal at sea, were suggested.

The Proponent responded that the objective is that excavated material from trenching would be used to backfill the pipeline trench and provide pipe protection, therefore it is not certain whether a disposal at sea permit would be required. The Proponent acknowledges that more advanced engineering

information is needed in order for Environment Canada to determine whether permitting is required and would continue to work with Environment Canada.

5.9.4 Characterization of Residual Project Effects

After considering all proposed marine mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on marine resources:

- Alteration of nearshore and offshore habitat; and
- Disturbance, injury and mortality to marine species.

EAO is of the view that the proposed Project is unlikely to have a residual effect on water quality due to the resuspension of contaminated sediments in the water column from construction activities at the Lelu Island shore transition site. Residual effects from sediment resuspension and sediment deposition on adjacent habitat have been considered in the residual effects from alteration of habitat and effects on marine species.

EAO's characterization of the combined residual effects of the proposed Project on marine resources is summarized below, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Habitat Alteration: Moderate to High Species: Low to	Nearshore habitat: The nearshore marine environment at the landfall sites can be sensitive to effects relating to disruption of benthic habitats and interference with critical life history stages for fish species. Nearshore habitats sensitive to disturbance including eelgrass and salt marsh which provide important habitat for juvenile salmon and other species have been avoided to the extent possible and mitigated. Many invertebrates have a high resiliency, while juvenile salmon have a moderate resiliency. Species and habitats in the nearshore and construction footprint have a moderate to high resiliency. Offshore habitat: Most of the seabed (over 95%) along the pipeline route is formed of mud substrates that are considered to be resilient to disturbance. Sensitive habitats such as rocky and glass sponge areas are avoided and mitigated. Crab: Dungeness crab are relatively abundant

Criteria	Assessment Rating	Rationale
	Moderate	throughout the RAA with important harvesting areas and habitat along the proposed Project route in Chatham Sound and Iceberg Bay. The population of Dungeness crab in Chatham Sound has been subject to previous disturbance from human activity including historic and current harvest pressure in CRA fisheries and seabed habitat disturbances, including ground trawl fisheries, trenching and disposal at sea activities in Chatham Sound. The resiliency of crab species to potential barrier effects and habitat fragmentation of the proposed pipelines on the seabed in offshore areas is expected to be low, particularly where the pipelines may not be partially or fully buried in areas overlapping with important crab nursery habitat. However, it is not expected to result in a population level effect or a decrease in habitat productivity for crab species within the RAA. Other species: Overall, most marine species within the RAA are expected to have a low to moderate resiliency. The residual effect occurs in areas considered undisturbed (i.e., relatively unaffected by human activity or known to be ecologically fragile) and disturbed (i.e., areas previously disturbed by human activity or known to be ecologically resilient). Marine species may be sensitive to effects relating to alteration of habitats and disturbance during critical life history stages. Juvenile salmon and eulachon within critical estuary habitat have a low to moderate resiliency. Many invertebrates have a high resiliency, while species at risk (e.g., Northern abalone) have a low resiliency. Marine mammals may be temporarily displaced or affected during construction and operation. Marine species may be sensitive to effects relating to noise or pressure waves. With mitigation, many species have a high resiliency to noise, while whales have a low to moderate resiliency.

Criteria	Assessment Rating	Rationale
Magnitude	Habitat Alteration: Low to Moderate Species: Low to Moderate (<i>Crabs: Moderate</i>)	Nearshore habitat: Alteration or loss of marine habitat, as well as disturbance, injury or mortality of marine life would be of low magnitude based on anticipated reclamation and restoration plans, and associated mitigation which is expected to effectively reduce the effects on nearshore habitat. Offshore habitat: For most of the route, the pipe would lay on soft sediments, resulting in an increase in hard seabed habitat due to the concrete coated pipe surface overlying the seabed sediments, and would result in a negligible, and possibly positive effect on overall habitat value and function. In areas lacking rocky substrate, positive effects are expected from increased habitat complexity, invertebrate colonization on the pipe surface and an increase in productive habitat for a variety of fish and invertebrate species. Areas subject to seabed modification (trenching, blasting or rock fill) may result in a moderate loss of habitat value and could require habitat offsetting and <i>Fisheries Act</i> authorization by DFO for permanent alteration of habitat resulting in serious harm to fish. Crab: The pipeline could create a barrier to crab movement on the seabed in offshore areas (> 20 m deep) where the pipeline is not buried or does not settle into the seabed, which may result in a moderate effect on crab movement and habitat fragmentation in localized areas within and between important crab nursery areas in Iceberg Bay and Chatham Sound. The proposed route would go through approximately 40 km of important crab habitat in Chatham Sound and approximately 3 km in Iceberg Bay. The area of seabed habitat alteration from the proposed pipelines within the RAA would be relatively small, and in some areas the pipe's hard surface would create a positive effect for marine invertebrates including crab, due to increased habitat complexity and colonization. Monitoring and mitigation would be implemented to address the barrier effects to crab; however, there are some uncertainties regarding location and effectiveness for proposed mitigation measures, requiring effectiveness monitoring and adaptive management measures. The magnitude of residual effects on crab species are therefore expected to be moderate, however is not expected to result in any population level effects or a decrease in habitat productivity for

Criteria	Assessment Rating	Rationale
		crab species within the RAA. Other species: Direct harm from construction and operation is predicted to be low in magnitude for fish and benthic invertebrates. Direct harm from construction and operation is predicted to be low in magnitude for marine mammals and species at risk, except at the pipeline construction footprint where it could be moderate for some species if mitigation is not effective. Impacts due to construction sound levels would be moderate, and at or near the construction site they would approach levels known to evoke behavioural response in some fish species. Sound levels during construction would approach and exceed documented thresholds for behavioural response in marine mammals, but would not exceed thresholds considered to possibly harm or injure marine mammals. During operation effects are expected to be negligible to low.
Extent	Habitat Alteration: Project footprint Species: Project footprint to regional	Direct habitat effects from trenching would be limited within the Project footprint and potential indirect effects from sediment deposition on adjacent habitat in the immediate vicinity at shoreline transition sites. The displacement and disturbance of marine life would largely be within the LAA. Effects on marine species are not predicted to extend beyond the immediate vicinity of the pipeline LAA, with the possible exception of underwater sound interactions with whales and movement of crabs, both of which have the potential to extend further within the RAA.
Duration	Habitat Alteration: Short-term to long-term Species: Short- to long-	Habitat Alteration: Direct habitat disturbance would be limited to construction and would occur over the medium-term (effect continues for up to two years following construction before returning to baseline conditions) except for construction related activities resulting in increased TSS levels which are short-term (effect limited to construction phase before returning to baseline conditions) and blasting activities where residual effects may occur over the long-term (effect continues for more than two years after construction phase, or continues during operational phase but is not permanent). Disturbance to marine life would be limited to

Criteria	Assessment Rating	Rationale
	term	construction period. Operational disturbance due to pipeline noise may be long-term. With monitoring and mitigation, the potential impacts to crab movements are expected to be of short to medium duration.
Reversibility	Reversible	All effects would be fully reversible.
Frequency	Isolated to Continuous	The effects to habitat would be isolated (construction) to continuous (barriers to crab), while displacement and disturbance impacts would be isolated. The effects to seabed habitat and crab movement would be continuous, while construction disturbance impacts would be isolated.
Likelihood	There is a high likelihood that residual effects to landfall and near shore marine habitats and ecosystems would occur from the proposed Project. There is a high likelihood of effects to habitat due to seabed modification and disturbance to marine life due to construction activities (e.g. trenching, noise, and blasting). There is a moderate likelihood of effects on crab movement due to unburied pipeline sections acting as a barrier, as mitigation and monitoring are unproven in reducing the residual effect.	
Significance	Residual adverse effects are considered significant when there is a long-term or irreversible residual adverse effect with a magnitude that is predicted to exceed an acceptable biological threshold or standard, or is predicted to affect the indicator population such that stated management or conservation objectives might not be attainable. EAO considered the low-moderate magnitude impact to marine resources, the generally short-term duration and reversibility of effects to the marine environment. EAO considered the mitigation and monitoring measures identified by the Proponent and the proposed conditions requiring the development and implementation of the EMP, a Crab Movement Mitigation and Monitoring Plan, Marine Sediment Management and Monitoring Plan, and a Marine Mammal Monitoring Plan. EAO concludes that the proposed Project would not have significant residual effects the marine environment VC's.	
Confidence	Moderate to High Confidence – The level of confidence is determined by the understanding of the Project VC interaction, the level of information relevant to the Project area and the understanding of the effectiveness of mitigation. The significance determination and likelihood for marine resources is determined with moderate to high confidence. EAO believes that there is a good understanding of Project-VC interactions, effectiveness of proposed mitigation measures, and regulatory requirements associated with various legislations, regulations and guidelines related to protection of the marine environment. However, as acknowledged by the Proponent, there is some uncertainty regarding the effectiveness of the	

Criteria	Assessment Rating	Rationale
		proposed mitigation and monitoring measures, particularly related to crab barrier effects and underwater noise disturbance to marine mammals.

5.9.5 Cumulative Effects Assessment

The Application included a cumulative effects assessment of the combined residual effects that the proposed Project, existing projects and reasonably foreseeable future projects could have on the marine environment. The cumulative effects assessment (CEA) and significance determination was completed within the context of the various relevant resource management plans that have been developed and legal requirements, including the:

- Pacific North Coast Integrated Management Area (PNCIMA);
- Marine Planning Partnership for the North Pacific Coast (MaPP);
- Port of Prince Rupert 2020 Land Use Management Plan;
- Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams; and
- *Nisga'a Final Agreement*.

Land use and linear infrastructure associated with marine activities have the potential to interact cumulatively with Project residual effects. For each residual Project effect, the rationale and potential for potential cumulative effects, are provided below.

Alteration of Marine Nearshore and Offshore Habitat

Cumulative effects on changes in nearshore and offshore habitats from existing and past projects in combination with the proposed Project is not likely to occur as communities of fish, invertebrates, and algae are likely to have stabilised from the construction effects of other projects that may overlap with the effects of the propose Project.

If there is a change in habitat resulting in serious harm to fish DFO may require an authorization and offsetting measures. Mitigation measures to avoid causing serious harm to fish identified in the Application and offsetting measures outlined in the *Conceptual Habitat Offsetting Plan* (submitted July 2014 to EAO) have been proposed to further mitigate residual effects on fish and fish habitat. If other projects considered in the cumulative effects assessment within the RAA would result in serious harm to fish (if and as determined by DFO), would also be expected to implement similar mitigation and offsetting strategies.

Cumulative effects of sediment re-suspension were raised as a concern for Lelu Island areas, particularly Flora Bank eelgrass habitats because of proximity to the PNW LNG project on Lelu Island. Additional detail on the proposed seeding and/or replanting of eelgrass beds disturbed by project activities and physical works was requested.

The Proponent responded that modelling has indicated that there would be no elevated TSS or sediment deposition over Flora Bank (with no mitigation assumed in modelling). The Proponent has committed to monitor water quality during trenching. Monitoring details would be spelled out in the Sediment Monitoring and Management Plan to be drafted in consultation with the appropriate regulatory authorities and in consultation with First Nations.

EAO notes that with the recent (Oct 3, 2014) revision of the PNW LNG project, previously proposed dredging for the PNW marine terminal jetty and trestle adjacent to Flora Bank (approximately 7 million m³) has been eliminated. No significant cumulative effects are anticipated as a result of elevated TSS or deposition of sediment.

Considering the limited spatial and temporal overlap between the proposed Project and other reasonably foreseeable projects and activities, and the implementation of mitigation measures for this Project and others, the cumulative effects on marine habitat are predicted to be not significant.

Potential Disturbance, Injury, and Mortality to Marine Species

Given the types of proposed projects and activities, and their potential impacts on the marine environment, the potential harm to fish species is presumed to be well within the range of natural variation and would not have affected the sustainability or ongoing productivity of fisheries or species at risk.

Existing and proposed projects and activities that generate underwater noise (e.g., blasting, excavation, and shipping) could cumulatively contribute to changes in marine mammal behaviour. Behavioural changes of marine mammals are predicted to be short-term and not extend beyond the construction phase for any project. Underwater noise and associated behavioural changes would be concentrated in the vicinity of construction activities, which would be limited to a specific area for a period of days to weeks. The potential for pre-trenching to Lelu Island may take five to six months. Project construction would implement mitigation measures designed to reduce effects on marine mammals, including adherence to DFO's blasting guidelines, a 500 m marine mammal exclusion zone, monitoring and adaptive management and, where practicable, use of bubble curtains during blasting.

Other proposed projects and activities are assumed to incorporate similar mitigation measures, and overlap with other projects would be limited, therefore the cumulative effect of the Project's noise disturbance with the residual effects of other projects and activities on behaviour of fish, marine mammals, and species at risk within the RAA are not likely to result in adverse cumulative effects of concern.

Mitigation measures to minimize harm to marine mammals (including marine mammal monitoring) that would be implemented by the Proponent are expected to be similarly implemented by overlapping projects. With these measures in place, the likelihood of harm to marine mammals is very low and no significant residual effects are expected.

Populations of marine fish and mammals, and diversity of these communities within the RAA are not likely to be threatened. The cumulative effects to marine resources as a result of harm to fish, marine mammals and species at risk are not likely to be significant because:

- There is limited spatial and temporal overlap; and
- The implementation of mitigation measures, including (as necessary) habitat offsetting.

One potential exception is the possible barrier to crab movement resulting from multiple pipelines in important crab areas in Chatham Sound and Iceberg Bay (a total of 4 marine pipelines are proposed with the combined PRGT and WCGT projects). Both of the proposed PRGT and WCGT pipeline routes in Chatham Sound would traverse approximately 40 km of important area for Dungeness crab designated in the Pacific North Coast Integrated Management Plan. EAO proposes a condition for both the proposed Project and the proposed WCGT Project that would require the Proponents to develop and implement a detailed Crab Movement Mitigation and Monitoring Plan.

Considering the limited spatial and temporal overlap between the proposed Project and other reasonably foreseeable projects and activities, and the implementation of mitigation measures for this Project and others, the cumulative effects on marine species are predicted to be not significant.

5.9.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is

satisfied that the proposed Project is not likely to have significant adverse effects on marine resources.

6 Assessment of Economic Effects

6.1 Economy

6.1.1 Background

This section describes the potential adverse effects of the proposed Project on employment, focusing on the capacity of the labour force to absorb Project-related changes in labour demand.

The LAA considered a 200 km corridor and the RAA extends beyond the LAA to include three large communities outside the LAA that may serve as staging communities and/or service hubs to the Project. These include Prince George, Terrace, and Smithers, as well as Aboriginal communities near each of those three major centres.

Table 6-1 provides selected population and labour force activity data for six sub-regions within the LAA defined to coincide with Regional District Electoral Area boundaries and the boundaries of Nisga'a lands, as well as the three major RAA communities.

Table 6-1: Selected 2011 Data on Labour Force Activity

Sub-Region	Population		Labour Force			Unemployment Rate (%)			
	On-Reserve	Total	Employed	Unemployed	% Aboriginal	Average	Non-Aboriginal	Off-reserve	On-reserve
Skeena-Queen Charlotte	761	13,842	5,865	1,000	32%	14.6%	10.2%	23.9%	n/a
Nisga'a Lands	n/a	1,909	200	100	n/a	33.3%	n/a	n/a	33.3%
Kitimat–Stikine	3,514	6,486	1,725	540	64%	23.7%	6.9%	37.5%	34.8%
Bulkley-Nechako	1,524	5,922	2,370	495	57%	17.2%	10.5%	12.8%	35.2%
Fraser–Ft. George	73	3,897	1,985	190	6%	8.7%	8.3%	11.8%	22.2%
Peace River	799	12,720	4,750	320	15%	6.3%	5.7%	17.7%	21.3%
LAA	6,671	44,776	16,895	2,645	31%	13.5%	8.9%	20.6%	32.7%
Prince George	80	84,232	42,325	4,685	9%	10.0%	9%	19.3%	n/a
Terrace	95	15,569	7,495	650	18%	8.0%	5.2%	20.8%	n/a
Smithers	n/a	5,404	2,790	235	13%	7.8%	7%	13.2%	n/a
RAA other	175	105,205	52,610	5,570	11%	9.6%	8.4%	19.3%	n/a
Total RAA	6,846	149,981	69,505	8,215	15%	10.6%	8.5%	19.7%	32.7%

As described in the Application, the regional economy as it relates to employment can be considered vulnerable. The population and labour force throughout the LAA has been declining, and rates of unemployment remain high (as shown in Table 6-1) mainly due to the loss of employment in basic (goods producing) industries.

6.1.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

The following list of potential adverse effects and measurable parameters were assessed in the Application for Project construction:

- Change in labour availability – employment rate; labour availability by trade or skill; and changes in skill levels (educational attainment);
- Change in wage rates – labour wage by skill level;
- Change in training requirements – supply of local and regional training programs related to skills required by the Project; and
- Change in migration and labour force stability – in and out-migration rates within the LAA and RAA.

During the operations phase of the proposed Project, no potential adverse effects on employment and the local and regional labour force are expected as only 23 on-site employees are expected to be required to operate the pipeline during the 40 years or more of operation (section 2.2 of this Report provides more detail).

Labour Availability

Project construction would require 8,570 person years (PY) of direct employment, or an average of 2,143 PY for each construction year (excluding the marine pipeline workforce). As shown on Table 6-2 the construction workforce would require a mix of labourers, welders, pipefitters, drivers, equipment operators, supervisors and safety personnel.

Table 6-2: Project Direct Construction Workforce by Type of Occupation

Occupation	Person Years of Direct Employment			% of Total Labour Force
	Pipeline (Land Based)	Compressor Stations	Total	
Supervisors	1,000	145	1,145	13%
Welders	1,030	295	1,325	15%
Equipment Operators	2,520	220	2,740	32%
Labourers	1,360	220	1,580	18%
Drivers	1,125	75	1,200	14%
Mechanics		220	220	3%
Electricians		220	220	3%
Other	65	75	140	2%
Total	7,100	1,470	8,570	100%

Note: The construction workforce for the marine portion of the pipeline is expected to be sourced outside of Canada, and is excluded from the above analysis.

The Proponent estimated the contribution of the LAA and RAA labour force to the construction workforce to be as follows:

- Some 39% of the Project direct construction workforce would be residents of BC (3,370 PY) with the balance being recruited from elsewhere in Canada (4,845 PY) and from other countries (355 PY);
- Local hires during construction would account for approximately 10% of the BC workforce;
- Local businesses are expected to have the capacity to supply between 10% and 20% of the \$1.12 billion in purchases of goods and services expected to be supplied by BC companies during Project construction, resulting in an estimated 770 PY of indirect employment being sourced from the LAA (i.e. 190 PY of indirect employment per year of construction); and
- Consumer spending by workers who are directly or indirectly employed by the Project is expected to create an estimated 2,895 PY of induced employment in BC, of which an estimated 150 PY would be within the LAA.

The potential regional distribution of employment is discussed in the Application.

Aboriginal persons comprise approximately 31% of the LAA labour force and 15% of the RAA labour force (see Table 6-1 above). The extent of local and Aboriginal employment on the Project would depend on a number of factors, including availability of appropriately qualified individuals to participate in construction jobs and the success of Aboriginal-controlled business to win Project-related contracts. The Application estimated that it may be possible for approximately 100 Aboriginal persons to find employment during Project construction. The Proponent committed to working with Aboriginal communities to address barriers to employment and labour force participation, and develop training programs that would seek to increase economic participation of Aboriginal populations in the Project.

Wage Rates

Average incomes and earnings for most parts of the LAA have been and continue to be below the provincial average. There is concern that the Project employment opportunities during construction could encourage LAA and RAA residents to leave their existing lower paying jobs in order to work on this Project. The Proponent estimated that the net effect of Project construction would be to create an estimated \$75 million in labour income for LAA residents over the four-year construction period, an amount equivalent to 0.8% of total earnings reported for all income earners in the LAA in 2010. Given the high rates of unemployment in several LAA sub-regions, the effect on labour income for LAA residents is expected to be too small to create local wage inflation.

The Proponent proposes several mitigation strategies to ensure that its competitive hiring practices do not contribute to wage inflation. This includes relying on labour imported from elsewhere in BC or Canada to fill its employment requirements should labour from the LAA not be available. Also, the Proponent expects that wages offered would be based on industrial rates negotiated province-wide and would therefore not be influenced by local supply/demand labour imbalances.

There is concern that this Project may be competing with other proposed construction projects for the available regional construction labour force, which could add to the strain on local and regional labour markets, indirectly cause wage rates to increase and adversely affect the financial viability of existing LAA and RAA businesses. Cumulative effects on employment are assessed in section 6.1.5 of this Report.

Training Requirements

The Proponent expects that there may be considerable interest from RAA residents to upgrade their skills in advance of Project construction given the relatively high level of unemployment in some sub-regions (see Table 6-1 above) and the relatively low levels of educational attainment by LAA and RAA residents.

The Proponent proposes to enhance Project benefits by working with training and educational facilities to provide opportunities for regional residents to upgrade their skills in advance of construction. This could lead to increased pressures on local and regional training facilities and programs.

There are currently four post-secondary institutions in northern BC that offer the types of training and facilities required to develop the skills needed by the project workforce: the College of New Caledonia (CNC), Northwest Community College (NWCC), the Northern Lights College (NLC) and the University of Northern British Columbia (UNBC). All four institutions have excess capacity in terms of student enrolment, and many have the physical facilities to accommodate new groups of students. CNC and NWCC operate mobile units to provide training at worksites.

The Proponent proposes to develop and implement a Training and Education strategy, which would seek to improve general work-readiness of the regional labour force and enhance local and Aboriginal participation in the Project. Although its specific commitments to regional training are still evolving, the Proponent's overall strategy is to work with existing training providers to prevent duplication of effort and reduce barriers for local or regional residents who wish to upgrade their skills.

In its Application, the Proponent reported that it had discussed with these institutions the capacity of specific programs being offered as they relate to the Project training plan. Local and regional training institutions provide specific programs on a cost recovery basis such that they should be able to accommodate at least some of the additional demands by increasing their capacity (e.g., hiring new instructors, renting out space in community halls). Also, recent regional initiatives such as the Workforce Tables in Northwest and Northeast BC are developing strategies to accommodate the training needed for regional residents to take advantage of future employment opportunities. More detail on these and other provincial initiatives are presented in section 6.1.5 as part of the cumulative effects assessment.

In-Migration and Labour Force Stability

The Proponent proposes to mitigate effects on migration and labour force stability by hiring local residents, wherever possible and practical, and by operating twelve self-contained construction camps for the non-resident workforce. See sections 2.2 and 7.1.2 of this Report for additional detail.

During the pre-construction phase (Q1 2015 to Q3 2016) early construction crews of up to 200 to 300 persons would be lodged in temporary accommodations (such as hotels and motels) for periods of up to six months. The Proponent proposes to target local hiring for the early construction crews to mitigate effects related to labour force stability and migration during the pre-construction phase.

The Proponent expects that workers from Canada or other parts of BC would choose not to permanently relocate to the RAA as the construction period for the Project is relatively short (i.e., four years in total, with most pipeline installation work occurring during a 1.5-year period, and approximately 10 months on average to construct any particular pipeline segment. In addition, construction camps would be located at some distance from communities and many of the specialized skills required for pipeline construction may not be required in the region once construction has been completed.

The Proponent expects Project construction to support additional labour force stability in the short term by providing to RAA residents and businesses some employment and income opportunities they might not otherwise have. Between 2006 and 2011, the number of workers decreased by 22% in the LAA (10% in the RAA), as workers left the region to find work elsewhere.

In the longer term, the training and employment provided to local residents could improve their employability and reduce the need for such individuals to leave the region in search of employment. Training and employment opportunities being offered could

help RAA residents find employment in the region even after Project construction has ended.

6.1.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During Application Review, several concerns were raised regarding employment and the Project effects on the LAA and RAA population and labour force.

Effects estimates and employment commitments by community

During Application Review, Lax Kw'alaams Band and Nak'azdli Band requested that estimates of employment, contracting opportunities, and mitigation measures for their individual communities be provided, differentiating for Aboriginal communities and for Aboriginal people living on- and off-reserves. Lax Kw'alaams Band also recommended that quotas or minimum commitments for employment be established for individual Aboriginal Groups. Northern Health asked that Project effects on income distribution within communities be addressed.

Doubts were expressed that the Proponent's proposed mitigation strategies would be sufficient to provide opportunities for qualified Aboriginal and local contractors and residents to gain employment and other benefits from the Project (mentioned by the Aboriginal Groups mentioned above, the Skeena Watershed Conservation Coalition and residents of Hazelton and Dawson Creek). There was also concern that training would not be delivered in time for local workers to take advantage of higher skilled Project-related jobs.

In response to these concerns, the Proponent prepared a technical memorandum that explained the methodology adopted by the Proponent to assess Project effects on employment by LAA sub-region. The Proponent also explained the types of issues that can be associated with attempting to set and achieve employment or procurement quotas or minimum commitments for individual Aboriginal Groups or communities. These issues include the inability to predict the extent of participation of local, regional and Aboriginal individuals and businesses in construction opportunities, and unintended adverse economic effects across different communities or groups within communities.

The Proponent indicated that they could not provide reliable estimates of the proportion of employment that could be obtained by existing residents of communities and how the proposed Project may affect income distribution and income inequities among communities, or within communities including

Aboriginal people living off reserve. In its Application, the Proponent indicated that while no follow-up or monitoring would be required by regulation or guidelines to monitor the effects of projects on regional economies, the Proponent would consider undertaking monitoring and reporting to demonstrate achievements related to training, hiring and procurement commitments.

EAO proposes a condition that if an EA Certificate is issued, the Proponent would be required to develop a Socio-Economic Effects Management Plan (SEEMP) that would include monitoring and reporting on the effectiveness of the Proponent's employment, procurement and training programs. The Ministry of Community, Sport and Cultural Development (CSCD) has indicated that they would take a lead coordinating role.

Community representatives expressed their concerns with the potential for several LNG pipelines and other projects acting cumulatively to impact ability of local businesses and communities to realize the full economic benefits expected from Project construction. These concerns are further discussed in section 6.1.5 on cumulative effects.

Potential boom and bust cycle

During Application Review, Northern Health and others, including Nak'azdli Band, raised concern about the legacy impacts of the "boom and bust" economic cycle that could result from Project construction activities, including the potential adverse effects on vulnerable groups in local communities.

The Proponent responded that the Project construction workforce would consist primarily of workers from outside the LAA who would reside in work camps, work for relatively short periods of time during various construction seasons, and return home when the Project is completed. For these reasons, Project construction would not show a sustained increase in economic indicators in the LAA, followed by a sharp and rapid contraction.

Location and size of temporary construction camps

During Application Review, concerns were raised by Northern Health and others about the locations of temporary construction camps, and the number of workers expected to occupy each work camp location, including annual variations and seasonal variations in workforce. EAO requested that the Proponent provide a map of proposed camp locations and information on peak workforce activity for the main camp locations for the land-based portion of the pipeline.

The Proponent's information summarized in Table 6-3 suggests that the construction workforce would average between 2,000 and 2,500 workers between 2015 and 2017, but that it could reach a peak of 7,200 workers in 2017, or 9.3% of the 2011 RAA labour force (Table 6-1 above).

As the proposed Project would proceed through the pre-construction phase and camp contractors are selected, the Proponent expects to be able to identify with greater certainty the locations, scale and construction schedule for each proposed main construction camp.

Table 6-3: Number of Workers at Main Construction Camps by Year

Main Construction Camp	Main Camp Capacity	2015			2016			2017			2018		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
#1 West Moberly Lake (104)	1,100	65	485	229	113	1,143	449	16	106	56			
# 2 west of Chetwynd (108)	1,100	65	442	204	59	442	245	16	1,143	292			
#3 near Mackenzie (111)	1,100	65	442	201	39	414	188	36	1,143	317	16	106	52
#4 remote, west of Mackenzie (113)	1,100	65	485	229	72	1,143	417	15	106	54			
#5 west of Middle River (115)	1,100	65	442	204	59	442	245	16	1,143	292			
#6 Fort Babine (118)	1,100	65	442	201	39	414	185	36	1,143	318	16	106	52
#7 near Kispiox (122)	1,100	65	485	229	113	1,143	449	16	106	56			
#8 north of Cranberry Junction	1,100	65	442	204	59	442	245	16	1,143	292			
#9 Nisga'a Lands	1,100	65	442	201	39	414	188	36	1,143	322	16	60	34
Total	9,900	585	4,107	1,902	592	5,997	2,611	203	7,176	1,999	48	272	138

During Application Review, Metlakatla First Nation requested that more information on the marine pipeline workforce be included in the assessment of effects on the local and regional workforces.

The Proponent indicated that the marine pipeline construction workforce is expected to be sourced from outside Canada and lodged on construction barges able to accommodate up to 500 construction workers, likely near Prince Rupert.

In-migrant workers and population changes

During Application Review, Northern Health and other representatives from northern communities (e.g., RDKS and PRRD) raised concerns that communities near

construction camps may have a greater than anticipated number of in-migrant direct, indirect and induced workers. Concerns were raised about the risks related to population changes including temporary or “shadow” population with several references being made to the population effects of oil and gas and other developments in the BC northeast and Kitimat region.

The Proponent indicated that based on its experience, the Project construction was not expected to result in workers relocating to the LAA to work on the Project. The Proponent clarified that they or their contractors cannot dictate where workers choose to reside, although due to the short-term nature of the pipeline construction, it is unlikely that these workers would choose to permanently relocate to LAA and RAA communities. Construction camps would operate for a maximum of three construction seasons and would be removed when Project construction is complete.

The Proponent referred to several mitigation strategies to mitigate the effects on community infrastructure and services including temporary accommodation, which is discussed in the section 7.1.2 of this Report.

6.1.4 Characterization of Residual Project Effects

The proposed Project would have the following residual effect on employment and labour availability:

- The creation of a shortage of available labour for some skills.

The residual effect on employment and labour availability is characterized as follows:

Criteria	Assessment Rating	Rationale
Context	Not sensitive/ Somewhat resilient	Except for the Peace River Regional District, the other four regional districts have moderately high unemployment rates and moderate to low labour force participation rates.
Magnitude	Moderate	Characterization of moderate magnitude takes into account implementation of a formalized monitoring and reporting process. A construction workforce of up to 7,200 workers would represent 9% of the total RAA labour force. However, the peak construction period is likely to attract workers from all over BC and elsewhere, particularly given the temporary nature of

Criteria	Assessment Rating	Rationale
		the construction work, and short peak construction period (approximately ten months) in any pipeline segment. Use of 9 main construction camps should help mitigate adverse effects on local and regional labour force.
Extent	Regional	Any potential adverse effects related to the economic environment would primarily occur in communities and businesses in the five Regional Districts crossed by the proposed Project (Peace River, Fraser-Fort George, Bulkley-Nechako, Kitimat-Stikine and Skeena-Queen Charlotte).
Duration	Short-to medium-term	The adverse effects of Project construction on the economic environment at the community level would occur until the cause of the effects ceases with the end of Project construction (i.e., a three- to four-year construction period); in a specific pipeline segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017).
Reversibility	Reversible	Reversible after construction ceases.
Frequency	Continuous	Would be continuous during construction but with varying magnitude.
Likelihood	The likelihood is high that some degree of adverse effects would occur during Project construction with respect to skilled labour shortages in the RAA economy.	
Significance	Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual effects on labour availability.	
Confidence	Moderate Confidence – Moderate level of confidence in validity of assumptions and analysis and effectiveness of proposed mitigation strategies. This arises from the inherent difficulties in accurately predicting how local labour markets may respond to new events.	

6.1.5 Cumulative Effects Assessment

The Proponent's cumulative effects assessment on the local and regional labour force identifies other proposed industrial projects in northern BC that could produce effects potentially overlapping both geographically and temporally with those associated with Project construction. Given the relatively short peak construction period for the Project, especially for any particular segment, forecasting temporal overlap with other projects is highly speculative.

The Proponent estimated that the labour demands proposed for the RAA (43 projects in all) could add to 204,200 PY of employment or an average of 34,050 PYs per year over the six years from 2014 through 2019. This would be six times larger than the entire RAA construction labour force and represent 44% of the total 2011 RAA labour force of 77,720 people. The analysis assumes that all the pipeline projects proceed as planned.

In the BC northeast, construction of the Project's pipeline segment could produce effects overlapping both geographically and temporally with those associated with construction of proposed gas processing plants, additional natural gas production and the proposed BC Hydro Site C Project, which would all contribute to the demand for labour in that region. A recent drop in coal prices has led to the closure of several coal mines in the Peace region and reduced the likelihood of new coal mine development in the near term.

In the RD of Kitimat-Stikine and the Skeena Queen Charlotte RD, some \$5 billion in construction projects would be winding down between 2014 and 2017 which may provide some degree of labour demand offset in the Pacific Northwest (e.g., Rio Tinto Alcan Kemano Modernization Project, Northwest Transmission Line/ Iskut Extension, and AltaGas Forrest Kerr and associated projects).

The BC Government, industry, Aboriginal communities and other communities have embarked on several initiatives to identify potential adverse cumulative effects on labour markets to help mitigate labour shortages expected in northern BC and/or increase the proportion of potential benefits likely to accrue to local communities and Aboriginal Groups from the LNG sector. These include:

- British Columbia Natural Gas Workforce Strategy Committee: The Committee includes representatives from major companies, industry associations and provincial government ministries. In July 2013, the Committee released the B.C. Natural Gas Workforce Strategy and Action Plan, which details multiple strategies and actions on the local, regional, Canadian and international fronts to help overcome issues that have prevented portions of the labour force from

participating in regional employment. That report estimated that at peak construction, which could occur between 2016/2017 and 2021, some 21,600 jobs could be directly involved in building up to 5 LNG export facilities and associated pipelines in northern BC.

- Premier's LNG Working Group: In September 2013, the BC Government established the Premier's LNG Working Group with representatives from organized labour, industry, Aboriginal Groups and the Province to review the skills training and workforce planning issues associated with the LNG industry. In March 2014, this Working Group issued a detailed report outlining key strategies for addressing the potential skilled labour shortages likely to emerge as major proposed projects in the LNG and other sectors proceed to the construction phase.
- Northwest Readiness Project: In December 2013, CSCD initiated the Northwest Readiness Project in consultation and collaboration with the Ministry of Jobs, Tourism and Skills Training. This project is key in ensuring provincial service providers and communities expected to experience significant population growth in northwest BC are prepared to meet infrastructure, health, safety and social services demands as proposed new industrial projects move from concept to construction stages and beyond.
- Northwest Regional Economic Collaborative – The Collaborative includes the Northwest Labour Market Partnership, Northwest Tourism Strategy, Regional Investment Readiness and Bio-Energy Investment Attraction. The Collaborative brings the communities of Kitimat, Terrace and Prince Rupert, as well as the Aboriginal communities of Kitselas First Nation, Kitsumkalum First Nation, Haisla Nation, Metlakatla First Nation and Lax Kw'alaams Band, together to identify priority areas for regional collaboration and promote economic diversification across the region.
- Industry: BC LNG Alliance – The BC LNG Alliance brings together four major LNG proponents in the province to coordinate community relations and labour strategies related to the proposed LNG facilities in BC's northwest. They include: Petronas's PNW LNG, Shell Canada Energy's LNG Canada, BG Group's Prince Rupert LNG, and Chevron's Kitimat LNG project.

EAO recognizes that there are considerable uncertainties relating to the location and timing of the effects given the lack of quantifiable data about the precise location, footprint, schedule and design of many of the reasonably foreseeable future developments. The Proponent indicated that it would consider undertaking monitoring and reporting to demonstrate achievements related to training, hiring and procurement commitments.

EAO proposes a condition that would require the Proponent to develop a SEEMP that includes monitoring activities to inform provincial management of potential cumulative socio-economic effects relating to pipeline construction and other projects. CSCD has indicated that they would take a lead coordinating role. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to the economic environment.

EAO concludes that there would be a high likelihood of moderate magnitude cumulative adverse effects on the regional labour supply and demand balance, but that the effect would be short term during Project construction. Project construction could combine with other reasonably foreseeable developments to cause a reduction in the available labour pool for existing industries that would be noticeable and moderately modify the regional and local economic environment.

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant cumulative adverse residual effects on employment and labour availability.

6.1.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), and initiatives undertaken by BC Government ministries and agencies, EAO is satisfied that the proposed Project is not likely to have significant adverse effects on the economic environment.

7 Assessment of Social Effects

Potential adverse effects of the Project on social values were examined with respect to four VCs:

- Community infrastructure and services;
- Transportation;
- Visual quality; and
- Land and resource use.

7.1 Community Infrastructure and Services

7.1.1 Background

Project effects on community infrastructure and services are examined through the following key indicators:

- Accommodations;
- Emergency and protection services;
- Health care services;
- Education services;
- Community recreation and leisure facilities; and
- Water and waste management.

For community infrastructure and services the LAA and RAA boundaries are the same as the LAA and RAA for the economic environment. The LAA considered a 200 km corridor and the RAA extends the LAA to include Prince George, Terrace, and Smithers.

The Application provides baseline information on community infrastructure and services and for most key indicators, data are disaggregated by community and by Aboriginal Group.

7.1.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Potential Project effects on community infrastructure and services relate primarily to the expected influx of construction workers and associated activity during construction.

Accommodation

The Project would result in a change in demand for accommodations during construction. As was discussed in section 6.1.4 (In-migration and labour force stability), Project construction is expected to require 8,570 PY of direct employment including 340 PY from LAA residents and 8,230 PY from outside the region.

Workers from outside the region are expected to be lodged in temporary accommodation near the worksites in 12 construction camps:

- Each of the nine main camps would be established along the main spread to accommodate up to 1,100 workers;
- Where there is sufficient lead time to establish early construction camps, each main camp would first be built to house up to 400 workers (early construction camps are expected to take three to six months to establish if and once regulatory approvals are obtained and early construction camps located along the eastern portion of the Project are not expected to be set up in time to accommodate workers); and
- Three camps for compressor station crews would be established to accommodate up to 150 workers.

The Proponent expects that Project construction would increase the demand for temporary accommodation such as hotels, motels campgrounds and recreational vehicle (RV) parks as follows:

- In Hudson's Hope, Chetwynd, Fort St. John, Mackenzie, and Fort St. James, early construction crews would be lodged in temporary accommodations;
- Workers lodging in camps may seek temporary accommodation in local communities for their weekly day-off;
- When work in a specific area is complete, most workers are likely to either migrate directly to the next job site or return home immediately following the end of their contracts;
- Personnel working at the marine pipeline stockyard in Prince Rupert are likely to be housed in local communities;
- The marine construction workforce would likely be lodged on construction barges and use temporary accommodations in Prince Rupert while in transit; and
- There may also be regional effects as some workers may travel to Fort St. John, Prince George or Terrace on their weekly day off or between shifts.

Due to the short-term nature of pipeline construction, the Proponent does not expect workers who are indirectly involved in supplying goods and services to the Project and its construction workforce to permanently relocate to the LAA and RAA communities.

The Proponent has proposed several mitigation measures to manage any change in demand for temporary accommodation:

- Continue to consult and share Project information, including workforce information and accommodation requirements, to local governments, service providers and businesses so they are aware of any anticipated Project-related demands and coordinate with them to identify any potential service gaps or issues;
- Contractors would endeavour to hire qualified, local workers for pre-construction activities to limit demand on existing accommodations before camps are available;
- Construction camps would be self-contained and sited in remote locations near the Project footprint and away from local communities to the extent possible and desirable;
- Contractors would keep camps open on days off and stagger the days off, identify service gaps, and manage the number of workers housed in local communities at any one time throughout the construction phase; and
- Strive to coordinate a phased start to various early construction activities by region, to allow a benefit to communities while minimizing potential effects in communities where the capacity of temporary accommodation is limited.

Emergency and protection services

Project construction-related employment has the potential to increase demand on local emergency and protection services through accidents and injuries, search and rescue activities, and socially disruptive interactions, which could occur at the worksite, on the road, in camp, and in surrounding communities and areas when workers are on time off. During operations, the effects on emergency services would likely be negligible except in the case of an accident or malfunction such as a pipeline leak, fire or explosion.

During the early-construction phase, the RCMP services in Fort St. John and Fort St. James may experience some pressure due to existing high caseloads in those communities. Once the main construction camps are established, Project-related demand for emergency and protection services are expected to be low as the camps would be remote and self-contained. The risks of disruptive social interactions to local communities are expected to be partly limited by the work schedule consisting of 12-hour work days and a six-day on, one day-off schedule. One potential exception is

the District of Mackenzie where a construction camp may be sited in or near the community. If a construction camp is established in Mackenzie, the enforcement of codes of conduct and zero tolerance policies, pre-screening, hiring of on-site security, and ongoing communication and collaboration with the Mackenzie RCMP detachment, would be expected to mitigate any increased demand on their services in the community.

The Proponent proposes several measures to mitigate the potential for increased demand on emergency and protection services including the development and implementation of several plans that would meet or exceed WorkSafeBC practices and other provincial requirements. These plans would include:

- Spill Contingency Response Plan;
- Fire Suppression Contingency Plan;
- Traffic Management Plan; and
- Emergency Response Plan.

The Proponent also proposes several non-standard mitigation measures to manage any increased demand on emergency and protection services including:

- Continue to consult with and share Project information, workforce information to local emergency and protection service providers and local governments so they are aware of any anticipated demands early on and coordinate with them to identify any service gaps or issues as they arise;
- Develop and test site-specific Emergency Response Plans to provide effective response in the event of an emergency;
- Employ personnel trained in first response or higher to provide emergency first aid onsite;
- Employ in-camp and worksite security for personnel in camp and enforce zero-tolerance policy for drug use and alcohol abuse;
- Ensure compliance with TransCanada's Motor Vehicle Operation Program among all personnel who operate vehicles for the Project; and
- Additional mitigation measures such as the use of buses or crew vans to transport workers and reduce the risks of vehicle accidents are discussed in section 7.2 (Transportation) of this Report.

Health Care Services

Health care services in the LAA are provided by the Northeast, Northern Interior and Northwest Health Service Delivery Areas (HSDAs) under the administration of the Northern Health Authority (NHA). Funding for hospital and health centre staffing is

managed by the NHA and is based largely on the resident population of a local health authority catchment area. Health care facilities that serve Aboriginal communities are generally provided by the First Nation Health Authority.

According to several health care providers contacted by the Proponent, rapid population growth and large transient populations associated with projects have created strain on health care services in communities, particularly in the Northeast HSDA but also in the Northern Interior and the Northwest regions.

Project related increased demand for health care services is most likely to arise in response to primary and more serious acute-care needs, such as infections, injuries, and accidents. These needs would likely be met by local hospitals and clinics except for extreme cases of trauma when workers would have to be transported to specialist care at hospitals in Prince George or Vancouver. In the case of trauma, workers would likely be transported back to their home community to receive long-term acute care. The Proponent also expects that construction workers would likely continue to use physicians in their home community for routine health check-ups, specialist diagnosis or follow-up for chronic conditions.

The Proponent proposes to implement the following mitigation measures prior to construction and throughout construction as the need arises to manage increased demand on health care services:

- Establish early and ongoing communications with local health authorities and health care service providers to provide Project information, anticipate potential accidents, injuries, and illnesses that might occur, and identify any service gaps and issues as they arise and in anticipation;
- Equip camps with first aid facilities and equipment and staff them with emergency medical technicians or if possible nurse practitioners; and
- Implement several policies to promote physical and mental wellness, prevent injuries and limit the spread of communicable diseases (e.g. equip camps with fitness facilities, deliver health and safety orientation and training, and implement zero-tolerance policy for drug and alcohol use).

Education Services

The potential effect assessed for this indicator relates exclusively to workforce training services, which are summarized in section 6.1.2 (Training Requirements) of this Report. Construction workers tend not to move their families to an area for temporary pipeline construction work, and as a result, elementary and secondary education services are not expected to be affected by the Project.

Community Recreation and Leisure Activities

The Application describes recreational facilities and amenities in the LAA and RAA communities, such as skating rinks, pools, libraries or outdoor parks, and provides annual visitor rates to visitor centres in the RAA for 2010 and 2011.

The Proponent's discussions with community representatives suggest that community recreation and leisure facilities are used at levels below capacity in most RAA communities owing to declining and aging populations; the exception may be Terrace and Prince George, but no Project facilities are being planned in close proximity of these two communities. The Project may contribute positively to local communities that provide access to Project construction workers on a user-pay basis.

The Proponent expects that the demand on community and recreational facilities from construction workers would be limited by the 12-hour workdays, six-days-on/one-day-off shift schedule, the remoteness of most construction camps, and that each main camp would be equipped with fitness and entertainment facilities.

Water and Waste Management

Potable water, wastewater, and recycling service are usually provided by the municipalities although some regional districts provide services to rural areas. Responsibility for solid waste management (i.e., transfer stations and landfills) often rests with the regional districts. Districts and municipalities manage their own recycling programs. Table 7-1 shows the Proponent's estimates of Project demand for water and waste management systems during construction.

Table 7-1: Estimated Project Demand on Water and Waste Management Systems

Per Workcamp Worker	Amount	
Water use	227-250	litres per day
Waste water	227-250	litres per day
Waste disposal per camp of 1,100 workers		
Solid waste of non-compacted, bagged general waste	116	m ³ per week
Cardboard and other paper packaging materials	1,100	m ³ per week
Recyclable cans and bottles	20,000	units per week
Hazardous waste per week	308	kg per week
Overall average weight of solid waste per month	46	tonnes per week

The Proponent proposes to rely on existing community water, wastewater and solid waste infrastructure and facilities to meet Project demands where remaining capacity exists, and using trucks to bring potable water to the camps and to transport waste water and solid waste from the camps to local facilities. The Proponent reports that:

- Most communities in the LAA have available capacity to provide potable water to construction camps for a fee with the possible exceptions of Chetwynd, the Hazeltons, and Port Edward, which rely on stored water in their reservoirs for short periods in the spring and summer;
- Wastewater treatment and storage capacities vary considerably between communities in the RAA, with the communities of Hudson's Hope, Chetwynd, Terrace, and Prince Rupert having little to no remaining capacity; and
- Regional landfills in the Peace River Regional District (PRRD), the Regional District of Fraser-Fort George (RDFFG), and Regional District of Bulkley Nechako (RDBN), and the Prince Rupert municipal landfill have considerable remaining capacity or the space to expand as needed; solid waste landfills in the Regional District of Kitimat-Stikine (RDKS) face capacity issues but plans for a new regional landfill appear to be proceeding.

Construction vessels would be equipped with wastewater treatment and management systems on board and wastewater would be discharged in accordance with applicable regulations and would not be discharged to coastal waters.

The Application proposes several mitigation measures to be implemented prior to construction and as the need arises throughout construction, to manage the change in demand on water and waste management infrastructure and services. These include sharing Project information and consulting with local governments and service providers to prevent workforce and other Project related demands to overburden the LAA and RAA water and waste management systems. The Project would also contribute user fees for the use of relevant community infrastructure and services.

7.1.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

The primary concerns raised during Application Review regarding Project-related adverse effects on community infrastructure and services focused on the following key indicators: accommodation, emergency and protection services, health care services and water and waste management infrastructure. No major concerns were raised about education services and community recreation and leisure activities.

Accommodation

During Application Review, concerns were raised by Northern Health and other representatives from northern communities (e.g., RDKS and PRRD) regarding uncertainties relating to locations and size of proposed construction camps and risks

related to population changes including temporary or shadow populations. See section 6.1.3 for additional discussion of concerns. Concerns raised that pertained to the demand for accommodation also included:

- Concern that a greater than assumed proportion of construction workers may choose to reside in nearby communities rather than in the construction camps, which could create supply and demand imbalances for temporary housing in RAA communities (also raised by Nak'azdli Band);
- Workers and their families may utilize campgrounds and recreational facilities, which may impact local residents and visitors; and
- Potential to indirectly increase the demand for non-market housing units from low-income individuals as the cost of market housing rises, particularly when potential cumulative effects are considered (also raised by Nak'azdli Band).

In response to these concerns, and at the request of EAO, the Proponent provided additional detail on when and where early construction workers may be housed in commercial temporary accommodations. Communities in the eastern portion of the pipeline route most likely to be affected include:

- o Hudson's Hope and/or other nearby communities such as Chetwynd and Fort St. John for up to two construction seasons including summer 2015 and winter 2015/2016;
- o Mackenzie for summer of 2015 and summer of 2016 construction seasons; and
- o Fort St. James for winter 2015/2016 and summer 2016 construction seasons.

The number of early construction workers per spread may reach up to 400 workers, but some of these workers may be local hires who do not require temporary accommodations.

The Proponent's data suggest that while some smaller municipalities such as Hudson's Hope and Chetwynd appear to have sufficient units of temporary accommodation to house 250 or more early-construction workers, others like Mackenzie and Fort St. James could face greater challenges in housing an early construction workforce. For several communities that may have nearby construction camps associated with the Project, any substantial ratio of people (workers, family members or visitors) requiring temporary accommodation in communities, relative to the number of workers in the camps, would strain the current accommodation capacity (e.g., Fort Babine, Kispiox/Hazelton, Nisga'a Nation).

Emergency and protection services, community recreation and leisure activities

During Application Review, several Aboriginal Groups (e.g., Kitsumkalum First Nation, Metlakatla First Nation, Nak'azdli Band), regional districts (e.g., PRRD), local residents (from Kispiox, Hazelton and other communities), Northern Health and others raised concerns about the ability of the existing emergency, protection and other services to meet the demand that may result from Project-related direct, indirect and induced effects associated with construction camps being established near their communities. EAO requested additional information during Application Review regarding construction camps, including the average number of construction workers expected at each camp each year.

The Proponent's response to the information request showed that while the main camps are expected to have a combined capacity potentially reaching 9,900 workers (i.e. 9 main camps each with a capacity of up to 1,100 workers), the number of workers residing at those camps might peak at 7,000 workers in summer of 2017, but would average 1,900 workers in 2015, 2,600 workers in 2016 and 2,000 workers in 2017 (see Table 6-3 above).

During Application Review, there was concern from smaller communities (e.g., Hazelton and Kispiox area) and Aboriginal Groups, including Nak'azdli Band, that establishing large construction camps near small communities could potentially result in increases in organized crime, drug and alcohol abuses and other unhealthy behaviours, as well as strain other infrastructure and services. Several Aboriginal Groups and other LAA communities expressed concern that workers would visit communities during their weekly day-off, which could bring benefits in terms of local spending, but could have adverse effects on community quality of life.

The Proponent responded that it plans to build one main construction camp in the Kispiox region, and that a future compressor station site and associated camp are also contemplated. The proposed construction schedule anticipates that the pipeline construction camp in Kispiox would operate for up to 31 months starting in January 2015 and that the camp would be occupied by an average of 275 workers, with a peak of 1,143 workers for approximately two months at the end of 2016. The Proponent acknowledged that social issues are complex and multifaceted, and indicated that several mitigation measures would be implemented to manage Project effects on emergency and protection services including many of these that would also address social concerns related to drug and alcohol use, crime, and other disturbances.

EAO proposes a condition that would require the Proponent to develop a SEEMP that would include requirements for the Proponent to engage with local government and provincial service delivery agencies on mitigation proposed to manage potential effects to social service delivery. The SEEMP is expected to include on-going monitoring and reporting of Project effects including a final report at the completion of Project construction.

Health care services

Northern Health and others, including Nak'azdli Band, raised concerns during Application Review with respect to the potential increase in demand on health infrastructure and services during construction (including demand associated with physical health and mental health). The primary concerns relate to the potential increase in demand from the proposed construction camps (mentioned by Nak'azdli Band, Kitsumkalum First Nation and Lax Kw'alaams Band, several residents from Smithers and Kispiox Valley).

EAO also requested that the Proponent provide quantitative estimates of proposed Project related medical incidents per year, the types and frequency of health services that workers could require over and above services provided on-site or in construction camps, and other Project-related effects on health care services, emergency and other services.

In response to those requests, the Proponent provided TransCanada's 2013 average injury rates for its employees and its contractors, summarized in Table 7-2. The Project construction phase may result in 150 recordable cases over the 4-year construction period, or an average of 37 cases per year for the 5 regional districts crossed by the Project. These injuries may or may not result in medical service requirements beyond services provided in construction camps. Only 6 of these would be away-from-work cases (defined as an injury or illness that prevents an employee from returning to work on the next scheduled shift).

Table 7-2: Estimated Number of Injuries During Construction

	TransCanada Rates per 100 Full-Time Workers (2013)		Project's Estimated Number of Cases (Based on Contractors' Rate)	
	Employees	Contractors	Total Construction	Average Per Year
Total Recordable Cases	0.57	1.75	150.0	37
Away from Work Cases	0.14	0.29	24.9	6

The Proponent also reported that the most common medical treatments sought by workers are sutures and the removal of foreign objects from eyes. Other less

frequent types of medical attention sought by workers include treatment for fractures and X-ray services.

Water and Waste Management

During Application Review, MOE, communities and several regional districts (including RDBN, PRRD, and SQCRD) raised concern that an efficient approach to water requirements and waste disposal may not be possible without sufficient planning lead time. As a result of these and other concerns, EAO requested that the Proponent identify which local systems the Proponent expected to access.

The Proponent responded that detailed estimates of water needs, solid and liquid waste flows and the identification of which local systems are expected to be accessed to meet the needs for water and waste water services would be developed once contractors have been hired. Prior to the start of construction, contractors would obtain permits to use waste and waste water management infrastructure from the appropriate municipal and regional districts.

7.1.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on communities and infrastructure and services:

- Increased demands put on community utilities and services (i.e., accommodation, emergency and protection services, health care services, and waste management facilities).

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on community infrastructure and services, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low to Moderate resiliency and moderate to high sensitivity	With the possible exception of the pipeline segment in the Peace River RD and the marine RDSQC segment, the remoteness of the proposed pipeline route and proximity to smaller communities (e.g., Fort Babine, Kispiox/ Hazelton, Nisga'a Villages, etc.) result in a context of low resiliency and high sensitivity for many of the LAA communities.
Magnitude	Community	Community infrastructure and services overall:

Criteria	Assessment Rating	Rationale
	infrastructure and services: Low to Moderate overall Accommodation: Moderate Emergency and protection services: Moderate Health care services: Low Water and waste management facilities: Moderate	The magnitude of potential effects on community infrastructure and services is expected to be of low to moderate magnitude overall, after mitigation strategies, monitoring and adaptive management. Accommodation: effects on temporary accommodation in nearby communities likely to be of moderate magnitude given existing accommodation units inventory and size of Project (e.g., demand from construction workers in transit, non-camp workers, indirect and induced effects). Emergency and protection services: Main camps are largely self-contained, but remoteness of proposed pipeline route and proximity to relatively small communities such as Chetwynd, Hudson's Hope, Mackenzie, Fort St. James, Kispiox/Hazelton and the Nisga'a Villages) could create challenges in providing emergency and protection services to camp residents; also, camp proximity to small communities could result in adverse effects of moderate magnitude on social conditions and protection services for vulnerable communities that may be more challenged to meet increased demands. Health care services: Based on TransCanada's historical injury rates and estimates of off-site related accidents, the requirements for off-site health care services appear low after implementation of mitigation, monitoring and adaptive management. Water and waste management facilities: Project-related demand for water and waste management facilities during construction from nine main camps is considered of moderate magnitude, when compared to existing waste management capacity.
Extent	Community and regional	The effects to community infrastructure and services would be primarily within local community population centres, but would also be experienced at the regional level.

Criteria	Assessment Rating	Rationale
Duration	Short to medium-term	Effects on the social environment at the community level would cease once Project construction is completed. The duration of construction and effects of construction is medium term (e.g., three- to four-year construction period), but in a specific pipeline segment, peak activity and effects of construction are expected to be limited to several months.
Reversibility	Reversible	Reversible once Project construction is completed.
Frequency	Continuous	Continuous during construction, but with varying magnitude.
Likelihood	The likelihood is high that some degree of adverse effects would occur during Project construction with respect to community infrastructure and services in the LAA and RAA.	
Significance Determination	Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual effects on community infrastructure and services.	
Confidence	Moderate Confidence – Moderate level of confidence in validity of assumptions and analysis and effectiveness of proposed mitigation strategies, particularly in consideration of the requirements for on-going monitoring and adaptive management.	

7.1.5 Cumulative Effects Assessment

The Proponent's cumulative effects assessment on community infrastructure and services identified various projects that may have effects overlapping spatially with the effects of the Project, by potentially relying on the same communities as the proposed Project for infrastructure and services. The primary driver of potential adverse cumulative effects is likely to be multiple construction camps in proximity to a community.

Several of the other natural gas pipeline projects and/or other projects also plan to establish camps in or near the same communities being considered for this Project. For example:

- Hudson's Hope: other natural gas pipelines and Site C Clean Energy project;

- Chetwynd/ Moberly Lake/ Lemoray: other natural gas pipelines;
- Mackenzie, near Fort St. James, near Fort Babine, near Kispiox/Hazelton and Nisga'a Villages: WCGT project; and
- Prince Rupert/Port Edward: WCGT project and two proposed LNG facilities including PNW LNG facility to be associated with this Project and the Prince Rupert LNG facility proposed for Prince Rupert.

As is the case with this Project, the exact location, timing and scale of those other proposed construction camps are unknown.

The BC Government, industry, Aboriginal communities and other communities have embarked on several initiatives to identify potential cumulative effects on community and regional infrastructure and services expected from this Project and other natural gas pipeline and projects, and develop mitigation strategies to address these effects.

Section 6 of this Report described initiatives that focused at least in part on the potential cumulative effects on skilled labour shortages in the RAA. There are several other initiatives that specifically target community readiness and the establishment of infrastructure and services at the community and regional levels. These include:

- BC Government Community Readiness Initiatives and Grants from Northern Development Initiative Trust: Grants totaling up to \$1 million are being provided to help local governments in the Northwest plan for economic growth associated with LNG developments and industrial expansion;
- Fair Share Agreements: In northeast BC, the Fair Share Agreements provide for provincial royalties in the oil and gas sector to be reallocated to municipalities in the Peace River RD to support infrastructure development; and
- Other Initiatives: Several government funded projects and initiatives such as Western Diversification, Community Futures, and Northern Development Initiative Trust make strategic investments in initiatives that enhance and strengthen businesses and communities of northern BC.

The relatively large workforces and construction camps proposed for this Project and other industrial projects being proposed for northern BC could result in adverse cumulative effects on community utilities and services, transportation infrastructure and services, and community quality of life.

EAO recognizes that there are considerable uncertainties relating to the geographical and temporal overlap of effects from multiple projects given the lack of quantifiable data about the precise location, footprint, schedule and design of many of the reasonably foreseeable future developments. EAO also recognizes that in any given location,

Project construction activity levels associated with moderate magnitude social effects are likely to occur over a period of several months. This increases the challenge of forecasting potentially important temporal overlaps or adjacencies in effects from other projects, particularly projects with similar short-term peaks in construction activity levels.

The Proponent proposes to address potential cumulative effects from the Project on community infrastructure and services in the LAA/RAA communities through implementation of mitigation during the construction phase such as housing the proposed Project workforce in construction camps and the implementation of several management plans including an Emergency Readiness Plan and an Environmental Management Plan.

EAO has proposed a condition for the Proponent to develop a SEEMP to address risks and uncertainties identified in the EA process regarding Project effects on socio-economic values including the Project's contribution to cumulative effects. As part of the SEEMP, the Proponent would be required to inform local, regional and provincial governments in planning for capacity adjustments to infrastructure and services and address adaptive management to mitigation, if necessary. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to community infrastructure and services.

EAO determines the magnitude of cumulative residual adverse effects to be moderate in magnitude as Project construction would combine with other reasonably foreseeable developments to cause an increase in demand for community infrastructure and services, which in some LAA/RAA communities could exceed existing infrastructure capacity. The effects would pertain to the LAA/RAA, be short term in duration (during construction), continuous and reversible.

EAO is satisfied that the adoption of the Proponent's mitigation strategies, supplemented by initiatives by the BC Government and others that are documented in this section of the Report would be sufficient to mitigate the Project's contribution to cumulative adverse effects on the LAA/RAA community infrastructure and services. The EAO concludes with moderate confidence that the Project residual adverse cumulative effects on community infrastructure and services would not be significant.

7.1.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is

satisfied that the proposed Project is not likely to have significant adverse effects on community infrastructure and services.

7.2 Transportation

7.2.1 Background

Project effects on transportation are examined through the following key indicators:

- Marine and freshwater navigability;
- Road condition and traffic; and
- Airports and railways.

The LAA for the transportation valued component includes the main routes (major roads, highways, airports and railways) used to transport workers, goods and equipment to and from the Project, and the navigable waters that have the potential to be disrupted by pipeline construction and operation activities. The RAA includes the transportation network connecting to the LAA within BC.

7.2.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

Marine Navigability

West of Cranberry Junction, the proposed pipeline route heads southwest through Nisga'a Treaty Lands to Nasoga Gulf and transitions to a marine pipeline heading south through Portland Inlet and Chatham Sound to Lelu Island.

Chatham Sound, particularly the areas around Prince Rupert, Port Edward, and the approach to Lelu Island, is an area busy with marine traffic throughout the year. The Prince Rupert Port Authority (PRPA) operates a number of deep water facilities in the area including: two cruise ship terminals; terminals for bulk commodities such as coal and grain; and a container terminal. In 2012, there were approximately 6,000 vessel movements near the Lelu Island approach portion of the pipeline route, of which 60% were by tugs and pilot boats that assisted the navigation of larger vessels, 20% were ferries, 14% were merchant vessels, and 2% were fishing vessels.

Between April and November 2013, the PRPA recorded 8,458 small vessel movements in Porpoise Channel (north of Lelu Island), Flora Bank (west of Lelu Island) and near the slough, of which 54% were by recreation vessels, 37% by fishing boats, and 9% by commercial boats. Other recreational uses include sea kayaking, particularly on the west side of Kaien Island (on which Prince Rupert is located) and near Kitson Island towards Porcher Island.

Portland Inlet is much less frequently used than Chatham Sound but is still recognized as an important area for fishing and recreational use. It also provides access to the Nass area, as well as the communities of Stewart, BC, including the Port of Stewart, and Hyder, Alaska. Small vessels in Portland Inlet tend to hug the shorelines as the waters can be rough. Nass Bay, Iceberg Bay, and Nasoga Gulf are also recognized as important areas for fishing and recreational use, particularly with respect to harvesting marine species by the Nisga'a Nation and other local Aboriginal Groups. These areas are also thoroughfares and access points to local freshwater watercourses.

During the pipeline construction phase, marine pipe placement, including trenching, seabed preparation, and lowering activities have the potential to affect marine navigability; this may include a zone around construction vessels and construction areas for safety that may temporarily impede other vessels from safely passing through or accessing certain areas, or require them to take a longer route.

For the marine pipeline portion from Nisga'a Lands to Nasoga Gulf, the route is relatively shallow and close to shore. Nearshore and foreshore construction may temporarily impede other vessels from safely passing through or accessing certain areas or require them to take a longer route during the construction period. Traffic is considered moderate in those areas, consisting primarily of fishing and recreational use by local Aboriginal communities.

From Nasoga Gulf to Portland Inlet, the use of the Nasoga Gulf during construction may be heavily impeded particularly for larger vessels as the Gulf is barely wider than the safety zone in some areas. Construction in that area is expected to require between a few days and a few weeks for each of three phases of construction (lowering in, pipe placement and pipe protection).

Vessels navigating the deep water portions of Portland Inlet to Chatham Sound would have to navigate around the construction vessels and their safety zones during construction. The area is wide and used extensively.

Vessels approaching Lelu Island may also have to take a longer route to get around the construction vessels or construction areas. In this portion of the marine pipeline route, a shallow water pipelay barge would extend the pipeline through the shallower waters to a distance of approximately 2 km offshore. For the remaining 2 km to the Lelu Island shoreline, the final construction methodology has not yet been confirmed, but it is assumed that a safety zone would remain throughout the 19 week construction period.

The presence of physical facilities during operations would not affect navigability.

The Proponent proposes several mitigation measures and best practices to minimize or eliminate disruptions to navigation during construction including complying with the *Navigation Protection Act* and developing and implementing a Marine Access/ Traffic Management Plan that would include a marine communication strategy.

Freshwater navigability

For the freshwater watercourse crossings, thirteen are greater than 50 m wide and are therefore not considered a minor work under the *Navigation Protection Act*. Freshwater watercourse crossing construction activities have the potential to restrict or interfere with navigation by partially or fully blocking the watercourse, depending on the crossing method. For most crossings, navigation would be impacted for typically one or two days. In addition, the aerial and trenchless bottom lay crossings have the potential to impede navigation throughout the operation phase by reducing the clearance above or below the water surface.

The Proponent expects the effect on freshwater watercourse transportation may be most pronounced for the Williston Lake crossing, most of which is greater than 20 m deep and frequently used for navigation.

The Proponent proposes to implement several measures to reduce or eliminate disruptions to freshwater navigation including complying with the *Navigation Protection Act*, allowing vessels safe access through the work sites, informing watercourse users of the construction activities, and where open cut or isolated crossing methods are used on navigable waters, restoring the bed of the waterway to its natural contours. Operational activities are not expected to disturb freshwater navigability.

Major Roads and Highway Infrastructure

The majority of roads in the LAA are Class II highways: provincially operated and maintained, in rolling or mountainous terrain, rural, two-lane, and narrow shouldered. The segments generally operate well below capacity and at a high level of service. In most cases, winter weather conditions (ice, snow) and terrain are the main limiting factors for traffic flow.

During the early construction phase, workers would be accommodated within a combination of neighbouring communities and construction camps, depending on the location. Up to 400 person-trips per day between communities and the Project sites would be generated, and up to 80 person-trips per day between the construction camps and airports. Up to 220 person-trips per day between construction camps and airports would be generated.

The movement of pipe between rail siding sites and stockpile or worksite locations would generate an estimated 13,000 to 14,000 truck trips. An additional 30,000 to 35,000 trips would be generated by the movement of other items such as camp components and consumables, diesel fuel, compressors, heavy construction equipment, and other materials.

The Application provides Ministry of Transportation and Infrastructure (MOTI) traffic volume data for 21 major road and highway segments in the LAA which are likely to be used by the Project and compares projected peak Project conditions for each of those segments. The analysis indicates that traffic volumes are low relative to capacity on most road segments of the LAA and that peak Project related traffic is expected to increase baseline traffic volumes by less than 5% for most road segments under review.

Table 7-3 shows the Proponent's road segment analysis for the segments where the peak Project traffic is expected to result in a more than 5% change in average annual daily traffic volume (AADT). The greatest traffic volume increases are expected to occur on: Highway 27 from Vanderhoof to Fort St. James (328 vehicle-trips per day); Highway 97 west of Chetwynd (288 vehicle-trips per day); Highway 16 near Hazelton (270 vehicle-trips per day); and Route 39 to Mackenzie (240 vehicle-trips per day).

Table 7-3: Peak Project Conditions for Selected Road Segments

	Baseline Volume (AADT)	Baseline + Project Volume (AADT)	Peak Project Traffic (AADT)	Project as a % of AADT
#39 to Mackenzie	1,093	1,333	240	21.9%
# 29 near Hudson's Hope	2,219	2,350	131	5.9%
# 97 west of Chetwynd	3,449	3,737	288	8.4%
# 27 from Vanderhoof to Fort St. James	1,243	1,571	328	26.4%
# 118 north of Houston	398	455	57	14.3%
# 16 near Hazelton	3,170	3,449	279	8.8%
# 113 north of Terrace	809	913	104	12.9%
# 37 north of Kitwanga, south of Cranberry Junction	1,013	1,114	101	10.0%
Nass Road	493	607	114	23.2%
Nisga'a Highway	1,018	1,109	91	8.9%
Other locations				Less than 5%

AADT: Average Annual Daily Traffic

The Proponent's traffic analysis also shows that peak Project-related heavy vehicle traffic is expected to change the proportion of total traffic that is heavy vehicles by less than 10% for all 21 road segments under review.

During Project construction and operations, the Proponent would comply with the MOTI permit approval conditions for transporting oversize or overweight items on provincial highways to avoid unnecessary wear on road surfaces and bridges, and with the *Transportation of Dangerous Goods Act*. The Proponent also proposes the following measures during construction for transportation on major roads and highways, which includes: establishing construction camps near the Project site as soon as possible; using buses or crew vans for worker transportation; developing and implementing a Traffic Management Plan; working with road and highway authorities to optimize timing and routing; and negotiating road agreements for forestry and service roads.

Railways and Airports

Railways and airports would be used for transportation of equipment, materials and workers from supply locations to the pipeline ROW.

Canadian National (CN) Railway controls and owns most of the rail lines in northern BC and rail is expected to be used to transport equipment and materials for the Project to pipe yards and the ROW. Many of CN's rail corridors are in alignment with the provincial highway corridors (e.g., Routes 16, 39, 97). The Proponent expects an estimated 40,000 lengths of pipe to be transported by rail to the various rail siding locations. Each rail car can carry four to five pipe lengths, for a total of 5,000 to 9,000 rail cars.

Twelve airports were identified during the baseline data collection, six of which currently provide commercial airline service and are described in greater detail below. There are also smaller, private airstrips in the LAA that are not included in the overview of existing conditions because they are less likely to be used by the Project. The estimated traffic effects assume that each construction worker would use the airport twice per month, or less.

The Proponent's analysis suggests that the increased demands on airports could be met through a combination of unused current capacity and planned upgrades at each of the airports, particularly since the peak Project air passenger traffic is typically short-term, lasting only a few months. The demands may extend to other airports in the LAA if charter flights are used. There are six other airports within the LAA: Woodcock, Burns Lake, Vanderhoof, Mackenzie, Hudson's Hope, and Chetwynd that do not currently offer commercial flight services but could accommodate the Project workforce through the use of charter planes.

7.2.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the review of the Application, additional issues, potential project effects and proposed mitigation measures were raised by regulatory agencies and Aboriginal Group representatives.

Marine and Freshwater Navigability:

Transport Canada, Metlakatla First Nation, Gitxaala Nation and Lax Kw'alaams Band expressed questions or concerns regarding potential adverse effects from pipeline construction activities on marine navigation and the adequacy of mitigation measures for the marine environment including the Marine Access/ Traffic Management Plan.

The Proponent responded that it is aware of the potential for both the construction and operation of the marine pipelines to interfere with navigation and that it would seek all necessary approvals from Transport Canada (e.g., under *Navigation Protection Act*) and the PRPA for the portions of the pipelines that may interfere with navigation. The Proponent re-iterated its commitment to the development and implementation of the Marine Access/Traffic Management Plan which would include the identification of specific measures to address specific issues and concerns identified during ongoing consultation pre-construction.

Transport Canada, Nak'azdli Band, and others raised questions regarding the mitigation measures for the freshwater environment. In April 2014 the *Navigation Protection Act* replaced the *Navigable Waters Protection Act* and introduced the List of Scheduled Waters, which for this Project includes the Peace River, Skeena River, and Williston Lake. Some groups raised concern that compliance to the *Navigation Protection Act* may not be sufficient to mitigate effects on freshwater navigability for non-scheduled waters.

To address these concerns, the Proponent proposed to augment its Access Management Plan (AMP) to include a section specific to freshwater navigability for non-scheduled waters, which would draw on Traditional Knowledge information and the results of stakeholder consultation and would include the development of additional mitigation measures as necessary.

Major Roads and Highway Infrastructure

MOTI and others raised several questions regarding Project-related effects on traffic volumes and the RAA transportation infrastructure. Several local residents from

Smithers, Hazelton, Kispiox Valley, as well as the SkeenaWild Conservation Trust and the Skeena Watershed Conservation Coalition, raised concerns about the potential for increased construction related traffic in the Kispiox Valley, particularly on several one-way bridges in the area. Related to these concerns, EAO requested estimates of Project-related traffic volumes on Forest Service Roads (FSR) and other access roads.

The Proponent indicated that Project-related traffic volumes and baseline estimates for LAA Highways and major roads are available, but similar traffic volume information is not available for FSRs or other access roads. The Proponent also indicated that more detailed estimates of traffic volumes on FSRs and other access roads would be developed as Project planning and design proceeds, and that these estimates would be used to negotiate road use agreements, where appropriate.

MOTI requested that current highway inventory and future expansion of the provincial highway network (roads and structures) not be negatively impacted by pipeline ROW, access roads or other pipeline works, and that pipeline ROW should be placed no less than 30 m from the edge of the MOTI road boundaries. MOTI raised specific concerns regarding the Hudson's Hope Bridge, Highway 37 crossing, and Nisga'a Highway.

In the response, the Proponent has indicated to EAO that it has been in ongoing discussions with MOTI regarding these concerns, and would continue to work to address these concerns through final design and permitting.

Airports and Railways

No additional concerns were raised during Application Review to those already discussed in the Application.

7.2.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on transportation:

- Project construction activities for pipeline construction would likely disrupt marine and freshwater navigability;
- Increase in vehicle traffic is likely to increase transportation congestion; and
- Increases in railway and airport traffic are likely.

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on transportation and access, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low to high resilience	Navigability: Construction activities for marine pipeline expected to occur in some areas of low to moderate resilience, for example the narrow channels of Nass Bay and certain more higher volume areas such as west of Lelu Island and the approach to the Prince Rupert Harbour; remainder of marine pipeline route is sufficiently wide to be considered of moderate to high resiliency (e.g., most of Chatham Sound). Freshwater navigability likely to be of moderate to high resilience. Transportation: Project construction would rely primarily on the existing road and transportation infrastructure systems to deliver materials and labour to the proposed pipeline ROW. While there are some concerns about traffic congestion at certain points on major roads, most have sufficient capacity to accommodate increased traffic.
Magnitude	Marine navigability: Low to Moderate Freshwater navigability: Low Transportation: Negligible to Moderate	Marine navigability: Magnitude expected to range between low and moderate as vessels would need to navigate around the construction vessels and their safety zones during construction; this disruption of marine navigability is not expected to constitute more than a temporary inconvenience or nuisance to most marine users (low magnitude) but could have greater effect for some users/areas at certain times of the year (moderate magnitude). These effects would also occur for the second pipeline. Freshwater navigability: Disruptions to freshwater navigability for recreational users likely to constitute a temporary inconvenience or nuisance. Transportation: The magnitude of potential Project effects on vehicle traffic is likely to be negligible to moderate in magnitude relative to existing traffic, as a result of Project related demands on highways as well as secondary and Forest Service Roads.

Criteria	Assessment Rating	Rationale
Extent	Local	Navigation and transportation impacts would be on specific routes or locations.
Duration	Short to medium-term	Navigation impacts at any one location would typically last days, but may last for a couple of weeks to months at landfalls. Transportation effects would generally continue for six to 12 months. These effects would occur again during the construction of the second pipeline.
Reversibility	Reversible	Would reverse immediately after the activity ceases.
Frequency	Once to continuous	Navigation effects would generally occur twice at any one location, while landfall effects would be continuous for a period. Transportation effects would be occasional or continuous at any location.
Likelihood	The likelihood is high that some degree of adverse effects would occur during Project construction with respect to transportation infrastructure and services in the LAA/RAA.	
Significance Determination	Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual effects on transportation.	
Confidence	Moderate Confidence – Moderate level of confidence in validity of assumptions and analysis and effectiveness of proposed mitigation strategies, particularly in consideration of the requirements for on-going monitoring and adaptive management.	

7.2.5 Cumulative Effects Assessment

For the cumulative effects assessment on the transportation VC, the primary driver of potential adverse cumulative effects would likely be multiple linear projects being built at the same time thereby creating additional traffic on nearby roads and other transportation infrastructure.

Marine and freshwater navigability

The proposed WCGT project would include a marine pipeline portion that could be concurrent with the Project's marine construction schedule and spatially close enough to cause cumulative effects on marine navigability in combination with the Project, particularly in the narrower channels of Nass Bay and the Nasoga Gulf. The Proponent suggests that if both projects were to happen concurrently, careful coordination between contractors and permitting through the *Navigation Protection Act* and PRPA could alleviate the potential for cumulative effects in the marine environment.

The timing of other projects and routes selected would influence the nature and severity of cumulative effects in other areas including the marine pipeline route approaching Lelu Island. Based on known construction timelines, the residual effects due to the increased marine traffic during construction of the two proposed LNG facilities for Prince Rupert (i.e. Pacific Northwest LNG and Prince Rupert LNG) are expected to be minimal. While the timelines for the other industrial and marine use projects proposed for the PRPA area (e.g., terminal expansions, Canpotex) are not well defined, the location of these projects is such that spatial overlap with the effects of the Project would be minimal. Additionally, the PRPA would be establishing a construction coordination committee to ensure any potential overlapping project effects on navigation within its area of administration are managed.

In the freshwater environment, other energy projects would install pipelines that cross streams and lakes, potentially disrupting use of waterbodies. Such effects are likely to be intermittent and temporary, and are unlikely to occur at the same time or have cumulative effects.

Road condition and traffic

All listed projects have the potential to act in a cumulative fashion with the Project, through the movement of workers, equipment, or materials on the same network of roads and potentially at the same time.

Various projects are planning construction camps in or near the same communities being considered for this Project, which could result in increased traffic on the same road segments potentially being used for this Project. For example: other natural gas pipelines and/or the Site C Clean Energy project plan to establish camps in Hudson's Hope, Moberly Lake, Chetwynd and Lemoray; the WCGT project is planning camps near Mackenzie, Fort St. James, Fort Babine, Kispiox/Hazelton and the Nisga'a Villages; and several projects are planning for camps in and near Prince Rupert/Port Edward. As is the case with this Project, the exact location, timing and scale of those other proposed construction camps are unknown.

The combination of traffic associated with the Project and other major projects proposed for the LAA/RAA including forestry activities would contribute to cumulative effects of reduced road surface quality, traffic volumes and safety. The volumes of heavy transport trucks and varying routes used to access the Project, and the timing of other projects and routes selected would influence the nature and severity of cumulative effects.

The Proponent's analysis suggests that in most areas, the existing road network is currently functioning at a high level of service, indicating a surplus of available capacity and high resilience to accommodate cumulative demands. It is expected that future developments would be required to apply similar standard mitigation strategies such as road agreements and compliance with oversize and overweight load regulations, which should limit or eliminate cumulative effects from heavy or oversized vehicle demands.

As mentioned in section 6.1.5 and section 7.1.5, the BC Government, industry, Aboriginal communities and other communities have embarked on several initiatives to identify potential cumulative economic and social effects expected from this and other natural gas pipeline and other projects, and develop mitigation strategies to address these effects. As described in those sections, several of these initiatives are focused on mitigation strategies to address potential labour shortages while others are focused on community readiness.

EAO determines the magnitude of cumulative residual adverse effects to be low to moderate in magnitude, as Project construction may combine with other reasonably foreseeable developments to cause adverse effects to road transportation or marine navigation. The effects would be largely localized, short term, and reversible. EAO proposes a condition requiring a Marine Access and Traffic Management Plan which would require identification and mitigation to manage effects to other marine users. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to transportation. EAO is satisfied that the adoption of the Proponent's mitigation strategies the residual cumulative effect to transportation would not be significant.

7.2.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on transportation and access.

7.3 Land and Resource Use

7.3.1 Background

The land based portion of the Project would be located primarily on provincial Crown lands, traversing many areas with tenured uses such as forestry, mining, trapping, guide-outfitting, commercial recreation, agriculture and infrastructure ROW. Approximately 83 km of the pipeline route would cross Nisga'a Treaty Lands and further small segments cross private fee simple lands.

The Application's consideration of land and resource uses focused on the following key indicators: Parks and protected areas, land use plans; outdoor recreation; tourism; guide outfitting; trapping; commercial fishing; agriculture; forestry; and, other industrial land use.

The land and resource use Project footprint includes the permanent pipeline ROW and all potential locations for temporary construction camps and other construction workspaces. The LAA is a 2 km band that fully encompasses the terrestrial portion of the Project footprint. The RAA is a 30 km wide area centered on the Project footprint.

7.3.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

This section summarizes Project-related effects on land and resources, and key proposed mitigation assessed in the Application.

Parks and Protected Areas

The Project footprint would cross the Nisga'a Memorial Lava Bed Provincial Park (Anhuluut'ukwsim Laxmihl Angwinga'Asanskwhl Nisga'a), a Class A Provincial Park that is jointly managed by the Nisga'a Nation and BC Parks, for approximately 12 km. A total of 63 ha of the Nisga'a Memorial Lava Bed Park would be overlapped by the Project footprint, or 0.3% of the park's total areal extent.

The affected habitat would be lava bed, with small lichens or moss. There would be access restrictions during construction, as well as an increase in access, if unmitigated, along the cleared Project footprint during operations. The Project is unlikely to limit the ability of users to visit or use the park, during the Project construction phase. Depending on the placement of the final pipeline route, there would be a permanent visual change to the park along the 12 km, which some users may find noticeable, but this would not be expected to widely restrict or degrade present land uses to a point where activities

cannot continue at current levels (the effects of the Project on visual quality are discussed in section 7.4 of this Report).

The Nisga'a Memorial Lava Bed Provincial Park was established in 1992 with pre-existing disturbances; a transmission line (BC Hydro) crosses a portion of the park near the north end of Lava Lake, and other past and present park uses include logging access roads, gravel pits, former log sorting sites, as well as a few residential buildings on private property along the east shore of Spencer Lake.

In order for the pipeline to be built through the Park, the area corresponding to the Project footprint would have to be removed from the park by a Park Boundary Adjustment, as per the *Park Boundary Act* and the Nisga'a Final Agreement (NFA). The Proponent would continue to work with BC Parks and Nisga'a Lisims Government (NLG) to determine specific Project mitigation including potential park enhancements.

Land Use Plans

Portions of the Project footprint would intersect with 21 land use plan boundaries including:

- Ten Land and Resource Plan (LRMP) areas;
- Six Sustainable Resource Management (SRMP) Plan areas;
- Mugaha Marsh Sensitive Area Plan;
- Coast Land Use Decision Implementation (CLUDI) area;
- Peace Moberly Tract SRMP Agricultural Development Areas and Settlement Reserve areas within four Forest Districts;
- Aboriginal land management plan areas (the Application describes 10 identified groups and communities with identified Aboriginal land and resource plans); and
- Official Community Plan areas of the District of Hudson's Hope and the District of Mackenzie.

RMZs are contained within LRMPs and provide additional direction and assurance for resource development while incorporating provisions for the protection of important environmental and recreational resource values in the area. The Proponent's analysis finds that while there are many LRMPs and RMZs, as well as two OCPs in the Project footprint, none of these plans preclude development when the defined mitigation measures are applied and appropriate permits are obtained. Procedures and mitigation related to relevant wildlife species and habitats, and other values such as scenic areas, are defined in the relevant chapters of the assessment. Also, the OGC would consider environmental objectives contained in land use plans prior to issuing project permits.

The Proponent noted that the Mackenzie LRMP reflects the priorities of the Mugaha Marsh Sensitive Area Plan through the Parsnip RMZ objectives. The Project footprint would overlap 345 ha of the Parsnip RMZ (within the Mackenzie LRMP). The Mugaha Marsh Sensitive Area Plan, which is not included in the spatial data on land use plans used from Data BC, would overlap the Project Footprint by 10.9 ha.

Map Reserves

A Map Reserve is administered by FLNR and temporarily allows the withdrawing or withholding of Crown lands for a specific purpose, generally for a period of 30 years or less. The Project footprint would overlap with map reserves for 576 ha, which includes seven Map Reserves: 40 ha for quarrying purposes; 136 ha for transportation and other uses; 128 ha for an Aboriginal tenure; and, 272 ha for environment, conservation and/or recreation purposes. The percentage of each Map Reserve overlapped by the Project footprint varies from 0.4% to 45%.

Interactions with Map Reserves would further be mitigated through negotiation and agreements with other parties. The Proponent committed to continue meeting with tenure holders to discuss the implications of the Project on their activities and work to reduce any adverse effects.

Tourism and Outdoor Recreation

Outdoor recreation activities and recreational hunting and fishing are responsible for a large volume of tourism activities in the RAA with 44% of visitors in the region having participated in sightseeing, nature and wildlife viewing, 34% taking part in hiking and 25% visiting national and provincial parks. The variety of outdoor recreational pursuits in the LAA and RAA include hiking, mountain biking, skiing, boating, all-terrain vehicle (ATV) riding, and snowmobiling, hunting and fishing.

The RAA outdoor recreational features and activities, commercial recreation activities, potential Project effects and proposed mitigation measures are described in detail in the Application.

The Proponent indicates that while the proposed Project may cause a shift or change in recreational activity and temporary access restrictions, the Project corridor would, for the most part, still be available for recreational use and may provide new opportunities for certain types of activities for recreation use. There are no recreation sites that would overlap with the Project footprint, although one recreation site would overlap with the LAA at Bonus Lake. The footprint crosses four known trails used for snowmobiling, hiking and other activities. There are 221 recreation features (Recreational Features

Inventory) in the Project footprint and a total of 387 recreation features in the LAA. Of the 221 recreation features in the Project footprint, 45 are of high importance, of which 17 are identified as having high sensitivity, 27 are of medium sensitivity and 1 is of low sensitivity. These include several highly significant or important recreational features in or near the Hazelton/Kispiox area, the Skeena River, the Nass River and the Babine/Suskwa Rivers.

Regarding potential impacts to hunting, the Project footprint overlaps 17 wildlife management units (WMUs), or 0.1% of the total combined area of these WMUs. Hunting activities would be restricted within the Project footprint during construction. The potential Project effects on guide-outfitters are discussed further in this section.

Recreational fishing in the RAA is an important activity that includes guided and non-guided angling in both freshwater and marine systems. Within the RAA, the Skeena watershed is unique due to its species diversity, large fish size, fly fishing opportunities, and pristine setting two sections of the Skeena River as well as 14 tributaries (including the Bulkley, Suskwa and Babine Rivers in the RAA) have been given Class I or Class II status. Also within the RAA, the Omineca region includes headwaters of several provincially-important rivers, as well as several regionally-important lakes that are within the drainages of these rivers including BC's largest reservoir, Williston Lake, which is overlapped by the LAA and the RAA, Hautete Lake, which is overlapped by the RAA, and the Stellako River, which is overlapped by the LAA.

Any recreational fishing activity occurring near Project watercourse crossings would likely be disturbed during the construction of the crossing as noise and other construction activities would change the quality of experience for the anglers and also potentially the catch-ability of the target species. The Proponent expects that these effects would be very short-term and would be geographically limited to the river crossing area and for a distance downstream.

The health and sustainability of the steelhead fishery and the potential Project effects on water quality in the Skeena River were identified as potential areas of concern by a number of guided anglers that were surveyed by the Proponent. Potential Project effects and mitigation measures for fish and fish habitat are discussed in section 5.5 of this Report.

In the longer term, clearing and vegetation management activities would result in habitat alteration that could affect recreation activities and recreational values. The presence of the Project footprint could increase access to the area from access points within the LAA, which could have both positive and adverse effects. Consultation with guide

outfitters and guided anglers indicates that the remoteness of the experience is highly valued. For outdoor recreation users who value the remoteness of the area for undertaking outdoor recreation activities, increased access to popular areas may increase competition for resources and overall usage of the area. However, broader access along the Project footprint could also increase access to some areas.

Mitigation measures proposed in the Application to address potential disruption of access to outdoor recreation activities include:

- Developing and implementing a Traffic Management Plan and an Access Management Plan, in consultation with regulatory agencies, stakeholders and community groups, to reduce human-wildlife conflicts;
- Communicating Project activities and timing to local communities and interest groups; scheduling construction activities to occur within the in-stream work window, where possible, for watercourse crossings;
- Prohibiting Project personnel from hunting, fishing, and using recreational vehicles on the Project footprint during working hours; and
- Reporting incidents with nuisance wildlife or collisions with wildlife.

Commercial Recreation

Commercial recreation includes freshwater and marine tourism activities such as guided angling, river rafting, kayaking/ canoeing, sail cruising; land-based activities such as guided-hiking, mountain biking and ATV experiences and ski touring, snowmobiling and heliskiing in the winter; and lodges, guest ranches and guide outfitters.

The Application provides general information on approximately 12 commercial recreation operators that offer a wide range of fishing charters and guided angling on the rivers and waterbodies within the RAA as well as rafting expeditions, mountain-pack trips, heliskiing and other summer and winter activities. For the 2012–2013 season, 22 angling guiding licences were issued for Skeena Region 6 and Omineca Region 7a.

The marine recreational and guided sport fishery includes a wide array of fish and shellfish species. The majority of effort has traditionally focused on salmonid species, particularly coho, chinook, and steelhead, as well as fewer numbers of cutthroat and Dolly Varden.

Project construction and operation near tourist areas and use of tourism infrastructure has the potential to disrupt existing land and marine uses. Project activities most likely to interact with tourism, including recreational hunting and fishing, are discussed by the

Proponent in the context of change in outdoor recreation. In addition to the mitigation measures outlined for outdoor recreation, the Proponent proposes to continue to consult with registered tourism providers in the LAA to help mitigate potential adverse effects from Project construction and operation activities on tourism operators.

Commercial Fishing

The Application provides information on the importance of commercial fishing to the LAA/RAA economy, the level of effort by area and type of fishery, and the Aboriginal participation in the integrated commercial fisheries.

Catch data for the area show that virtually the entire marine route has experienced some level of commercial fishing, representing an area of 11.1 km² in the Project footprint, 110.5 km² in the LAA, and 2,098.3 km² in the RAA. Major commercial fisheries active in the marine RAA include: the Dungeness crab trap fishery; the prawn trap fishery, the shrimp trawl fishery and salmon fisheries by seine and gillnet. The groundfish fishery is primarily located outside the LAA, towards the outer limits of the RAA.

Construction in the marine environment is expected to require approximately two years although the duration for each pipeline segment and activity would vary. The time required for pipeline installation would likely vary from 500 m per day for trenching activities to up to 2 km per day for pipelay in deeper waters. Detailed planning by marine contractors and consideration of engineering design requirements would inform the details of construction timing and duration for each segment.

During construction, constraints to navigation are likely to affect key commercial fishing areas including: the mouth of the Nass River; the mouth of Portland Inlet; mid-Chatham Sound; and southern Chatham Sound west of Lelu Island. The potential effect is applicable to all fisheries but may be more pronounced for the salmon seine and gillnet fisheries as these typically occur for short periods in June, July or August, often with only in a few days' notice. Other important commercial fisheries in the RAA occur year round including the Dungeness crab and shrimp beam trawling fisheries. The spot prawn fishery typically occurs from May to June/July.

Because of Project construction activities fishing vessels may be temporarily unable to access fishing grounds while construction vessels are preparing the seabed and laying marine pipeline, and during specific construction activities such as trenching near landfall sites. This could affect the efficiency and/or cost of fishing vessel operations within the LAA. The installation of the pipeline has the potential to create habitat

disturbance related to the Dungeness crab fishery (see section 5.9 for discussion of this issue).

During operations, the pipeline(s) would be buried or have rock protection placed on top of the pipe in shallow waters where they would be exposed to potential hazards from marine traffic. In exposed sections, the pipeline is designed to withstand impacts from conventional mobile fishing gear and there would be no fishing restrictions over the pipeline. The pipeline would also be shown on the nautical charts issued by the Canadian Hydrographic Service so that other marine users are aware of their presence. Fishers may choose to avoid the area over concerns related to gear damage. As with construction activities requiring a safety zone, this would have the potential to affect the efficiency and/or cost of fishing vessel operations within the LAA.

The Proponent proposes several strategies to mitigate the disruption of commercial fishing activities, including:

- Communicate Project activities, locations and timing to local communities and interest groups;
- Limit the area of disturbance to the extent technically and economically feasible;
- To the extent possible, ensure fill material used for rock berms or pipe protection is free of debris and deleterious substances;
- Where necessary, implement fish habitat compensation programs that would be designed to comply with the DFO objective of no-net-loss of the productive capacity of fish habitat ; and
- In the unlikely event of gear loss or damage as a result of pipeline activities, assess any claims for damages and compensate fishers for any damages suffered as a result of the operations of the Proponent.

Guide Outfitting and Trapping

Guide outfitting is an important source of economic revenue in rural BC, with approximately 245 licensed guide outfitters. Guide outfitters offer a variety of services and experiences to non-resident hunters, although big game hunting is usually the dominant product offered.

The Project footprint would intersect 14 guide outfitter tenures with the Project footprint overlapping area representing 9,929 ha or 0.1% of the total areal extent of all tenures combined, and a maximum of 0.4% of the total areal extent of any single tenure. The guide outfitters with the greatest LAA overlap are in the Omineca Management Region and include United Guide Outfitters, Kazchek Lake Camp and Silver Lake Outfitters.

Trapping activities are regulated through a system of registered trapline areas, with most trapping activity focused in the winter and spring seasons. The Project footprint overlaps 82 active and inactive trapline tenures (12,017 ha), which represents 0.6% of the 82 traplines' combined total areal extents.

During construction, potential Project effects include terrain disturbances from clearing, installation, and other construction activities on the Project footprint, but could also include access constraints. In addition, the activities associated with installation of the pipeline and the presence of vehicles and equipment may result in a reduction in the quality of experience even if the level of catch is not reduced.

Mitigation for change in guide outfitting and commercial trapping activities is similar to that suggested for hunting and other recreational outdoor activities, but also considers the commercial nature of these activities. Mitigation includes:

- Engaging with trappers and guide outfitters operating near the Project;
- Compensating trappers if construction activities disrupt trapping and result in economic loss; and
- Implementing the EMP, Reclamation Plan, and Chemical and Waste Management Plan to reduce potential effects on subsistence activities.

Agriculture

Agriculture includes farming (food crops, forage production, dairy and other livestock in fenced paddocks) and use of range land for cattle production. The Project would cross private and public agricultural lands, including two segments recognized as Agricultural Land Reserve (ALR), for 32 km. The Project footprint is expected to intersect 563 ha of ALR, representing 4.5% of the total Project footprint.

The Project footprint would cross five active grazing range tenures and 471 ha of active grazing tenures would be overlapped by the Project footprint (the extent of the Project footprint overlap for any single tenure ranges between 0.1% and 2.8%).

The Application examines several types of potential Project effects on agriculture, including disruption of existing farming activities, disruption of livestock activities, decreased soil capability, disruption of future farming activities, spread of invasive weeds, and development of non-farm uses on ALR lands.

The Proponent's EMP would include standard mitigation measures for agricultural land use and would allow for continued agricultural operations post-construction. As a result of these measures, the Proponent expects that for the most part, restrictions on agricultural activities should be limited to disturbance during the construction period, although on-going interactions between agricultural land users and Project maintenance activities are expected to continue for the duration of the Project.

The Proponent has proposed the following measures for mitigating potential effects on agricultural activities:

- Arrange for landowners to harvest crops, if practical, and mow, cut, or bale any remaining crops and remove from the Project footprint prior to construction to facilitate topsoil handling;
- Following construction, land may be reclaimed to equivalent land capability to allow for continued agricultural operations; and,
- On private land, the final seed mix would be based on input from landowners and the availability of seed at the time of reclamation.

Forestry

Forestry, including timber harvesting and related activities, is one of the primary sectors of employment in the RAA, and forest products manufacturing in the RAA includes wood products processing, pulp and pellet-plant operations, bioenergy facilities, and value-added wood production.

The proposed route would cross seven Forest Districts including the Peace, Mackenzie, Fort St. James, Nadina, Skeena-Stikine, Kalum and North Coast Forest Districts, and eleven Timber Supply Areas (TSA) including the Fort St. John, Dawson Creek, Mackenzie, Prince George, Bulkley, Kispiox, Kalum, Lakes, Morice, Nass and North Coast TSAs. In addition, the proposed route would cross two Tree Farm Licences (TFLs) including TFL 48 held by Canadian Forest Products Ltd. (Canfor) and TFL 1 held by Coast Tsimshian Resources Partnership Ltd. The Project footprint would border or overlap 114 cut blocks for a total of 723.3 ha.

The Project would cross areas affected by the Mountain Pine Beetle (MPB) infestation. The Proponent estimates that 13.6% of the Project footprint is moderately or severely infested by the MPB, 17.4 % is lightly infested, another 11.2% has a trace of infestation and the balance, or 57.8% is not infested.

The Project is expected to have three types of adverse effects on forestry: reductions in mid-term or long-term timber supply due to the loss of forested landbase associated with the pipeline ROW, temporary disruption/alteration of forestry operations in tenured areas during Project construction, and disturbance of Permanent Sample Plots.

OGC has guidelines for specific forestry authorizations that may be required for oil and gas developments. Before any Crown timber is cut, a cutting permit form must be submitted to the OGC, in addition to a fibre utilization form if merchantable fibre may be affected. When the removal of Crown timber is necessary for oil and gas activity to go forward, a master licence to cut must be approved for each forest district affected.

A number of mitigation measures would be employed prior to and during timber harvesting activities:

- Continue to consult with all forestry tenure holders within the Project footprint, FLNR and the OGC regarding the removal and salvage of merchantable timber from the Project footprint and prepare and implement a Timber Utilization Plan that follows the OGC guidelines for use of merchantable timber;
- Engage with tenure holders about overlapping tenures in the Project footprint and coordinate construction activities with forestry operators active in the area;
- Salvage and deck timber as denoted in the EMP, or in accordance with landowner requests;
- Harvest merchantable timber and clear other timber resources in a manner consistent with constraining the spread of the MPB;
- Reduce the amount of land disturbance by using previously disturbed areas as much as feasible for stockpiles and temporary construction camp sites; and
- Provide opportunities to locals and Aboriginal Groups to participate in timber salvage operations.

Other Industrial Land Uses

Other industrial land uses within the pipeline corridor would include mining, oil and gas activities, and energy generation and transmission activities.

A wide range of mineral development activities are ongoing within the RAA:

- The Project footprint and LAA would overlap with one mining lease;
- The LAA would overlap with five coal licences, four of which would be also be crossed by the Project footprint; and
- The Project footprint would overlap 150 active mineral tenures and including the overlapping tenures in the Project footprint, there are 251 active mineral tenures

that overlap the LAA.

There are tenures for three proposed or developing mine sites that the Proponent's current alignment would cross: the Decar Mine, the Mount Milligan Mine and Morrison Mine. All potentially affected mineral tenure holders have been contacted and the Proponent will continue to engage with these holders.

Oil and gas-related exploration and development activities are concentrated in the Northeast portion of the RAA and include several pipelines, well sites, gas processing plants, and related facilities. There are no oil and gas well sites or facilities within the Project footprint, though there are four well sites and 12 oil and gas facilities in the LAA. Several new and amended pipeline ROWs would overlap 2.4 ha (less than 0.1%) of the Project footprint, including Canbriam Energy Inc.'s Altares pipeline, Hudson's Hope Gas Ltd.'s two unnamed pipelines, and one unnamed amended pipeline ROW segment of Canadian Spirit Resources Inc.

The Project footprint would cross or overlap seven transmission line segments. This includes 2.8 km from four crossings/overlaps of transmission lines related to the BC Hydro GM Shrum and Peace Canyon facilities, 2.3 km from crossing/overlaps of the Skeena-Aiyansh BC Hydro transmission line and 3.0 km from three other crossings/overlaps.

Project construction and operation activities and the existence of the pipeline during operation have the potential to interact with a small number of locations along the pipeline route. The Proponent proposes to continue to meet with industrial tenure holders to discuss the implications of the Project on their activities and work to minimize these effects. Based on existing conditions for other industrial land use in the vicinity of the Project, the Proponent anticipates that the Project would have a limited effect on mining, oil and gas, and energy transmission facilities, and that any adverse effects would be mitigated through negotiation and agreements between the Proponent and other parties.

7.3.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During Application Review, concerns were raised by government agencies, Aboriginal Groups, and the public about Project-related effects on current land and resource use. Some of these concerns and the accompanying Proponent's responses are summarized in this section.

Parks and Protected Areas

Public concern was expressed regarding the crossing of Nisga'a Memorial Lava Bed Park, and any removals/alterations to park boundaries or permission of an industrial use within the park (mentioned the public, including several residents of New Aiyansh, Gitwinksihlkw, Hazelton, and Kispiox Valley).

The Proponent responded to those concerns by acknowledging the historical, cultural and environmental importance of the Nisga'a Memorial Lava Bed Park, and re-iterated its commitment to work closely with Nisga'a Lisims Government and BC Parks during planning, construction and operation to minimize effects to the park and its users. The Proponent noted the route as proposed has the following attributes over four other route options that avoid the Memorial Park, and one additional one that avoids the lava flow:

- o Avoids crossing the K'alii Aksim Lisims (Nass River), a river of high value to Nisga'a citizens and technically difficult to cross;
- o Avoids Nisga'a community watersheds;
- o Avoids high-value environmental and cultural resources (e.g., mushroom harvesting areas, fish spawning habitats, cultural heritage features);
- o Crosses fewer watercourses and no wetlands;
- o Primarily aligns with Nisga'a Highway, creating a common infrastructure corridor;
- o No new roads required for construction access – limiting new access to the region; and
- o Has fewer construction challenges than other route options.

EAO notes that impacts to the Nisga'a Memorial Lava Bed Park will be required to be assessed as part of the Park Boundary Adjustment regulatory process. This process would require several different reviews and approvals, including from the Minister of Environment and legislative amendments from the BC Government and the Wilp Si'ayuukhl Nisga'a (the Nisga'a legislature).

Land Use Plans and Other Designated Areas

The Bulkley Valley Community Resources Board and several residents from Smithers expressed the need for the Project to be consistent with values stated in the Bulkley LRMP. Specific concerns were raised about access management, and in particular the creation of circular access routes in the Bulkley LRMP area and new land-based motorized access to Nilkitkwa Lake during and after pipeline construction.

The Proponent noted that they proposed to restrict access to or along the ROW during construction by limiting non-construction personnel through onsite inspectors, traffic management and signage. In addition, after pipeline construction, the Proponent would deactivate and reclaim any access roads, subject to direction from regulators. Finally, the Proponent would implement the Traffic Management Plan and Access Management Plan, to address changes to existing access and new access routes created by the Project, including any Project-related access to Nilkitkwa Lake, during and after pipeline construction.

Impacts to the Bulkley LRMP would be further considered as part of the regulatory permitting process undertaken by the OGC.

Tourism and Outdoor Recreation

Concern was raised during Application Review that the Project would be crossing the Kispiox River too close to Bear Claw Lodge, a remote fishing and heliskiing lodge on the Kispiox River. A primary concern is the visual effects of the pipeline corridor.

The Proponent responded that the proposed Kispiox crossing is approximately 1.7 km north of the Bear Claw Lodge and is designed as an HDD crossing, which would help minimize overall effects, avoid disturbance to the bed, banks or approaches, and that there would be no noticeable disturbance within 800 m.

Members of the public and the Bulkley Valley Community Resources Board commented on the heritage importance of the trail at Suskwa Pass and the Grease Trail located on the north side of Tsezakwa Creek.

The Proponent acknowledged the importance of cultural trails as potential heritage resources and as indicators of areas with potential for other heritage resource types (e.g., archaeological sites) and referred to the effects assessment on the Grease/Fort Babine trail in the Application (i.e. the Project footprint overlaps 200 m (3.4%) of the 11.6 km Grease/Fort Babine Trail and the Project LAA includes 8 km (69%) of the trail). The Proponent also mentioned other measures currently underway to mitigate adverse effects, including ongoing consultation with Aboriginal groups and archaeological assessments.

During Application Review, concerns were raised with respect to the potential effects of increased road and ROW access during Project construction and operations on hunting, fishing and gathering, as well as trapping activities. In general, the concerns related to the need to balance the social desire for increased recreational access against

potentially adverse effects on established hunting, fishing, gathering and trapping activities.

The Proponent plans to develop and implement a Traffic Control Management Plan and an Access Management Plan which would include access control measures to avoid or reduce unauthorized motorized access. Temporary access used during construction is expected to be deactivated and reclaimed following construction to discourage increased access during the operations phase. The Proponent commits to monitoring the effectiveness of access management measures as part of the post-construction monitoring program described in the EMP.

EAO proposes several conditions related to access management, including the development of an Access Management Plan. Additional discussion can be found in the wildlife section 5.8 of this Report.

FLNR, Metlakatla First Nation, Kitselas First Nation, the Bulkley Valley Community Resources Board, and the public expressed concerns about additional recreational fishing pressure near Project work camps.

The Proponent responded that the heavy work schedule and several mitigation measures to restrict workers from taking part in recreational fishing and other activities while housed in Project accommodation camps should manage the potential effects of increased angling and hunting as a result of Project activities to an acceptable level. The Proponent re-iterated its commitment to continue to engage regulatory agencies, Aboriginal Groups, and other stakeholders to refine mitigation measures and resource management planning including those to manage the effects of potential increased pressure on recreational fisheries resulting from increased access as a result of the proposed Project.

EAO proposes a condition that would require the Proponent to implement a no-hunting, no-trapping, no-fishing, no-plant gathering policy for employees and contractors during work hours.

Forestry

FLNR and several others Working Group members raised concerns related to the volume and utilization of merchantable and non-merchantable timber to be harvested from the Project construction footprint, and the potential for long-term effects related to reductions in the timber harvesting land base (THLB). EAO and OGC entered into discussions with the Association of BC Professional Foresters (ABCPF), the Council of

Forest Industries (COFI), and BC Timber Sales (BCTS) to better understand the concerns of the forest industry.

In response to these and other concerns, EAO requested additional information from the Proponent on the area to be cleared from the THLB within each forest management unit, the gross volume of merchantable timber volume by management unit, and the long term effects of the pipeline corridor on timber supply. Supplementary information was provided by the Proponent, including Table 7-4 below, which presents the amount of merchantable and non-merchantable timber volumes within the Project footprint as well as information on the amount of THLB and non-THLB areas within the Project footprint.

Table 7-4: Timber Volumes and THLB Area Within the Project Footprint

Timber Volumes (m³) Within Project Footprint	Merchantable Timber	Non-Merchantable Timber	Total	% of Total Volume
THLB	1,130,299	122,136	1,252,435	72%
Non-THLB	<u>390,718</u>	<u>86,879</u>	<u>477,597</u>	<u>28%</u>
Total	1,521,017	209,015	1,730,032	100%
% of Total	88%	12%	100%	
Area (ha) Within Project Footprint	Total Area (ha)			% of Total Area
THLB	8,110			64%
Non-THLB	-			<u>36%</u>
Total	12,622			100%

As is shown in Table 7-5 the expected timber harvest from the Project footprint represents 5.4% of the combined Annual Allowable Cut (AAC) for management units crossed by the Project. The merchantable volume harvested represents 47% of the AAC for the North Coast TSA and 41% of the AAC for the Kispiox TSA. In some regions, the size of the harvest could potentially impact local markets and timber flows to processing facilities. The Proponent suggests mitigation measures, primarily concerning communication and coordination with tenure holders and forest managers to limit disruptions or plan for alterations to timber flows to markets.

Table 7-5: Timber Volumes Within the Project Footprint by Management Unit

	Administrative Unit THLB AAC (m³)	Timber Volume Present in Project Footprint (m³)		Merchantable Volume as a % of AAC
		Merchantable	Non- Merchantable	
Fort St. John TSA	2,115,000	3,000	517	0.1%
Dawson Creek TSA:	1,860,000			
TFL 48	<u>900,000</u>			

	Administrative Unit THLB AAC (m³)	Timber Volume Present in Project Footprint (m³)		Merchantable Volume as a % of AAC
		Merchantable	Non- Merchantable	
Dawson Creek TSA and TFL 48	2,760,000	256,409	19,080	9.3%
Mackenzie TSA (includes MLMCF)	3,050,000	184,408	32,100	6.1%
Prince George TSA	12,500,000	168,324	13,842	1.4%
Bulkley TSA	852,000	47,813	7,334	5.6%
Kispiox TSA	1,087,000	441,896	43,209	40.7%
Lakes TSA	2,000,000	19,412	1,568	1.0%
Morice TSA	2,165,000	86,873	28,466	4.0%
Kalum TSA	424,000			
TFL 1	<u>128,000</u>			
Kalum TSA and TFL 1	552,000	114,301	31,416	20.7%
Nass TSA	865,000	852	15,336	0.1%
North Coast TSA	400,000	197,730	16,147	49.4%
Total	28,346,000	1,521,018	209,015	5.4%
Potential Project Harvest Volumes as a % of AAC	100%	5.4%	0.7%	

Project footprint effects on the THLB of 8,110 ha represent 0.08% of the total THLB for the forestry management units affected by the Project. Relative to the size of each area, the effects would be greatest for the Kispiox (0.7%), Kalum (0.3%), Dawson Creek (0.1%), North Coast (0.1%), and Morice TSAs (0.1%). In addition, the overlap between the Project footprint and the McLeod Lake Mackenzie Community Forest is estimated by the Proponent at 34 ha, or 0.14% of the gross area of 24,664 ha (i.e. including THLB and non-THLB).

In response to concerns that the Project footprint could affect particularly valuable timber harvesting land base areas not affected by the MPB infestation, the Proponent provided estimates that 71% of THLB area potentially harvested for the Project footprint is forested with non-pine leading stands.

In consideration of the potential effects of the proposed Project on forestry activities, and the issues raised during Application Review, EAO proposes a condition that the Proponent develops a Timber Salvage Strategy to ensure appropriate management of merchantable and non-merchantable timber. In addition, EAO proposes a condition that the Proponent engages forest tenure holders in the development of the Timber Salvage Strategy, the Access Management Plan, and the Traffic Control Management Plan, to mitigate associated adverse effects on the forest sector. FLNR, ABCFP, COFI and BCTS were engaged in the development of these proposed mitigation measures to reduce the potential effects of the proposed Project on forestry operations.

Non-Timber Forest Products

During the public consultation process, two local residents raised concern about the Project interfering with two specific harvesting areas important for mushroom and berry picking, in the area around Aiyansh and the upper Suskwa FSR.

The Proponent responded that impacts would vary by species and location, but it is anticipated that removing forest cover would create new habitat for a number of berry producing shrubs within approximately five years of clearing and in general, an increase in berry shrub abundance along the pipeline route is expected.

Mining Activities

Thompson Creek Metals Company Inc., the owners of Mt. Milligan copper and gold mine, raised concerns that mineral tenures that would be crossed by the pipeline route simply could not be developed or used for mine-related infrastructure in the presence of a natural gas pipeline, in addition to other concerns about impacts on their project.

In response to these concerns, and at the request of EAO, the Proponent provided EAO additional information in a Technical Memo on October 6, 2014, which provided EAO with a summary of all consultation activities between the Proponent and Thompson Creek Metals regarding the potential overlap with the Mt. Milligan Mine; a map showing how all proposed pipeline infrastructure would impact tenures associated with the Mt. Milligan Mine; an explanation of whether and how the proposed Project would be compatible with the rights currently held by Thompson Creek Metals; a discussion of potential direct and indirect impacts of the proposed Project and additional mitigations proposed; and a discussion of options that the Proponent has previously considered to avoid or lessen the impacts on Thompson Creek Metals.

Cliffs Natural Resources Exploration Canada Inc. and First Point Minerals Corp (Cliffs/First Point) raised concerns about the Project footprint crossing existing mineral tenures associated with the proposed Decar Nickel Project.

In response to these concerns, and at the request of EAO, the Proponent indicated that it believes it possible for the Project and the Decar mining proposal to coexist in the affected area without major disruptions to either project.

EAO has shared the information regarding the Mt Milligan mine and the proposed Decar Project with the OGC, and notes issues regarding the compatibility of land rights and uses would be required to be addressed at permitting.

General concern regarding cumulative effects on land and resource uses

During Application Review, several members of the Working Group and general public raised concerns about multiple pipelines using separate corridors, including the potential impacts on wilderness values and concerns that LRMPs were not developed in consideration of natural gas pipelines.

The Proponent indicated that LRMPs in northwestern BC broadly included resource development activities and sometimes mentioned oil and gas activities specifically, although pipelines are typically not explicitly mentioned. Section 7.3.5 of this Report provides additional information on the assessment of cumulative effects on current land and resource uses.

7.3.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on current land and resource use:

- Removal of land from the Nisga'a Memorial Lava Bed Park;
- Loss of long term timber supply and alteration of forestry operations;
- Disruption of marine commercial fishing activities;
- Access restrictions and potential limitations to some mining activities in close proximity; and
- Access restrictions and other disruptions to agriculture and commercial and recreational activities.

Summarized below is the EAO's characterization of the expected residual effects of the proposed Project on current land and resource uses, as well as the EAO's level of confidence in the effects determination.

Criteria	Assessment Rating	Rationale
Context	All: Low to moderate sensitivity and resiliency	Many parts of the local and regional study areas have a low level of sensitivity to disturbances to land and resource uses, with a history of resource development activity. There are some localized areas with higher sensitivity including scenic areas, recreation areas, and fishing areas. Most of the land and resource uses in the study areas have a moderate level of resiliency.
Magnitude	Park: Low to	Park: A Park Boundary Adjustment would be required to

Criteria	Assessment Rating	Rationale
	moderate	remove 12 km from the Park adjacent to the Nisga'a Highway.
	Forestry: Low to Moderate	Forestry: The potential Project effects on alteration of forestry operations in tenured areas during construction are considered to be low to moderate in magnitude due to access constraints and alteration of harvesting plans. The potential long term effects on timber supply are considered low in magnitude as less than 1% of the timber harvesting land base of each major license is expected to be unavailable for forestry for the duration of the Project. Disturbance to some Permanent Sample Plots is likely, resulting in long term effects of low to moderate magnitude.
	Fishing: Low to Moderate	Fishing: In the event that construction activities displace the activities of commercial fishers, there may be associated financial losses resulting in residual effects of moderate magnitude. The potential damage from fishing gear entanglement with construction vessels and equipment engaged in marine pipe-lay activities expected to be low in magnitude after mitigation and financial compensation; in the event that the barrier effect of the pipeline results in a change in the availability of Dungeness crab for the commercial fishery, there may be associated financial losses.
	Mining: Low to Moderate	Mining: Project construction may disrupt access to aggregate pits, Mt. Milligan Mine and a specific mineral prospect (Decar nickel properties) that is under active development, as well as many other mineral and coal tenures, resulting in effects of low to moderate magnitude.
	Other activities: Low to Moderate	Other activities: During Project construction, disruption of other activities is considered to be moderate in magnitude due to noise, access restrictions and disruptions to visual aesthetics. The potential effects from increased access along the proposed route (mainly during construction but some increased access during operations) are considered to be low in magnitude after mitigation. After compensation for direct disturbances, residual effects from Project operations are expected to

Criteria	Assessment Rating	Rationale
		be of low magnitude, and related to noise and other long term inconveniences.
Extent	All: Project footprint to regional	Extent would range between effects limited to Project footprint (alienation of specific parcel of agricultural land, timber clearing, etc.) and more regional effects where disruptions during construction and the existence of the ROW could affect activity and/or enjoyment of land and resources (e.g., recreational uses, guide outfitting).
Duration	All: Short term to long term	The duration of adverse effects from Project construction would generally be short term, but the duration of adverse effects from the existence of the ROW and compressor and metering stations would persist for the life of the Project (e.g., recreational trails, alienation of agricultural lands, alienation of THLB, disruptions to designated areas and scenic viewing in Nisga'a Memorial Lava Bed Park).
Reversibility	All: Reversible	Activity disturbance effects are expected to be reversible once construction is complete. Operations impacts would be reversible following decommissioning.
Frequency	All: Occasional to continuous	The adverse effects during construction range between occasional (e.g., noise-related effects on activity) and/or continuous for the length of the construction period. The adverse effects during operations would be continuous (40 years or more).
Likelihood	The likelihood is moderate to high that the adverse effects on land and resource use discussed above would occur during Project construction and during operations.	
Significance	Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual effects on land and resource use.	
Confidence	High Confidence – There is a high level of confidence in the likelihood and significance determination.	

7.3.5 Cumulative Effects Assessment

The Proponent's cumulative effects analysis on land and resource use focuses on foreseeable projects within the LAA and linear infrastructure projects that cross the Project RAA. There is a lack of available information on the precise location, footprint, schedule and design of many of the reasonably foreseeable future developments, information that would contribute to a better understanding of potential cumulative effects on some of the land and resources key indicators.

Park: Within the Nisga'a Lava Bed Memorial Park there is the potential for cumulative effects of the proposed Project with the proposed WCGT Project. At present the two proposed projects have different routes through the Park, which would result in two separate corridors being removed from the Park. Both Boundary Adjustments require additional regulatory review by BC Parks, as well as approval by the Minister of Environment, legislative amendments from the Nisga'a Lisims Government and the BC Government.

Forestry: Project construction is expected to result in a timber harvest of approximately 1.5 million m³ of merchantable timber, which represents 5.4% of the total AAC for the forestry management units across the pipeline route and long term removals from the THLB of those same management units averaging less than 0.1%.

Several of the forestry management units would be crossed by the Project and the proposed WCGT and/or the CGL pipeline routes. The estimated cumulative effect of all three pipelines is likely less than 0.3% of THLB. The Kispiox TSA may experience the largest combined effects on any single management unit, where the combined effects from two proposed pipelines could approach a long-term removal of 1% of THLB.

The Project's estimated merchantable timber harvest volume of 1.5 million m³ could contribute to cumulative effects on planned forest industry timber harvesting, along with the proposed WCGT project and other pipelines. Local or regional excess timber supply situations (relative to short term processing capacity) may develop if foreseeable projects deliver similar volumes of harvested timber to markets in the same or consecutive years.

Fishing: The Project would likely overlap geographically and temporally with other projects for the marine portion of the pipeline route potentially disrupting commercial fishing activities and/or resulting in damage to or loss of fishing gear during construction. Since the potential Project effects on marine activities are primarily related to Project construction, the degree of the cumulative effects would be dependent on the

temporal overlap between the construction periods of several projects. The area of impact would likely be within the port of Prince Rupert.

Mining: There is potential for the reduction in the area available to explore or develop mineral deposits which could affect mining in the RAA. The residual effects of the proposed Project are not expected to cumulate with other reasonably foreseeable projects and activities.

Other Activities: Some of the reasonably foreseeable future developments would occur within the wider land and resource RAA, and while they would not necessarily overlap spatially with the Project footprint, they would contribute to cumulative disturbances to commercial and recreational activities at the regional scale.

- There could be cumulative increased access to wildlife populations, which could result in increased hunting in areas that were previously not considered accessible hunting areas; and
- There could be reduced wilderness character due to Project effects on access, clearing and helicopter overflights, and given that mitigation available for the potential effects on wilderness areas is limited, regional effects could be further exacerbated by the presence of multiple projects.

EAO proposes a condition for the Proponent to develop a SEEMP to address risks and uncertainties identified in the EA process regarding Project effects on land and resource use values including the project's contribution to cumulative effects. For the CGL and WCGT Projects, EAO has proposed similar conditions regarding potential effects to land and resource use.

EAO is satisfied that the adoption of the Proponent's mitigation strategies, supplemented by initiatives by the BC Government and others that are documented in this section of the Report would be sufficient to mitigate cumulative adverse effects on land and resource use. EAO concludes that the residual adverse cumulative effects on land and resource use would not be significant.

7.3.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on land and resource use.

7.4 Visual Quality

7.4.1 Background

This section summarizes Project-related effects on visual quality. In BC scenic landscapes are valued by both residents and visitors. Scenic viewing is an important aspect of recreation and tourism activities on BC's forest lands.

The list of measurable parameters for the visual quality assessment includes:

- Number of recreational, cultural, and publically accessible viewpoints affected;
- Amount of area (in hectares) potentially visible from selected viewpoints;
- Change in existing visual condition; and
- Change in visual quality class as determined by the procedures described in the Visual Impact Assessment Guidebook Second Edition (BC MOF 2001) and the categories of visually altered forest landscapes presented in the Application (Table 22-1).

The LAA comprises visual sensitivity units (VSU) within a 2 km distance that fully encompasses the land-based portion of the Project footprint, particularly those visible from known viewpoints along highways, roads, and recreational boating areas. The RAA includes a 50 km band that fully encompasses the land-based portion of the Project footprint, which captures visual sensitivity units that could present mid-ground or background views of the Project.

7.4.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

A visual impact assessment was conducted for each of 138 viewpoints to determine if addition of the Project to the visual landscape would be consistent with Visual Quality Objectives (VQOs) for each VSU. It was assumed for the visual impact assessment that for any proposed infrastructure within a VSU, the maximum area would be cleared during construction as follows:

- The area cleared for the pipeline and the adjacent work area was modelled to be a maximum of 60 m wide in areas where visual sensitivity is particularly high;
- Where switchbacks or access roads were proposed, they would be in addition to the area cleared for the pipeline, and were modelled to have a cleared width of 30 m, typical of a main FSR;
- For compressor stations, campsites, and stockpiles, the entire site would be cleared; and
- Future compressor station locations and associated site clearing activities are

included in the visual impact assessment irrespective of the development timing.

Clearing of forest during construction, maintenance of vegetation along much of the pipeline route during operation, and the presence of visible structures during operation are the mechanisms that could produce a change in visual quality. Potential effects on the visual landscape were judged relative to VQOs based on the shape, size and visibility of the proposed landscape alterations.

The Project footprint was determined to be visible from 75 of 138 viewpoints assessed, in 43 of the 86 visual sensitivity units considered. The Proponent's visual impact assessment identified ten VSUs where the addition of the Project to the visual landscape would not conform to established VQOs. These included pipeline crossings of the Peace River, Middle River, Babine River and Nisga'a Highway, as well as areas near Tochcha Lake, Kispiox Village, Little Fish Lake, Canyon Creek, and in Nisga'a Memorial Lava Bed Park.

Mitigation measures to reduce effects on visual quality include:

- Utilizing as much existing disturbance to reduce the overall area of new clearing required;
- Allowing cleared areas not required after construction or for operation to regenerate naturally; and
- Where infrastructure cannot be moved, allow natural regeneration to fill in cleared areas and/or paint visible infrastructure to facilitate blending into the landscape.

In its Application the Proponent indicates that visual impact monitoring would be undertaken during the clearing phase of construction, and post-construction visual impact assessments would be used to verify the category of visible forest alteration is within limits of the established visual quality objective for each VSU.

7.4.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During Application Review, concerns were raised by FLNR and the public about effects on visual quality.

FLNR provided extensive comment on the visual quality assessment and indicated concern regarding assessment methods, accuracy of the assessment, and conclusions drawn presented in the Application. Specific concerns are as follows:

- Viewpoints selected for the assessment do not always include the most affected viewpoints to visual sensitivity units altered by the Project, particularly viewpoints from water bodies.

The Proponent responded that the most prominent viewpoint(s) were selected for the assessment.

- o Conclusions regarding attainment of VQOs emphasize the size criterion of viewscape alterations, and the shape and prominence criteria, which may understate effects.

The Proponent agreed that more emphasis was placed on the “percent alteration” criterion in its assessment of Project effects relative to VQOs.

- o Mitigation measures do not include provisions for designing Project alterations to meet VQOs as per the FLNR Visual Landscape Design Training Manual, specifically the section regarding linear utilities.

The Proponent indicated that they would consult the Visual Landscape Design Training Manual in planning ROW clearing for the Project.

Public concerns regarding visual effects of the Project include three main areas as including viewpoints and vistas in and near Nilkitkwa Narrows, viewscales from Bear Claw Lodge on the Kispiox River and loss of natural darkness.

The Proponent responded that nine VSUs would be overlapped by the pipeline route in or near Nilkitkwa Narrows, which includes 19 viewpoints. Of these viewpoints, the proposed alteration be exceed the VQO from two of the viewpoints, and the proposed alteration would result in a VQO of Partial Retention for the landscape (from Retention).

The Proponent responded that the proposed Kispiox crossing is approximately 1.7 km north of the Bear Claw Lodge and is designed as an HDD crossing, which would minimize overall effects, and avoids disturbance to the bed, banks or approaches.

The Proponent responded that light would only be generated during construction for safety and security purposes in areas of active construction as well as around compressor stations (during construction and operation). Lighting design around compressor stations would incorporate use of cut off optics to reduce light spill.

EAO proposes a condition that the Proponent develop a Visual Quality Management Plan in consideration of FLNR's Visual Landscape Design Training Manual (1994), prior to construction. The plan should demonstrate consideration of FLNR policy where the project footprint intersects with scenic areas, and describe efforts made to support achievements of VQOs.

7.4.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the following residual adverse effects on visual quality:

- Variation from current visual quality objectives in some visually sensitive areas.

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on visual quality and EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Moderate sensitivity	Visual Sensitivity Classes of the visual sensitivity units affected by the Project range between 2 (very important) and 4 (moderately important).
Magnitude	Moderate	The magnitude of effects on visual quality (change in visual quality) is expected to be moderate as the cleared Project footprint would likely be visible as an unnatural disturbance in many scenic areas, and inconsistent with established VQOs in many of the more visually sensitive areas. However, it is acknowledged that VQOs were established in relation to forestry activity and do not consider the design constraints of oil and gas projects.
Extent	Regional	Regional effects are expected where disruptions during construction and the existence of the ROW could affect activity and/or enjoyment of land and resources.
Duration	Short-term to long-term	Visual effects from Project construction would be most pronounced in the short term, diminishing as reclamation/regeneration proceeds on much of the construction footprint. Adverse effects from maintenance of the ROW and compressor stations would persist for the life of the Project.

Criteria	Assessment Rating	Rationale
Reversibility	Reversible	Some of the effects would be reversible in the medium term though reclamation/regeneration, while the remainder would be reversible following Project decommissioning.
Frequency	Continuous	Adverse effects would be continuous for 40 or more years although with varying magnitude.
Likelihood	The likelihood is high that some degree of adverse effects on land and resource use would occur during Project construction and during operations.	
Significance	Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual effects on visual quality.	
Confidence	Moderate to High Confidence – There is a moderate to high level of confidence in validity of assumptions and analysis and effectiveness of proposed mitigation strategies.	

7.4.5 Cumulative Effects Assessment

Cumulative effects for visual quality are assessed within visual sensitivity units of the LAA, as these are the visual sensitivity units that overlap with the proposed Project footprint and could spatially and/or temporally overlap with other projects.

Within the LAA, the proposed WCGT Project and Northwest Transmission Line Project have the potential to intersect VSUs (30 in total) that are in common with the proposed Project. Nineteen of those 30 visual sensitivity polygons are “Unclassified Areas” which either fall outside the jurisdiction of FLNR or have not been formally classified as part of the visual landscape inventory. Mitigation measures have been proposed for Project infrastructure in these areas.

The remaining 11 visual sensitivity polygons in the LAA have established VQOs that range in sensitivity from Partial Retention to Modification. Two of these 11 polygons currently exceed established VQOs without the consideration of infrastructure from other projects, however, the mitigation strategies proposed are expected to reduce the impacts to within established VQOs. Another three areas may exceed established VQOs following the inclusion of other project infrastructure, as the percent alteration would be close to the upper limit of the categories set for visually altered landscapes

with the addition of Project infrastructure. Again, with mitigation these areas are likely able to support the additional infrastructure proposed thus meeting established VQOs.

To facilitate further analysis of cumulative effects on land and resource uses by FLNR and other agencies as the projects proceed through planning and construction, EAO has asked each proponent proposing a linear corridor to provide information that would support FLNR's cumulative effects management.

In consideration of the above analysis, the mitigation strategies proposed by the Proponent, together with mitigation strategies that would be required of other proponents, EAO concludes that the residual adverse cumulative effects on visual quality would not be significant.

7.4.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on visual quality.

8 Assessment of Heritage Effects

8.1 Heritage Resources

8.1.1 Background

Heritage and archeological resources are the physical remains of past human activities, as well as sites and resources of value or importance to human populations. The Application assessed the effects of the proposed Project on heritage values with respect to three indicators:

- Historic sites;
- Archaeological sites; and
- Palaeontological sites.

Potential adverse heritage effects could include:

- Reduction or loss of heritage sites (archaeological, historical, paleontological or architectural) or elements of archaeological sites;
- Reduction or loss of heritage value associated with archaeological sites; and
- Increased access to heritage sites.

The LAA for heritage resources is the same as the Project footprint, while the RAA considers the Borden blocks crossed by the proposed Project. (A Borden block is used throughout Canada to track archaeological sites and the artefacts that come from them, and each block measures approximately 16 km by 16 km.)

Archaeological sites protected under the *Heritage Conservation Act* (HCA) are provincially regulated by the Archaeology Branch of FLNR, while historic and architectural sites are provincially regulated by the Heritage Branch. Historic places may also be formally recognized and protected under the *Local Government Act*, and regulated by local governments. Historic sites are those defined by the BC *Archaeological Assessment Guidelines*, and architectural sites refer to modern (post-1846) sites, although not all post-1846 sites are architectural.

8.1.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

BC has a robust regulatory regime to protect and mitigate impacts to heritage resources. Archaeological sites in BC are protected under the HCA, and FLNR's

Heritage Branch and Archaeology Branch are the primary agencies responsible for administering the HCA and maintaining the Provincial Heritage Site Register. Section 13 of the HCA specifies that an individual (or corporation) must not “damage, excavate, dig in or alter, or remove any heritage object” from a heritage site, unless under a permit issued by the Minister pursuant to Sections 12 and 14. For the proposed Project OGC would issue any Section 12 site alteration permits.

The Proponent was required to undertake an Archaeological Overview Assessment (AOA) before submitting the Application. The AOA, which involved developing an “archaeological potential” model to guide fieldwork, found that most of the lands crossed by the Application Corridor have the potential for heritage sites.

In-office and field observations contributed to the Proponent’s evaluation of archaeological potential, using listed criteria such as terrain, forest cover, and proximity to potable water. Fieldwork in 2013 focused on locations considered to have archaeological potential (e.g., major drainage crossings and locations near previously recorded sites), based on a preliminary review of maps and known site locations. Aboriginal assistants accompanied the field crews with the goal of providing additional interpretation of the landscape and of the sites encountered. Traditional Knowledge (TK) information was gathered through the Proponent’s ongoing Aboriginal Consultation Program, TK field programs and Project-specific Traditional Land Use (TLU) studies (refer to section 33 of the Application and Appendix W).

The Proponent is presently completing the required Archaeological Impact Assessment (AIA). The primary objectives of the AIA are to:

1. Identify and evaluate archaeological resources within the Project area;
2. Identify and assess all impacts on archaeological resources that might result from the proposed Project; and
3. Recommend viable alternatives for managing unavoidable adverse impacts, including a preliminary program for implementing and scheduling impact management actions and, where necessary, conducting surveillance and/or monitoring.

AIA methodology includes systematic surface surveys to locate and characterize aboveground heritage resources and to identify locations with potential for buried sites, based on terrain attributes. Where locations with potential for buried sites were identified, they were investigated by shovel testing to establish the presence, nature, and extent of cultural deposits. The permitted study area for the AIA is defined as a 75 m wide corridor, centred on the pipeline.

Completion of the AIA prior to construction would require a survey and assessment of portions of the Project footprint with high potential for archaeological sites. Continued input would be sought from Aboriginal Groups, so that locations with potential for heritage resources not captured by the model are also considered in the AIA.

The Application's baseline information included a general summary of the history of archaeological research within the RAA, an inventory of previously recorded heritage sites within the RAA, and a description of previously recorded heritage sites within the AIA study area.

The Application identified 57 archaeological and/or historical heritage sites within the Project footprint based on previous studies, sites identified in the AOA, and as a result of the ongoing AIA field program.

The AOA identified eight previously recorded heritage sites situated within the LAA which consist of Culturally Modified Trees (CMT), stone tool scatters (lithics) and the Takla Grease trail, and the AIA found 49 heritage sites near the proposed route, most of which are CMTs.

The pipeline route would cross two main areas of high palaeontological potential although based on fossil site data provided by the Peace Regional Palaeontology Research Centre and the Royal British Columbia Museum, no previously recorded fossil sites are within the LAA. A field assessment was not completed for palaeontology.

Avoidance of heritage resources is the primary mitigation recommended for the proposed Project. If avoidance is not feasible, site-specific mitigation plans would have to be developed in consultation with FLNR (e.g., Archaeology Branch and Heritage Branch) as appropriate to the nature of the site, and informed by discussion with affected Aboriginal Groups. Where avoidance through re-routing would not be feasible or practical, the Application proposes mitigation measures which include: avoidance through micro-routing (i.e. design changes within Project corridor); additional investigation, monitoring, field studies and surface collection; controlled excavations; documentary research; and collection and dating of CMT stem round samples.

All site-specific mitigation measures for archeological sites would be established following the provincially-regulated procedures and policies and as outlined in the Heritage Resources Management Plan that would be developed for the proposed Project. The results of the AIA must be reviewed and accepted by FLNR. The final AIA report would also be provided to local Aboriginal communities.

8.1.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During their review of the Application, the Working Group, including Aboriginal Groups, and the public raised several key issues related to heritage.

In response to these concerns from the Working Group, and at the request of EAO, the Proponent provided several Technical Memos which included additional information on post-construction heritage effects assessments, site specific information, archaeological baseline information, and palaeontological resources.

Lax Kw'alaams Band and Nak'azdli Band requested recognition of a wider range of site types that include places of spiritual significance, named locales, known travel routes, and other locations of cultural value regardless of the presence of physical remains.

In response, the Proponent provided the "Sufficiency of Information Regarding Identification of Unprotected Cultural Heritage Sites" Technical Memo which stated that any such sites with physical evidence identified in the AIA are subject to detailed documentation, regardless of protection status. The AIA is ongoing and, if received, additional TK and TLU information may still be considered in the study. Where heritage and archaeological sites are identified in the LAA, including sites which may not be automatically protected under the HCA, procedures for site management prior to Project construction would follow those required under Provincial regulation as well as those outlined in the Heritage Resource Management Plan (HRMP). Assessments considered effects to some of the more intangible elements such as spiritual and ceremonial sites, traditional travel routes, and landscapes.

In addition to comments received from Working Group members, there were two public comments regarding impacts to trails: the "First Nation Grease Trail" on Tsezakwa Creek and the trail at Suskwa Pass (the original supply route to Fort Babine from Hazelton).

In response, the Proponent noted that Aboriginal Groups provided the Proponent with information regarding the importance and in some cases specific location of the Grease Trail and other trails. In addition, AIA fieldwork is ongoing for the proposed Project and locations where the Grease Trail would intersect the Project footprint were specifically targeted as part of the 2014 AIA field program. Details of this assessment would be provided in the Final AIA report submitted to the Archaeology and Heritage Branch in accordance with terms and conditions of HCA Permit 2013-0258. Where identified within the LAA, Project effects on

heritage and archaeological sites (including trails) would be managed in accordance with provincial regulations as well as the HRMP.

FLNR expressed several concerns regarding the management of paleontological resources encountered during pipeline construction.

The Proponent stated that the Heritage or Palaeontological Resources Discovery Contingency Plan would include chance find protocols for palaeontology (draft provided during Application Review). The Proponent responded that it has a standard no-collecting policy for heritage resources (archaeology and palaeontology). Workers are informed of this policy during Project orientation, and are directed to report any chance discoveries. An onsite environmental inspector would note any chance discovery of fossils and would initiate notification calls to either the Royal British Columbia Museum or the Tumbler Ridge Museum Foundation, depending on location. In addition, the Proponent would provide the following mitigation measures:

- o Fossil recognition training during Project orientations; and
- o A professional palaeontologist would monitor construction activities in zones considered to have high potential.

FLNR (Archaeology Branch) stated that ground-altering activities within an archaeological site are, by definition, an adverse impact, whether the alterations are caused by excavation or construction. Information from the site may be harvested via excavation, which does contribute to overall information on archaeological values and therefore mitigates the physical loss of the site to some extent. However, information is inevitably lost during excavation, as an assessment cannot collect all of the data at an archaeological site.

With only a partially completed AIA, neither EAO nor the Proponent can at this time fully quantify the specific number of archaeological sites that would potentially be impacted by the proposed Project. However, EAO notes that protection under the HCA, which includes a stringent permitting process, consultation requirements, and mitigation measures for potentially affected sites, are set out by the Heritage Branch, the Archaeology Branch and OGC.

8.1.4 Characterization of Residual Project Effects

The proposed Project would have the following residual effect on heritage resources:

- The disturbance of some archaeological sites, and loss of some site-specific archaeological information.

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is likely to have negligible to no residual adverse effects to heritage resources.

Criteria	Assessment Rating	Rationale
Context	Disturbance varies	Heritage resources are protected under the HCA. Mitigation measures for potentially affected sites would be determined in consultation with the Archaeology and Heritage Branch, and may take the form of avoidance, systematic data recovery, and/or construction monitoring to avoid or reduce the loss of scientific data resulting from site destruction.
Magnitude	Low to Moderate	Generally impacts would be avoided or largely mitigated (and therefore of low magnitude), but there is potential to affect portions of archaeological sites of moderate or high value. However, information collection should generally mitigate these impacts to be relatively low.
Extent	Project footprint	Generally limited to portions of the Project footprint that are having direct ground disturbance.
Duration	Permanent	Any archaeological values not collected would likely be permanently destroyed.
Reversibility	Irreversible	Any permanent losses would be irreversible.
Frequency	Once	Disturbance to archaeological sites would occur only one time (i.e. during construction ground disturbance)
Likelihood	There is a moderate to high likelihood that some archaeological resources would be adversely affected.	
Significance	EAO notes that heritage resources are protected under the HCA and the mitigation measures for potentially affected sites would be determined in consultation with the Archaeology and Heritage Branch and OGC. Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have	

Criteria	Assessment Rating	Rationale
		significant adverse residual archaeological effects.
Confidence		High Confidence – Limitations on the effects assessment include the difficulty to accurately identify the presence of archaeological resources within the Project footprint. The AIA will increase the confidence in the assessment, provided the results are accepted by the Archaeology and Heritage Branch. Confidence in the overall effects assessment is high, given that provincially required mitigation programs would be conducted and would be based on input from Aboriginal communities and regulatory bodies.

8.1.5 Cumulative Effects Assessment

Given the localized nature of the potential impacts on archaeological resources, and in consideration of information made available in the Application and during Application Review, EAO does not anticipate any significant cumulative effects to heritage resources as a result of effects of the proposed Project interacting with effects of past, present and reasonably foreseeable projects and activities.

8.1.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse residual archaeological effects. The proposed Project is likely to have negligible to no residual adverse effects on other heritage resources.

9 Assessment of Health Effects

9.1 Human Health

9.1.1 Background

The proposed Project's potential health effects were evaluated through a Human Health Risk Assessments (HHRA) framework, and considered Human Health as the Valued Component. The effect selected for the assessment of human health is change to human health. The Application considered how proposed Project-related activities that may allow contaminants to become potentially available through the air or via traditional and country foods could result in human health risks through respiration or ingestion.

The LAA was a 1 km band that fully encompasses terrestrial and marine portions of the proposed Project footprint and a 20 km x 20 km square area centred on each compressor station. The RAA is described as a 5 km band that fully encompasses terrestrial and marine portions of the proposed Project footprint and a 50 km by 50 km square area centred on each compressor station.

The HHRA was conducted following guidance from Health Canada, whose mandate includes the protection of human health from exposure to chemicals, and in relation to compliance with the BC Ministry of Health's *Public Health Act*.

9.1.2 Project Issues and Effects and Proposed Mitigation Identified in the Application

The Application assessed the proposed Project's potential to impact human health, including due to the resuspension of contaminants during the construction of the marine pipeline and due to air emissions during the operation of compressor stations.

Potential Health-Related Project Effects from Marine Pipeline Placement

The Application's assessment of human health effects resulting from marine sediment quality focused on the disturbance of contaminated sediment in the marine environment and the potential uptake of chemicals by marine organisms eaten by people. Construction in the foreshore and nearshore would involve the disturbance of sediment from trenching and side-casting. There is the potential that disturbance of these sediments, as a result of Project activities, could result in increased concentrations of contaminants within the water column, which could be taken up into the marine food chain and pose a risk to humans who eat seafood harvested from the area.

Areas along the proposed marine route were identified in the Application as containing elevated metals in sediment through Nass Bay and Nasoga Gulf marine route, and south of Lelu Island. These metals concentrations were naturally occurring and were well below *Canadian Council of Ministers of the Environment* (CCME) probable effect levels and also below the BC Contaminated Sites Regulations for soil standards related to the protection of human health. An analysis of metals uptake in seafood found that while metal concentrations (bound to sediment) could increase during disturbance of sediment, they would clear from marine bivalves within days to weeks. The health risks associated with the ingestion of seafood exposed to these metals were found to be negligible.

The Lelu Island approach showed historical contamination of marine sediments with polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs) from previous pulp and paper mill activity in the area. PCDD/Fs are understood to be toxic to humans. Although PCDD/Fs concentrations at the Lelu Island approach were very low, a sediment plume model was used to estimate potential for suspending and therefore allowing PCDD/Fs bound to sediment to be available to marine organisms as a result of dredging and trenching. The model predicted that there are no anticipated changes in chemical exposure of PCDD/F to marine organisms through direct contact with sediment, and therefore the risk for people to be exposed to increased concentrations of PCDD/F through ingestion of locally harvested marine traditional and country foods was negligible. The Application concluded that trenching would not result in a change in human health from consumption of marine traditional and country foods.

Potential Health-Related Project Effects from Changes to Air Quality

The Application's assessment of potential human health effects due to increased concentrations of air contaminants during operations near compressor stations. The Application predicted that one or more Criteria Air Contaminants (CACs) could be above ambient Air Quality Objectives and therefore the HHRA associated with air emissions during the operation phase was carried forward to a quantitative assessment for human receptors (towns and communities) within the LAA of compressor stations. The assessment estimated potential maximum concentrations of air contaminants at human receptor locations and compared these against health-based objectives or Toxicological Reference Values (TRV) based on short and long term exposure to air contaminants. Carcinogenic health risks were also calculated using maximum annual air concentrations to determine the Incremental Lifetime Cancer Risk.

The HHRA results indicated that human health risks from the inhalation of CAC for people using areas near the proposed Project and for people living in the LAA, are negligible. The Incremental Lifetime Cancer Risks from inhalation exposure to air

contaminants were calculated as 1,000 times lower than the acceptable increase in this risk established by Health Canada. Therefore, the potential cancer risks associated with inhalation of project-related emissions were also predicted to be negligible.

Section 5.2 and section 5.9 of this Report describes the proposed Project's potential adverse effects to air quality (specifically CACs) and to water quality in the marine environment respectively. Each section also describes mitigation measures proposed to avoid or reduce the potential adverse effects.

9.1.3 Project Issues and Effects and Proposed Mitigation Identified During Application Review

During the Application Review, the Working Group and the public raised concerns about the potential effects of the proposed Project on human health. The key issues and the responses of the Proponent are summarized below.

MOH, MOE, Metlakatla First Nation, Nak'azdli Band, Gitxaala Nation, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band and Doig River First Nation provided comments related to general methods used for the HHRA. These comments related to the adherence of the HHRA to applicable guidelines, the identification of users near compressor stations, the derivation and use of TRVs (see separate memo response for further details), the sufficiency of the baseline information on the types and usage of traditionally important country foods and drinking water sources, and the perceived lack of quantitative assessment of exposure pathways and corresponding mitigation measures.

The Proponent developed a memo entitled *Health General Methods* in response to these comments (July 21, 2014). The memo explained the Application's use of relevant scientific literature and standard guidance provided by Health Canada including a tiered framework used to evaluate the plausible exposure scenarios associated with Project activities. The HHRA found that no human health-based threshold would be exceeded as a result of Project activities.

The *General Methods* memo details the conservative methodology used to determine the potential for health concerns associated with proposed Project-related air emissions for people who live, work or engage in recreational activities within the study area, including exposures immediately adjacent to compressor stations. Specifically, no exceedances of air quality objectives were identified using conservative maximum values which support the conclusion that there are no anticipated health effects from proposed Project-related air emissions.

The *General Methods* memo confirmed that sources of TRVs used in the HHRA were selected for a conservative approach to assess the risks of acute and chronic exposures and that TRVs used were health-based and are widely used in risk assessments in Canada. The evaluation of potential cancer risks is based on the assessment of long-term or chronic exposures to chemicals in the environment, as outlined in Health Canada guidance. The memo presented the formula and inputs used to estimate non-carcinogenic human health risks associated with hazardous air pollutants, and described how incremental lifetime cancer risk was calculated.

The *General Methods* memo recognized the importance of terrestrial country foods to Aboriginal and non-Aboriginal diets, traditions, and lifestyles. It describes that additional detailed baseline information was not required as part of the assessment because the proposed Project has a negligible potential to have chemical effects on local water, soil, or vegetation.

MOH, MOE, Kitselas First Nation, and Lax Kw'alaams Band requested further information about the assessment of baseline health risk and on Project-related health risks from eating country foods from the Lelu Island area.

The Proponent developed a memo entitled *Marine Country Foods* (July 16, 2014) in response to these concerns. The memo describes the methodology and calculations used to predict the existing potential risks to human health, and confirms that the hazard quotient for the consumption of consuming local marine country foods (prawn and crab) in the vicinity of Lelu Island is well below the threshold set by Health Canada.

The memo provided additional clarification on the Application's conclusion that there would be no increased potential for human health effects from the proposed trenching, by modelling sediment fate in terms of magnitude, duration and extent of the total suspended solids plume which could lead to particulate uptake by marine life. The model indicated that the suspended sediment plume from trenching would last from several hours to days (in rare occurrences) noting that this represents a very short time period for potential exposures, and does not approach the timeframe of years required for bioaccumulation to occur. The sediment plume would be 200 m wide and rarely up to 2 km wide depending on currents and tides. The modeled TSS concentration was generally less than 2 mg/L, but in one modelled case was up to 43 mg/L and lasting for 3 hours.

The model results indicated that for any one location, the expected duration of elevated TSS would be less than one day and that the TSS concentration would be less than 2 mg/L on average. It was also noted that the average weighted PCDD/F concentration in TSS would be several times lower than the baseline sediment PCDD/F concentrations found at surface, because PCDD/F were found mainly in the top 50 cm of sediment while dredging would occur to a depth of 3 m. Based on the quantitative sediment fate modeling, and in consideration of PCDD/F concentrations predicted in TSS plumes, the potential for biological exposure to meaningful quantities of PCDD/F bound to redistributed sediment was considered negligible.

MOH, Metlakatla First Nation, Gitxaala Nation, West Moberly First Nations, Saulteau First Nations, McLeod Lake Indian Band and Doig River First Nation provided comments relating to the TRVs or health-based thresholds cited in the HHRA. Working Group members requested clarification of methods used to select TRVs, clarification of the ranking system used for prioritizing TRVs from multiple sources in the HHRA itself, and concerns about the appropriate use of TRVs under different scenarios.

The Proponent developed a memo entitled *Health Toxicological Reference Values* in response to these concerns (July 21, 2014). The memo provided a description of the steps used to identify, select and apply TRVs for both non-carcinogenic and carcinogenic risk estimates for human health. All TRVs used in the HHRA were derived by reputable agencies like Health Canada or the US EPA. The memo described for each contaminant type which TRV value was used and the order of preference for choosing the TRV and when an alternative was used (i.e. when the TRV was based on weak scientific evidence).

MOH requested further information related to assumptions used regarding biometrics, frequency and portion sizes of marine country foods applied in the HHRA.

The Proponent clarified that the biometric data used was recommended by Health Canada. The Proponent explained that consumption rates used to calculate results in the Application for marine foods were comparatively high that what is shown in the research literature, and therefore the Application results are more conservative (i.e. more protective of human health) than if actual consumption rates were used.

Metlakatla First Nation, Nak'azdli Band, and Halfway River First Nation raised concerns with the application of herbicides and pesticides within their asserted territories, which could affect water quality and the quality of traditional and country foods.

The Proponent indicated that an Invasive Plant Management Plan would be prepared and take into account identified concerns and sensitive locations and outline site specific measures. Where Aboriginal Groups have expressed a concern about using herbicides in their territory, consideration would be given to other options of vegetation control.

EAO has proposed a condition requiring the development of an Invasive Plant Management Plan, including consideration of the requests made by some Aboriginal Groups to not use pesticides or herbicides on their traditional territory.

9.1.4 Characterization of Residual Project Effects

Residual and cumulative effects in relation to air quality are considered in section 5.2 (Air Quality), which concludes that there would be low magnitude residual effects during operations and no cumulative effects resulting from the proposed Project.

Given the analysis provided above relating to the potential for adverse human health effects and given the mitigation provided in this and other sections of this Report to avoid and minimize contaminant availability in the environment, as well as recognizing the proposed conditions identified in the TOC, and federal and provincial permitting requirements, EAO concludes that the proposed Project would not likely result in any residual adverse effects on human health.

9.1.5 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on human health.

10 Accidents, Malfunctions and Effects of the Environment on the Proposed Project

10.1 Background

During construction or operation of the proposed Project, unplanned events could occur which could result in potential effects to environmental, social, health, heritage or economic values. Unplanned events could arise from accidents or malfunctions associated with proposed Project activities, or from environmental events or processes which could have adverse effects on the proposed Project. Section 31 of the Application describes Accidents and Malfunctions for the proposed Project and section 32 of the Application describes the Effects of the Environment on the Project.

The potential occurrence of unplanned events was assessed in the Application using a risk-based approach, according to the likelihood and consequence of the occurrence. The Application considers scenarios for each of the potential unplanned events and ranks the risk of each according to the likelihood of the scenario arising and the potential consequence or severity of the scenario arising.

During Application Review, Working Group members were actively engaged in considering questions related to potential risks and unplanned events associated with the proposed Project. Responses and clarifications to these concerns were provided by the Proponent during meetings and also through written response to questions in the Working Group tracking table.

Members of the public also raised concerns regarding possible impacts to people and the environment from a spill or leak from the pipeline.

The following sections provide an overview of possible unplanned events associated with the proposed Project activities, the context within which they could arise, the potential impacts of each event and proposed key mitigation measures to address each event. Issues raised during Application Review are summarized below, as well as EAO's conclusion on the significance of the risk posed by the unplanned event.

10.2 Accidents or Malfunctions

The following section of this Report describes the potential accidents or malfunctions considered in the Application that could occur during construction and operation of the Project, as follows:

- Hazardous material spills;
- Release of drilling muds;
- Leakage or failure of the pipeline during operation;
- Motor vehicle or helicopter accidents;
- Marine vessel accidents;
- Forest fire;
- Fly rock from blasting;
- Explosion or fire; and
- Sediment release into watercourses or marine environment.

Hazardous Material Spills

Spills present a risk primarily during construction, where a release or discharge of hazardous materials into the environment could occur. Without the application of mitigation measures, both small-scale and large-scale spills of hazardous materials could impact soils, vegetation, wetlands, water quality, marine resources, marine birds, fish and fish habitat, as well as air quality, wildlife, wildlife habitat, land use including traditional land use, cultural and recreational sites, and human health.

Key mitigation proposed to address spill hazards include:

- Implementation of mitigation measures in the Marine and Terrestrial EMPs and related plans including the Spill Contingency Plan, Chemical and Waste Management Plan, and Emergency Response Plan which include a combination of incident prevention measures, safety devices and emergency response planning and procedures to ensure public safety and prevent environmental damage; and
- Implementation of best management practices such as:
 - o Requiring construction vehicles and pipelay vessels to carry spill response equipment/materials and training personnel in the proper use of these materials/equipment;
 - o Training personnel in the proper handling, identification, documentation, storage and disposal of hazardous materials; and
 - o Locating hazardous materials storage and refueling areas away sensitive receptors including wetlands, watercourses or waterbodies.

Release of Drilling Muds

Drilling muds are used during construction to support HDD watercourse crossings. The potential for release of drilling mud is limited to the construction phase. An accidental

release of drilling mud can occur when pressurized mud is returned to the surface through a fracture in the substrate. This process can release drilling muds into water (freshwater or marine) or onto land. Effects to aquatic ecosystems are possible depending on the volume and location of the accidental release.

In the event of an accidental release of drilling mud in a watercourse, the Proponent would be required to comply with all regulatory requirements, including those relating to spill response, reporting and disposal.

Mitigation measures that would be implemented to reduce the likelihood and consequence of a drilling mud release include:

- Conducting pre-construction investigative drilling;
- Adhering to the DFO (2007) operational statement, the Drilling Waste Management chapter of the Oil and Gas Handbook, and the proposed Project's Drilling Procedures and Contingency Plans;
- Using a non-toxic drilling mud compound; and
- Implementing appropriate storage and handling procedures.

Pipeline Leakage or Failure

The risk of pipeline leakage or failure, both terrestrial and offshore, is considered to be remote given proper implementation of mitigation measures. Major causes of pipeline failures during operation include third-party damage, mechanical damage, or corrosion of the pipe wall (due to influences of the external environment).

Natural gas is non-toxic and has low solubility in water. In the event of a natural gas pipeline rupture, pressurized gas would rapidly dissipate into the atmosphere, with little potential effect to the surrounding environment. The primary impact would be the additional release of methane (CH₄) to the atmosphere. Within the marine environment, a natural gas pipeline rupture would be expected to bubble to the surface and dissipate into the air.

A major rupture of a natural gas pipeline resulting in a release of highly pressured gas in proximity to an ignition source could result in an explosion and have a similar impact to that of a fire, as described in section 10.2 of this Report.

Mitigation measures proposed to reduce the likelihood of pipeline failure or leakage include:

- Implementation of best practices regarding the design and management of the

pipeline including constructing to Canadian Standards Association (CSA) Z662, designing appropriate wall thickness, applying cathodic protection and implementing effective monitoring systems;

- Regular maintenance and operational procedures including cathodic protection monitoring, periodic inspection of the permanent right-of-way, and monitoring systems to alert staff of potential leakages or failures; and
- For marine sections of the route, installation of remotely operated isolation valves and when warranted, additional protection including heavy wall pipe, pipe burial and rock placement.

There are also regulatory requirements that the Proponent would be required to adhere to for the development and implementation of an Integrity Management and Damage Prevention program.

Motor Vehicle or Helicopter Accidents

Motor vehicle or helicopter accidents during construction or operations of the proposed Project could result in serious injury or death to humans and wildlife, as well as damage to property. Vehicle collisions with wildlife are considered in section 5.8 of this Report.

Mitigation proposed to prevent and respond to motor vehicle and helicopter accidents include:

- Actively manage Project-related traffic during construction;
- Limiting the use of helicopters to transport personnel and equipment only when required;
- Transporting workers between construction camps and the worksites using multi-passenger vehicles;
- Complying with applicable traffic, road-use, and safety laws; and
- Conducting safety training on the operation of Project-related vehicles, including speed restrictions.

Marine Vessel Accidents

The potential for marine vessel accidents would be limited to the construction phase of the marine pipeline and during periodic inspections and maintenance of the pipeline during operation. The types of accidents could include: collisions (involving two or more vessels underway); capsizing, sinking, grounding or striking; fire or explosion; propeller, rudder or structural damage; and flooding. The worst-case scenario for a marine vessel accident during construction would involve a collision with another vessel leading to a

human fatality and/or discharge of the vessel's contents into sensitive marine environments.

Mitigation to prevent and respond to marine vehicle accidents includes:

- Routine inspection and maintenance of vessels;
- The use of established communication and navigation procedures;
- Adherence to Transport Canada, Canadian Coast Guard, and Prince Rupert Port Authority (in the event that vessels are operating within the port limits of Prince Rupert) requirements;
- Conducting employee awareness training;
- Implementation of a Marine Access and Traffic Management Plan and Emergency Response Plan;
- Establishment of a temporary safety zone around the construction vessels to safeguard against collisions; and
- Following vessel operating procedures and conducting hazard assessments.

Fly Rock from Blasting

Blasting would be required during construction to remove areas of hard or rocky substrate. Fly rock is any debris that lands outside of the designated blast area. Should fly rock from blasting occur, the worst-case scenario would be high velocity rock particles causing injury or death to workers or wildlife. Rock particles entering a watercourse could also cause fish mortality. In addition, unexpected detonation could cause death or injury to a construction worker in close proximity to the blasting zone.

The Proponent would mitigate the potential for fly rock accidents by adhering to their Blasting Specifications Procedure, which includes provisions for on-site and personnel safety, the use of certified blasting technicians and pre- and post-blast warning signals. A blast design and an effective blasting plan would also be developed to reduce the likelihood of fly rock. DFO's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* would also be adhered to.

Explosions and Fires

A fire or explosion could occur where a combination of a fuel source, oxygen source, and source of ignition is available. Fuel sources associated with the proposed Project include natural gas, engine fuels, hydraulic oils, and natural fuel sources such as vegetation. Ignition sources include forest fires, lightning strikes as well as human sources. An explosion and subsequent fire during operation could endanger workers,

cause damage to vegetation and adjacent property, and disrupt public infrastructure and services.

Mitigation measures to reduce the likelihood of explosions and fires include:

- Implementation of a Fire Suppression Contingency Plan and have firefighting capabilities and training onsite that includes the proper disposal methods for welding rods, cigarette butts and other hot or burning materials;
- Managing storage and burning of cleared vegetation according to best management practices;
- Incorporating best management engineering design and construction methods including appropriate blasting techniques, appropriate pipeline wall thickness, cathodic protection and siting the pipelines away from existing structures; and
- Managing the integrity of the pipeline over its lifetime by performing regular maintenance and implementing a damage prevention program to mitigate damage from third parties.

10.2.1 Issues and Concerns Raised During Application Review

FLNR raised the concern that minor releases from the pipeline often do not cause significant drops in pressure pipe or volume and can occur for a very long time if not monitored or detected properly. FLNR requested details on the proposed methods for detecting such minor releases, as well as the detection parameters and thresholds at which a release would be detectable within the system.

The Proponent responded that several methods would be employed to prevent the occurrence of all leaks through integrity management systems. The Proponent also clarified that there are no specific regulated thresholds for leak detection on a natural gas pipeline system. The regulatory threshold for reporting natural gas releases in BC is where there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas. A SCADA system would monitor and control the pipeline operating pressure and report any abnormal conditions to the Control Centre which is manned 24 hours a day. An aerial leak detection program would also be carried out one to four times per year using equipment similar to Boreal Laser GasFinder AB system with a detection level for methane of as little as 1 part per million (ppm). These would then be followed up with ground-based leak detection activities.

FLNR and West Moberly First Nations raised concerns around the potential impacts to drinking water quality and other environmental values including fish and fish habitat resulting from a release of drilling fluids during HDD stream crossings.

MNGD clarified that HDD stream crossings are completed using non-toxic drilling fluid comprised of bentonite clay, water and a small amount of polymer. The loss of containment of drilling fluids during HDD involves the fluid migrating from the pipeline bore to the surface through fractures in the overlying rock or through pore space in the overlying till. OGC indicated that there is no significant potential for human health impacts. This type of accident could result in a temporary increase in turbidity or clay (bentonite) deposition within the streambed and resulting adverse effects to fisheries.

The Proponent explained that fish species present in the immediate vicinity or downstream of the release could potentially be affected. A release of the clay-based drilling mud would be unlikely to result in an overall reduction in the productive capacity of fish habitat or fisheries following the implementation of mitigation measures. It is also unlikely to increase fish mortality or cause serious harm to fish. The Proponent indicated that the Drilling Mud Release Contingency Plan includes measures to contain and clean up the mud.

MNGD explained that the loss of drilling fluids is considered a spill, and that all appropriate procedures would be required in the event of the loss of drilling fluids from an HDD including notification, response, and contingency measures. In addition to preventative measures undertaken by the Proponent, regulatory prevention measures include the submission of geotechnical crossing information to OGC during permitting which are reviewed for fish habitat, riparian issues and geotechnical information by qualified specialists.

Lax Kw'alaams Band raised concern that the Application was missing an assessment of potential effects of accidents and malfunctions on traditional land and resource use, including the effects of real and perceived contamination risk on Aboriginal harvesting.

The Proponent responded that Part C of the Application assessed potential Project interactions with Aboriginal Interests, including the potential effects of accidents or malfunctions and provides a cross reference between these concerns and the assessment of accidents and malfunctions in section 31 of the Application.

The Proponent further indicated that the real and perceived contamination risk

from accidents or malfunctions on Aboriginal harvesting would be considered in the development of the EMP. Specifically, the EMP would include risk communication procedures, including notification and involvement of potentially affected Aboriginal Groups during construction, operation, and in the case of accidents or unplanned events. EAO proposes a condition which would require the Proponent to engage Aboriginal Groups in the development of the EMP, and another condition which would require the Proponent to continue to consult with Aboriginal Groups through construction and into operations.

Metlakatla First Nation and Gitxaala Nation noted that float plane accidents and anchor strikes from marine vessels were not assessed in the Application and requested rationale for their exclusion.

The Proponent responded that the primary methods of transportation during the proposed Project would be ground-based transport, watercraft and helicopters. The assessment of accidents and malfunctions includes consideration of hazardous materials spills and best management practices for both ground and air settings and that these commitments would apply to float-plane accidents.

Regarding potential pipeline strikes from anchors, the Proponent responded that this type of accident is included in the assessment as a type of third-party damage or mechanical damage. The Proponent further specified that marine pipelines would be marked on nautical charts issued by the Canadian Hydrographic Service so that other marine users would be aware of their presence. Notices to mariners would also be provided upon the construction of the new pipelines.

Kitsumkalum First Nation raised concern regarding potential impacts to marine bird species from an accidental spill or other accident or malfunction in the marine environment.

The Proponent's response points to the Application which states that all mobile equipment and refueling areas would be supplied with appropriate spill kits so that if a spill occurs, the primary containment response can be rapidly deployed and would help limit the extent and magnitude of a hazardous materials spill, and that any impacts to marine birds would be fully reversible and not significant.

10.3 Effects of the Environment on the Proposed Project

The following types of environmental processes were assessed in the Application with respect to their potential to affect the proposed Project and result in effects to VCs:

- Climate Effects;
- Geophysical Hazards;
- Forest Fires;
- Exterior Pipeline Corrosion; and
- Seabed Conditions.

Climate Effects

The proposed Project would cross a diverse landscape including areas dominated by cold high-pressure systems and frequent temperature inversions as well as areas with significant precipitation. Severe weather events and future climate scenarios could damage project infrastructure as well as pose a risk to VCs.

Severe Weather Events

Severe weather events include heavy precipitation, flooding, high winds, and extreme winter conditions. These events are normally short in duration and could occur in regions that the proposed Project would pass through. The potential adverse effects from extreme weather events include delays in the construction schedule, which could interfere with the Proponent's ability to work within wildlife or fishery timing windows. Other potential effects include increased potential for slope stability failures, mass wasting events and erosion which could expose the pipeline and cause structural damage.

Future Climate Scenarios

Future climate change scenarios have been predicted for northern and coastal BC, suggesting that conditions could be wetter in the winter and spring, and drier during the summer. Potential effects related to future climate change scenarios include increased intensity and frequency of storm surges, extreme storms, flooding and erosion events, as well as sea level rise and heavy precipitation. These factors could lead to increased potential for structural failure of the pipeline.

Proposed design, mitigation and contingency measures in consideration of climate effects include:

- Regular monitoring of weather to provide advanced warning of potential adverse

weather conditions;

- Appropriate timing of construction activities to suit the seasons and weather conditions;
- Designing watercourse crossings and aerial crossings to account for river bed scour and extreme weather events;
- Designing for climate effects to minimize risk to infrastructure;
- Conducting a pipeline risk assessment to incorporate future climate scenarios and severe weather events;
- Conducting ongoing inspection and maintenance programs; and
- Implementation of the following contingency plans:
 - o Adverse Weather Contingency Plan;
 - o Flood and Excessive Flow Contingency Plan; and
 - o Wet Soils Contingency Plan.

Marine-based Climate Effects

Freshwater discharge to the marine environment (from large river systems impacted by snowmelt and major storm events) influences the physical and biological characteristics of the ocean. Strong winds and large volumes of runoff may temporarily overpower normal tidal currents and alter tidal fluctuation. Strong ocean currents and tides can cause movement and strain on pipeline sections and destabilize rock covering meant to protect pipeline infrastructure. Extreme currents can also cause scouring of supporting material under the pipeline, possibly resulting in sag or free spans. During the construction phase, prolonged severe sea states and weather conditions could cause delays in deep water lay barge operations or inshore installation activities. Delays could potentially affect the Proponent's ability to work within environmentally sensitive timing windows. Sea level rise is not expected to have notable effects on the proposed Project.

Design and mitigation measures to reduce the likelihood and consequences of marine-based climate effects on the proposed Project include:

- Regular monitoring of weather to provide advanced warning of potential adverse weather conditions;
- Timing construction activities and maintaining flexibility in the construction schedule to accommodate extreme or prolonged weather conditions;
- Designing subsea infrastructure to withstand ocean currents and storm events, including a one in one-hundred year probability of tsunami;
- Burial of the pipeline in the subsea marine environment;
- Conducting a pipeline risk assessment including metocean, hydrodynamic and geophysical studies to inform detailed engineering design;

- Conducting ongoing inspection and maintenance programs; and
- Implementation of the Emergency Response Plan, as required.

10.3.1 Land-based Geophysical Hazards

Seismic Events

Several major plate tectonic boundaries exist in Western Canada, including the Juan de Fuca Plate, the North American Plate and the Pacific Plate, as well as the Queen Charlotte-Fairweather Fault. The seismic hazard rating within the proposed Project footprint is considered medium along the coast and low further inland. The primary effect of a seismic event on the proposed Project would be damage to infrastructure through shaking and vibration. If unmitigated, this could result in an accidental release from the pipeline.

Slope Stability and Mass Wasting Events

Slope stability failures and mass wasting events involve the movement of rock, debris or sediment down a slope. The potential effects of slope stability failures or mass wasting events on the proposed Project include excessive pipeline loading (which could cause structural failure over time), exposed or damaged infrastructure and catastrophic failure. The debris produced by landslides or avalanches could also impede emergency response efforts.

Liquefaction

Liquefaction occurs when unconsolidated sediments at or near saturation experience a rapid loss of strength and start to flow. Potential effects of liquefaction on the proposed Project include pipeline deformation or rupture, possibly resulting in a gas release to the environment.

Design measures to reduce the likelihood of occurrence and consequences of land-based geophysical hazards include:

- Conducting detailed terrain studies and identifying routing alternatives to reduce risk from geophysical hazards;
- Conducting geotechnical assessments of identified geohazards and a pipeline risk assessment;
- Including safety features in pipeline design (e.g., low pressure shut-off valves);
- Conducting slope monitoring and installing stabilization measures as required; and
- Regular inspection and maintenance of Project infrastructure.

10.3.2 Marine-based Geophysical Hazards

Geophysical hazards that could adversely affect the proposed Project in the marine environment include seismic events, tsunamis, slope instability, liquefaction and marine mass wasting events. Tsunamis are primarily generated by subsea earthquakes, but mass movement events such as landslides can also trigger tsunami events. Potential effects of subsea geohazards include damage to the subsea pipeline through disturbance of supporting material, sediment transfer and the creation of currents, extreme waves and/or a tsunami. Damage to the pipeline infrastructure could cause eventual or catastrophic failure and related leaks or releases.

Design measures to reduce the likelihood of occurrence and consequences of marine geophysical hazards include:

- Conducting liquefaction and slope stability studies, as well as probabilistic seismic hazard analyses and including these in pipeline design;
- Rerouting the pipeline to avoid seabed features such as faults and potential liquefaction zones;
- Designing subsea infrastructure to withstand a one in one-hundred year probability of tsunami; and
- Concrete coating the pipeline, burying the pipeline and placing rock covering where appropriate.

Forest Fire

Factors that influence the probability and magnitude of wildfires include vegetation type, ignition source, and weather conditions, including relative humidity, air temperature, fuel moisture, precipitation, wind speed and wind direction. The potential effects of a forest fire on the proposed Project would be a temporary suspension of construction activities and/or delays in construction-related traffic. During operations, forest fires are unlikely to adversely affect the buried pipeline; however, they could affect above ground facilities and maintenance activities.

The Proponent would implement the Emergency Response Plan and the Fire Suppression Contingency Plan to avoid and mitigate the potential impacts from forest fires.

Exterior Corrosion (Pipeline Integrity)

Corrosion of the exterior walls of a pipeline can result from the interaction of the pipeline with air, soils, surface water and groundwater. For marine sections of a pipeline, corrosion can result from interaction with ocean water and the seabed/marine

sediments. Corrosion decreases pipeline integrity and increases the potential for structural failure and a subsequent leak.

Additionally, in the terrestrial environment, oxidation of sulphide minerals contained in rock masses can produce sulphuric acid, leading to ML/ARD. If left unmitigated, ML/ARD can result in acidic ground or surface water coming into contact with the pipeline which would accelerate corrosion.

The following design and mitigation measures are proposed to reduce the likelihood and consequences of exterior pipeline corrosion in both the terrestrial and marine environments:

- Burial of the pipeline;
- Installation of cathodic protection for the pipeline and metering station;
- Coating the pipeline; and
- Regular inspection and maintenance during construction and operation phases to detect and correct pipeline integrity issues. In the marine environment, this would include ROV surveys and in-line inspections.

Seabed Conditions

Seabed conditions that could affect the proposed Project infrastructure include sediment scour, fault movement and fluid release from the sea floor. Marine sections of the pipeline would be buried in the seafloor. Unanticipated seabed conditions or events could result in the loss or shifting of supporting material under the pipeline, causing sag or free spans which would increase the possibility of structural failure.

Planned design and mitigation measures to reduce the potential effects of seabed conditions on the proposed Project include:

- Determining and designing for the maximum allowable free span;
- Incorporating seabed conditions into design of the pipeline route and avoiding potentially problematic areas and seabed features; and
- Conducting ROV surveys throughout operations to detect the presence of free spans.

10.3.3 Issues and Concerns Raised during Application Review

FLNR requested additional information on marine and terrestrial geohazards including: high resolution base maps sufficient for terrain/geohazard interpretation; geohazard maps of all identified hazards; and risk analyses.

The Proponent clarified that a geotechnical assessment of geohazards and a marine pipeline risk assessment is required as part of the OGC permitting process and would be used to inform pipeline design. The geohazard assessment was completed during Application review and the results were summarized in a Pipeline Geohazard Report and Route Assessment Charts. The Proponent indicated that they would be willing to meet with FLNR to discuss the information being used to inform engineering design.

Gitxaala Nation and Metlakatla First Nation expressed concern that potential effects of ocean acidification associated with climate change on submerged marine pipeline infrastructure and effects of weight associated with marine species encrustation on freespan sections of marine pipeline were not considered in the Application.

The Proponent clarified that these potential effects do not represent a substantial or reasonably foreseeable risk to the proposed Project and so were not assessed in the Application. Additionally, design considerations, mitigation measures and inspection requirements for the marine pipeline such as installation of cathodic protection, performance inspections, ROV surveys and in-line inspections would effectively mitigate these risks.

The Proponent also indicated that the proposed Project would be constructed and operated in accordance with regulatory and industry standards, which would reduce the likelihood of pipeline failure as a result of either climate change or structural failure, including OGAA, the Pipeline and Liquefied Natural Gas Facility Regulation (BC Reg 281/2010), CSA Z662-11, as well as other applicable standards.

10.4 Summary and Conclusions

Project design measures such as strategically placed engineered pipe protection, route placement and other design mitigation would be used to lower the likelihood and reduce the severity of any accident, malfunction or effect of the environment on the proposed Project.

Prior to the commencement of construction activities, the Proponent would be required to develop an EMP for implementation throughout the Project's lifetime which would address preparedness, prevention and response to an accident or malfunction or an effect of the environment on the project. The EMP is described in section 11 of this Report.

Based on the combination of project design measures, implementation of the EMP and associated plans, and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that neither accidents or malfunctions nor effects of the environment on the proposed Project is likely to pose significant risk to environmental, social, economic, health or heritage VCs associated with the Project.

11 Environmental Management Plan

An Environmental Management Plan (EMP) would be required to minimize adverse environmental effects throughout the proposed Project's lifespan. Specifically, the EMP is a framework to communicate and implement mitigation measures and best management practices, and to support compliance with applicable legislation, terms and conditions of permits, and approvals and authorizations issued in relation to the proposed Project, including an EA Certificate, if issued.

11.1 Components of the Environmental Management Plan

The Application (section 36) included a summary of the proposed EMP for construction and operations in the terrestrial and marine environment. Late in Application Review the Proponent provided EAO and the Working Group with copies of the draft marine and terrestrial construction EMPs, including supporting management and monitoring plans. The Proponent's EMPs would:

- Outline environmental protection measures and mitigation related to proposed Project activities;
- Provide recommended measures for carrying out construction activities to reduce adverse environmental effects; and
- Serve as reference information to the construction staff and personnel to support decision-making, and provide links to more detailed information.

Environmental monitoring would be a key component of the EMP to ensure that construction conditions, field management and when necessary, compliance with the proposed Project's environmental commitments, approvals, permits and licenses are adhered to. In addition, monitors would document effectiveness of mitigation, recommend any alternative mitigation, identify issues, as they arise and report on the progress of the status of the mitigation measures post-construction.

Contingency plans would be included in the EMP with specific instructions, measures and strategies for addressing environmental issues, should they arise during construction.

Management plans would include guidelines and procedures to support the mitigation activities identified in the EMP for chemical and waste management, access and traffic control management, metal leaching and acid rock drainage, soil handling/conservation, erosion and sediment control, heritage resources, invasive plant species, bird nest

mitigation and other management issues for both the terrestrial and marine portions of the proposed Project.

Post-construction monitoring would be detailed in the EMP as a follow up measure to ensure that the mitigation measures applied have been effective. Post-construction monitoring would identify any post-construction environmental issues and recommend additional measures to protect Valued Components in the proposed Project area.

11.2 Proposed Environmental Management Plan – Terrestrial

The draft Construction Environmental Management Plan (CEMP) contains both general and site-specific environmental protection and mitigation measures for the terrestrial environment. The CEMP is supported by environmental alignment sheets, as well as a number management plans and contingency plans:

Management Plans

- *Chemical and Waste Management Plan* – Specific measures for the procurement, storage, handling and disposal of hazardous materials required for the proposed Project are provided in this plan.
- *Access Management Plan* – This plan describes management strategies for the movement of humans and wildlife into or within previously inaccessible areas as a result of new or improved access from the proposed Project. The plan recognizes traditional and non-traditional land use, as well as ecological functions that could be altered by the new or improved accesses.
- *Traffic Management Plan* – This plan outlines management strategies and control measures for pre-construction, construction and post-construction traffic along the proposed Project footprint, including temporary access.
- *Hydrovac Cutting Handling Plan* – This plan outlines specific measures to ensure that hydrovac slurry generated through Project activities is handled and disposed of in accordance with applicable provincial and/or federal guidelines and reclamation objectives.
- *Erosion and Sediment Control Plan* – The objective of this plan is to provide measures to avoid or reduce the potential for adverse environmental effects on land use and receiving waters associated with erosion and sediment runoff from construction activities.
- *Invasive Plant Species and Vegetation Management Plan* – This plan outlines the procedures to identify, prevent, control and monitor the introduction or spread of undesirable or noxious and invasive plant species to a level equivalent of that observed on adjacent lands for the proposed Project.

- *Bird Nest Mitigation and Management Plan* – This plan provides measures to reduce the risk of incidental take during clearing activities and to ensure compliance with applicable federal legislation. Incidental take is defined as the accidental disturbance, injury or destruction of a nest, egg or bird.
- *Mountain Goat Helicopter and Mitigation Plan* – The purpose of this plan is to reduce potential adverse effects of Project-related helicopter activity on mountain goat by providing mitigation, primarily in the form of avoidance windows, and avoidance areas during the construction phase.
- *Heritage Resources Management Plan* – This plan describes the mitigation measures for heritage (historical, archaeological and palaeontological) sites which may be in conflict with the proposed Project. The plan also outlines management strategies for sites which may be identified as a result of ongoing field work so that potential adverse effects on heritage resources are properly managed and residual effects are not significant.
- *Caribou Habitat Restoration Plan* – This plan describes mitigation measures to reduce caribou mortality risk due to habitat change from construction and operation activities. A final Caribou Habitat Restoration Plan would be completed following construction and would include an updated summary of issues, concerns and recommendations.
- *Metal Leaching and Acid Rock Management Plan* – This plan describes mitigation strategies to manage rock with acid rock drainage and/or metal leaching concerns that may be encountered in the construction phase. The plan serves to manage the associated environmental risks and liability by correctly predicting the drainage chemistry of the waste material.
- *Greenhouse Gas Management Plan* – Although not included in the Proponent's draft CEMP, a Greenhouse Gas Management Plan would be required. This plan would outline the mitigation measures being undertaken to reduce effects to GHGs during construction and operations of the proposed Project.

Contingency Plans

- *Spill Contingency Plan* – This plan outlines the steps to take in the event of an accidental release and includes initial response, containment measures and reporting requirements.
- *Adverse Weather Contingency Plan* – This plan provides guidance and mitigation where adverse weather conditions and activities have the potential to cause adverse environmental effects.
- *Watercourse Mitigation and Inspection Plan* – This plan outlines the roles, responsibilities, mitigation/protection measures, monitoring/inspection requirements and reporting requirements for all watercourse crossing activities.

- *Flood and Excessive Flow Contingency Plan* – This plan contains monitoring and inspection requirements, notification procedures and contingency measures in the event of a major storm during watercourse crossing construction.
- *Wet Soils Contingency Plan* – This plan describes contingency measures to minimize terrain disturbance and soil structure damage when soil conditions are excessively wet. Soils are considered to be excessively wet when the planned activity could cause unacceptable damage to soils either through rutting, soil handling, compaction or pulverization.
- *Fire Suppression Contingency Plan* – This plan outlines measures to be implemented in the event of a fire.
- *Soil Handling Contingency Plan* – This plan provides mitigation measures to preserve soil capability, based on the type of condition or concern encountered.
- *Soil Erosion Contingency Plan* – This plan describes the controls to be implemented in the event of observed wind or water erosion during construction, or failure of stream banks.
- *Directional Drilling Procedures and Instream Drilling Mud Release Contingency Plan* – This plan describes measures to minimize the risk of adverse environmental effects during directional drilling and includes contingency measures to be implemented in the event of an accidental release of drilling mud adjacent to or into a watercourse, in accordance with the BC Spill Reporting Requirements.
- *Plant Species and Ecological Communities of Concern Discovery Contingency Plan* – In the event that rare plants or ecological communities are discovered along the proposed Project footprint during construction, this plan describes appropriate documentation and mitigation to be undertaken to minimize potential effects to these species and communities of concern.
- *Wildlife Species of Concern Discovery Contingency Plan* – The plan provides guidance to reduce disturbance to species of concern and important habitat features during pre-construction and construction.
- *Heritage or Palaeontological Resource Discovery Contingency Plan* – This plan outlines the procedures to be followed in the event of a discovery of archaeological, historical or palaeontological materials during construction in order to avoid or reduce unforeseen impacts on these resources.
- *Traditional Land Use Site Discovery Contingency Plan* – This plan provides guidance to avoid or minimize potential effects to new Traditional Land Use (TLU) sites discovered during construction.

Post-Construction Monitoring Program

Post-construction monitoring would include an assessment of the reclamation, re-vegetation, erosion control and any significant weed problems on the areas disturbed by construction of the proposed Project. Post-construction monitoring would also consider recommendations made and any unresolved issues identified in the initial post-construction report. It would be conducted during the first five years after final cleanup and reclamation.

11.3 Proposed Environmental Management Plan – Marine

The draft Marine CEMP describes both general and site-specific mitigation and environmental protection measures to avoid or reduce potential effects in the marine environment. The plan is supported by marine environmental alignment sheets, as well as a number of management and contingency plans, described below.

Management Plans

- *Marine Access and Traffic Management Plan* – This plan would be developed prior to construction and would include: a marine communications strategy; details on construction vessels, safety zones and scheduling; and mitigation measures for traditional navigation routes, fishing and harvesting, commercial shipping activities, tourism and marine-based transportation.
- *Marine Chemical and Waste Management Plan* – This plan would be developed based on the overarching Chemical and Waste Management Plan for the proposed Project (discussed in section 11.2. above), but would contain procedures specific to the marine environment.
- *The Bird Nest Mitigation and Management Plan and Erosion and Sedimentation Control Management Plan* would be developed to support terrestrial construction (see section 11.2. above), but would support construction of the marine sections of the proposed Project.
- *Activity-based Management Plans* – Several activity-based plans would be developed by the marine contractor in advance of construction. These would include monitoring, sampling and measurement requirements. Examples of these plans include:
 - o Trenching Management Plan;
 - o Rock Protection Management Plan; and
 - o Hydrostatic Testing Management Plan.

Contingency Plans

- *Marine Spill Contingency Plan* – This plan would outline the steps to take in the event of an accidental release in the marine environment and would include procedures for spill containment, clean-up, response equipment, roles and responsibilities, qualifications, response coordination and communications.
- *Heritage Resource Discovery Contingency Plan* – This plan would be based on the overarching Heritage Resource Discovery Contingency Plan but would contain information and procedures specific to the marine environment. For marine construction, heritage resource discoveries would be either at the shore crossing or at wrecks in deeper waters.

Post-Construction Monitoring Program

Post-construction monitoring would ensure compliance with specific reclamation performance expectations and conditions. It would include: post-construction videos of the pipeline route; an evaluation of the effectiveness of mitigation measures; documentation of actual effects; environmental monitoring surveys (i.e. fish and fish habitat surveys) as required; identification of issues and deficiencies; and recommendations and remedial measures.

Other Plans Not Included in the EMP

Emergency Response Plans would be filed with the OGC and act as a guideline for the Proponent to ensure a prompt and coordinated response to emergencies. The plans would apply to all phases of the proposed Project, including emergencies that result from natural hazards (e.g., forest fires and flooding) or route development work. Emergency Response Plans are generally developed to protect the general public, the environment, company personnel, and property.

Safety and Security plans would provide direction to enable compliance with WorkSafe BC regulations at all times and adherence to applicable standards and codes, including those of TransCanada Pipelines Limited and the Canadian Standards Association.

11.4 Issues and Concerns Raised During Application Review

A summary of specific issues raised by Working Group members related to the implementation of the EMP and related plans is provided below. Themes of interest to Working Group members and members of the public included: requests for more details

on the EMP and associated plans; effective implementation of proposed mitigation measures; access management; communications management; and the importance of ongoing monitoring to confirm mitigation efficacy in combination with mitigation adaptation, as needed.

Gitxaala Nation, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band and Doig River First Nation requested that the EMP include effective measures to reach individual residences in remote communities along the pipeline route in the event of emergency throughout construction and operations. MOE requested clarification on notification of downstream drinking water users if water quality becomes affected through proposed Project activities.

The Proponent responded that landowners, regulatory agencies and other stakeholders would be provided notification of the construction schedule and timing of specific construction activities to facilitate awareness of upcoming activities and to plan for construction activities in their area. The EMP for the construction phase would include details on the parties to be notified in the event of an emergency, such as affected water quality. For operations, the plan would include notification and reporting requirements to identified company and external parties, including affected community members, regulatory agencies and local emergency and health services contacts.

For remote communities, specific measures would be in place in the plan to reach individual residences in those communities throughout the construction and operations phases. The Proponent committed to continued engagement with Aboriginal Groups to determine the most effective method for notification in remote communities.

FLNR, MOE, West Moberly First Nations, Sauteau First Nations, McLeod Lake Indian Band, Doig River First Nation and Kitsumkalum First Nation expressed concern that the summary EMP presented in the Application lacked detail. These groups indicated that the lack of specific information in the Application made it difficult to assess the effectiveness of the EMP and associated plans.

The Proponent provided EAO with the draft EMP on September 30, 2014 and clarified that there would be an opportunity for input from Aboriginal Groups in the detailed development of the plans as part of the OGC permitting process. EAO shared the draft EMP with the Working Group via email on October 8, 2014. EAO is proposing a condition whereby the Proponent would be required to consult with Aboriginal Groups in the development on the EMP.

Yekooche First Nation and Halfway River First Nation requested further details on the drilling mud release contingency plan, including specific measures to be taken in the event of an inadvertent release of drilling mud into fish habitat.

The Proponent provided a comprehensive Drilling Mud Release Contingency Plan as part of the draft EMP on September 30, 2014, which includes the appropriate steps to be taken in the event of an accidental release of drilling mud.

11.5 Compliance Reporting

The Proponent would be required to implement compliance reporting to ensure EMPs, monitoring plans and EA Certificate commitments are fulfilled and the progress of commitments are regularly reported to the applicable regulatory agencies, Aboriginal Groups and stakeholders. Compliance reports would be provided to the appropriate regulatory authorities for review and/or approval prior to implementation during pre-construction and construction phases, and monitoring reports would be required during the post-construction period. Compliance reports would be submitted to EAO and made available publically on EAO's website.

PART C – ABORIGINAL GROUPS CONSULTATION

12 EAO Consultation Process: Overview

The Government of British Columbia is legally obligated to consult and, if necessary, accommodate asserted or established Aboriginal rights including title, or treaty rights (“Aboriginal Interests”) that may be impacted by provincial decisions. In *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73 (*Haida*), the Supreme Court of Canada established that the Crown is required to consult with Aboriginal Groups⁸ with respect to Crown-authorized activities that might affect Aboriginal Interests, and that the extent (or level) of the consultation is proportionate to preliminary assessments of the following factors:

- Strength of the case for the claimed Aboriginal rights (including title) that may be adversely affected; and
- Seriousness of the potential impact of contemplated Crown action or activity on Aboriginal Interests.

The extent (or level) of the Crown’s obligation to consult is described in the *Haida* case as lying on a spectrum from notification to deep consultation. The EA process is not a rights determining process in relation to asserted Aboriginal rights or title. Instead, a key objective of the EA process is to identify potential adverse effects of proposed projects on Aboriginal Interests and explore measures to avoid, mitigate or otherwise appropriately address such effects.

On November 8, 2013, EAO issued a Section 11 Order which specified the consultation activities that both EAO and the Proponent would undertake with all Aboriginal Groups potentially affected by the proposed Project.

At the initial stages of EA for the proposed Project, EAO relied primarily on the proximity of the proposed Project to an Aboriginal Group’s asserted traditional territory to determine whether an Aboriginal Group would be included on Schedule B or C:

- Those Aboriginal Groups with Aboriginal Interests within 2 km of the proposed Project were listed in Schedule B; and

⁸“Aboriginal Groups” means the Treaty 8 First Nations, Aboriginal Groups, and other Aboriginal entities as identified on Schedule B and Schedule C of the Section 11 Order (the “Order”) issued November 8, 2013 or subsequently amended from time to time, to be consulted in accordance with Part G of that Order. The Order can be found at http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_403_36251.html

- Those within 30 km of the proposed Project were listed in Schedule C.

Aboriginal Groups in Schedule B of the Section 11 Order were consulted at the deeper end of the consultation spectrum, and were provided the following opportunities:

- Participation in the Working Group;
- Participation in meetings to identify and discuss both Aboriginal Interests that may be affected by the proposed Project and potential measures to avoid, mitigate, address or otherwise accommodate impacts;
- Review and comment on key documents, including the draft Value Component document, draft Application Information Requirements (AIR), the draft Section 11 Order, Proponent's Application for an EA Certificate, and EAO's draft Assessment Report and Aboriginal Consultation Report, and the Proponent's Aboriginal Consultation Reports; and
- Submission of a document outlining the Aboriginal Group's views on the Assessment Report to be included in the package of materials sent to Ministers when the proposed Project is referred for decision.

Aboriginal Groups in Schedule C of the Order were consulted at a lower level on the consultation spectrum, and were provided the following opportunities:

- Notification of key milestones – such as the issuance of the Section 10 and 11 Orders, AIR, acceptance of the Application for review, timing of public comment periods (including open houses), referral of the final Assessment Report to Ministers and the resulting decision;
- Invitation to meet with EAO to discuss any Aboriginal Interests in the proposed Project area; and
- Invitation to review and comment on a draft of EAO's Assessment Report, including this Part C Aboriginal Consultation Report, and other draft referral materials.

The Section 11 Order also required the Proponent to develop and implement an Aboriginal Consultation Plan and subsequent Aboriginal Consultation Reports, to the satisfaction of EAO.

Consideration was given to areas where Treaty 8 rights were historically exercised and initial assessments of the strength of the Aboriginal rights and title claims were conducted and discussed with Aboriginal Groups identified on Schedules B and C starting in the winter of 2013. As a result of these discussions, and refinement of route alternatives under consideration by the Proponent, several modifications to the Section 11 Order were made during the EA:

- Gitanyow *wilp* Luux Hon was removed from Schedule B and added to Schedule C (April 2, 2014);
- Gitxsan *wilp* Haiwaas was added to Schedule C (April 2, 2014);
- Gitxsan *wilp* Wiigyat was removed from Schedule C (April 2, 2014); and
- Doig River First Nation was moved from Schedule C to Schedule B (May 21, 2014).

EAO has considered all relevant comments received from Aboriginal Groups, stages of the EA, issues, comments and concerns raised by Aboriginal Groups in relation to the proposed Project, submitted via correspondence, raised directly at meetings or in working groups were forwarded to the Proponent for tracking and response, as required. Input from Aboriginal Groups was received through participation in Working Group meetings, teleconferences, direct meetings with EAO and/or the Proponent and written correspondence (letters or emails).

The Proponent also provided EAO with three Aboriginal Consultation Reports, each covering distinct periods of time during the EA (one during pre-Application, one at Application submission, and one during Application Review), which outlined comments received by the Proponent from Aboriginal Groups in meetings, correspondences and general conversations. The Proponent also provided responses to all comments received from EAO or received directly from the Aboriginal Groups in the Consultation Reports, in tracking tables and in other correspondences.

EAO reviewed the adequacy of the Proponent's responses to all comments received from Aboriginal Group representatives in the Working Group and recorded in the Issues Tracking Table. EAO required the Proponent to update the Issues Tracking Table and supporting Technical Memos as appropriate. In addition, EAO considered the comments and issues in the development of this Report. In addition, EAO arranged specific Working Group meetings and offered to meet with Aboriginal Groups to review responses and any additional concerns presented by Aboriginal Groups. Prior to referring the Application to ministers, EAO provided the final tracking tables, completed to EAO's satisfaction, to Aboriginal Groups and other Working Group members.

A draft of this Report was provided to Aboriginal Groups participating in the Working Group on October 15, 2014 to demonstrate how EAO considered all Aboriginal Groups' comments received up until October 29, 2014. Comments and feedback on the draft received up until November 3, 2014 were considered and incorporated into the final version of this Report, where appropriate.

12.1 Tsilhqot'in Nation v. British Columbia

On June 26, 2014, the *Tsilhqot'in Nation v. British Columbia* (*Tsilhqot'in*) decision was released by the Supreme Court of Canada. The decision clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation at 1846 (the time of assertion of European sovereignty). In addition, the case set out considerations for government when consulting Aboriginal Groups regarding potential impacts on asserted Aboriginal title claims.

As is typical for significant legal cases such as these, government is taking some time to examine the implications including the legal, policy and public interest considerations. The proposed Project was at the 41st day of the 180 day Application Review period when the *Tsilhqot'in* decision was released.

As a result of the *Tsilhqot'in* decision, EAO:

- Reassessed the strength of claimed Aboriginal title overlapping the proposed Project on the basis of the tests set out in the *Tsilhqot'in* decision, for the purpose of confirming appropriate level or depth of consultation;
- Included the results of that reassessment in this Report as it relates to each Aboriginal Group with asserted title claims overlapping the proposed Project;
- Sought Aboriginal Groups perspectives on both the preliminary assessments of strength of Aboriginal claims and seriousness of impacts, as well as proposed accommodations through the provision of a draft version of this Report; and
- Considered other approaches being taken by government that may be relevant to the accommodation for potential impacts to Aboriginal Interests.

The Aboriginal Groups who have been assessed as potentially having strong Aboriginal title claims overlapping the proposed Project (post-*Tsilhqot'in*) were already included on Schedule B of the Section 11 Order prior to the *Tsilhqot'in* decision and have been consulted at a deeper consultation level throughout the EA.

After re-assessing the strength of claim to Aboriginal title for each Aboriginal Group who asserts a title claim, EAO determined that the level of consultation it was currently undertaking was appropriate for each group, and did not need to be modified as a result of the *Tsilhqot'in* decision.

As noted above, EAO is not a body for determining rights, including rights to Aboriginal title, nor does EAO have all of the necessary information to make such a determination. For the purposes of this Report, EAO's assessment of whether Aboriginal Groups may

have a *prima facie* claim to Aboriginal title is intended solely to inform the level of consultation required for each Aboriginal Group.

13 Aboriginal Groups Consulted

EAO consulted the following Aboriginal Groups, listed below by treaty or cultural affiliation and/or tribal council or association:

Treaty 8:

- Blueberry River First Nations
- Doig River First Nation
- Fort Nelson First Nation
- Halfway River First Nation
- McLeod Lake Indian Band
- Prophet River First Nation
- Saulteau First Nations
- West Moberly First Nations
- Treaty 8 Tribal Association

Carrier First Nations:

- Carrier Sekani Tribal Council
- Lake Babine First Nation⁹
- Nak'azdli Band
- Takla Lake First Nation
- Tsay Keh Dene First Nation
- Tl'azt'en Nation
- Yekooche First Nation

Wet'suwet'en:

- Office of the Wet'suwet'en

Tsimshian:

- Gitxaala Nation
- Kitselas First Nation
- Kitsumkalum First Nation
- Lax Kw'alaams Nation¹⁰
- Metlakatla First Nation

Gitxsan (*Huwilp*):

- Antguulibisxw
- Delgamuukw
- Gaxsbgaba
- Geel
- Gitludahl
- Guutkunuxw¹¹
- Gwii Yeehl
- Gwis Gyen
- Gyetm Galdoo
- Hanamux
- Haiwaas
- Kliiyeem Lax Ha
- Kyooluugyat
- Luus
- Luutkudziiwus
- Mauus
- Miluulak
- Nii Kyap
- Nikateen
- Sakum Higookxw
- Spookw
- Ts'ogashlee
- Wii Eelast
- Wii Gyet
- Wii Mugulsxw
- Wosimlaxha
- xGwoimtxw
- Yagosip

⁹ Lake Babine Nation was identified in the Section 11 Order as "Lake Babine First Nation". For the purposes of this Report, Lake Babine Nation will be used.

¹⁰ Lax Kw'alaams Band was identified in the Section 11 Order as "Lax Kw'alaams Nation". For the purposes of this Report, Lax Kw'alaams Band will be used.

¹¹ Gitgwinuxw was identified in the Section 11 Order as "Guutkunuxw". For the purposes of this Report, Gitgwinuxw will be used.

Gitanyow:

- *Wilp* Gamlakyeltxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs' Office)
- *Wilp* Malii (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs' Office)
- *Wilp* Gwaas Hla'am (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs' Office)
- *Wilp* Watakhayetsxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs' Office)
- *Wilp* Luux Hon

EAO also consulted with Nisga'a Nation on the proposed Project, as required under the terms of the Nisga'a Final Agreement (NFA). Consultation with Nisga'a Nation and EAO's assessment in relation to the NFA requirements are presented in Part D of this Report.

The following sections provide background information drawn from ethnohistoric material available to the Province for each group.

13.1 Treaty 8

Under Treaty 8¹², negotiated in 1899, the treaty First Nations signatories negotiated for an 840,000 km² area of what is now northern Alberta, northeastern BC, northwestern Saskatchewan and the southern portion of the Northwest Territories.

Treaty 8 grants signatory First Nations the treaty rights to:

“pursue their usual vocations of hunting, trapping and fishing throughout the tract surrendered as heretofore described, subject to such regulations as may from time to time be made by the Government of the country, acting under the authority of Her Majesty, and saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes.”

The rights to hunt, fish and trap and the ancillary activities associated with carrying out these rights are recognized and affirmed by Section 35 of the *Constitution Act, 1982*.

In understanding the scope and nature of the rights and obligations under Treaty 8, the Crown is guided by the text of the treaty, as well as the understandings and intentions of the Aboriginal and Crown participants to the making of the treaty or subsequent adhesions, following rules of treaty interpretation articulated by the Supreme Court of Canada.

Oral promises (recorded in the Report of Commissioners for Treaty 8, Winnipeg, Manitoba, September 22, 1899) are of considerable importance in the interpretation of Treaty 8. Following is an excerpt of those promises:

¹² Details of the history and text of Treaty 8 can be viewed on the federal Aboriginal Affairs and Northern Development Canada website, currently at <http://www.aadnc-aandc.gc.ca/eng/1100100028805>.

“Our chief difficulty was the apprehension that the hunting and fishing privileges were to be curtailed.... we had to solemnly assure them that only such laws as to hunting and fishing as were in the interest of the Indians and were found necessary in order to protect the fish and fur-bearing animals would be made, and that they would be as free to hunt and fish after the treaty as they would be if they never entered into it.”

Through Treaty 8, the Crown has the right to “take up” lands for settlement, mining, lumbering, trading, or other purposes. As stated by the Supreme Court of Canada in *Mikisew Nation v. British Columbia* (SCC 2005), with the general principle recently reaffirmed in *Grassy Narrows First Nations v. Ontario* (SCC, 2014), the Crown’s right to take up lands under Treaty 8 is subject to the duty to consult and, if appropriate, accommodate the Treaty 8 First Nation’s rights before reducing the area over which their members may continue to pursue hunting, trapping and fishing rights. Although all Treaty 8 First Nations are entitled to engage in hunting, fishing and trapping activities within the whole of the Treaty 8 area, where a Treaty 8 First Nation no longer has a meaningful right to hunt, trap or fish in relation to the territory over which it traditionally hunted, trapped or fished, this may result in a treaty infringement.

Eight modern-day bands that were consulted about the proposed Project were, or are evolved from, the original signatories to Treaty 8: Saulneau First Nations, West Moberly First Nations, Halfway River First Nation, Doig River First Nation, Blueberry River First Nations, Prophet River First Nation, Fort Nelson First Nation and Dene Tha’ First Nation. The McLeod Lake Indian Band adhered to Treaty 8 in April 2000, in accordance with the McLeod Lake Treaty 8 Adhesion and Settlement Agreement (Adhesion Agreement). Each modern-day band is governed by a Chief and Council.

Except for McLeod Lake Indian Band, Fort Nelson First Nation and Blueberry River First Nations, all other Treaty 8 First Nations located in BC are currently members of the Treaty 8 Tribal Association, a regional Aboriginal organization with an office in Fort St. John.

The Beaver Indians or Deneza, are Athapaskan people who generally settled along the Peace River in British Columbia and Alberta. These Aboriginal Groups in northeast BC traditionally lived semi-nomadic lifestyles while following seasonal rounds to pursue hunting, trapping, fishing and gathering for subsistence and commercial uses. The specific seasonal movements of the Treaty 8 First Nations of the Peace River Region prior to the arrival of the Europeans and the fur trade are not well documented. The ethnographic descriptions provided by anthropologists are based on land use when

traplines and trading posts had already become part of the Treaty 8 First Nations' economy. Following allocation of reserve land, many Aboriginal Groups continued for several decades to live a semi-nomadic lifestyle, travelling seasonally throughout the Peace River country from the Rocky Mountains to the plains of Alberta.

13.2 Carrier Groups

The Carrier groups generally live between the Rocky Mountains to the east and the Coast Mountains to the west. The 56th parallel marks the Carrier's approximate northern boundary. The southern boundary, until the 19th century, angled northwest from Alexandria to mid-way between Ulkatcho and Anahim Lake. In the 20th century, Carrier from Ulkatcho established themselves at Anahim Lake, which was traditionally Tsilhqot'in until the Tsilhqot'in began migrating east (about 1850). Some Carrier also moved into Sekani hunting territory north of Takla Lake. These Carriers, with some Sekani, generally make up the Takla Lake First Nation. With the exception of Ulkatcho and Takla Lake, Carrier settlements are located along lakes and tributaries of the Upper Skeena and Fraser Rivers. It is theorized that many centuries ago, the Carrier originally lived east of the Rockies and moved to this territory, pushing the original inhabitants (Salish people) south and west.

Carrier are named according to a distinct sub-tribe, each associated with a particular territory. Fourteen sub-tribes have been identified, and have also been divided into three groups based on dialect and geographic commonalities: the Babines (Babine Lake, Bulkley River), Upper (or Northern) Carriers (Stuart Lake, Stuart-Trembleur Lake), and the Lower (or Southern) Carriers (groups to the south).

13.3 Wet'suwet'en

The Wet'suwet'en have been identified by ethnographers as a sub-tribe of the Carrier, speaking the language of Witsuwit'en (a western dialect of the Babine-Witsuwit'en language), which is a different language from that of other Carrier groups. Unlike other Carrier, the Wet'suwet'en were strongly influenced by the Gitksan, with whom they had long intermarried and traded.

At the time of European contact in the early 1820s, the Wet'suwet'en had developed a society organized into five clans and 13 houses. Descent and inheritance were traced through the female line. Wet'suwet'en territory was divided into house territories. House chiefs were considered to hold the rights and responsibilities within the house territory on behalf of house members.

Wet'suwet'en cultural and economic practices appear to have been largely unaffected until the period between the 1860s and 1900 when there was increased interaction with the Hudson's Bay Company and the creation of reserve lands. The creation of reserves ultimately led to the establishment of the modern-day *Indian Act* Bands.

Based on this information, the Province understands that the Wet'suwet'en collective that existed at the time of contact (early 1820s) and at the time of Crown assertions of sovereignty in BC (1846) would today include the total membership of the following six contemporary Bands: Moricetown Band, Hagwilget Band, Skin Tyee Nation, Nee-Tahi-Buhn Band, Ts'il Kaz Koh First Nation (formerly Burns Lake Band) and the Wet'suwet'en First Nation (formerly Broman Lake Band). However, the nature of Band membership and close relations and intermarriage with the Gitksan, Lake Babine Nation, Cheslatta and other Carrier groups to the east may complicate definition of the full Wet'suwet'en collective.

The Province understands that the house- and clan-based governance system continues to play a major role in Wet'suwet'en culture. The Hereditary Chiefs assert to collectively represent the entire Wet'suwet'en Aboriginal rights and title holding collective under the traditional house-based governance system, as led by the Hereditary Chiefs and administratively represented by the Office of the Wet'suwet'en. The Skin Tyee Nation, Nee-Tahi-Buhn Band, Wet'suwet'en First Nation and Ts'il Kaz Koh First Nation each independently assert Aboriginal rights and title within what they have identified as their traditional territory.

13.4 Tsimshian

There are five Aboriginal Groups potentially affected by the proposed Project that are part of what is termed collectively as the Tsimshian culture, which has been identified ethnographically and linguistically as consisting of the *Nine Allied Tsimshian Tribes*, *Interior (Canyon) Tsimshian*, and *Gitxaala Nation*.

Key socio-political entities of the Tsimshian include the house (*wa.lp*), clan, tribe and nation. Inter-weaving these entities are the linkages of common ancestry and kinship ties developed through marriage, trade and inter-tribal alliances.

Traditionally, the Tsimshian lived in large, semi-permanent winter villages consisting of multiple related groups known as "houses," "house-groups" or *wa.lps* (singular: *wa.lp*). A *wa.lp* is described by anthropologists as a corporate lineage that held exclusive ownership rights to specific places and tracts of land, and the associated rights to

access and harvest resources at those locations. A *wa.lp* is an independent socioeconomic unit of traditional Tsimshian social and political life and each house has an individual leader (*Sm'oogyet*) who inherits both a name and associated rights of the house's territory.

The leader of the most powerful house in a tribal village usually had leadership responsibilities for the community, with the authority derived from the status of the house-group. Each *wa.lp* is part of a network of *wa.lps* that shares a matrilineal connection to a common ancestral group. These affiliated matrilineal groups are called clans, crest-groups or *Bupdeex* (singular: *pdeex*), and traditionally formed the organizing structure of village residence. A Tsimshian person belonged (and belongs today) to one of four clans:

- *Ginhada* (raven);
- *Gispwudwudha* (killer whale);
- *Laxsgiik* (eagle); or
- *Laxgibuu* (wolf).

Each *wa.lp* owned its own hunting and fishing grounds, and the combined territories of the *wa.lps* in its composite, constituted the tribal territory. The territory held by a *wa.lp* was understood in Tsimshian culture to be owned in a proprietary sense, a concept that was at the foundation of the Tsimshian geopolitical system. The traditional legal system that provides validation to the ownership and rights, acquired or inherited, of *wa.lp* territories, and which regulates rights of access and resource use is described in *adawx*, the oral histories of each *wa.lp*.

For most Tsimshian groups, life before contact with European explorers, traders and settlers revolved around the harvesting of seasonally available food. Each house left its winter village during the spring to occupy small seasonal camps sites, collecting different resources as they became available and returning to the same winter village in the late fall or early winter. This seasonal movement is often described as a "seasonal round" by anthropologists. In the late winter and early spring, Tsimshian families would collect and process eulachon along the Nass River. Eulachon grease was (and remains) a highly prized and nutrient-rich commodity that was traded along the Nass and Skeena Rivers and into the BC Interior via well-established trade routes that are commonly referred to as "grease-trails."

From May through late August fishing was the primary activity, beginning in May with halibut and cod fishing. Seals and sea lions were also hunted during this time, and women gathered as many as 20 different varieties of seaweed, along with herring spawn on kelp and hemlock, and cedar bark for winter weaving. In June, the eggs of

marine birds such as sea gulls and oyster catchers were gathered, along with shellfish such as abalone, cockles and clams during the low summer tides.

By early summer, Tsimshian moved to their seasonal camps at traditional fishing sites as salmon gathered at the river mouths to begin their spawning migration. These sites were strictly controlled by individual *wa.lps* and managed by chiefs. The harvesting of the five species of salmon that spawn in the Skeena River and its tributaries represented the main economic activity within the Tsimshian's seasonal round. Summer was also a time for gathering edible plants and berries which were dried or stored in grease for winter consumption.

Salmon fishing, processing and storage occupied the Tsimshian until October, at which time the tribes returned to their winter villages. Fall was the season when men hunted deer, bear, mountain goat, moose, ducks and geese.

From November to February the winter was spent in the permanent winter villages of each tribe. Fairly intensive subsistence activities included the gathering of marine invertebrates, fishing, trapping of fur-bearers and game hunting of both terrestrial and marine mammals. Winter was the season for the culturally important ceremonial feasts, marriages and for the validating of *adawx*.

The combined territories of the *wa.lps* that composed a tribe typically encompassed a watershed or similarly defined geographic areas. Among the Tsimshian, these regions and associated territories were: the nine Allied Tsimshian Tribes whose territories include the lower Skeena River and mainland coast from the mouth of the Skeena River to the mouth of the Nass River; the Gitxaala Nation, whose territories span the archipelago of islands south of the Skeena River and several watersheds along the Douglas Channel; and, the Interior Tsimshian, whose territories include the Kitsumkalum River watershed and an area of the Skeena River east and west of the Kitselas Canyon.

13.4.1 Nine Allied Tsimshian Tribes

Before the time of contact, ten Tsimshian groups relocated their winter villages on the Skeena River, below the canyon, to village sites in the Prince Rupert Harbour. Nine of these Tsimshian survived: Giluts'aaw, Ginandoiks, Ginaxangiik, Gispaxlo'ots, Gitando, Gitlaan, Gits'iis, Gitwilgyoots, and Gitzaxlaal. These tribes had their winter villages in the vicinity of Prince Rupert Harbour, and continued visiting their traditional territories on the Skeena River for fishing and hunting each summer and fall, and their eulachon fishing stations on the Nass River each spring. They possessed a number of regular

seasonal villages and camping sites in these areas as well. The Lax Kw'alaams Band and Metlakatla First Nation are understood to have descended from these nine tribes, each of which had their own individual territories, harvesting areas and villages.

13.4.2 Interior Tsimshian:

The Kitselas First Nation and Kitsumkalum First Nation identified as two of the 12 tribes of the Coast Tsimshian cultural-linguistic group, and are generally referred to in the ethnographic literature as the Canyon or Interior Tsimshian Tribes. While the surviving nine Allied Tsimshian Tribes with Prince Rupert winter villages became increasingly consolidated after contact, it is understood that the Kitsumkalum First Nation and Kitselas First Nation remained separate tribes. Their ancestors travelled to the coast to trade and socialize, and to harvest eulachon at the Nass River (at Red Bluff) each spring, their winter villages and resource harvesting areas were located around the Skeena River canyon and Kitsumkalum River drainage near the modern day community of Terrace. They spoke a distinct dialect of the Tsimshian language. In these ways, they are distinguished from the Nine Allied Tsimshian Tribes.

13.4.3 Gitxaala Nation:

The Gitxaala Nation were closely related by cultural practice, kinship and trading relationships to the nine Allied Tsimshian Tribes but are ethnographically distinguished from the nine Allied Tsimshian Tribes by their dialect and the fact that they did not resort to the Skeena for the late summer salmon fishery and do not have ethnographic evidence of territories on the Skeena or at Prince Rupert Harbour. The Gitxaala Nation participated in the eulachon fishery on the Nass River, and likely stopped at campsites on their way to and from the Nass.

13.5 Gitxsan

The Gitxsan share a common society, culture and language with their Tsimshian and Nisga'a neighbours. The Gitxsan are a composite group comprising lineages of both Tsimshian and Athapaskan heritage. Gitksan lineage histories (*adaawk*) tell of an ongoing integration of Athapaskan peoples from the upper reaches of the Nass and Skeena watersheds into Tsimshian speaking communities in the middle Skeena region.

The Gitxsan are identified by anthropologists as Tsimshian and speak one of four dialects of the Tsimshian language. The traditional lineage histories (*adaawk*) reveal that the Gitxsan communities are partly a result of ancient migrations from both the Athapaskan speaking groups of the upper Nass and Skeena watersheds and Tsimshian speaking groups on the coast. Because of this diverse linguistic and cultural heritage,

and because of their upriver location and economy, the Gitxsan may to some extent be seen as a transitional group between Tsimshian and Athapaskan cultures specifically, and between the more general culture areas of the northwest coast and the sub-arctic interior. Gitxsan currently claim as traditional territory lands situated on the Skeena River above the Kitselas Canyon, and in the watersheds of the upper Skeena, Nass and Babine Rivers and their tributaries. Gitxsan participated in the eulachon trade on the Nass River each year, evidenced by the series of twenty-three “grease trails” linked to inland communities. Trade was also conducted with the Tsimshian on the coast and with the Carrier inland.

In the 19th century the Gitxsan were organized into seven independent winter villages: Kispiox, Kisgaga^{as}, Gitsegyukla (Kitsegukla), Gitwangak (Kitwanga), Gitanmaax (Kitanmaks), Galdo^o (Kuldo) and Kitwancool (Gitanyow). These winter village aggregations usually consisted of two or more houses or *huwilp*. The basic social unit of Gitxsan society was the *wilp*, a corporate matrilineage whose core members lived together, and are led by a hereditary chief (*Simgiigyet*). Each *wilp* is associated with one of four larger descent groups known as “clans” or *pdek*: Lax Ganeda (Raven); Lax Se^{el} (Frog); Lax Gibuu (Wolf); and Gisk^{aast} (Fireweed / Killer Whale / Grizzly). Whereas the *wilp* is a local residential group with control over certain areas, the *pdek* is a much broader unit of association which transcends *huwilp*, winter village aggregates and even the boundaries of the greater Gitxsan society.

Currently, there are between 50 and 65 *huwilp* (houses) within Gitxsan traditional territory. Each *Simgiigyet* is responsible for managing distinct sections of the *wilp* territories and fishing sites, with additional wing-chiefs who assist with management in each house territory. The *Simgiigyet* has the ability to make decisions about his or her territories, but does not hold exclusive power within the *wilp*. Each *wilp* owns a set of hereditary names that are assigned power and authority based on their individual ranking and are linked to specific territories. Impacts to a territory may have an impact on that *wilp* and its ability to feast and access resources to demonstrate their wealth and jurisdiction, an integral aspect of Gitxsan culture. Under Gitxsan traditional law, an impacted *wilp* may not simply move into a neighbouring territory to access its resources, although the neighboring *wilp* may choose to permit access. The *Liligít* (feast hall), or potlatch, is a structure that legitimizes business, social and political decisions in the traditional system. In Gitxsan society, *ayookw* (traditional laws) govern a number of activities that occur in *wilp* territories, including conservation, citizenship, adoption, marriage, property, use of resources and personal conduct at the *Liligít*.

In the absence of a single entity with the mandate to represent the Gitxsan Nation as a collective during the period that the EA was underway, EAO consulted with the

Simgiigyets whose *huwilp* could be impacted by the proposed Project. As such, 11 *Simgiigyets* were identified as potentially directly impacted by the proposed Project and were consulted at the deeper end of the Haida spectrum. EAO consulted *Simgiigyets* whose *wilp* territories were further away from the proposed Project area at the lower end of the Haida spectrum (notification). For the purposes of this Assessment Report, “Gitxsan” will generally refer to the 11 *huwilp* that were consulted at the deeper end and will be considered as one Aboriginal Group, unless otherwise clarified.

13.6 Gitanyow

Gitanyow is a Gitxsan group of Tsimshian and Athapaskan heritage who speak a dialect of the Nass-Gitxsan division of the Tsimshian language family. Historically, Gitanyow was one of seven Gitxsan village groups located in the middle Skeena Valley, but much of their territory was in the Nass watershed. Hunting, fishing and harvesting plants were important traditional activities undertaken by Gitanyow. The Kitwanga valley and the Cranberry River valley were important resource areas used by Gitanyow for fishing, hunting, trapping and harvesting plants. Gitanyow lived in, and utilized various parts of, their territory at different times of the year, moving between the shared tribal winter village at Kitwancool and separate *huwilp* hunting and fishing territories in the valleys of Kitwanga, Cranberry, Kiteen, Nass, Kinskuch, Meziadin, Kispiox and elsewhere. At the time of European contact, and throughout the 19th century, Kitwancool (located at the confluence of the Kitwanga and Kitwancool rivers) was Gitanyow’s winter village. Gitanyow is comprised of eight *huwilp*, each of which belongs to either the Wolf or Frog/Raven Clan and asserts its own individual traditional territory.

Due to their inland location, the Gitanyow relied on hunting and the use of large upland tracts. The Gitanyow fished for sockeye, Chinook and steelhead salmon at house-owned fishing sites and made use of permanent wiers and traps. The Cranberry, Kiteen and Kitwanga River watersheds were noted as the location of key Gitanyow fisheries and hunting territories. The Cranberry River in particular is the site of a number of reported villages and fishing stations.

Politically, the Gitanyow Hereditary Chiefs Office supports consultation on behalf of and with most Gitanyow hereditary chiefs. EAO consulted at the deeper end of the *Haida* spectrum with five *Simgiigyets* (Hereditary Chiefs) whose *huwilp* could be impacted by the proposed Project – four through the Gitanyow Hereditary Chiefs Office, and directly with *wilp* Luux Hon. For the purposes of this Assessment Report, “Gitanyow” will generally refer to the five *huwilp* that were consulted and will be considered as one Aboriginal Group, unless otherwise specified.

14 EAO-Led Consultation Activities with Aboriginal Groups

This section provides an overview of consultation activities undertaken by EAO.

14.1 Capacity Funding

Capacity funding was provided by EAO to Aboriginal Groups in Schedule B to assist with their participation in consultation discussions and Working Group meetings during both the pre-Application and Application Review phases of the EA.¹³

In addition, the Proponent offered funding to all Aboriginal Groups listed in Schedule B, and had provided funds to most Aboriginal Groups to participate in regulatory processes, gather Project-based information to inform the Application, and to understand the impacts to Aboriginal Interests posed by the proposed Project. Proponent capacity funding had been offered but not yet been accepted by Metlakatla First Nation, Kitsumkalum First Nation, Lake Babine Nation, Tl'azt'en Nation, and Blueberry River First Nations.

14.2 Working Group Activities

Aboriginal Groups were kept fully informed of the EA process throughout the review. In addition, Aboriginal Groups on Schedule B were invited to participate in the Working Group activities, comment on EA documents, and meet with EAO staff as outlined below.

1. EAO invited the 16 Schedule B Aboriginal Groups originally identified in the Section 11 Order and one Schedule B Aboriginal Group added by a Section 13 Order to participate in the Working Group, along with federal, provincial and local government agencies¹⁴.

During the Pre-Application stage of the EA, ten Working Group meetings were held:

- September 12, 2013: EAO held a teleconference to discuss the Proponent's

¹³ For each Aboriginal Group in Schedule B, \$5,000 was allotted during the pre-Application phase and \$10,000 during Application Review. For the 11 Gitksan *huwilp*, \$1,000 each was allotted during the pre-Application phase and \$2,000 during Application Review. The Gitanyow *wilp* Luux Hon was also provided, \$1,000 during the pre-Application phase and \$2,000 during Application Review, as they are consulted separately from the other Gitanyow *huwilp*, which are consulted through the Gitanyow Hereditary Chiefs' Office.

¹⁴ The 13 Gitksan *huwilp* and the 5 Gitanyow *huwilp* listed on schedule B are counted as one of the 16 Aboriginal Groups.

proposed VCs and the draft Section 11 Order. The meeting was attended by representatives of Kitselas First Nation, Nak'azdli Band, Tl'azt'en Nation, McLeod Lake Indian Band, Takla Lake First Nation and West Moberly First Nations.

- October 17, 2013: Working Group introductory meeting held in Prince George. EAO provided an overview of the EA Pre-Application phase of the EA process, including timelines and the purpose of the Working Group. The OGC provided an overview of their permitting process and the interaction between OGC and the EA process. The Proponent provided an overview of the proposed Project, proposed VCs and methodologies. The meeting was attended by representatives of Gitxaala Nation, Gitxsan, Halfway River First Nation, Kitselas First Nation, Lax Kw'alaams Band, Metlakatla First Nation, Nak'azdli Band, Takla Lake First Nation, Tl'azt'en Nation and Yekooche First Nation.
- November 19, 2013: Working Group meeting on the marine VCs in the draft AIR including an overview of construction methods. The meeting was attended by representatives of Gitxaala Nation, the Gitxsan Working Group, Kitsumkalum First Nation, Lax Kw'alaams Band, Metlakatla First Nation, and Yekooche First Nation.
- November 20, 2013: Working Group meeting on the freshwater VCs in the draft AIR including an overview of construction methods. The meeting was attended by representatives of Gitanyow Hereditary Chiefs Office, the Gitxsan Working Group, Kitsumkalum First Nation, Lax Kw'alaams Band, Halfway River First Nation, and Yekooche First Nation.
- November 27, 2013: Working Group meeting on the terrestrial VCs in the draft AIR including an overview of construction methods. The meeting was attended by representatives of Gitanyow Hereditary Chiefs Office, the Gitxsan – *wilp* Guutkunuxw, Lax Kw'alaams Band, Metlakatla First Nation, Halfway River First Nation, West Moberly First Nations, Takla Lake First Nation, Tl'azt'en Nation, Kitselas First Nation, and Yekooche First Nation.
- January 28, 2014: Working Group Teleconference provided Working Group members with information on what to expect during Application Evaluation (Screening) and Application Review process to provide clarity on process and timing and to support Working Group members in planning and allocation of resources for participating in upcoming Application Reviews of three pipelines. All Schedule B Aboriginal Groups were invited to attend this teleconference.
- February 5, 2014: Working Group meeting held in Prince George with a satellite location in Terrace. EAO-led discussions on the EA process and the role of the Working Group. The Proponent provided an overview of the proposed Project including an overview of construction methods. The meeting was attended by representatives of Lake Babine Nation, Yekooche First Nation, Halfway River First Nation, Carrier Sekani Tribal Council, Tl'azt'en Nation, Nak'azdli Band,

Gitxsan Nation (Gitludahl, Geel), Lax Kw'alaams Band, West Moberly First Nations, Doig River First Nation, McLeod Lake Indian Band, Sauteau First Nations, Gitxsan Nation, Kitselas First Nation, Metlakatla First Nation, Nisga'a Lisims Government and Gitanyow Hereditary Chiefs Office.

- February 7, 2014: An EAO Fish and Wildlife Technical sub-Working Group meeting held in Prince George with a satellite location in Terrace. Presentations were delivered by the Proponent followed by participant comments. The meeting was attended by representatives of Gitanyow Hereditary Chiefs Office, Gitxsan Nation, Nak'azdli Band, Doig River First Nation, Lake Babine Nation, McLeod Lake Indian Band, Tl'azt'en Nation, Sauteau First Nations, Halfway River First Nation, Takla Lake First Nation, Kitselas First Nation, Metlakatla First Nation, Nisga'a Lisims Government, Yekooche First Nation, and Lax Kw'alaams Band.
- February 13, 2014: An EAO Marine Technical sub-Working Group meeting was held in Prince Rupert. Presentations were delivered by the Proponent followed by participant comments. The meeting was attended by Gitanyow Hereditary Chiefs Office, Gitxaala First Nation, Lake Babine Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams Band, Metlakatla First Nation, and Nisga'a Lisims Government.

During Application Review, seven Working Group meetings were held:

- May 15, 2014: EAO held a teleconference to provide an overview of guidance for the Application Review of the proposed Projects and to answer Working Group questions related to EA reviews.
- July 23-24, 2014: EAO held marine technical Working Group meetings in Prince Rupert to discuss the effects assessments for marine VCs. The meetings were attended by representatives of Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams Band, Metlakatla First Nation, and Lake Babine Nation.
- July 28-31, 2014: EAO held Working Group meetings in Prince George and through teleconference to discuss the effects assessments for heritage, wildlife and terrestrial, fish and water, socio-economics and health effects. The following meetings were attended in person or via teleconference by representatives of Doig River First Nation, Gitxsan Hereditary Chiefs, Gitanyow Hereditary Chiefs, Kitselas First Nation, Lake Babine Nation, Halfway River First Nation, Lax Kw'alaams Nation, Nak'azdli Band, Nisga'a Lisims Government, McLeod Lake Indian Band, Metlakatla First Nation, Prophet River First Nation, Sauteau First Nations, West Moberly First Nations, Yekooche First Nation.
- July 18, 2014, July 25, 2014 and August 1, 2014: In response to a request from Aboriginal Groups, EAO provided an opportunity for Aboriginal Groups to meet

with EAO regarding proposed Project effects identified on a regional scale. Discussion topics offered included concerns about potential impacts to Aboriginal rights and title raised by Aboriginal Groups, concerns raised by Aboriginal Groups in relation to other interests including social, economic and health effects, consideration of Proponents' proposed mitigations, and included discussion of the content and review process involved with drafting EAO's Assessment Report and Aboriginal Consultation Reports. The July 18, 2014 meeting was held in Prince George for Treaty 8 Aboriginal Groups, July 25, 2014 meeting in Prince Rupert for Tsimshian Aboriginal Groups and the August 1, 2014 meeting was held in Prince George for Carrier Aboriginal Groups.

2. EAO provided Aboriginal Groups with an opportunity to review and provide comments on the key documents during the EA. As a matter of practice, EAO provided meeting summaries from Working Group meetings for their review and comment. During the Pre-Application stage, which began in June 2013 and ended in May 2014, EAO provided the following documents for comment:
 - Section 11 Order, which contains EAO's instructions to the Proponent on the scope, procedures, methods and consultation requirements of the EA. Through the issuance of the Section 11 Order and subsequent Section 13 Orders, EAO formally directed the Proponent to consult with the 17 Schedule B participating Aboriginal Groups;
 - The draft AIR, which outlines the issues to be addressed by the Proponent during the EA and the information that the Proponent must include in their Application, including the VCs and study boundaries; and
 - Screening of the Application, to evaluate whether the Application contained the information required by the AIR and could be accepted for technical review by EAO.

During Application Review, which began on June 6, 2014, and ended on November 12, 2014, the following documents were provided to Working Group members for review and comment:

- The Project Application, containing information required by the AIR, including Aboriginal Groups' information, the results of the baseline studies, an assessment of potential adverse effects of the proposed Project, and the proposed avoidance and mitigation;
- Conceptual Fish Habitat Offsetting Plans;
- July 31, 2014 Addendum to the Application;
- Technical Memos, containing supplemental technical information required by

- Advisory Working Group Members and/or EAO;
- Issues Tracking Table, which contains the comments and questions raised by Aboriginal Groups' representatives during the review of the Application, and the Proponent's responses;
- Draft TOC and CPD; and
- EAO's draft Assessment Report to the responsible Ministers.

Comments and information, including Traditional Land Use Study information, received from Aboriginal Groups until November 3, 2014 were fully considered by EAO, and incorporated into the final versions of documents when appropriate. Comments received on the Application from Aboriginal Groups, along with the Proponent's responses, are located in the tracking table (Appendix 2) of this Report.

14.3 Government-to-Government Consultation

EAO provided the opportunity for government-to-government consultation to each of the participating Schedule B and Schedule C Aboriginal Groups to discuss their views on potential impacts of the proposed Project on their Aboriginal Interests. Meetings with specific Aboriginal Groups are described in section 18 below.

14.4 Regional Workshops with Aboriginal Groups

EAO organized regional workshops with participating Aboriginal Groups to provide an overview of proposed LNG-related gas pipeline and facility projects, relevant regulatory processes and to provide an opportunity for Aboriginal Groups to identify key issues of concern for further discussions. The OGC participated and presented at each of these workshops on its regulatory authorities, Area Based Analysis, and the Pipeline Corridor Analysis (PCA).

The following workshops were held:

- November 26, 2013: Workshop held in Prince George. In attendance were representatives from Carrier Sekani Tribal Council, Lake Babine Nation, Lheidli-T'enneh First Nation, Nadleh Whut'en First Nation, Nak'azdli Band, Saik'uz First Nation, Skin Tyee Nation, Stellat'en First Nation, Tl'azt'en Nation, Wet'suwet'en First Nation and Yekooche First Nation. Themes raised during the workshop included capacity, funding, consultation and accommodation, cultural values, cumulative effects, impacts on wildlife and fish habitat, revenue sharing, strategic engagement and timeframes.

- November 28, 2013: Workshop held in Terrace. In attendance were representatives from Gitanyow First Nation, Gitga'at First Nation, Haisla Nation, Kitselas First Nation, Kitsumkalum First Nation, Lake Babine Nation, Metlakatla First Nation and Nisga'a Lisims Government. Themes raised during the workshop included air quality, capacity, cumulative effects, fish, wildlife and habitats, shipping and marine, and socioeconomics.
- December 13, 2013: Workshop held in Hazelton for Gitxsan. *Simgiigyeyet* on Schedule B of any of the proposed pipeline projects in Gitxsan territory were invited to attend. Thirteen *huwilp* were represented. Key themes raised during the workshop included culture and heritage, fish, wildlife, plant gathering, human health and accidents and malfunctions. To ensure open communication, the workshop proceedings were provided to the workshop participants as well as all of the Gitxsan *huwilp* included on Schedule B of the Section 11 Order.
- February 4, 2014: Northern Pipelines Workshop held in Prince George with teleconference in Terrace. In attendance were representatives invited from the Working Groups for the two northern pipeline currently proposed, which also included attendance from Aboriginal Groups involved in the review of the Coastal GasLink Project, including: Doig River First Nation, Fort Nelson First Nation, Gitanyow, Gitxaala Nation, Gitxsan, Halfway River First Nation, Kitsumkalum First Nation, Lake Babine Nation, Lax Kw'alaams Band, McLeod Lake Indian Band, Metlakatla First Nation, Nak'azdli Band, Nisga'a Lisims Government, Sauteau First Nations, Takla Lake First Nation, Tl'azt'en Nation, West Moberly First Nations, and Yekooche First Nation. Themes raised included recognition of hereditary systems, Skeena fisheries concerns, Forest Annual Allowable Cuts, and process issues.
- May 29-30, 2014: Natural Gas Pipelines Workshop held in Prince George. In attendance were First Nation representatives from Gitxsan, Fort Nelson First Nation, Doig River First Nation, Sauteau First Nations, Lake Babine Nation, Lax Kw'alaams Band, Kitselas First Nation, Halfway River First Nation, Yekooche First Nation, Carrier Sekani Tribal Council, Nadleh Whut'en First Nation, Lheidli-T'enneh First Nation, Nee-Tahi-Buhn Band, Nisga'a Lisims Government, Nak'azdli Band, McLeod Lake Indian Band, the Office of the Hereditary Chiefs of the Wet'suwet'en, Blueberry River First Nations, and West Moberly First Nations. This workshop presented strategic stewardship initiatives being contemplated or undertaken by the Province to respond to key issues of concerns identified in earlier workshops including the LNG Environmental Stewardship Initiative (ESI), the provincial Environmental Mitigation Policy and the proposed province-wide Cumulative Effects Management Framework, and PCA.

15 Proponent-Led Consultation Activities with Aboriginal Groups

As part of the Section 11 Order, EAO directed the Proponent to undertake procedural aspects of consultation during the EA. The Section 11 Order issued by EAO required the Proponent to develop and share drafts of an Aboriginal Consultation Plan and three Aboriginal Consultation Reports with Aboriginal Groups at prescribed milestones during the EA process. These documents were reviewed by Aboriginal Groups prior to being submitted to EAO, to enable updates in light of input received and concerns expressed by Aboriginal Groups. The intent of these documents was to enable EAO to understand the Proponent's consultation efforts and the perspectives of Aboriginal Groups related to those efforts, and to evaluate the Proponent's consultation plan for subsequent activities with Aboriginal Groups during Application Review.

From 2013 to 2014, the Proponent used a number of communication and information sharing methods including meetings with elected Chiefs and Council, Hereditary Chiefs and band staff; community open houses; site visits; tours of the proposed ROW and of existing pipeline facilities in northeast BC; telephone calls and written communication as well as a comprehensive project website. The Proponent-led engagement involved:

- Information sharing and discussions on routing, route alternatives and construction methods;
- Discussion of potential adverse effects on Aboriginal Interests, and possible mitigations;
- Information sharing on the proposed Project regarding terrestrial (vegetation/reclamation, wildlife), aquatic (water quality and fish), air quality (dust management and GHG emissions), heritage (palaeontology and archaeology), and cumulative effects impacts;
- Engagement on socio-economic issues including studies;
- Agreement for capacity funding to support ongoing engagement and involvement in the regulatory process;
- TLUS;
- Meetings to specifically discuss route options and proposed changes;
- Traditional Ecological Knowledge data collection; and
Engagement on economic benefits, contracting, education and training opportunities.

In addition, the Proponent participated in the majority of Working Group activities, including making proposed Project presentations and participating in discussions at Working Group meetings, and tracking and responding to comments from Aboriginal Groups on the draft AIR and the Application.

16 Common concerns raised by Aboriginal Groups

This section summarizes common concerns raised by Aboriginal Groups throughout the EA process, and EAO's responses to those concerns.

16.1 EA Timelines, Number of Projects, and Capacity of Aboriginal Groups

In February 2013, two LNG related projects were in the early stages of consideration by EAO. By February 2014, there were four LNG-related pipelines and three export facility projects in northern BC in various stages of review by EAO, as well as an amendment request for a Certified project. These projects, in addition to upstream natural gas development, mining, forestry and other natural resource development proposals in northern BC, resulted in increased consultative activity with Aboriginal Groups.

EAO heard extensive concerns expressed by most Aboriginal Groups involved in the proposed Project about the volume and pace of the work that made it challenging for them to effectively participate in the EA.

To address these concerns, EAO:

- Offered a Valued Component Guidance training session in the summer of 2013 for Aboriginal Groups across northern BC, to provide a deeper knowledge base to participate in and understand how EAO conducts EAs;
- Encouraged proponents and Aboriginal Groups to discuss capacity funding to enable Aboriginal Groups to be engaged in technical review, community dialogue, and identification of information requirements, project reviews and responses to key documents throughout the Project review (EAO understands that funding was offered and in all cases at least initial funding provided for Project engagement by the Proponent to Aboriginal Groups);
- Provided grant funding in lump sum amounts to Aboriginal Groups, based on all proposed projects related to LNG rather than smaller amounts being provided for each proposed project to enable more effective use of funds for each Aboriginal Group;
- Appointed a First Nations LNG Lead to support both project-specific consultation, and strategic-level regional workshops for Aboriginal Groups;
- Throughout the process, considered and, where appropriate, granted timeline extensions for participating Aboriginal Groups in response to their direct requests;
- Organized several regional meetings (described in more detail in section 14.4 above) with Aboriginal Groups to discuss all the proposed LNG-related projects

together, addressing regulators roles and the regulatory process, broad government policy matters and initiatives – and to give Aboriginal Groups the opportunity to express their concerns on all the projects in a common forum; and

- Worked to ensure that Working Group meetings, public open houses and public comment periods were scheduled in advance to avoid overlap, provide notice to make it easier for those with an interest in multiple projects to participate in meetings about this Project.

Public and Aboriginal Group concerns over the potential impacts of multiple pipelines in BC was prevalent throughout the EA. In response, EAO undertook a strategic level assessment developed in collaboration with EAO, the OGC, FLNR, and MOE to identify how the proposed pipeline corridors may overlap known and legally-designated resource values on the land.

EAO introduced the PCA to Aboriginal Groups at the May 29 - 30, 2014 workshop in Prince George, described below, and a link to the tool was subsequently shared with Aboriginal Groups¹⁵ for their review and use.

EAO adopted a planned approach to the multiple proposed LNG-related projects to ensure specific project EAs were conducted in the context of proposed LNG development. This approach enabled Aboriginal Groups, communities and stakeholders in northern BC to have opportunities to participate in both project-specific EAs and the discussion on cross-project potential impacts and benefits.

The approach includes a Memorandum of Understanding between EAO and the OGC that:

- Streamlines project reviews to the extent practicable to avoid duplication of work for participants in the EA process;
- Coordinates Aboriginal Groups' engagement to address strategic and operational questions at the same time;
- Coordinates consultations including the sharing of strength of claim information, key concerns brought forward by Aboriginal Groups and responses from EAO provided during Project review; and
- Ensures the compliance and enforcement regime is robust throughout regulatory review and, if approvals are granted, that enforcement action is effective.

¹⁵ http://forsite.ca/pca/pca_login.html

Each of these initiatives was intended to support Aboriginal Groups, communities, stakeholders and public engagement in the review of proposed LNG-related projects by bringing a strategic lens to project specific reviews.

16.2 Adequacy of the Effects Assessment, Including VC Selection and Baseline Study Methodology

During the EA, several Aboriginal Groups expressed concern about the adequacy of the effects assessment, including VC selection and baseline study methodology.

Before a draft AIR was developed, EAO required the Proponent to produce a VC selection document (August 2013), which was made available for review and comment by the Working Group. EAO continued to consult with all Working Group members on several versions of the draft AIR before issuing the AIR.

For the purposes of determining the appropriateness of the information in the Application, EAO was satisfied that the Proponent's Application contained the information as set out in the AIR.

If an EA Certificate is issued and the proposed Project proceeds to permitting, the Proponent would be required to complete additional baseline and field studies to fulfill permitting requirements. In addition, EAO proposes a number of conditions that would entail additional study prior to permitting, including a requirement for the Proponent to develop EMPs presented in the Application. In addition, EAO proposes a condition requiring the Proponent to continue to engage with Aboriginal Groups in the development of the EMP, various off-setting plans and conditions.

16.3 Conversion of a Natural Gas Pipeline to an Oil Pipeline

Many Aboriginal Groups expressed deep concern that the proposed pipeline could be converted from natural gas to an oil or bitumen pipeline.

The Province has committed to pursue options to prohibit any potential conversion of natural gas pipelines to transport oil or diluted bitumen, in response to Aboriginal Groups' concerns arising in the EAs for new natural gas pipelines.

In a letter to Wet'suwet'en hereditary and elected chiefs dated October 22, 2014, the Honourable Rich Coleman, Minister for Natural Gas Development communicated a proposal to advance a regulation under the *Oil and Gas Activities Act* that would prohibit

the OGC from permitting any conversion of a natural gas pipeline supplying a LNG facility to an oil or diluted bitumen pipeline.

The CPD, which is a schedule of the EA Certificate, describes the components of the proposed Project, and specifically states that the proposed Project would be a natural gas pipeline. If an EA Certificate is issued for the proposed Project, the Proponent must adhere to the EA Certificate, including the legally-binding CPD.

16.4 Location of Construction Camps and Ancillary Facilities

Many Aboriginal Groups expressed concern that the site-specific effects of potential construction camps and ancillary facilities were not specifically assessed during the EA. To construct the proposed Project, ancillary sites, such as access roads, temporary bridges, storage areas for equipment and pipe, as well as construction camps to house workers, would be required.

Provincial regulation of major projects occurs in stages – the Province is committed to consulting potentially affected Aboriginal Groups at each stage. EAO is of the view that it is reasonable to make a conclusion about the seriousness of potential impacts of a project even where additional detail is forthcoming at subsequent stages. During the EA, EAO directed the Proponent to assess the potential effects of the proposed Project (including ancillary facilities) on VCs in the area of the proposed Project footprint, the local study area, and the regional study area. If an EA Certificate is granted, OGC would be responsible for permitting the proposed Project during the detailed design stage.

The EA included the consideration of ancillary sites, including storage areas, construction camps, and access roads, and the preliminary locations of construction camps, as described in section 2.2 of this Report. The specific footprints were not included because the locations for these sites would be developed during the construction planning and detailed engineering design. In many cases the specific locations would be informed by Proponent-led discussions with Aboriginal Groups.

EAO has proposed a condition that would require the Proponent to continue to engage with Aboriginal Groups regarding the development of the EMP, as well as any plans set out in the TOC, and other relevant plans developed to meet regulatory requirements issues.

EAO notes that, should an EA Certificate be granted for the proposed Project, OGC would consider ancillary sites during permitting, including worker camps, laydown, and storage areas. Specifically, OGC would need to consider a pipeline permit application

for the Proponent to undertake any proposed pipeline activity, whether within an existing ROW or over new Crown land or private land. As part of a pipeline application to OGC, proponents are required to prepare Construction Plan(s) in accordance with the *Oil and Gas Activities Act* (OGAA) Section. 24(1)(b). The Construction Plans include locations, dimensions and areas of short term (less than two year tenure) ancillary sites (decking sites, temporary workspaces, shooflies, etc.), and would be shared with all Aboriginal Groups as part of the consultation packages.

16.5 Cumulative Effects

Aboriginal Groups expressed concerns about the inadequacy of the cumulative effects assessment of past, present and reasonably foreseeable industrial activity in their traditional territory. Specifically, many Aboriginal Groups sought a cumulative effects assessment of their territory, relative to their respective Aboriginal Interests. Throughout the review, EAO set out to address Aboriginal Groups' concerns regarding cumulative effects related to assessing the seriousness of impact of the proposed Project on Aboriginal Interests.

EAO considered the potential cumulative impacts of multiple proposed LNG Projects, along with past, current and reasonably foreseeable future projects (listed in the Proponent's Application), on Aboriginal Interests when assessing the seriousness of impacts on Aboriginal Interests. EAO drew on relevant information provided by the Proponent regarding the cumulative effects assessment of VCs, as well the potential impacts of a proposed Project on Aboriginal Interests. Cumulative effects are examined and assessed in each VC section of Part B of this Report, which considers information regarding the baseline conditions of selected VCs.

EAO also organized a regional workshop for Aboriginal Groups on May 29 - 30, 2014 that included presentation of the new Cumulative Effects Management Framework intended to guide natural resource operational decisions in BC.

16.6 Synchronous Permitting

Aboriginal Groups raised issues regarding synchronous permitting including the short timeframes required to respond to the OGC permit application requests, lack of capacity to respond to such requests and concern that permits would be issued before a decision is made on whether to issue an EA Certificate.

Synchronous permitting is a component of the Memorandum of Understanding between OGC and EAO. It is a flexible approach, giving proponents the opportunity to have both the EA and permitting processes proceed in tandem. This creates timeline efficiencies with the permitting processes if an EA Certificate is issued.

While synchronous permitting has similar attributes to concurrent permitting, the former proceeds without legislated timelines for decisions on the permits following any issuance of an EA Certificate. A permit for a pipeline or could not be issued by the OGC in advance of an EA Certificate, but the permit applications can be considered simultaneously.

The synchronous permitting process does not lessen opportunities for Aboriginal Groups to participate and comment on permit applications that are before the OGC; rather it enables an approach where Aboriginal Groups can work with both regulators at one time to reduce the burden of multiple meetings with multiple agencies.

The OGC will rely on the information developed and shared in the EA process to understand any broader concerns raised by Aboriginal Groups that could necessarily inform permitting decisions and required consultation with Aboriginal Groups.

16.7 Pipeline Benefit Discussions and Other LNG-Related Initiatives

The Province, led by the Ministry of Aboriginal Relations and Reconciliation (MARR), has approached Aboriginal Groups potentially affected by this proposed Project, and other LNG-related projects, to discuss initiatives that would provide economic, environmental and training benefits as outlined below.

16.7.1 Economic Benefits

The Province has actively pursued opportunities to discuss economic benefit sharing with all Aboriginal Groups affected by the proposed Project. Aboriginal Groups have been offered capacity funding to engage in benefit-sharing discussions and have been presented with benefit sharing offers by the Province. These economic benefits are in addition to any economic benefit arrangements with the Proponent and Aboriginal Groups under negotiation. As of the date of completing this Report, two agreements between the Proponent have been concluded - with Nisga'a Nation and Yekooche First Nation.

Table 16.1 provides a summary of the status of Project Agreements between the Proponent and Aboriginal Group.

Table 16-1: Status of Economic Benefits Agreements Between the Proponent and Aboriginal Groups (Excluding Nisga'a Nation) as of October 29, 2014

	Aboriginal Group	Economic Benefits Agreement Principles and Objectives Tabled	Status of Economic Benefits Agreement Negotiations
1	Blueberry River First Nations	Yes	In negotiation
2	Doig River First Nation	Yes	In negotiation
3	Gitanyow Hereditary Chiefs Office	Yes	In negotiation
4	Gitxaala Nation	Yes	In negotiation
5	Gitxsan	Yes	In negotiation
6	Halfway River First Nation	Yes	In negotiation
7	Kitselas First Nation	Yes	In negotiation
8	Kitsumkalum First Nation	Yes	In negotiation
9	Lake Babine Nation	Yes	In negotiation
10	Lax Kw'alaams Band	Yes	In negotiation
11	McLeod Lake Indian Band	Yes	In negotiation
12	Metlakatla First Nation	Yes	In negotiation
13	Nak'azdli Band	Yes	In negotiation
14	Saulteau First Nations	Yes	In negotiation
15	Takla Lake First Nation	No	To be initiated as soon as possible ¹⁶
16	T'lazt'en Nation	Yes	In negotiation
17	West Moberly First Nations	Yes	In negotiation
18	Yekooche First Nation	Yes	Complete

16.7.2 LNG Environmental Stewardship Initiative

In May 2014, the Province announced an environmental stewardship initiative (ESI) to be developed collaboratively with Aboriginal Groups affected by proposed LNG-related infrastructure, including Aboriginal Groups affected by the proposed Project. The Province initiated the proposed ESI in response to the environmental priorities that Aboriginal Groups have expressed through various LNG-related discussions, including negotiations that are occurring on economic benefits. The ESI is a proposal to collaboratively develop a long-term structure that can bring Aboriginal Groups,

¹⁶ Based on Takla Lake First Nation's submission to EAO dated October 29, 2014.

governments and industry together to monitor, assess, research, maintain and restore important values on the land. Initial collaborative design workshops with Aboriginal Groups were held from September 8 through September 16, 2014 in Fort St. John, Prince George, Prince Rupert, and Smithers. The collaborative design process indicates interest in advancing the ESI concept as part of ongoing negotiations.

The Province will be responding to the recommendations from the first phase of design in October. Based on input from Aboriginal Groups across the north and subject to the outcomes of phase one, there is an interest to explore a process to continue ESI design as well as implement demonstration projects. Potential ESI demonstration projects being contemplated include enhanced environmental monitoring opportunities that complement or support environmental mitigation and monitoring plans developed by the Proponent or additional cumulative effects assessment of key values within the key watersheds. Further discussions with Aboriginal Groups on the next phase of ESI design as well as these potential projects are planned for November 2014.

16.7.3 Employment Opportunities, Training, and Benefits

Aboriginal Groups are a key element of the province's workforce and can play a key role in meeting the potential future workforce demand created by the proposed Project. A number of provincial and federal programs exist to assist Aboriginal Groups in addressing training requirements associated with the current and potential future workforce needs associated with LNG-related proposals, including the proposed Project. As economic benefit negotiations advance, the Province will be engaging Aboriginal Groups affected by the proposed Project to supplement community-related skills training requirements.

These initiatives are additional measures developed outside of the regulatory process, intended to help address the impacts of LNG-related development, including the proposed Project, on the Aboriginal Interests of Aboriginal Groups.

In response to questions raised by Aboriginal Groups about training and education programs, and employment opportunities related to the proposed Project, EAO is proposing a condition that would require the Proponent to develop and update a Social and Economic Effects Management Plan (SEEMP) that would include:

- Consultation with affected Aboriginal Groups, local governments and service delivery agencies;
- Programs related to employment and contracting opportunities, skills training and education;
- Monitoring and reporting on the effectiveness of mitigation measures; and

- An adaptive management approach.

16.8 Project-Related Benefits for Aboriginal Groups

For Aboriginal Groups, the proposed Project is expected to provide important economic opportunities, including capacity-building initiatives to support employment, contracting and business development. Key elements of the Proponent's Aboriginal and Local Contracting Strategy developed for this Project are provided in the Application and include:

- Designating services that would be conducted only by Qualified Aboriginal Businesses, including medical and security services, ROW clearing, camps and catering services;
- Assessing community capacity and identifying work packages for Aboriginal and local businesses and workers;
- Implementing an Aboriginal participation component in the Request For Proposals relating to prime contractors and consideration of this criteria in the evaluation of those proposals;
- Providing successful prime contractors with a list of the Aboriginal and local contractors that the Proponent is aware of to be considered for work on the Project; and
- Providing information on contracting practices, employment opportunities, contractor qualification information in advance of Project construction; successful prime contractor(s) after contractor award; e-brief meetings with unsuccessful Aboriginal and local contractors to explain reasons for selection.

On-going Project planning has included Aboriginal participation in engineering and environmental studies, land and survey services, specialized consulting activities and helicopter support. For example, as reported in the Application, of the \$24 million spent on land surveying in 2013, some \$17 million was spent on contracts in BC including \$6 million in goods and services purchased from Aboriginal businesses and workers (25% of total), \$3 million from other local businesses and workers (13% of total), \$8 million from other contractors and suppliers based in BC (33% of total), and \$7 million from outside BC (29%).

Construction services are expected to include provision of non-camp related lodging (e.g., hotels, motels and campgrounds), restaurants, recreational facilities, helicopter support and local service stations. Construction subcontracting opportunities related to pipeline and associated facility construction are expected to include:

- Site preparation and road access clearing and grading,
- Gravel processing;
- Hauling materials and products (e.g., water, equipment and pipe)
- Site cleanup and reclamation;
- Monitors;
- Hydrovac crossings and trenchless crossings (e.g., HDD);
- Fuel supply;
- Flag personnel;
- Equipment rental and lease (e.g., generators, lighting towers and pumps);
- Security and medical services;
- Pressure testing services;
- Recycling services;
- Storage sites providers; and
- Preparation and management of construction camps (e.g., catering, office supplies, janitorial, waste and sewage services, and housekeeping).

At the time of Application submission, the Proponent had purchased \$10 million in goods and services from Aboriginal suppliers, through its prime contractors, and anticipates this number would increase during the construction phase. The Proponent is committed to continuing to engage with Aboriginal Groups and local communities through the life of the Project to help identify meaningful economic opportunities that would reflect the specific interests of each Aboriginal Group and local community.

16.9 Effective Environmental Management

Many Aboriginal Groups requested clarification on the process for implanting EMPs, monitoring and response to any accidents or malfunctions that occur during construction or operation of the proposed Project.

The Environmental Inspector (EI) is the on-site Proponent representative responsible for site compliance with the Project specific conditions (e.g., Environmental Management Plan and specific permit/approval conditions). EAO has proposed a condition for the EI that includes the requirement of an EI with the authority to stop work or relocate specific activities that may result in non-conformance with the environmental program, Project specific environmental commitments, or applicable laws and regulations.

16.10 Other Matters of Concern to Aboriginal Groups

The following table contains common concerns raised by multiple Aboriginal Groups throughout the EA process, and EAO's responses to those concerns.

Key Issue	Aboriginal Group	EAO Response
Improper consideration of multiple projects and cumulative effects	McLeod Lake Indian Band Saulteau First Nations Lake Babine Nation Carrier Sekani Tribal Council Nak'azdli Band Halfway River First Nation Kitselas First Nation Kitsumkalum First Nation Blueberry River First Nations West Moberly First Nations Takla Lake First Nation Gitxaala Nation Treaty 8 Tribal Association Tl'azten Nation Gitanyow Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation	Cumulative effects and multiple projects are considered in section 16.5.
Capacity, funding and timelines	Doig River First Nation McLeod Lake Indian Band Carrier Sekani Tribal Council Tsay Keh Dene Nation Saulteau First Nations Lake Babine Nation Nak'azdli Band Kitselas First Nation Takla Lake First Nation Gitxsan Blueberry River First Nations West Moberly First Nations Gitxaala Nation Metlakatla First Nation Halfway River First Nation Kitsumkalum First Nation Gitanyow Lax Kw'alaams Band	Capacity funding and timelines are considered in section 14.1 and 16.1.
Air quality	Tsay Keh Dene Nation Lake Babine Nation Yekooche First Nation Kitsumkalum First Nation Doig River First Nation Nak'azdli Band Takla Lake First Nation	Effects of air quality are considered in section 5.2. EAO is satisfied that the proposed Project is not likely to have significant residual adverse noise effects, as adverse effects would be highly

Key Issue	Aboriginal Group	EAO Response
		localized, and the effects assessments predict compliance with the OGC's <i>Noise Control Best Practices Guideline</i> and the Health Canada guidance at all compressor stations and during pipeline construction.
GHGs and impacts to climate	Takla Lake First Nation Tsay Keh Dene Nation Lake Babine Nation Kitsumkalum First Nation Nak'azdli Band Doig River First Nation	Effects of GHGs are considered in section 5.3. EAO is proposing a condition that would require the Proponent to develop a Greenhouse Gas Emissions Management Plan, with guidance from the MNGD and CAS. EAO concludes that there would likely be significant residual adverse effects of the proposed Project related to GHG emissions.
Training, contracting and employment opportunities including economic benefits Transient workforce should not reduce Aboriginal Group opportunities	Doig River First Nation McLeod Lake Indian Band Saulteau First Nations Kitselas First Nation Gitxsan Lake Babine Nation Halfway River First Nation Tsay Keh Dene Nation Takla Lake First Nation Kitsumkalum First Nation Metlakatla First Nation Gitanyow Nak'azdli Band Blueberry River First Nations Lax Kw'alaams Band Gitxaala Nation Tl'azt'en Nation	Economic effects are considered in section 6; and economic benefits including training and employment initiatives being discussed with Aboriginal Groups and the Province are discussed in section 13.2.1. For Aboriginal Groups, the proposed Project would have the potential to provide important economic opportunities, including capacity-building initiatives to support employment, contracting and business development. These initiatives include: - Identifying economic opportunities tailored and specific to each Aboriginal Group under agreements with the Proponent that would remain confidential; and - Developing an Aboriginal Participation Strategy that would identify and attempt to match Aboriginal Groups' contracting capacity with work packages for Aboriginal businesses and workers, and be adjusted as the proposed Project advances. The Application defines the proposed Aboriginal Participation Strategy in more detail.

Key Issue	Aboriginal Group	EAO Response
		EAO proposes a condition that would require the Proponent to develop and implement a Social and Economic Effects Management Plan (SEEMP). One of the objectives of the SEEMP would be to include the Proponent's approach to programs related to employment and contracting opportunities, skills training and education. The Proponent has been actively involved in discussions with local training organizations, post-secondary institutions and Aboriginal communities. These discussions include the sharing of information to ensure that meaningful partnerships are developed for both the Project and the community. Objectives and measurable outcomes would be developed alongside the training/ education partner and would be part of the final partnership plans. Partnership announcements for local education and training initiatives started in mid-2014.
Aboriginal Interests • Maintaining Treaty rights for Treaty 8 Nations • Monitoring potential effects • Loss of knowledge, traditional skills • Loss of resources • Traditional foods • Inadequate consideration of TLU/TEK	Doig River First Nation Nak'azdli Band Carrier Sekani Tribal Council Takla Lake First Nation Lake Babine Nation Kitsumkalum First Nation Halfway River First Nation Blueberry River First Nations West Moberly First Nations Tl'azten Nation Nak'azdli Band Takla Lake First Nation Gitxaala Nation Lax Kw'alaams Band Metlakatla First Nation	For the purposes of determining the appropriateness of the information in the Application, EAO was satisfied that the Proponent's Application contained the information as set out in the AIR. In addition, EAO has proposed a condition that would require the Proponent to update the EMP presented in the Application in consultation with Aboriginal Groups. Any additional ATK/TLU information provided by Aboriginal Groups, which would include additional Aboriginal hunting or trapping data, would also be considered by the Proponent to help inform the development of plans, any additional site-specific mitigation required as well as permitting decisions by OGC. The Proponent has committed to continue engagement with Aboriginal Groups about construction planning and Project design, including communication of the schedule of construction activities.

Key Issue	Aboriginal Group	EAO Response
Accidents and Malfunctions - Pipeline safety and leaks - Marine spills - Seismic activity - Acid rock drainage - Risk of fire or explosion	Kitseles First Nation Kitsumkalum First Nation Takla Lake First Nation Saulteau First Nations Lake Babine Nation Gitxsan Prophet River First Nation West Moberly First Nations Blueberry River First Nations Halfway River First Nation McLeod Lake Indian Band Nak'azdli Band Gitxaala Nation Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation Tl'azt'en Nation	Accidents and malfunctions are considered in section 10. Based on the combination of project design measures, implementation of Environmental Management Plans, and recognizing the recommended conditions, EAO is satisfied that neither accidents or malfunctions nor effects of the environment on the proposed Project is likely to pose significant risk to environmental, social, economic, health or heritage VCs associated with the Project.
Upstream development including fracking	Halfway River First Nation McLeod Lake Indian Band Takla Lake First Nation Blueberry River First Nations Tl'azt'en Nation Gitxsan Nak'azdli Band Doig River First Nation Saulteau First Nation West Moberly First Nations McLeod Lake Indian Band	EAO acknowledges the concerns of Aboriginal Groups regarding potential effects from upstream development. EAO has focused its assessment regarding these particular proposed upstream LNG-related facilities in relation to the adverse impacts flowing from these particular proposed Projects. However, this EA has considered the cumulative effects assessments of this proposed Project in relation to past, present and reasonably foreseeable projects. In addition, EAO requested that the Ministry of Natural Gas Development and the OGC provide an upstream forecast to provide information to Aboriginal Groups and Ministers for their consideration. This upstream forecast was provided to all Aboriginal Groups potentially impacted by LNG-related proposed projects by EAO on September 22, 2014.
Consultation - Adequacy - Determining who to consult - What constitutes consultation - After certificate issued - Meaningful	Carrier Sekani Tribal Council Nak'azdli Band Gitxsan Kitsumkalum First Nation Blueberry River First Nations Halfway River First Nation Takla Lake First Nation Gitxaala Nation Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation	The extent (or level) of the Crown's obligation to consult is described in the <i>Haida</i> case as lying on a spectrum from notification to deep consultation. The EA process is not a rights determining process of claimed Aboriginal rights or title. Instead, a key objective of the EA process is to identify potential adverse effects of proposed projects on Aboriginal Interests and explore measures to avoid, mitigate or otherwise

Key Issue	Aboriginal Group	EAO Response
opportunity to provide input	Saulteau First Nation West Moberly First Nations McLeod Lake Indian Band	appropriately address such effects. EAO works with hereditary systems if Aboriginal Groups have identified that such hereditary systems represent the rights holding group, for example the Office of Wet'suwet'en and the Gitanyow Hereditary Chiefs Office. In the absence of any coordinating body, as is currently the case for Gitxsan, EAO consults with individual House Chiefs whose House Territories are potentially affected by a proposed Project.
Common pipeline corridor including alternate route considerations	Halfway River First Nation Tsay Keh Dene Nation Saulteau First Nations Blueberry River First Nations West Moberly First Nations Gitxaala Nation Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation Nak'azdli Band	EAO does not have a role in making decisions about the locations of proposed pipeline routes; however, EAO has and will continue to share this concern with proponents to help inform their routing decisions.
Increase in access	Halfway River First Nation Tsay Keh Dene Nation Kitsumkalum First Nation Saulteau First Nations Nak'azdli Band Takla Lake First Nation Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band	Access roads are considered in section 17 and section 7.2 of this Report. Marine transportation and access in the marine environment are considered in section 17.2.6.
Soil erosion and terrain stability	Kitseles First Nation Yekooche First Nation Takla Lake First Nation Doig River First Nation	Soil erosion and terrain stability are considered in section 5.4.
Human health concerns - Compressor stations (including noise) - Impact on water source - Cumulative effects - Risk of contamination of country foods	McLeod Lake Indian Band Gitxsan Kitsumkalum First Nation Saulteau First Nations Takla Lake First Nation Tsay Keh Dene Nation Kitseles First Nation West Moberly First Nations Halfway River First Nation Yekooche First Nation Nak'azdli Band Blueberry River First Nations Gitxaala Nation	Human health is considered in section 9.

Key Issue	Aboriginal Group	EAO Response
	Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation	
EA methodology: Baseline information and Valued Component (VC) selection - Gaps and level of detail in baseline info. - Residual effects not applied consistently - EA scoping - Spatial extent	Nak'azdli Band Kitsumkalum First Nation Carrier Sekani Tribal Council Lake Babine Nation Blueberry River First Nations Gitxaala Nation Tl'azten Nation Yekooche First Nation Gitanyow Nak'azdli Band Takla Lake First Nation Lax Kw'alaams Band Metlakatla First Nation Doig River First Nation Saulteau First Nation West Moberly First Nations McLeod Lake Indian Band	The adequacy of baseline information for a particular VC has been examined in EAO's assessment in each VC section in Part B of this Report. Concerns raised by Aboriginal Groups relating to EA methodology, VC selection were considered by EAO during Pre-Application and responses were reflected in the Proponent Tracking Table and are considered in section 16.2.
Social effects	Kitsumkalum First Nation Kitselas First Nation Takla Lake First Nation Lake Babine Nation Blueberry River First Nations Doig River First Nation Gitxsan West Moberly First Nations Halfway River First Nation McLeod Lake Indian Band Nak'azdli Band Gitxaala Nation Lax Kw'alaams Band Metlakatla First Nation	Social effects are considered in section 7, with the assessment of the following VC's: Communities, infrastructure and services; transportation and access; and land and resource use. EAO is proposing a condition that would require the Proponent to develop a Socio-Economic Effects Management Plan (SEEMP). The SEEMP would include on-going monitoring, adaptive management and reporting of the Project's social and economic effects
Old growth Forests	McLeod Lake Indian Band Saulteau First Nations Gitxsan Doig River First Nation Takla Lake First Nation	Old growth management areas are considered in section 5.7. EAO is proposing a condition that would require the Proponent to avoid an incursion into an Old Growth Areas to the extent practicable, and where unavoidable, prepare a report to FLNR and propose habitat compensation if required.
Confidentiality of TLU/TEK information	McLeod Lake Indian Band Takla Lake First Nation Tsay Keh Dene Nation	EAO does not generally accept documents on a confidential basis, as it is usually necessary for EAO to share

Key Issue	Aboriginal Group	EAO Response
		information with Aboriginal Groups and working group members in order to adhere to principles of administrative fairness. Further, because EAO uses this information to inform decision making, EAO posts most documents related to an EA process on its electronic project information centre in order to ensure transparency and enhance public confidence in the process.

17 Summary of Potential Impacts on Aboriginal Interests

The sections below summarize impacts on Aboriginal Interests based on EAO and Proponent engagement efforts to consult with Aboriginal Groups. They include key issues and concerns raised by Aboriginal Groups, potential impacts of the Project on Aboriginal Interests, and EAO's response.

17.1 General Impacts of the Proposed Project

The proposed Project would consist of both land and marine based sections of pipeline. The primary impacts of the proposed Project on the surface of the land would include disturbance of an approximately 900 km construction corridor approximately 50 m in width and a permanent ROW up to 32 m in width during operations. Depending on the final route, the proposed Project could include up to 780 km of land-based pipeline to Nasoga Gulf; and up to 120 km with two marine-based pipelines from Nasoga Gulf to Lelu Island. The Project Description described in Part A of this Report describes details of Project construction, including marine pipeline construction activities. In addition to associated infrastructure, including access roads and temporary construction camps, the proposed Project may include up to eight compressor stations along the proposed pipeline route at full build-out. Section 2.2 of this Report contains a complete description of the proposed Project.

Aspects of the proposed Project that would affect traditional land use in the short term during construction, with possible longer term effects during operations, include:

Installation of pipelines and compressor stations

- Installation of one 48-inch diameter land-based pipeline that would remain underground throughout the life of the Project, which would preclude use of that particular underground area.
- For the proposed marine sections there would be up to two 36-inch diameter pipelines installed on the seabed.
- Potential disruption of the use of the land for resource harvesting activities (e.g., hunting, fishing, trapping, plant gathering) and culturally important sites (e.g., gathering places, habitation sites, sacred sites), trails and travelways¹⁷ through ROW clearing, which may alter connectivity to trails and travelways. Specific locations or sites that may be impacted by the proposed route are

¹⁷ "Travelways" is a term used to refer to freshwater or ocean watercourses that are used to access traditional land use areas, whereas "trail" is used for land-based access to traditional land use areas.

described in each Aboriginal Group's section of this Report.

- Aboriginal Interests associated with the marine environment, including resource harvesting activities and marine travelways, are further discussed in section 17.2.6.
- Construction and operation of up to 8 compressor stations, that would each require 9 - 20 ha of land to be developed (cleared, graded, graveled and fenced) in addition to requiring the construction of new permanent roads where existing access is insufficient, as well as a meter station.
- Noise effects may affect the enjoyment of the immediate vicinity of compressor stations, although noise effects are not expected to exceed OGC noise control thresholds, as identified in *BC Noise Control Best Practices Guideline* and assessed at a distance 1,500 m from the facility fence line or the nearest human receptor.
- With regard to air quality, the primary source of air quality impacts would be the compressor stations during operations. The Application's air quality data note that the provincial air quality objectives would not be exceeded around any of the potential eight compressor station locations.

Access

- New access roads would be needed during construction. Detailed review of access road upgrading and development would occur during permitting. Existing infrastructure would be used to the extent practical and access may be improved along existing roads during construction, where necessary. The Proponent estimates that almost all permanent and temporary access required for project construction and operation would be upgraded roads and not new construction. Upgraded can mean any improvement to an existing road from grading to a complete rebuild, including permanent and temporary bridges. Roads to proposed compressor station locations and meter stations would be permanent, while roads developed for construction would be reclaimed and deactivated, unless otherwise directed by regulators.
- Marine traffic associated with the construction of the proposed Project would be managed following a Marine Access/Traffic Management Plan, as part of the EMP, with specific mitigation measures developed in consultation with regulatory agencies and Aboriginal Groups.
- Marine offloading facilities and barge landings would be developed for the transportation of material and equipment.

Construction camps

- The Proponent proposes to operate approximately 12 temporary self-contained construction camps to support the construction of the proposed Project. Early

construction camps, of approximately 2.5 ha in area, would be required to house up to 400 people involved in early work and may be expanded to stationary camps for the main construction of the pipeline. Main construction camps would occupy up to 26.5 ha. They would comprise nine main camps, accommodating up to 1,100 workers and three compressor stations camps accommodating up to 225 workers. Accommodation for marine pipeline construction workers would be provided on construction vessels.

- Camps would be required along the pipeline route for a three- to four-year construction period; in a specific pipeline segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017). Section 2.2 of this Report provides the location, operational period, and estimated personnel required for the proposed construction camps. Section 6 of this Report provides additional detail on camp sizes, locations and worker compositions. EAO notes that the information is preliminary and subject to change.

17.2 Potential Impacts on Specific Aboriginal Interests

EAO sought input from Aboriginal Groups on the nature and scope of their Aboriginal Interests and how they might be impacted by the proposed Project. A summary of the potential impacts is provided in the sections below. Responses to the full set of concerns are described in the Application Review Working Group Issues Tracking Table (Appendix 2), as well as in each Aboriginal Group section of this Report.

With respect to assessing the seriousness of potential impacts of the proposed Project on Aboriginal Interests, EAO considered relevant factors, including:

- The location of each Aboriginal Group's traditional territory;
- Past, present, and anticipated future Aboriginal uses of the proposed Project area and its surroundings, including the frequency and timing of such uses by each Aboriginal Group;
- The baseline conditions of selected VC's, including those associated with the exercise of Aboriginal Interests, incorporating consideration of other development in the local or regional area that may contribute to the current condition of the VC's;
- The impact of the proposed Project on the current exercise of Aboriginal Interests;
- Mitigation proposed to avoid or minimize adverse effects to corresponding Aboriginal Interests;
- Residual and cumulative effects of the proposed Project on VC's associated with the exercise of Aboriginal Interests (e.g., wildlife, vegetation, fish, water quality);

- The extent to which the proposed Project could affect each Aboriginal Group's access to, and use of the proposed Project area to exercise Aboriginal Interests;
- The relative importance of the proposed Project area and its surroundings to the exercise of each Aboriginal Group's Aboriginal Interests, including any special characteristics or unique features of that area; and
- The relative availability of other areas in reasonable proximity, within the traditional territory of each Aboriginal Group, where the meaningful exercise of Aboriginal Interests could reasonably occur.

EAO recognizes that areas within the traditional territory of each Aboriginal Group, including areas within the vicinity of the proposed Project, may be particularly important and valuable for specific qualities associated with traditional harvesting sites (e.g., hunting, fishing and gathering in areas with specific resource values or cultural importance); and that some areas may be associated with traditional harvesting activities of specific Aboriginal Groups, individual members or families.

In addition to specific mitigations proposed in the Application to avoid and minimize potential adverse effects to VC's assessed in Part B of this Report, EAO also considered the Proponent's route selection process, route refinements and its consultation with Aboriginal Groups in Pre-Application to identify and avoid or modify the proposed Project footprint in key areas of concern as a key mitigation in minimizing potential impacts of the proposed Project on Aboriginal Interests. The consultation undertaken by EAO and the Proponent throughout the Pre-Application and Application Review on the proposed Project has informed the Proponent's route refinements and construction planning to avoid or mitigate key areas of concern.

The Proponent made a number of route changes through Pre-Application and Application review, in response to concerns raised by Aboriginal Groups. Some of these key changes, including a significant southern re-routing during Pre-Application that formed the route in the proposed Project Application, aligned the route to existing disturbance and reduced new access requirements, discussed in more detail section 2.4 of this Report.

Prior to conducting a detailed effects assessment for the Application, the Proponent's initial project planning and route selection process included mitigation to avoid and reduce potential adverse effects to wildlife, vegetation, fish and fish habitat, heritage, traditional land and resource use, and to Aboriginal Interests related to hunting, trapping, fishing or gathering, including:

- Assessing multiple route options within the proposed corridor and limiting the potential for adverse environmental effects through route selection (e.g., avoiding

sensitive moose and caribou habitat and ungulate winter ranges, to the extent practical);

- Locating the route along previously disturbed areas (e.g., existing forestry cut blocks and access roads) to reduce the overall proposed Project footprint, minimize habitat fragmentation and utilize existing access roads where possible; and
- Avoiding key areas known to be important for Aboriginal Groups' current and traditional land use activities.

A discussion on preliminary route selection and a complete list of route alternatives that were considered is provided in section 2.4 of this Report and section 1.5.3 of the Application. EAO has also considered a number of route refinements submitted by the Proponent as addenda during Application Review.

17.2.1 Hunting

Aboriginal Groups identified a number of wildlife species that are traditionally important food sources to their communities that may be impacted by the proposed Project. Species of interest that were identified by Aboriginal Groups were considered in the development of the key indicators for the wildlife VC during Pre-Application. Aboriginal Groups identified the most commonly hunted big game species to be moose, deer, elk, mountain goat, bear and mountain sheep. Aboriginal Groups indicated they hunt for these species in the areas surrounding the proposed Project area (i.e., the LAA and RAA).

Several Aboriginal Groups raised the concern that because the assessment area for wildlife was for the entire pipeline length, it did not capture the variability in wildlife populations and localized effects on wildlife. Several Aboriginal Groups stressed the importance of avoiding wildlife features and implementing buffers around features and recommended that local Aboriginal Groups' knowledge be used to help identify these features. Local effects to wildlife and wildlife features were identified in the Proponent's Application and considered in EAO's assessment and characterization of residual effects.

Aboriginal Groups also requested that further mitigation be specified to avoid impacts to bear dens and requested development of grizzly bear mitigation strategy prior to the end of Application Review. In addition, it was noted that local Aboriginal Groups' knowledge should be incorporated into the monitoring program on the effectiveness of reclamation and access control efforts as part of post-construction monitoring. Aboriginal Groups also raised concerns about the current status of moose populations and impacts to moose, grizzly bear and caribou from the proposed Project, particularly

effects resulting from increased access and the potential for an increase in non-Aboriginal hunting.

Aboriginal Groups identified the cultural importance of woodland caribou that were once plentiful and hunted extensively in the past. Declining numbers of caribou and concerns with increasing loss of caribou habitat were raised as an issue by several Aboriginal Groups, including their future ability to practice Treaty or asserted Aboriginal rights to hunt, including hunting caribou.

The Application included an assessment of VCs and corresponding key indicators of biological importance to Aboriginal Groups that occur in the proposed Project area that could be adversely affected, and relate to hunting activities of Aboriginal Groups. The key indicators of the wildlife and wildlife habitat VCs include grizzly bear, woodland caribou, moose, other mammals (mountain goat, marten, fisher, bats), birds and amphibians.

An assessment of residual effects to wildlife and wildlife habitat key indicators is provided in section 5.8 of this Report. Other issues related to wildlife and hunting, including non-Aboriginal (recreational) hunting, access management and regional land and resource management plans (LRMPs) are assessed in the Land and Resource Use (section 7.3 of this Report).

EAO identified a number of residual effects on wildlife and wildlife habitat (caribou, grizzly bear, mountain goat, moose, furbearers, bats, amphibians, and birds):

- Habitat loss, alteration and fragmentation;
- Sensory disturbance, particularly during construction and in the vicinity of compressor stations during operations; and
- Increased mortality risk from predators and humans.

The Application notes that Aboriginal field participants expressed concerns about the potential adverse effects on mammal habitat and, in particular, of disturbance in mature and old forests, ungulate forage, rut and calving areas, and critical habitat for species at risk. Effects of the proposed Project on wildlife and wildlife habitat are discussed in section 5.8 of this Report.

Potential Project interactions on traditional use of lands include:

- Disruption to hunting activities through construction and operations that could limit access to traditional hunting areas; and
- Change to the local harvesting locales, disturbance to wildlife resources,

increased public access to traditional hunting areas and increased harvest pressure on wildlife populations.

EAO response

EAO considered the following key factors in assessing the potential impacts of the proposed Project on an Aboriginal Group's Aboriginal Interest associated with hunting:

- The assessment of potential effect of the proposed Project on Aboriginal Groups' Aboriginal Interests associated with hunting is informed by the analysis of potential residual effects on relevant VCs. Residual effects are predicted for the wildlife and wildlife habitat VC and are characterized in section 5.8 of this Report;
- EAO understands that an Aboriginal Group's hunting activities depend, in part, on the status of wildlife populations within their area of traditional use. The wildlife LAA for the proposed Project is a 2 km wide corridor. The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAAs are intended to capture the area where the influence of other land uses and activities could overlap with proposed Project specific effects and result in cumulative adverse effects;
- The nature and extent of effects would depend on the inherent sensitivity of each wildlife species and habitat type, the nature and timing of the disturbances, and the effectiveness of mitigation;
- The permitting process may require additional mitigation, specific to a refined construction footprint, if an EA Certificate is issued;
- The primary effects of the proposed Project on wildlife and wildlife habitat are expected to be caused by:
 - o The change in habitat as part of proposed Project construction and operation; resulting in direct habitat loss, habitat fragmentation, sensory disturbance and changes to wildlife movement; and
 - o The change in mortality risk due to the creation of corridors from the ROW and access roads, which could improve access for both predators and humans. Construction and operation of the proposed Project could also cause direct mortality from wildlife collisions, or human-wildlife conflicts.
- The residual effect on caribou is expected to be significant, while residual effects on all other key indicator species would not. The magnitude of the residual effects on caribou and grizzly bear are expected to be moderate, moose would be low to moderate, while all other species would be low, following implementation of proposed mitigation. Therefore the existence of caribou within the traditional territory of an Aboriginal Group known to hunt the species could increase the seriousness of impact of the proposed Project to its Aboriginal Interest in hunting. Aboriginal Groups known to hunt grizzly bear and moose in

their traditional territory may also experience adverse impacts to their ability to hunt;

- Overall habitat disturbance from the proposed Project would be relatively small and would be reduced during operations by revegetating the ROW. Vegetation clearing along the ROW and revegetation may also have positive effects for some wildlife species – for example, by increasing forage habitat for deer and moose. The Proponent stated that efforts have been made to locate the proposed Project in lower-risk habitats (e.g., avoiding high-quality winter and spring habitats), to reduce the overall Project footprint and subsequent requirement for clearing, and to locate proposed Project components within or adjacent to several existing disturbances;
- An Aboriginal Group's access to the proposed Project area to hunt may be restricted within its territory where it overlaps with the proposed Project area for a short period due to safety reasons during the construction period and during specific events in operations; however the geographic extent of these lands is generally small. Engagement of Aboriginal Groups during construction planning is expected to mitigate some of these short term effects;
- The majority of works would be confined to the construction phase and are temporary, lasting over a period of three to four years; in a specific pipeline segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017). It is possible that the duration of construction from site preparation to site revegetation could be greater than four years. Natural recovery would be used as the preferred method of reclamation on level terrain and at wetlands. Native tree seedlings or shrubs would be planted at select locations. As part of the Proponent's Reclamation Plan, the Proponent would encourage a vegetative cover similar to that of the adjacent land and use an appropriate native seed mix. The Proponent would continue to engage with the appropriate agencies and Aboriginal Groups in development of the Reclamation Plan. Once revegetated, there may be periodic brushing of a corridor approximately 10 m wide over the life of the pipeline within the 32 m ROW. Full, natural re-vegetation would occur after decommissioning;
- Camps and compressor stations located within the traditional territory of an Aboriginal Group may prolong the duration of any disruption to hunting activities in that area, thereby increasing the seriousness of potential impact to that Aboriginal Group's Aboriginal Interest associated with hunting;
- Key hunting sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project were considered in relation to past, present and anticipated future use of the area for hunting. Multiple hunting sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project footprint could indicate a greater potential effect on that Aboriginal Group's

Aboriginal Interest associated with hunting;

- The potential exists for increased access to the general public to key hunting areas, which may result in increased and damaging pressures on wildlife and wildlife habitat. Measures in the Application, including the development of an Access Control Management Plan, are aimed at restricting public access to reduce the risk of negative impacts from such access;
- The Proponent has proposed mitigation to avoid and minimize potential effects to wildlife and wildlife habitat, traditional land use and other concerns associated with hunting activities raised by Aboriginal Groups. The Proponent's proposed mitigation includes:
 - o Develop site-specific mitigation strategies such as a Caribou Habitat Restoration Plan for affected caribou ranges, including detailed information on locations for line-of-sight mitigation and monitoring. EAO recognizes that enhanced monitoring over the life of the proposed Project and ongoing assessment of mitigation measures may confirm the Proponent's predicted effectiveness of mitigation, but to date similar mitigation measures have not been proven to reduce increased mortality and population declines in caribou in BC and Alberta;
 - o Develop and implement a Human-Wildlife Conflict Management Plan that would include measures to prevent any direct bear mortalities associated with the construction and operations of the proposed Project;
 - o Avoid creating new access within moose winter range and, where this is not feasible, deactivate and reclaim any temporary roads with native vegetation. The Proponent has committed to implementing measures to reduce access (human and predator) along these temporary roads;
 - o Solicit input from Aboriginal Groups on monitoring requirements for the proposed Project, including mitigation and monitoring related to traditional use sites; and develop a community engagement process to facilitate site access to the proposed Project area for Aboriginal Groups to undertake traditional practices;
 - o Pursuant to Proponent-Aboriginal Groups MOUs and Project Agreements, continuing to create opportunities for Aboriginal Groups to participate and observe fieldwork being conducted on the proposed Project site;
 - o In the event hunting sites are identified during a pre-construction TLU study, mitigation may include one or more of the following measures:
 - Adhere to species-specific timing constraints;
 - Leave breaks in the pipeline trench to allow animals to cross;
 - Limit the use of chemical applications; and
 - Alternative site-specific strategies recommended by the relevant Aboriginal Group.

- o Implement the EMP, Access Management Plan and Chemical and Waste Management Plan to reduce the potential adverse effects on subsistence hunting activities and wildlife habitat;
- Proposed conditions of the EA Certificate include:
 - o Continued engagement by the Proponent with Aboriginal Groups regarding construction scheduling, the development of the EMP and other plans as required by regulatory authorities;
 - o Development and implementation of a plan that includes all relevant wildlife mitigation, as set out in the draft EMP and the Application;
 - o Development of a Caribou Mitigation and Monitoring Plan, including requirements for consultation with Aboriginal Groups with asserted traditional territories overlapping the caribou herd areas, and the provision of up to \$2 million toward a provincial caribou monitoring program;
 - o Development of a Grizzly Bear Mitigation and Monitoring Plan, including requirements for consultation with affected Aboriginal Groups and the provision of up to \$750,000 toward a provincial grizzly bear monitoring program;
 - o Development of a Moose Monitoring Plan for the Nass Wildlife Area (NWA) and a requirement for a monitoring program to assess the effectiveness of the mitigation for moose populations outside of the NWA;
 - o A requirement for the Proponent not to conduct helicopter or fixed wing flights over ungulate winter ranges during critical timing windows;
 - o A requirement for the Proponent to avoid or mitigate any disruption to Aboriginal Groups carrying out traditional use activities during operations;
 - o A requirement for the Proponent to retain Environmental Inspectors, who would have full authority to cease construction activities that are inconsistent with the proposed EA Certificate or applicable legislation; and
 - o A requirement for the Proponent to consider TUS and TEK submitted as part of, or subsequent to, the EA process.

Aboriginal Groups emphasized the need for a well-defined post-construction wildlife monitoring program, developed collaboratively with regulatory agencies and Aboriginal Groups, in order to ensure effects are as predicted, and to determine the success of mitigation, restoration and reclamation for wildlife over the long-term.

EAO is proposing a condition that would require a Post-Construction Monitoring Program as part of the EMP. The Proponent committed to completing a Post Construction Monitoring Plan, and acknowledged that if monitoring resulted in the need for further action, they would work with the appropriate regulatory authorities to implement an adaptive management approach. In addition, EAO is proposing a

condition that requires the Proponent to develop a monitoring program for Aboriginal Groups to participate in construction monitoring.

A more detailed assessment on potential effects of the proposed Project on wildlife and wildlife habitat is contained in section 5.8 of this Report. The potential impact of the proposed Project on Aboriginal Interests associated with hunting for each Aboriginal Group is described in section 18.

17.2.2 Fishing

The Application identified a total of 62 fish species with potential to occur in watercourses crossed by the terrestrial portion of the proposed route within the Freshwater Aquatic Resources RAA, nine of which are fish species at risk.

Key indicator species assessed in the Application included fish species associated with commercial, recreational or Aboriginal (CRA) fisheries, including: salmon, trout, char, eulachon, sturgeon, arctic grayling and whitefish; and fish species at risk. Aboriginal Groups, identified several fish species (e.g., salmon) that are an important part of their traditional culture, an important source of food or fish species that are important to Aboriginal Groups for spiritual reasons.

For the terrestrial portion of the proposed route, most traditional use fishing sites identified in the Application as being important to Aboriginal Groups are located outside of the proposed Project corridor and are not expected to be affected by the proposed Project. However, EAO acknowledges that Aboriginal fishing activities may be occurring along any watercourse within asserted territories. Aboriginal Interests related to fishing in the marine environment, including assessment of potential effects to marine fish and fish habitat and marine navigability are discussed in section 17.2.6 below.

The Proponent assessed potential effects of the proposed Project on freshwater fish and fish habitat, surface water, and groundwater. Potential effects to freshwater fish and fish habitat associated with construction of the terrestrial pipeline and access road watercourse crossings are assessed in section 5.5 of this Report. Potential effects to marine fish and fish habitat associated with construction of the marine pipeline route are assessed in section 5.9 of this Report.

The proposed Project corridor would cross a total of approximately 588 fish-bearing watercourses in the Peace River, Fraser River, Skeena River, Nass River and Coastal watersheds, with the majority (30%) in the Peace River watershed. Pacific salmon (i.e., chinook, chum, coho, pink, and sockeye) and steelhead occur in approximately 60 of the fish-bearing watercourses intersected by the proposed pipeline route.

Specific issues identified by Aboriginal Groups included:

- Alteration of fish habitat including sensitive spawning, rearing and overwintering habitat;
- Increased erosion, sedimentation and adverse effects on water quality including drainage patterns, water cycles and flow;
- Potential morality and injury to fish and barriers to fish migration during construction;
- Increased access and harvesting pressure on fish populations; and
- Potential cumulative effects on fish and fish habitat from existing and future proposed projects.

Key mitigation measures for fish and fish habitat identified in the Application included:

- Project design including pipeline routing and re-alignments to reduce the number of watercourse crossings and avoid sensitive fish habitat (e.g., spawning habitat) where possible;
- Selection of watercourse crossing locations and construction methods (e.g., HDD) based on fish and fish habitat sensitivity and limiting instream and riparian disturbance areas;
- Adhering to least-risk timing windows for instream construction, where possible;
- Development and implementation of a Project-specific EMP, including specific mitigation and monitoring requirements for watercourse crossings; and
- Implementation of offsetting measures for serious harm to fish, if and as required by DFO for *Fisheries Act* authorizations.

In addition, several mitigation measures related to access, including the development of an Access Management Plan, would be implemented during construction and operations of the proposed Project in order to avoid or minimize potential effects to Aboriginal Interests related to fishing activities, including the use of trails and travelways to access fish harvesting areas.

The Application provides information on traditional and current land use for each Aboriginal Group within the proposed Project area including areas of importance for subsistence fishing activities. Potential Project interactions on traditional use of lands and resources include:

- Disruption to subsistence fishing activities during construction and operations that could limit access, or increase public access, to traditional fishing areas; and
- Change to the local harvesting locations, disturbance to fish resources, as well

as broader ecological effects and increased harvest pressure on fish populations.

EAO response

EAO understands that an Aboriginal Group's fishing activities depend, in part, on the status of fish populations within their area of traditional use. The aquatic environment LAA for the proposed Project, intended to capture the zone of potential impacts as a result of direct disturbance, considered an area 100 m upstream of a crossing location and a minimum of 300 m downstream of that location.

The nature and extent of effects would depend on the inherent sensitivity of each fish species and habitat type in each watershed, the nature and timing of the disturbances, and the effectiveness of mitigation. EAO assessed the magnitude of the adverse residual effects on fish and fish habitat as low at a regional and watershed scale.

The following key factors were considered by EAO in assessing potential impacts of the proposed Project on an Aboriginal Group's Aboriginal Interest associated with fishing:

- The assessment of potential effects of the proposed Project on Aboriginal Groups' Aboriginal Interests associated with fishing is informed by the analysis of potential residual effects on relevant VC. Residual effects to freshwater fish and fish habitat, water, and marine resources - characterized in sections 5.5, 5.6 and 5.9 respectively of this Report – are low to medium magnitude, and are not expected to be significant;
- Potential impacts of the proposed Project during construction and operations include:
 - o Mortality or injury to culturally important fish species (e.g., salmon);
 - o Alteration or loss of riparian and instream habitat and potential reduction of the productive capacity of fish habitat at proposed pipeline and access road watercourse crossings; and
 - o Increased fishing harvest pressure (e.g., recreational angling) resulting from increased access to previously inaccessible areas along the proposed ROW and associated access roads.
- Potential for precluding or inhibiting an Aboriginal Group's access to fishing areas. An Aboriginal Group's access to certain lands may be restricted for a limited period during Project construction. However, the geographic extent of these lands is generally small. Additionally, the construction period within each territory is short and engagement with Aboriginal Groups during construction planning is expected to mitigate some of these short term effects;
- The majority of works would be confined to the construction phase and are temporary, lasting over a period of three to four years; in a specific pipeline

segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017).

- Key fishing sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project were considered in relation to past, present and anticipated future use of the area for fishing. Multiple fishing sites or areas of major, fish-bearing watercourse crossings that overlap or are in proximity to the proposed Project footprint could indicate a greater potential effect on the Aboriginal Group's Aboriginal Interest associated with fishing;
- EAO considers the effectiveness of the Proponent's proposed mitigation to avoid and reduce potential effects to fish and fish habitat, surface water, groundwater, traditional land use and other concerns raised by Aboriginal Groups with regard to fishing to be high. Mitigation would include:
 - o Trenchless crossing methods such as HDD are proposed for nine large watercourse crossings with high fish and fish habitat sensitivity, channel stability concerns, and high flows, to avoid effects on fish and fish habitat.
 - o The majority of fish-bearing watercourse crossings would be constructed using an isolated trench method with additional mitigation measures to avoid and minimize potential effects to fish and fish habitat. Where an isolated trenched crossing method is proposed, the Proponent would conduct a fish salvage led by an aquatics specialist and in accordance with permit conditions, using appropriate methods and equipment.
 - o Disturbance of riparian vegetation during construction would be kept to a minimum, leaving as much existing riparian vegetation intact as practical.
 - o Measures to control sedimentation and erosion in disturbed areas would be implemented. Disturbed riparian areas would be re-established and seeded following construction activities with appropriate native seed mix along with a quick establishing cover crop;
 - o Detailed mitigation for watercourse crossings would be further developed in permitting, as required by DFO and OGC, in consultation with Aboriginal Groups;
 - o Scheduling of proposed Project activities would be coordinated through consultation with local fish harvesters and other interest groups and efforts will be made to schedule activities to minimize interference with fisheries, other activities and known biological events (e.g., salmon runs, spawning timing, egg incubation, smolt migration, herring spawning);
 - o SII captured fish would be released to areas downstream of the crossing that provide suitable habitat;
 - o Aboriginal Groups would be provided with the proposed construction schedule and pipeline route maps;
 - o In the event that important habitats or fishing areas are identified during

the pre-construction TLU study with an Aboriginal Group, mitigation would include recording and mapping of fishing locales, and alternative site-specific strategies as identified through consultation with the Aboriginal Group; and

- o Development and implementation of an offsetting plan for serious harm to fish, if and as required by DFO for *Fisheries Act* Authorizations. The Proponent's conceptual offsetting plan submitted during Application Review includes a commitment to consult with affected Aboriginal Groups and DFO during the development of the final offsetting plan. Implementation of habitat offsetting measures would include a monitoring program to confirm offsetting features are constructed in accordance with the plan and conditions of the *Fisheries Act* authorization are adhered to, to ensure effectiveness of offsetting measures.
- The Proponent's proposed Project location and design has been the primary mitigation to avoid or minimize impacts to fish and fish habitat, in addition to relocating the proposed route to avoid several key areas identified in consultation with Aboriginal Groups;
- Provincial and federal legislation and regulatory requirements associated with pipeline and access road watercourse crossings including: *Oil and Gas Activities Act* and Environmental Protection and Management Regulation, *Environmental Management Act*, *Water Act*, federal *Fisheries Act* and *Navigation Protection Act*; and
- The proposed Project would be constructed in accordance with the habitat protection provisions of the *Fisheries Act*, DFO's *Measures to Avoid Causing Harm to Fish and Fish Habitat* (formerly DFO Operational Statements), the *Environmental Protection and Management Regulation* under the *Oil and Gas Activities Act* and OGC's *Environmental Protection and Management Guide*, which includes avoidance of potential areas of groundwater upwelling or conducting works directly upstream of sensitive fish-rearing or spawning areas.

For a complete list of the Proponent's proposed mitigation on freshwater fish and fish habitat see Application section 10.5 and section 5.5 of this Assessment Report. It is noted that additional mitigation may also be developed and required during the permitting process, if an EA Certificate is issued.

Proposed conditions of the EA Certificate include:

- Develop and implement a Project-specific EMP, which includes specific mitigation and monitoring requirements for watercourse crossings and protection of fish and fish habitat;
- Develop and implement a Freshwater Water Quality Monitoring Plan to

implement onsite water quality monitoring during construction. The Plan must include monitoring at upstream locations and downstream of the location of disturbance;

- Provide any plans for offsets on aquatic, riparian, or in-stream values to Aboriginal Groups, if requested;
- Develop a construction monitoring program for Aboriginal Groups;
- Develop and implement a 'No Hunting/Fishing' Policy for project personnel;
- Consider TUS and TEK submitted as part of, or subsequent to, the EA process; and
- Avoid prohibiting access during proposed Project operations for Aboriginal Groups to carry out traditional use activities identified in Traditional Use Studies provided to the Proponent prior to construction.

Overall, EAO predicts that potential residual effects from the proposed Project are not expected to cause significant adverse effect to fish populations or to the productive capacity of fish habitat in a watershed context. A more detailed assessment on potential effects of the proposed Project on freshwater fish and fish habitat is contained in the Application in section 10 and section 5.5 of this Report.

The potential impact of the proposed Project on Aboriginal Interests associated with fishing for each Aboriginal Group is described in section 18.

17.2.3 Trapping

Many Aboriginal Groups have indicated that they trap in the area of the proposed Project for furbearers and other mammals and birds, including birds for feathers. Species trapped include beaver, marten, squirrel, mink, otter, lynx, wolves, coyote, fisher, weasel, fox, muskrat, goose, duck and rabbit.

The Application included VC's related to Aboriginal Groups' trapping activities including wildlife and wildlife habitat with key indicators related to mammals, birds and furbearers. EAO predicts low magnitude residual effects on wildlife, specifically furbearers, related to Aboriginal Groups' trapping activities.

Many of the concerns expressed by Aboriginal Groups in section 17.2.1 with respect to hunting apply to Aboriginal Interests relating to trapping.

EAO response

EAO understands that an Aboriginal Group's trapping activities depend, in part, on the status of furbearer populations within their area of traditional use. The Proponent's

assessment of the effects of the proposed Project on wildlife and wildlife habitat is detailed in section 10 of the Application and section 5.8 of this Assessment Report.

The following key factors were considered by EAO in assessing the nature of the potential impacts of the proposed Project on an Aboriginal Group's Aboriginal Interest associated with trapping:

- The assessment of potential effect of the proposed Project on Aboriginal Groups' Aboriginal Interests associated with trapping is informed by the analysis of potential residual effects on relevant VC's. Low magnitude residual effects are predicted in relation to furbearers associated with trapping, and these are not expected to be significant;
- The wildlife LAA for the proposed Project considered a 2 km corridor. The LAA is intended to capture the direct and indirect impacts from the proposed Project, while the RAA is intended to capture the area where influence of other land use activities could overlap with Project specific effects and result in cumulative adverse effects. The proposed Project is relatively small in terms of overall habitat alteration and disturbance, which would be reduced during the operation phase by revegetating the ROW. The Proponent states that efforts have been made to reduce habitat fragmentation by paralleling existing disturbance and minimizing the creation of new access;
- Reclamation of riparian areas and placing large woody slash on the ROW post-construction would help facilitate furbearer movement, and would be set out in the Proponent's EMP;
- Access restrictions related to trapping activities during construction and operation would be for a limited period, and the geographic extent of these lands is small;
- The majority of works would be confined to the construction phase and are temporary, lasting over a period of three to four years; in a specific pipeline segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017). It is possible that the duration of construction from site preparation to site revegetation could be greater than four years. Natural recovery would be used as the preferred method of reclamation on level terrain and at wetlands and native tree seedlings or shrubs would be planted at select locations. Once revegetated, there may be periodic brushing of a corridor approximately 10 m wide over the life of the pipeline within the 32 m ROW;
- Key trapping sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project were considered in relation to past, present and anticipated future use of the area for trapping. Multiple trapping sites or traplines identified by an Aboriginal Group that overlap or are in proximity to the proposed Project footprint, could indicate a greater potential effect on the Aboriginal

Group's Aboriginal Interest associated with trapping;

- Increased access to the general public to key trapping areas could be created and may result in increased and damaging pressures on wildlife and wildlife habitat;
- The Proponent's proposed mitigation presented in the Application avoid and minimize potential effects to wildlife and wildlife habitat, traditional land use and other concerns that are relevant to trapping raised by Aboriginal Groups. EAO considers the effectiveness of mitigation to be high. Mitigation would include:
 - o Notify registered trappers at least two weeks prior to construction;
 - o Allow trappers to have access to their traplines and for moving trapline equipment;
 - o Follow guidelines for travelling along the ROW to avoid/minimize disturbance of trails;
 - o Install signage and schedule construction during periods of least impact to trails;
 - o Losses to registered trappers would be compensated as per the Trapper Compensation Schedule for demonstrated economic losses related to construction of the proposed Project; and
 - o In the event trapping sites are identified during the pre-construction TLU study, mitigation may include one or more of the following measures:
 - Maintaining access to the trapline,
 - Moving of trapline equipment by the trapper prior to construction, and
 - Alternative site-specific strategies as identified through consultation with the Aboriginal Group.
- Impacts to the land would be partially rehabilitated over the shorter term through re-vegetation of the pipeline corridor and through the deactivation of roads not needed for ongoing maintenance. However, a cleared ROW must be retained for pipeline maintenance during the life of the proposed Project. Some small furbearers prefer forested habitat and will avoid large openings. Mitigation measures such as slash piles in the pipeline ROW and quick reclamation of riparian areas, which provide movement corridors, have been designed to mitigate these effects. Native vegetation, particularly for treed habitats, will not be fully re-established until project decommissioning. Periodic maintenance activity would be required.

Proposed conditions of the EA Certificate include:

- Continued engagement with Aboriginal Groups regarding construction planning and Project design, as well as the development and implementation of the Environmental Management Plan;

- Development of a Human-Wildlife Conflict Plan and an Access Management Plan;
- A requirement for the Proponent to retain Environmental Inspectors, who will have full authority to cease pre-construction and construction activities that cause unpredicted adverse impacts to the environment;
- Avoid prohibiting access during Project operations for Aboriginal Groups to carry out traditional use activities identified in TUS and avoid prohibiting access for Aboriginal Group trapline holders;
- A requirement for the Proponent to notify all tenure holders affected by construction activities six months prior to carrying out activities that may affect tenured rights; and
- A requirement for the Proponent to consider TUS and TEK submitted as part of, or subsequent to, the EA process.

The proposed Project would have low magnitude effect on furbearers, and EAO concluded that the proposed Project would not have a significant adverse effect on wildlife and wildlife habitat, with regards to furbearers, taking into account the proposed mitigation measures (detailed in section 10 of the Application) and proposed EA Certificate conditions.

The potential impact of the proposed Project on Aboriginal Interests associated with trapping for each Aboriginal Group is described in section 18 below.

17.2.4 Gathering

Aboriginal Groups have indicated that they gather plants for subsistence and medicinal purposes within the RAA. Plants identified as being important to preparing traditional medicine include Labrador tea, mint tea, jack pine (both bark and sap), pine (both bark and sap), balsam, strawberries, devil's club, red willow, juniper, violets, fiddleheads, soapberries and fireweed. Other harvested plants include wild onion, poplar, rhubarb, stinging nettles, mushrooms, spruce boughs, wild rice, dandelions, cow parsnip, lodgepole pine, spruce, cedar, white poplar, birch, willow, alder, chokeberries, blueberries, lichen and fungi.

Berry picking is integral to seasonal subsistence, as well as being an important social activity, with families often going out as a unit to pick berries. Berries are typically canned or frozen for use throughout the winter months. Berry species harvested include blueberries, soapberries, huckleberries, low and high bush cranberries, Saskatoon berries, strawberries, raspberries, chokecherries, currants and gooseberries.

The Application included VC's related to Aboriginal Groups gathering activities including ecological communities of concerns and plant species of concern.

Concerns were raised by several Aboriginal Groups that vegetation clearing along the ROW would decrease or permanently impact plant species of cultural and traditional importance. Aboriginal Groups have expressed concern that development within their asserted traditional territory in the past 50 years has greatly reduced areas available for berry picking.

EAO response

EAO understands that an Aboriginal Groups' gathering activities depend, in part, on the abundance and condition of preferred plant species within their area of traditional use. The Proponent's assessment of the effects of the proposed Project on plant species of concern is detailed in section 13 of the Application and section 5.7 of this Report. The Proponent's assessment of the effects of the proposed Project on wetlands and vegetation is detailed in sections 9 and 13 of the Application and EAO's assessment section 5.7 of this Report.

The effects to vegetation would likely be confined to the proposed Project footprint and may extend (indirectly) as far as the boundaries of the vegetation LAA, which considered a 300 m wide corridor. Effects to wetlands may extend as far as the boundaries of the wetlands LAA, which considered a 2 km wide corridor. EAO determined that the proposed Project would not have significant adverse effects on vegetation or wetlands.

EAO assessed the magnitude of adverse effects on plant species of concern as low to medium, depending on the plant species, its relative abundance, the extent of its occurrence, and the feasibility and effectiveness of mitigations. EAO assessed the magnitude of adverse effects to most ecological communities of concern as low, but moderate for plant species at risk, wetland function, and for blue- and red-listed ecological communities. Magnitude of effects from invasive species is considered low.

The following key factors were considered by EAO in assessing the potential impacts of the proposed Project on Aboriginal Interests associated with gathering:

- The assessment of potential effect of the proposed Project on Aboriginal Groups' Aboriginal Interests associated with gathering is informed by the analysis of potential residual effects on relevant VC's. Residual effects to wetlands and vegetation – characterized in section 5.7 of this Report – are low magnitude, and are not expected to be significant;

- The proposed Project is relatively small in terms of overall vegetation clearing and alteration, which would be reduced during the operation phase by revegetating the ROW. Once revegetated, there may be periodic brushing of a corridor approximately 10 m wide over the life of the pipeline and a corridor would be maintained with low vegetation cover during operation. Natural recovery would be used as the preferred method of reclamation on level terrain and at wetlands. Native tree seedlings or shrubs would be planted at select locations. Full natural re-vegetation would occur after decommissioning.
- Access restrictions impacting gathering activities, during construction and operation would be for a limited period, and the geographic extent of these lands is very small;
- The majority of works would be confined to the construction phase and are temporary, lasting over a three- to four-year construction period. In a specific pipeline segment, the highest magnitude effects would be for a shorter duration (i.e. several months in 2016 or 2017). It is possible that the duration of construction from site preparation to site revegetation could be greater than four years;
- Key gathering sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project were considered in relation to past, present and anticipated future use of the area for gathering. Multiple gathering sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project footprint, could indicate a greater potential effect on the Aboriginal Group's Aboriginal Interest associated with gathering;
- The Proponent's proposed mitigation is presented in the Application to avoid and minimize potential effects to native vegetation, traditional land use and other related concerns raised by Aboriginal Groups. EAO considers the effectiveness of mitigation to be high. Mitigation would include:
 - o Provide Aboriginal Groups with the proposed construction schedule and maps of the proposed route;
 - o Work with Aboriginal Groups to identify traditionally important plants and, where practical, develop site specific mitigation;
 - o Identify mushroom harvest sites, and where practicable, site specific mitigation will be developed in consultation with the affected Aboriginal Group(s);
 - o In the event important plant gathering sites are identified during the preconstruction TLUS, mitigation may include one or more of the following measures:
 - limiting the use of chemical applications;
 - Replacement of red-listed plant species during reclamation;
 - Avoidance of the site; and/or

- Alternative site-specific strategies, as identified through consultation with, the Aboriginal Group;
- o Vegetation removal only within the approved construction ROW and temporary workspace; the clearing width would be reduced to the minimum required for construction (i.e., 32 m) to avoid plant species of interest; and
- o Reduction or exclusion of temporary work space from OGMAAs and wetlands, to the extent feasible.

Monitoring, compliance, and enforcement would be conducted by regulatory agencies during and following construction to ensure that mitigation is implemented and is effective.

Proposed conditions of the EA Certificate include:

- Continued engagement with Aboriginal Groups regarding construction planning and design, as well as the development and implementation of the EMP;
- A requirement for the Proponent to implement reclamation measures to revegate the ROW in a manner compatible with surrounding vegetation and land uses;
- A requirement for the Proponent to retain Environmental Inspectors, who will have full authority to cease pre-construction and construction activities that cause unpredicted adverse impacts to the environment;
- A requirement for the Proponent to develop and implement a Wetlands Management Plan to ensure no net loss in wetland function. The Plan would include pre-construction surveys for wetlands to collect site-specific information on wetland location, type, and function, as well as post-construction monitoring to confirm whether residual loss of function occurs;
- A requirement for the Proponent to consider TUS and TEK submitted as part of, or subsequent to, the EA process; and
- A requirement for the Proponent to consult Aboriginal Groups regarding the use of herbicides on traditional territories.

EAO determined that the proposed Project would not have a significant adverse effect on plant species of concern, ecological communities of concern, or wetlands, taking into account the proposed mitigation and expected EA Certificate conditions.

The potential impact of the proposed Project on Aboriginal Interests associated with gathering for each Aboriginal Group is described in section 18.

17.2.5 Archaeology and Cultural Heritage Interests

BC has a robust regulatory regime to protect and mitigate impacts to heritage resources. Archaeological sites in BC are protected under the *Heritage Conservation Act* (HCA), and FLNR's Archaeology Branch is the primary agency responsible for administering the HCA and maintaining the Provincial Heritage Site Register. Section 13 of the HCA specifies that an individual (or corporation) must not "damage, excavate, dig in or alter, or remove any heritage object" from a heritage site, unless under a permit issued by the Minister pursuant to Sections 12 and 14. For the proposed Project OGC would issue any Section 12 site alteration permits.

The Proponent was required to undertake an Archaeological Overview Assessment (AOA) before submitting the Application. The overview assessment, which involved developing an "archaeological potential" model to guide fieldwork, found that most of the land crossed by the proposed route has the potential for heritage sites.

In-office and field observations contributed to the Proponent's evaluation of archaeological potential, using listed criteria such as terrain, forest cover, and proximity to potable water. Aboriginal participants contributed to the assessment during TEK studies. During the field studies along the proposed route, participants identified several areas of archaeological potential based on knowledge of ideal conditions for campsites and hunting grounds. Lands near water sources were considered ideal since these water sources attract animals that could be hunted. Sites that were relatively flat, provided a high vantage point, or featured reasonable cover from visibility and weather were also considered ideal for camping and hunting.

The Proponent is presently completing the required Archaeological Impact Assessment (AIA). The primary objectives of the AIA are to:

- Identify and evaluate archaeological resources within the proposed Project area;
- Identify and assess all impacts on archaeological resources that might result from the proposed Project; and
- Recommend viable alternatives for managing unavoidable adverse impacts, including a preliminary program for implementing and scheduling impact management actions and, where necessary, conducting surveillance and/or monitoring.

The AIA methodology includes a visual survey augmented by subsurface testing, to identify subsurface archaeological resources and the significance of archaeological sites, and systematic data recovery, to further assess archaeological sites. For historic resources, AIA methodology would include context study, historical research including

review of aerial photographs and archival maps, consultation with local/regional governments and Aboriginal communities, and review of community heritage registers.

The Application identified 57 archaeological and/or historical heritage sites in the Project footprint based on previous studies and sites identified as a result of the ongoing AIA field program.

There are two recorded lithic sites within 37.5 m of the pipeline centerline. Recorded sites found in the RAA of the Subarctic/Boreal Forest include:

- 106 lithic scatters;
- 9 subsistence/habitation features;
- 4 petroforms;
- 2 burials;
- 1 cultural depressions; and
- 1 trail.

There are six recorded archaeological sites in the Interior Plateau culture region that are within 37.5 m of the pipeline centerline including many culturally modified trees (CMTs) and the Takla Grease Trail. Recorded sites found within the RAA in the Interior Plateau zone include:

- 143 CMTs;
- 37 cultural depressions;
- 13 lithics;
- 13 subsistence/habitation features;
- 11 trails;
- 5 multi-component; and
- 1 petroglyph.

There are no recorded archaeological sites or historical sites in the Northwest Coast zone that are within 37.5 m of the pipeline centreline. Recorded sites found within the RAA in the Northwest Coast zone include:

• 154 CMTs;	• 11 multi-component;
• 56 subsistence/habitation features;	• 10 petroforms;
• 53 shell middens;	• 6 lithics;
• 27 burials;	• 4 trails; and
• 21 rock art;	• 2 fire modified rock (FMR)

- 15 cultural depressions;

Potential residual effects on heritage resources include the disturbance of some archaeological sites, and loss of some site-specific archaeological information, as any archaeological values not collected would likely be permanently destroyed.

EAO response

Generally, impacts on archaeological and cultural heritage sites would be avoided or largely mitigated (and therefore of low magnitude), but there is potential to affect portions of archaeological sites of moderate or high value. However, information collection and route refinement within the ROW should generally mitigate these impacts to be generally low.

Limitations on the effects assessment include the difficulty to accurately identify the presence of archaeological resources within the proposed Project footprint. Confidence in the overall effects assessment is high, given that provincially required mitigation programs will be conducted and would be based on input from Aboriginal communities and regulatory bodies. The AIA is underway, and this additional information collected would inform permitting.

During construction of the proposed Project, avoidance of heritage resources would be the primary mitigation. If avoidance were not feasible, site-specific mitigation plans would be developed in consultation with FLNR (e.g., Archaeology Branch, Heritage Branch) as part of the regulatory regime, and informed by discussion with affected Aboriginal Groups.

Key measures to mitigate heritage impacts include:

- Completing AIA site investigations;
- Developing a Heritage Resources Management Plan in the event of discovery of a heritage site during construction. The plan would include the requirement for construction at that location to be halted immediately, the EI to be notified, and the Archaeology Branch, Heritage Branch, and/or OGC to be consulted;
- Prohibiting the collection and removal of any archaeological resources;
- Monitoring selected areas during construction where there is high palaeontological potential, according to the recommendations of a professional palaeontologist;
- In the event important cultural sites are identified during the pre-construction

TLU, mitigation may include one or more of the following measures:

- o Detailed recording and mapping to within 100 m on both sides of the pipeline ROW; in partnership with community representatives, a decision is then made about the relative importance of the site and, if warranted, how best to maintain and control access; and
- o Other mitigation options include signage or scheduling construction during periods of least effect, and/or alternative site-specific strategies, as identified through consultation with the Aboriginal Group.

As committed to in the Heritage Technical Working Group on July 28, 2014, the Proponent will be providing interim AIA Reports to Aboriginal Groups. The Proponent will also provide these reports to the Archaeology Branch of British Columbia as required.

Archaeological and cultural heritage sites, trails and travelways identified by an Aboriginal Group that overlap or are in proximity to the proposed Project were considered in relation to past, present, and anticipated future use of the area. Multiple archaeological or cultural heritage sites identified by an Aboriginal Group that overlap or are in proximity to the proposed Project could indicate a greater potential effect on the Aboriginal Group's Aboriginal Interests associated with the historical connection to and continued use of these sites. However, potential effects on Aboriginal Interests associated with trails and travelways that overlap or are in proximity to the proposed Project are generally expected to be low, given the time limited nature of the disturbance and relatively small post-construction footprint, which are not predicted to compromise the integrity of these features.

The potential impact of the proposed Project on culturally-important sites, trails, and travelways for each Aboriginal Group is described in section 18.

17.2.6 Aboriginal Interests Associated With the Marine Environment

Several coastal Aboriginal Groups exercise Aboriginal Interests in the marine environment within their asserted traditional territory overlapping or in the vicinity of the proposed Project. The proposed Project corridor within the marine environment includes a total length of approximately 120 km from Nasoga Gulf, through Portland Inlet and Chatham Sound to the proposed terminal at Lelu Island near Prince Rupert Harbour.

The proposed Project route in the marine environment includes:

- Two 36" pipelines from Nasoga Gulf, through Portland Inlet and Chatham Sound

- to the marine terminal on Lelu Island (approximately 110 km total length); and
- One 48" pipeline for the Nass Bay Nearshore Marine and Iceberg Bay crossing on the route to Nasoga Gulf.

On July 31, 2014, the Proponent submitted an Addendum to the Application with several route adjustments including removal of the Nasoga Tunnel, Nass Bay Shoreline and Nass Bay Nearshore Alternative route. The Proponent has selected a single route to Nasoga Gulf, including the Nass Bay Nearshore Marine and Iceberg Bay crossing. The Addendum also included the Chatham Sound alternate route for a minor route realignment. EAO's assessment of the route revisions did not change any of the residual effects characterizations or potential impacts on Aboriginal Interests in the marine environment.

The proposed Project marine routes would cross through the asserted traditional territories and marine resource harvesting areas of several coastal Aboriginal Groups including: Lax Kw'alaams Band, Metlakatla First Nation, Gitxaala Nation and Kitsumkalum First Nation. Kitselas First Nation asserted traditional territory (including Smith Island near the Skeena River estuary) is within 2km of the proposed marine route landfall at Lelu Island, however the proposed marine route would cross through their asserted harvesting area in Chatham Sound.

The approximate duration of marine construction activities¹⁸, and duration of potential effects related to restricted marine navigation and access to fishing areas within nearshore and landfall construction areas, includes:

- 10 weeks – Nass Bay Nearshore Marine Route;
- 7 weeks – Iceberg Bay Crossing;
- 10 weeks – Nasoga Gulf to Portland Inlet; and
- 19 weeks – approach and landfall at Lelu Island.

Aboriginal Groups raised concerns with potential impacts on the marine environment related to Aboriginal Interests associated with fishing, hunting, and gathering, including:

- Potential effects to fish, fish habitat and fish populations in the marine environment from marine pipeline construction and seabed modifications;
- Potential crab movement effects from marine pipelines on the seabed with important habitat and harvesting areas in Chatham Sound and Iceberg Bay;
- Potential displacement, injury or mortality to fish, marine mammals and marine

¹⁸ The Proponent notes that the duration of marine construction activities will be determined through detailed engineering design and input from marine contractors.

- birds during construction activities;
- Potential effects to critical habitat for juvenile salmon in the Skeena estuary during trenching for construction of the pipeline landfall on Lelu Island and risk of contamination of seafood from trenching and re-suspension of historically contaminated sediment around Lelu Island; and
- Potential disruption of marine travel navigability/interruption of travelways and access to fishing areas, particularly around Lelu Island and Flora Bank, if construction activities were to occur during Aboriginal fisheries for harvesting salmon and eulachon near the Skeena River estuary.

Other specific issues identified by Aboriginal Groups which were addressed in the Application Marine Resources VC (section 5.9) included:

- Adequacy of proposed habitat offsetting and other mitigation measures in addressing adverse effects of the project on fish and fish habitat, particularly on species that are important for sustenance, cultural and commercial purposes;
- Adverse effects of increased marine traffic (noise, vessel strikes) on species and ecosystems at risk in the region, including marine mammals;
- Changes in fish and fish habitat related to sedimentation and scour effect;
- Introduction of invasive aquatic species;
- Reduced ability to harvest seaweeds (e.g., giant kelp, species growing on rocky shorelines);
- Exposure of marine mammals and other organisms to intentional and unintentional discharge of chemicals and biological wastes from vessels, particularly in high traffic zones, and for shellfish; and
- Pipelines could result in snagged fishing gear, creating a potential accumulation of that gear, or be damaged by anchors.

Several Aboriginal Groups including Metlakatla First Nation, Lax Kw'alaams Band, Gitxaala Nation, Kitsumkalum First Nation, and Kitselas First Nation expressed concerns of potential adverse effects of the proposed Project on important Aboriginal marine fisheries including the harvest of Pacific salmon, eulachon, groundfish, herring, herring spawn, sea urchins, seacumber, abalone, Dungeness crab and shellfish.

Several other Aboriginal Groups with asserted traditional territories which are not within the marine environment (e.g., Lake Babine Nation, Gitanyow First Nation, and Gitxsan) expressed concerns regarding potential residual and cumulative effects of the proposed Project within the marine environment to Skeena River salmon populations and critical rearing habitat in the Skeena River estuary near the Lelu Island landfall.

The proposed marine pipelines would be installed on the seabed with several areas requiring seabed modification. Landfall areas nearshore (e.g., Lelu Island, Nasoga Gulf, Iceberg Bay and Nass Bay Nearshore Marine) would require trenches approximately 3 m deep and 10 m wide for the pipelines to be installed below the seabed from high water mark on shore to water depths of approximately 15-20 m. Horizontal Direction Drilling (HDD) was also identified as an option for construction of the Nasoga Gulf and Lelu Island Landfall, however open-cut excavation trenching was identified as the preferred method and assessed in the Application for potential effects.

Potential effects of the proposed Project on Aboriginal Interests within the marine environment are primarily limited to the construction window and footprint and include:

- Potential biophysical effects to resource harvesting areas that are in proximity to the proposed Project footprint including: fish and fish habitat; wildlife and wildlife habitat, and marine plants;
- Potential disruption of subsistence activities, including hunting, trapping, fishing and plant gathering, during construction; and
- Potential disruption of use of marine travelways and boat access to resource harvesting areas may be affected in the short term, for a limited area and time during the construction phase, where access may be restricted for safety reasons (e.g., vessel safety exclusion zones around the pipe lay vessel and landfall areas).

Specific activities with potential temporary effects on marine navigability during construction include:

- Nearshore construction of a trench, approximately 4 km in length, for the marine pipeline landfall at Lelu Island, which may impede navigability of vessels transiting near Lelu Island, Kitson Island and Flora Bank – construction duration of approximately 5 months, total disturbance area of approximately 12.8 ha;
- Nearshore construction of the Nasoga Gulf landfall, Nass Bay Nearshore Marine, and Iceberg Bay crossing – construction duration of approximately 4 months; and
- Offshore installation of the pipelines on the seabed in Chatham Sound and Portland Inlet, which would temporarily restrict marine navigation around the safety exclusion zones for pipe lay vessel and other construction vessels.

Other potential effects to fishing activities during construction may include perceptions of reduced catch and/or perceived risk of contamination of seafood post-construction, and therefore potential avoidance of fishing in areas affected by construction activities.

VC's and factors considered in the assessment of potential effects on the Aboriginal Interests regarding resource harvest activities in the marine environment include:

- Marine Resources VC (section 5.9), including assessment of potential effects on:
 - o Fish species associated with commercial, recreational or Aboriginal (CRA) fisheries (e.g., salmon, herring, halibut, eulachon, crab, prawn);
 - o Habitat-forming vegetation of cultural or ecological Importance, or at-risk
 - o Marine mammals;
 - o Species at risk; and
 - o Marine water quality.
- Freshwater Fish and Fish Habitat VC (section 5.5) including potential effects of proposed pipeline watercourse crossings on fish and fish habitat;
- Human Health VC (section 9.1) including human health risk assessment for consumption of marine country foods near Lelu Island, Nasoga Gulf and Nass Bay;
- Land and Resource Use VC (section 7.3) including assessment of potential effects from construction of the marine portion of the Project on commercial fisheries and other marine activities;
- Transportation VC (section 7.2) including assessment of potential effects on marine navigability;
- Assessment of Heritage Resources (section 8);
- Accidents, Malfunctions and Effects of the Environment on the Project (section 10); and
- Marine Environmental Management Plan (section 11.3).

EAO response

EAO understands that an Aboriginal Group's marine resource harvesting activities for hunting, fishing, trapping and plant gathering depend, in part, on the status of resources in the marine environment within their asserted traditional territory, and the extent to which the proposed Project could affect an Aboriginal Group's access to, and use of the area. EAO has considered the potential interactions and effects on fish and fish habitat in the marine and freshwater environment in assessing potential impacts of the proposed Project on Aboriginal Interests related to fishing.

The following key factors were considered by EAO in assessing potential impacts of the proposed Project on an Aboriginal Group's Aboriginal Interest associated with resource harvesting activities in the marine environment:

- The duration of marine construction activities at landfalls and potential effects to marine navigation in these areas is expected to be approximately three to six

months;

- Marine construction activities with potential effects to marine transportation and access for fishing vessels is expected to be primarily limited to nearshore construction activities (i.e. trenching) at marine pipeline landfalls, including Lelu Island, Nasoga Gulf, Nass Bay and Iceberg Bay;
- During the pipeline construction phase marine construction activities may temporarily impede other vessels from safely passing through or accessing certain areas, or may require that a longer route be taken to avoid construction vessels. The pipe lay vessel is expected to be able to install approximately 2 km of pipe per day along the marine route;
- Potential for precluding or inhibiting an Aboriginal Group's access to fishing, hunting, trapping, culturally important areas and marine travel routes. An Aboriginal Group's access to certain areas may be restricted for a limited period during Project construction along the marine corridor. Engagement with Aboriginal Groups during construction planning is expected to mitigate some of these short term effects;
- The potential for pipeline damage resulting from anchors or snagging by fishing gear was assessed in the Application (section 23) Land and Resource Use VC. The Proponent concluded the pipeline is designed to withstand potential impacts from anchors; and the potential for fishing gear to snag on the pipe is considered unlikely;
- EAO found no residual effect relating to contaminated sediment in the marine environment;
- Potential impacts of the proposed Project during construction and operations include:
 - o Alteration/loss of habitats within the landfall Project footprint;
 - o Alteration/loss of habitats adjacent to the proposed Project footprint due to sedimentation;
 - o Disturbance to fish, birds and marine mammals due to construction noise;
 - o Injury or mortality of invertebrates or fish and displacement within and adjacent to the proposed Project footprint due to trenching, material side-casting and related activities; and
 - o Potential cumulative impacts of multiple projects occurring in the same area, particularly in consideration of the PNW LNG terminal construction.

The Proponent proposed mitigation to avoid and minimize potential effects on Aboriginal Interests in the marine environment, including:

- Develop a Marine Environmental Management Plan (MEMP) including:
 - o Marine Construction Activities and Mitigation;

- o Marine Access and Traffic Management Plan;
- o Marine Chemical and Waste Management Plan;
- o Marine Heritage Resource Discovery Contingency Plan;
- o Marine Spill Contingency Plan;
- o Seabed Sediment and Related Water Quality Monitoring Plan; and
- o Environmental Compliance Monitoring and Reporting.
- Coordinate the scheduling of Project activities through consultation with local fish harvesters and other interested groups to schedule activities to minimize interference with fisheries, other activities and known biological events (e.g., salmon runs, juvenile salmon smolt migration and rearing in estuary habitat near Lelu Island and Flora Bank, herring spawning);
- Comply with provincial and federal legislation and regulatory requirements associated with marine pipeline construction including: *Oil and Gas Activities Act* and Environmental Protection and Management Regulation, *Environmental Management Act*, *Water Act*, federal *Fisheries Act* and *Navigation Protection Act*;
- In the event that important habitats or fishing areas are identified during the pre-construction TLUS with an Aboriginal Group, mitigation may include one or more of the following measures:
 - o Recording and mapping of fishing locales; and
 - o Alternative site-specific strategies as identified through consultation with that aboriginal group.

In response to concerns raised by Aboriginal Groups and comments on the draft Assessment Report, EAO proposed several specific conditions related to the marine environment, including:

- Marine Access Traffic Management Plan to develop a planned approach to marine traffic management in consideration of Aboriginal, commercial, recreational and other users;
- Fisheries Interaction Plan to develop an approach to compensate commercial fishing and other vessel-related gear loss and to monitor, and if necessary remove, material accumulation of gear;
- Marine Mammal Monitoring Plan to prevent sensory disturbance or injury to marine mammals during construction;
- Crab Movement Mitigation and Monitoring Plan to minimize impacts to crab movement;
- Marine Sediment Management Plan, including sediment and water quality monitoring; and
- Undertake detailed geotechnical and risk assessment to identify and measures to mitigate scour potential for the Nass Bottomlands and the approach to Lelu

Island.

EAO has also proposed a condition requiring the Proponent to develop and implement an EMP in consultation with Aboriginal Groups and relevant regulatory authorities, in accordance with section 36 of the Application and the draft EMP submitted to EAO on September 30, 2014.

Overall, EAO concluded there are no significant adverse effects to any of the marine environment VC's. A more detailed assessment on potential effects of the proposed Project on marine environment VC's is contained in section 5.9 of this Assessment Report.

17.2.7 Aboriginal Title

Possible effects to Aboriginal title claims include temporary effects related to construction and longer-term effects. Temporary effects related to construction, if certified, may include:

- Potential disruption of subsistence activities, including hunting, trapping, fishing and plant gathering, during construction;
- Access for Aboriginal groups to the proposed Project area to hunt, trap, fish, gather or conduct other activities may be affected in the short term, for a limited area and time during the construction phase, where access may be restricted for safety reasons; and
- Disruption of use and connectivity of trails and travelways through clearing.

Longer term effects of the proposed Project, if certified, are predicted to include:

- ROW clearing may disrupt use of lands including use of areas as trails, travelways, resource harvesting and home sites; and
- Associated infrastructure including access roads and temporary construction camps may also impact use of these areas as trails, travelways, resource harvesting and home sites.

The Application notes that approximately 6 km of new access roads would be needed during construction throughout the proposed Project, and it is anticipated that approximately 850 km of existing forestry roads may require upgrading, which could include vegetation clearing, resurfacing, watercourse crossing upgrades and, in some cases, widening to allow for safe hauling of materials and travel of personnel. Existing infrastructure would be used to the extent practical and access may be improved along existing roads during construction, where necessary. Roads to proposed compressor

station locations and meter stations would be permanent, while roads developed for construction would be reclaimed and deactivated.

EAO response

The following factors have informed EAO's determination of the adequacy of consultation and accommodation:

- The majority of works would be confined to the construction phase and are temporary. The timelines for construction would involve site preparation as early as 2015, with the majority of construction works undertaken in 2016 to 2017-18, and a small portion of the pipeline construction would carry into 2019;
- There is no contemplation of transfer of ownership of land to the Proponent along the pipeline route for the pipeline. The Proponent would be granted a temporary Licence of Occupation, and upon completion of legal survey requirements a Statutory Right of Way for the life of the proposed Project. For proposed compressor stations and other facilities, a Crown Lease under section 38 of the *Land Act* would be used to address land tenure, and on private land the Proponent plans to purchase the land for compressor stations. Only the lease areas provide exclusive use and occupation during the term of the lease; and
- Other uses of the areas along the pipeline corridor and access roads would generally not be precluded, particularly given that the pipeline is intended to be buried or submerged, wherever possible. Installation of 48-inch diameter pipes would remain underground throughout the life of the Project, which would preclude use of that underground area; and the 36-inch diameter pipes in the marine segment would remain submerged throughout the life of the Project.

Scheduled works for operation and maintenance activities (including vegetation management over a narrow portion of the ROW) to facilitate pipeline integrity monitoring would preclude some uses of the surface area for brief periods of time. Should an Aboriginal Group establish title, that Aboriginal Group would continue to have the ability to make decisions regarding certain uses of the surface area, recognizing there will be some limitations in accordance with the legislated safety requirements of the operating pipeline.

18 Specific Issues Raised by Aboriginal Groups and EAO's Conclusions

This section of the Aboriginal Consultation Report considers the information received from each Aboriginal Group through consultation efforts during the EA process, and summarizes the consultation and accommodation of potentially affected Aboriginal Groups in relation to this proposed Project. Throughout that process, EAO has learned how Aboriginal Interests could be adversely affected by the Project construction and operational activities if it were to be certified by Ministers. In addition, this section includes a consideration of the comments and input received from Aboriginal Groups during the period October 15 to November 3, 2014.

Potential impacts of the proposed Project on Aboriginal Interests are characterized in general terms in section 17 of this Assessment Report. Below, EAO outlines issues identified during the EA, provides additional background information specific to each of the Aboriginal Groups, and lays out its considerations and conclusions on the seriousness of impacts to the Aboriginal Interests of each of the Aboriginal Groups. Although Aboriginal Interests are generally discussed in separate sections, EAO acknowledges their interconnectedness and recognizes that factors affecting one type of Aboriginal Interest may also affect another.

18.1 Treaty 8

In consideration of the historic and current context of Treaty 8 provided in section 13.1 of this Assessment Report and information gathered throughout the consultation process, the following sections are intended to set out:

- A summary of concerns related to Treaty 8 rights raised by Treaty 8 First Nations; and
- EAO's evaluation of potential effects of the proposed Project to Treaty 8 First Nation's rights.

The potential impacts to the Treaty 8 right to hunt, fish and trap and other interests are discussed in relation to each Treaty 8 First Nation in the subsequent sections. An overarching issue of cumulative effects was raised by all Treaty 8 First Nations, which will be discussed upfront in this section along with a coordinated, independent review of the Project by several Treaty 8 First Nations.

Collaborative Review (Saulteau and West Moberly First Nations, Doig River First Nation and McLeod Lake Indian Band)

Technical comments on EAO's draft Assessment Report, the CPD and maps and the draft TOC were provided collaboratively by Saulteau First Nations, West Moberly First Nations, Doig River First Nation and McLeod Lake Indian Band on October 29, 2014.

These Treaty 8 First Nations are of the view that EAO's determination on the significance of impacts to VCs and Treaty 8 rights is premature. They view the work to be conducted during permitting as an important component to understanding effects on Treaty 8 rights and raised the concern that potential impacts to Treaty 8 rights are substantially underestimated within the EA. In their view, the proposed Project would seriously impact their Treaty 8 rights to hunt, trap and fish.

Comments and concerns provided by this collaborative group have been considered to the extent practicable by EAO in the development of the decision making materials for Ministers.

Independent Technical Review (Saulteau and West Moberly First Nations, Doig River First Nation and McLeod Lake Indian Band)

The Treaty 8 First Nations listed above advised EAO that they initiated an independent technical review of the proposed Project. Prophet River First Nation indicated to EAO that they would also like to participate in this independent technical review. The technical review has occurred outside of the EA process, and would continue in this manner in consultation with the Proponent.

EAO response

While the review is being conducted outside the EA process, EAO has proposed a condition that requires the Proponent to share the results of the technical review with responsible permitting agencies, if the results are provided by Treaty 8 First Nations to the Proponent. In addition, the Proponent would be required to continue to engage with the Treaty 8 First Nations on the results of the review.

Cumulative Effects on the Treaty 8 Rights to Hunt, Trap and Fish

The contribution of the proposed Project to cumulative effects was raised as a serious concern by Treaty 8 First Nations during the EA. Treaty 8 First Nations have expressed the concern that their traditional territories (crossed by approximately the first 125 km of the proposed Project) have been and continue to be subject to extensive industrial development relating to oil and gas, development of power generation (e.g. Site C), forestry and mining. Deep concern was expressed about the potential upstream gas

development (e.g. wells, processing plants, pipelines, roads) that would be required to meet the capacity of proposed LNG facilities and pipelines.

Treaty 8 First Nations indicated that cumulative effects to their territories have not been sufficiently addressed in the Application and not sufficiently mitigated as part of the EA process.

EAO response

In considering how cumulative effects may impact Treaty 8 rights, EAO has drawn on the Proponent's assessment of impacts to VCs associated with the exercise of Treaty 8 rights, including the impacts of past, present and reasonably foreseeable projects and activities. EAO's cumulative effects assessment included consideration of Site C and many other proposed projects and activities, in a manner consistent with EAO's assessment methodology.

EAO considered the concerns about cumulative effects brought forward by Treaty 8 First Nations including the mitigation measures described in the Application and EAO's proposed conditions. EAO determined that the cumulative effects assessment has been conducted appropriately.

However, in light of concerns expressed by Treaty 8 First Nations, EAO requested the MNGD and OGC provide a forecast of natural gas development for northeast BC. This forecast has been provided to Ministers as part of the referral package and was shared with Treaty 8 First Nations as well as other Aboriginal Groups on September 22, 2014. In addition, EAO shared concerns expressed by Treaty 8 First Nations with MARR to inform strategic initiatives like the LNG Environmental Stewardship Initiative and on-going negotiations.

The following sections contain EAO's assessment relating to specific Aboriginal Groups.

18.1.1 Blueberry River First Nations

Context

- Blueberry River First Nations is a signatory to Treaty 8. Blueberry River First Nations community is located in the Peace River Regional District in northeastern BC, north of Fort St. John. Blueberry River First Nations has two reserves covering 1,505.8 ha: Blueberry River Indian Reserve (IR) 205, comprising 1,148.5 ha; and the South Parcel of Beaton River IR 204, comprising 357.3 ha.
- As of September 2013, Blueberry River First Nations had a total registered

population of 471, with 207 living on Blueberry River IR 205, 230 living off reserve, and 34 living on other reserves. Blueberry River First Nations is governed by a Chief and four Councillors elected under the *Indian Act* electoral system.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to be located approximately 26 km away from the area asserted by Blueberry River First Nations as its traditional territory.
- Given the nature and location of the proposed Project and EAO's assessment of the potential impacts to Blueberry River First Nations' Treaty 8 rights as discussed below, EAO is of the view that the duty to consult Blueberry River First Nations lies at the lower end of the *Haida* spectrum. Blueberry River First Nations was listed on Schedule C of the Section 11 Order.
- In response to the Section 11 Order, Blueberry River First Nations expressed their view that EAO should include them on Schedule B of the Section 11 Order. EAO considered all of the information provided by Blueberry River First Nations, and determined that the duty to consult remained at the low end of the *Haida* spectrum.

Summary of Consultation

In October 2012, Blueberry River First Nations asserted a larger traditional territory than the boundary previously understood by the Province to be its consultation area (the 2012 Blueberry River First Nations Asserted Area). Since October 2012, the asserted boundary has been the subject of active discussion and negotiation with the Province as part of negotiations for a new strategic engagement agreement. In October 2013, EAO received information from Blueberry River First Nations provided in a 2011 report that depicted a traditional territory of the Beaver Indians (the 2011 Boundary), from which Blueberry River First Nations is understood to have been derived. The 2011 Boundary has since been accepted by the Province to inform consultation, but it has not been agreed to by Blueberry River First Nations, and is smaller than the 2012 Blueberry River First Nations Asserted Area.

Throughout the EA, Blueberry River First Nations contested EAO's approach to determining the depth of consultation based on both historic and current use of the proposed Project area. Blueberry River First Nations (like other Treaty 8 First Nations) was particularly of the view that historic traditional use should be irrelevant in determining the scope of consultation. EAO notes that the proposed Project, originating

north of Hudson's Hope, is at least 25 km outside 2011 Boundary. EAO described the historical and current use information received from Blueberry River First Nations to inform EAO of the necessary depth of consultation relating to this and all of the LNG-related pipeline projects. EAO explained that this approach was consistent with the consultation approach taken broadly by the Province with Treaty 8 First Nations. EAO did not receive information relating to the historic use by Blueberry River First Nations of the proposed Project area that would inform such consideration, and as such, EAO did not change its approach to the depth of consultation with Blueberry River First Nations in relation to the proposed Project.

EAO provided Blueberry River First Nations with notification of key milestones for the proposed Project, opportunities to review and provide comments on the draft Assessment Report, and a standing offer to meet EAO staff directly, all of which was intended to provide opportunities for Blueberry River First Nations to discuss specific information about its uses in the proposed Project area and to identify potential impacts of the proposed Project on its Treaty 8 rights. The Proponent notified Blueberry River First Nations of the proposed Project in January 2013. The Proponent continues to provide regular updates regarding the proposed Project to Blueberry River First Nations, including finalizing a TLU protocol agreement. Blueberry River First Nations participated in TEK programs, specifically archaeology and vegetation surveys. Members of Blueberry River First Nations also participated as assistants on environmental fieldwork activities.

EAO and Blueberry River First Nations met several times during the EA, including in July 2013, October 2013, July 2014 and October 2014. Blueberry River First Nations also attended EAO's May 29-30, 2014 Natural Gas Pipeline Workshop.

Blueberry River First Nations provided letters to EAO (July 24, 2013, September 13, 2013, September 30, 2013, November 6, 2013, November 7, 2013, December 18, 2013, December 20, 2013, June 27, 2014, August 15, 2014) commenting on EA documents, providing EAO with information on Blueberry River First Nations' key concerns regarding the proposed Project, as well as requesting to be added to Schedule B of the Section 11 Order. EAO provided responses to those letters, as well as EAO's views on Blueberry River First Nations' practice of Treaty 8 rights in the proposed Project area (letters on July 24, 2013, September 9, 2013, March 20, 2014 and October 7, 2014).

Potential Impacts of the Proposed Project to Blueberry River First Nations' Treaty 8 Rights and Other Interests:

Key issues raised by Blueberry River First Nations' in relation to its Treaty rights include concerns about potential impacts to:

- Hunting and trapping bison, moose, woodland caribou, rabbits, beaver, grouse, ducks, porcupines, squirrels, lynx, fox, coyote, marten, fisher, and wolverine;
- Cumulative effects to moose, elk deer and grizzly bears;
- Fishing practices;
- Limited access to fishing areas;
- Reduced access to waterways; and
- Blueberry River First Nations travelled extensively to engage in their way of life.

Other Blueberry River First Nations' concerns relating to traditional practices include the potential impacts to:

- Gathering berries, cambium, and tree roots;
- Limited access to plant harvesting areas;
- Potential effects to cultural elements of their territory; and
- Ability to spend time on the land and pass on knowledge to youth.

On October 31, 2014, Blueberry River First Nations provided EAO with an interim Socio-economic Baseline Profile, a Harvest Baseline and Socio-economic Effects Study (the Harvest Study) and a Knowledge and Use Study. EAO observes that the territory depicted in these reports is based on the 2012 Blueberry River First Nations Asserted Area, and includes area which lies outside the 2011 Boundary and outside what EAO understands to be the western boundary of Treaty 8 (recognizing that the western boundary of Treaty 8 is an area of dispute and subject to litigation between the Province and certain Treaty 8 First Nations).

The Harvest Study indicates that Blueberry River First Nations members continue to rely on traditional food to the extent possible, though harvest levels are reported to have been impacted for a number of species, including moose, porcupine, deer, beaver, caribou, rabbit, and berries. The Harvest Study notes the following harvesting changes on the land: a reduction in abundance of many harvested species and areas; reduced access to harvesting areas; increased competition from non-Aboriginal hunters and recreational users; members have to travel further to find animals to harvest; and hunts are less successful. The Study indicates that five potential ancillary sites associated with the proposed Project have been identified within Blueberry River First Nations territory, that would vary from 8 – 58 ha, and that the proposed route would cross the

following key watercourses within Blueberry River First Nations territory: Peace River, Moberly Lake and several other creeks.

The Knowledge and Use Study notes that members rely on the area that would overlap the proposed Project for a number of traditional uses. The Knowledge and Use Study identifies impacts of the proposed Project on habitat; movement of animals away from preferred harvesting areas; disturbance of important environmental features, such as mineral licks, calving grounds, and wildlife trails; destruction and disturbance of trapline areas; contamination of harvested resources, land, water and air; and inability to pass on traditional knowledge due to lack of access to resources. The Knowledge and Use Study notes that Blueberry River First Nations members have expressed importance of the entire proposed Project area, although use is particularly concentrated from the proposed pipeline crossing at the Peace River through Burnt Trail Creek. Members identified the Peace River as being an important area for fishing, camping and berry picking.

The Knowledge and Use Study designated a “Project Footprint” of 250 m as a zone of influence within which the abundance of wildlife and land use by humans may be altered by the proposed Project. The proposed Project construction corridor would be approximately 50 m in width, with a permanent ROW of 32 m during operations. The Knowledge and Use Study designated a Local Study Area (LSA) of 5 km as a “reasonable approximation of the area of regularly relied-upon resource use surrounding a given transportation or habitation value”.

The Knowledge and Use Study provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations were randomized and shown with a 1 km buffer. The information provided to EAO does not allow EAO to conclude definitively whether a reported value point location would be intersected by the Project footprint or be within 250 m of the centerline in the discussion of potential impacts of the proposed Project on Aboriginal Interests. The Knowledge and Use Study identified five categories of site-specific use values: cultural, environmental, habitation, subsistence and transportation. It was not clear what proportion of specific-use sites relate specifically to hunting rather than fishing, gathering, firewood or drinking water collection sites. For example, site-specific values labelled as “subsistence” in the study could relate to hunting, fishing or gathering.

The spatial boundaries used in the Knowledge and Use Study are called the Local Study Area (LSA) and Regional Study Area (RSA). These areas are used to study the cultural, environmental, habitation, subsistence and transportation site-specific use values. The LSA and RSA differ from the LAA and RAA used by EAO for wildlife

(in section 17.2.1 and 17.2.3), fish and fish habitat (section 17.2.2), vegetation (section 17.3.4), and archaeology and cultural heritage (section 17.2.5). EAO's assessment of effects on Aboriginal Interests is informed, in part, by the spatial boundaries for the VC's and EAO has considered the Knowledge and Use Study boundaries in relation to the VC spatial boundaries.

According to the Knowledge and Use Study, a total of 700 site-specific use values were reported in the study area for the proposed Project. The Knowledge and Use Study reports that 166 values would fall within 250 m of the proposed Project and include:

- 18 cultural/spiritual values;
- 21 environmental values;
- 19 habitation values;
- 95 subsistence values; and
- 13 transportation values.

The Knowledge and Use Study reports that 334 values would fall within 5 km of the proposed Project (including those identified above) and include:

- 47 cultural/spiritual values;
- 39 environmental values;
- 47 habitation values;
- 172 subsistence values; and
- 29 transportation values.

Within the LSA and RSA, members reported intensive use in several areas; specifically around:

- Butler Ridge – heavily used hunting and camping area, with high value habitat for sheep and elk, as well for bear, moose and caribou;
- Johnson Creek Road – including multiple cultural and environmental values, as well as wildlife and plant habitat;
- Dunlevy Creek at Williston Lake – high concentration of camping sites, trails and fish catch sites; and
- Cameron and Moberly Lakes – heavily used for hunting, fishing, camping, and cultural and spiritual ceremonies.

A number of maps are presented in the study generally locating the site specific use values within the study areas in relation to the proposed Project. Time of use of sites ranged from mid 1800s to the present (2014).

The area the Province understands to be Blueberry River First Nations' area of traditional use (the 2011 Boundary) lies outside of the LAA and RAA for the Wildlife and Wildlife Habitat VC, Water Quality and Quantity VC, Fish and Fish Habitat VC, Terrestrial Vegetation VC, Wetland Function VC, Current Use of Land and Resources for Traditional Purposes VC and Heritage Resources VC.

The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAAs are intended to capture the area where the influence of other land uses and activities could overlap with project specific effects and result in cumulative adverse effects. The effects of the proposed Project are expected primarily within the Project footprint and LAA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into the area understood to be Blueberry River First Nations' area of traditional use.

Taking into consideration the residual adverse effect from the proposed Project, and the distance of the proposed Project to Blueberry River First Nations' area of traditional use (the 2011 Boundary) and the Knowledge and Use Study, EAO concludes that the proposed Project is not expected to result in any adverse effects on Blueberry River First Nations' Treaty rights to hunt, trap and fish, nor are adverse effects expected to Blueberry River First Nations' gathering activities or culturally important sites.

18.1.2 Doig River First Nation

Context

- Doig River First Nation is a signatory to Treaty 8 and a member of the Treaty 8 Tribal Association. It has two reserves with a combined area of 1,358.1 ha: Doig River IR 206, comprising 1,000.8 ha; and the North Parcel of Beatton River IR 204, comprising 357.30 ha.
- As of September 2013, Doig River First Nation had a total registered population of 297, with an on-reserve population of 141 and an off-reserve population of 156.
- Doig River First Nation has one Chief and two Councillors elected under the *Indian Act* electoral system.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- Initially, EAO understood that the proposed Project was outside Doig River First Nation's area of traditional use. EAO was of the view that the potential impacts to

the Treaty 8 rights exercised by Doig River First Nation would be low and that the duty to consult Doig River First Nation lay at the low end of the *Haida* spectrum. Doig River First Nation was listed on Schedule C of the Section 11 Order.

- However, as a result of information provided by Doig River First Nation relating to EAO's request for historic use of the proposed Project area specifically in the vicinity of the Peace River crossing and the area around Hudson's Hope, EAO added Doig River First Nation to Schedule B of the Section 11 Order on May 21, 2014 to provide Doig River First Nation greater consultation opportunities.
- There is one compressor proposed to be located within Doig River First Nation asserted territory - the area the Province now understands to be its area of traditional use.
- Given the nature and location of the proposed Project and EAO's assessment of the potential impacts to Doig River First Nation's Treaty 8 rights as discussed below, EAO is of the view that the duty to consult Doig River First Nation lies at the low to middle range of the *Haida* spectrum.
- Doig River First Nation expressed their view that they disagree with EAO's assessment of "low". EAO considered all of the information provided by Doig River First Nation, and determined that the duty to consult remained at the low to middle range of the *Haida* spectrum.
- Doig River First Nation is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to five BC Treaty 8 First Nations residing in and around the Peace River Valley northeastern BC. EAO consults directly with member nations of the Treaty 8 Tribal Association regarding the potential effects of the proposed Project on their Treaty 8 rights.

Summary of Consultation

Doig River First Nation was invited to review and provide comments on the Proponent's Aboriginal Consultation Reports, on the screening of the Application and on the Application. Doig River First Nation was also provided with opportunities to attend Working Group meetings, beginning in early February 2014, to attend workshops and to meet with EAO staff directly.

EAO provided \$10,000 in capacity funding to Doig River First Nation early in the Application Review phase of the EA process to assist with costs associated with their participation in the environmental review. In August 2014, the Proponent concluded a MOU with Doig River First Nation to provide capacity funding and concluded a TLU Protocol Agreement.

EAO met with Doig River First Nation on January 24, 2014 related to their request to be on Schedule B of the proposed Project. Doig River First Nation provided comments to

EAO on the screening of the Application that indicated that in their view, the Application did not meet the AIR requirements because it did not include TLU or socio-economic baseline studies, nor was the cumulative effects assessment model in keeping with their interests. Doig River First Nation, together with McLeod Lake Indian Band, West Moberly First Nations and Sauteau First Nations, provided written comments on the Application, which are included where appropriate in the sections below. Doig River First Nation attended Working Group meetings on February 5, 7, July 28-31, 2014 and a Treaty 8 Working Group meeting on July 18, 2014. In addition, Doig River First Nation participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

The Proponent offered Doig River First Nation the opportunity to conduct a TLU and TEK study. In response, Doig River First Nation Knowledge Holders participated in TEK programs, specifically archaeology and vegetation surveys, and environmental fieldwork activities. The TLU study was provided to EAO on September 30, 2014, and EAO's Assessment Report was updated to reflect site-specific details reported in the TLU. The TLU identified five categories of site-specific use values: cultural, environmental, habitation, subsistence and transportation. It was not clear from the TLU what proportion of specific-use sites relate to hunting rather than fishing, gathering, firewood or drinking water collection sites. Some interpretation was required by EAO linking site specific use values presented in the study to the discussion of potential impacts of the proposed Project on Aboriginal Interests. For example, site-specific values labelled as "subsistence" in the study could relate to hunting, fishing or gathering.

The TLU designated a "project footprint" of 250 m as a zone of influence within which the abundance of wildlife and land use by humans may be altered. The proposed Project construction corridor would be approximately 50 m in width, with a permanent ROW of 32 m during operations. The TLU designated a LSA of 5 km, as "a reasonable approximation of the area of regularly relied-upon resource use surrounding a given transportation or habitation value".

The spatial boundaries depicted in the TLU that are used in relation to cultural, environmental, habitation, subsistence and transportation site-specific use values for the Project footprint, LSA and RSA differ from the LAA and RAA used by EAO for wildlife (in section 17.2.1 and 17.2.3), fish and fish habitat (section 17.2.2), vegetation (section 17.3.4), and archaeology and cultural heritage (section 17.2.5). EAO's assessment of effects on Aboriginal Interests is informed, in part, by the spatial boundaries for the VC's and EAO has considered the TLUS boundaries in relation to the VC spatial boundaries.

The TLU provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations were randomized and shown with a 1 km buffer. The information provided to EAO does not allow EAO to conclude definitively whether a reported value point location will be intersected by the Project footprint or be within 250 m of the centerline in the discussion of potential impacts of the proposed Project on Aboriginal Interests.

The table below shows the number of site-specific use values identified during mapping interviews or collected from previous similar pipeline interviews, within three distinct study areas. Additional values were identified during on-the-ground field work and helicopter overflight including potential future use areas.

TLU Study Area	Distance from Proposed Project	# of Site Specific Use Values
Project footprint	250 metres	188
Local Study Area	five kilometres	171 (359 including footprint)
Regional Study Area	25 kilometres	240 (599 including LSA)

A number of maps are presented in the study generally locating the site specific use values within the study areas in relation to the proposed Project. Time of use of sites ranged from late 1700s to the present (2014).

The TLU reported Doig River First Nation use throughout the study areas with particularly intense use around the Peace River, Moberly Lake and the Upper Moberly River as well as the east side of Williston Lake. Important areas used by Doig River First Nation are listed within the proposed Project footprint and LSA, unless otherwise noted for the RSA:

- Canyon Drive, in particular the road from Hudson Hope to the W.A.C. Bennett Dam used heavily to access fishing, hunting, and berry picking areas;
- Hudson Hope used for traditional camping, food cache and medicinal plant collection. The area continues to be used as a fishing spot and gathering place;
- Peace River at the pipeline crossing used for intensive fishing and berry picking. Habitat observations for wildlife (moose, elk, deer, black and Grizzly bear, marten, fisher, weasel, lynx, rabbit, grouse and bald eagle) were also provided for this area;
- Johnson Creek Road is reported as a commonly used route to visit hunting, fishing, camping and berry picking areas;
- Moberly Lake and the surrounding area used for camping sites, fishing and berry picking areas, gathering places and ceremonial places;
- Moberly River Road to the south of Pete Lake used for hunting (moose, rabbit and grouse), camping sites, berry picking areas (huckleberries) and picking

- medicinal plants (muskeg tea);
- John Hart Highway near two proposed compressor stations and an access road is noted as good habitat for bears, camping, fishing, and collecting plants (rhubarb and juniper bark);
- Williston Lake (east side) includes berry picking, camping and gathering areas for rodeos. Good bear habitat observations are also made;
- Between Tudyah Lake and Windy Point Lake where a proposed access road is proposed includes cabins and camping sites, hunting of large and small game (moose, lynx, marten, rabbit, porcupine, grouse and squirrel), berry picking areas (blueberries, huckleberries, cranberries and saskatoon berries) and firewood and water use sites. Kobes Creek Road used for hunting (moose), fishing and camping (RSA);
- Farrell Creek Road: used for hunting (moose), fishing and camping (RSA);
- Confluence of Farrell Creek and the Peace River noted as hunting area for deer and elk, camping sites, gathering place, berry and medicinal plant picking for saskatoon and raspberries and habitat observations as well as presence of a moose lick (RSA);
- Confluence of Lynx Creek and the Peace River noted as frequently used fish catch area for Dolly Varden, rainbow trout and whitefish, as well as camping area, gathering area for rodeos (RSA);
- Gravel Hill Creek where it meets Williston Lake is noted for camping sites, fish catch sites (rainbow trout) and hunting with noted kills of wolf, elk and grouse (RSA); and
- Dunlevy Creek where it meets Williston Lake is noted as, camping, hunting (grouse) and fishing (rainbow trout, lake trout, bull trout, jack fish, Dolly Varden) area as well as habitat observations (RSA).

On October 29, 2014, in addition to technical comments provided with other Treaty 8 First Nations, Doig River First Nation provided comments on the draft Assessment Report, which EAO incorporated into the final version of the Assessment Report, where appropriate. In this letter, Doig River First Nation provided site specific use values as noted in the following sections. EAO considered the site specific information provided by Doig River First Nation and reassessed the conclusions on impacts of the proposed Project to Treaty 8 rights.

In addition Doig River First Nation provided comments on this Assessment Report specifically related to the recent approval of the Site C Energy Project. Doig River First Nation raised concerns that EAO's assessment of cumulative effects in general and cumulative effects to Treaty 8 rights specifically, does not appear to have considered cumulative effects associated with the Site C Energy Project. Doig River First Nation

also indicated that the methodology used by EAO to characterize effects on Aboriginal Interests is not included in the Assessment Report and it is unclear how EAO reached their conclusions with respect to the magnitude of potential effects.

Section 17.2 of this Assessment Report describes the methodology and factors considered with respect to assessing potential impacts of the proposed Project on Aboriginal Interests. Section 16.5 of this Assessment Report describes how cumulative effects have been considered with respect to potential impacts of the proposed Project on Aboriginal Interests.

Issues raised by Doig River First Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Doig River First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to Doig River First Nation's Treaty 8 Rights and Other Interests

Hunting

Doig River First Nation raised key concerns regarding changes to wildlife, wildlife habitat and hunting, including:

- Increased access to hunting areas by recreational hunters;
- Contamination of wildlife that may deter members from hunting and trapping;
- Impacts on moose, deer and elk mineral licks;
- Impacts to beaver dams and animal dens;
- Noise effects from compressors and construction;
- Critical/sensitive life periods for ungulates, marine mammals and birds affected by aerial patrols;
- Change in species abundance;
- Change in wildlife behaviour;
- Change in calving and fawning areas;
- Change in traffic and effect on wildlife mortality;
- Increased access to hunting areas by recreational hunters;
- Loss of income from reduced wildlife harvesting;
- Effect on ability to harvest food and other resources; and
- Effects on water quality and wildlife health.

The TLU identified 78 subsistence specific-use sites within the proposed Project footprint, 23 of which are hunting and trapping sites, with 139 in the LSA and 250 in the

RSA. Maps of the general location of these sites are included in the TLU. The TLU reports that subsistence values within the proposed Project footprint include game kill locations for moose, white tail deer, wolverine, porcupine, rabbit, and grouse. No additional site specific values were reported for the LSA. The RSA includes reports of game kill locations for wolf, beaver and elk. The study reports a number of environmental sites (25 within the Project footprint, 42 in the LSA and 84 in the RSA). Environmental values include high value habitat observations (moose, caribou and deer), animal sightings, game trails a mineral lick and an Aboriginal settlement from the 1800s. The LSA environmental values were similar and included an eagle's nest, a moose calving area. The RSA includes cougar, porcupine and bear den sitings.

The TLU references specific special use sites located within the proposed Project footprint and the LSA including: Moberly River Road to the south of Pete Lake for hunting moose, rabbit and grouse and the area where an access road is proposed between Tudyah Lake and Windy Point Lake where hunting of both large and small game occurs (moose, lynx, marten, rabbit, porcupine, grouse and squirrel). The Knowledge and Use Study also references particular land access routes into hunting areas such as Canyon Drive and Johnson Creek Road. Within the RSA specific moose hunting areas (and camping) are referenced at Kobes Creek Road and Farrell Creek Road. The confluence of Farrell Creek and the Peace River is noted as a hunting area for deer and elk with a moose lick in the area. Within the RSA where Gravel Hill Creek meets Williston Lake a hunting area is noted and specific kills of wolf, elk and grouse are referenced. Dunlevy Creek where it meets Williston Lake is also reported as a grouse hunting area.

The TLU shows Doig River First Nation hunt large and small game, including moose elk, white tail deer, wolf, wolverine, porcupine, beaver, rabbit and grouse. Hunting is seen as integral for food security and cultural continuity. Moose are particularly important and the study reports that members have moved from the bush into the mountains to ensure hunting success. Porcupine sightings are now rare.

The study lists a number of concerns regarding potential Project interactions with Doig River First Nation hunting of wildlife (in particular moose) including:

- Disturbance of animals due to noise and traffic during construction and operation, causing them to move away from the area;
- Habitat destruction and fragmentation from clearing limiting animal movement and reducing the size of habitat areas available to animals;
- Linear disturbances (ROWS or roads) improving hunting success rates for predators such as wolves and bears, resulting in increased numbers of bears and wolves, adding further pressure to prey species, leading to reduced numbers

- of species such as moose, elk and caribou;
- Increased hunting pressure from linear disturbances (ROWs or roads) improving access for hunters, and increasing their success rates due to long lines of sight, adding to hunting pressure on wildlife populations and from construction workers becoming familiar with good hunting locations; and
- Potential contamination of animals due to the contamination of soil, air, water and plants during pipeline construction, leaks during the operation of the pipeline, and the consumption of plant materials sprayed with herbicides along the pipeline right-of-way and access roads. Contamination of hunted moose is observed and attributed to contamination from chemicals around industrial projects and from herbicides sprayed along cleared areas and roads. Altering resource consumption from the fear of contamination was also listed as a concern.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report – the proposed Project is expected to have minor impacts on Doig River First Nation's Treaty 8 right to hunt in the area of the proposed Project.

Fishing

Doig River First Nation identified important fish harvesting areas along the Peace River where the proposed Project route is proposed to cross the river, west of the Halfway River reserve, along the northern portion of the route, south of the Peace Arm of the Williston Lake and near Mackenzie.

Doig River First Nation identified the exercise of fishing and the need to protect sensitive spawning habitat in the Peace River Valley, Halfway River, Lynx Creek and Cache Creek areas (BC Hydro 2013).

Doig River First Nation raised key concerns regarding fishing activities, including:

- Change in habitat;
- Change in species abundance;
- Change in fish behaviour;
- Change in fishing areas;
- Change in access to fishing areas; and
- Effect on ability to harvest food and other resources.

Of the 37 fishing sites within the proposed Project footprint presented in the TLU, there are references to fish catch sites that include the following species: rainbow trout, grayling, Dolly Varden, jackfish, pickerel and whitefish are reported. Within the LSA, subsistence values for fish species also include ling cod and suckers. Reference is made to bull trout and lake trout in the RSA. Of the listed environmental value sites, reference is made to an ice fishing area within the LSA. Within the proposed Project footprint and LSA, specific reference in the study is made to a fishing spot at Hudson Hope, intensive fishing at the Peace River where the proposed pipeline would cross, Moberly Lake, and the John Hart Highway near where two proposed compressor stations and one access road would be located. The TLU also references particular land access routes into fishing areas such as Canyon Drive and Johnson Creek Road. Within the RSA the confluence of Lynx Creek and the Peace River is noted as a frequently used fish catch area for Dolly Varden, rainbow trout and whitefish. Rainbow trout fish catch sites are noted at Gravel Hill Creek where it meets Williston Lake and fishing at Dunlevy Creek where it meets Williston Lake for rainbow trout, lake trout, bull trout, jack fish and Dolly Varden is reported. Kobes Creek Road and Farrell Creek Road are also noted as being used for fishing (and camping). Fishing is indicated as an important subsistence activity and that members continue to fish on a regular basis for sustenance.

The TLU lists a number of concerns regarding potential Project interactions with Doig River First Nation fishing including:

- Physical disturbance of watercourses and fish habitat within the proposed Project footprint at water crossings;
- Contamination or perceived contamination of fish in the proposed Project footprint and LSA. Contamination impacts could be felt downstream beyond the RSA; and
- Cumulative impacts of the proposed Project, together with other industrial operations, on contamination or perceived contamination of water and fish throughout the proposed Project footprint, LSA and RSA and downstream for large distances.

The proposed Project corridor would cross approximately 29 major watercourses with indicated fish presence in Doig River First Nation's area of traditional use.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is

expected to have minor impacts on Doig River First Nation's Treaty 8 right to fish in the area of the proposed Project.

Trapping

Harvesting activity by Doig River First Nation members was identified west of Fort St. John, in the Peace River Valley to Hudson's Hope and north from Hudson's Hope past the Halfway River. These harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation; from the information available it was determined that portions of these harvesting areas may intersect with the LSA near Hudson's Hope and where the LSA intersects the Peace River Valley.

Doig River First Nation raised key concerns regarding changes to wildlife, wildlife habitat and trapping, including:

- Change in habitat;
- Contamination of wildlife that may deter members from hunting and trapping;
- Change in species abundance;
- Change in wildlife behaviour;
- Change in trapping areas;
- Change in access to trapping areas;
- Sensory disturbance;
- Change in income derived from trapping; and
- Effect on ability to harvest food and other resources.

Reference to small game hunting and trapping in the TUS includes rabbit, porcupine, marten and lynx. In addition to trapping for furs, animals may be trapped for food and medicines. Habitat references are made within the project footprint under the environmental category (marten, lynx, weasel, fisher, and rabbits) as well as a siting of a beaver dam. Trails to access trapping areas are also noted in the project footprint including reference to a historic water route used to travel to the mountains to hunt marmot. Subsistence and environmental values that could relate to trapping are also noted in the RSA (porcupine siting and wolf game kill location). A site described as being of sacred (or spiritual) significance is noted in the RSA where bones, scrapers and tools were found and could relate either to hunting or trapping.

There are 23 hunting and trapping sites identified by Doig River First Nation as being within the proposed Project footprint. Site specific-use sites presented in the TLU study under the subsistence value category that relate to trapping include the Peace River (marten, fisher, weasel, lynx and rabbit), and between Tudyah Lake and Windy Point

Lake for small game such as lynx, marten, rabbit, porcupine and squirrel. Access routes used for hunting may also be used for trapping (e.g., Canyon Drive and Johnson Creek Road). The TLU includes reports of historic trapping on the ice of the Peace River (as well as transportation) and observations that river no longer freezes in the same manner.

Several observations of good trapping areas were made during field visits. Doig River First Nation members noted marten are seen to be declining with industrial development and loss of forested habitat and members have to go a longer distance to ensure trapping success. Observations of ill animals that cannot be eaten are increasing.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Doig River First Nations Treaty 8 right to trap in the area of the proposed Project.

Gathering

Doig River First Nation identified 15 berry sites within the proposed Project footprint. Important harvesting sites are located west of the Halfway River reserve, along the northern portion of the route, along the Peace River where the proposed Project is to cross the river and in the Hudson's Hope area.

Both cultural/spiritual values and subsistence values include plant gathering sites including muskeg tea, blueberries, saskatoons, cranberries, raspberries and huckleberries occur within the Project footprint. Within the LSA additional rhubarb and strawberry gathering sites are listed. The RSA includes references to medicinal plant picking for poplar and jack pine roots as well as general berry picking areas for chokecherries. The study lists several sites important for gathering including heavily use sites for berry picking at Canyon Drive, Hudson Hope, the Peace River, Moberly Lake, Moberly River Road, East side of Williston Lake and the area between Tudyah Lake and Windy Point Lake where a proposed access road could be located. Access routes to gathering sites such as Canyon Drive and Johnson Creek Road are also listed for the project footprint and LSA. The confluence of Farrell Creek and the Peace River is noted in the RSA as a site of berry picking (saskatoons and raspberries) and medicinal plant picking.

Doig River First Nation raised key concerns regarding gathering activities, including:

- Change in habitat;

- Change in plant gathering areas;
- Potential disturbance of rare and important ecosystems including old growth forests, south aspect grassland, shrub and aspen slopes;
- Effects of invasive species;
- Effects of vegetation control such as herbicides;
- Increased access for recreational harvesters which may lead to increased pressure on plant resources;
- Change in access to plant gathering areas and practices;
- Direct removal of food plants, use plants and medicinal plants and fungi in the proposed Project footprint during pipeline construction;
- Contamination of plant and fungi picking sites by traffic fumes and dust during construction and along roads and access routes used for the proposed Project; and
- Concern or uncertainty about contamination deterring members from gathering plants and fungi in the proposed Project footprint and LSA.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on Doig River First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Doig River First Nation identified trails and travelways in the areas of Moberly River and the Peace Moberly Tract (PMT) which may intersect with the LSA.

Doig River First Nation noted that the location of the proposed Johnson Creek compressor station would be near sacred areas. Doig River First Nation identified an interest in sacred areas in relation to burial sites, sacred and ceremonial sites, and historic sites through the Project related consultation program and in TLU studies conducted for other development projects. Specific burial areas identified, in a previous study, include the south side of the Peace River, Attachie, Hudson's Hope, in the valley bottom downstream of Bear Flats, as well as multiple other unmarked sites reported to be located in the Peace River Valley (BC Hydro 2013) and in proximity to the proposed Johnson Creek compressor station.

Doig River First Nation raised key concerns regarding cultural sites, trails and travelways, including:

- Effects to habitation and sacred areas;
- The destruction of or lack of access to specific important sites for harvesting resources or cultural activities;
- Reduced access to general areas due to increased traffic and noise changing the character and safety of an area;
- Reduced access to general areas due to the presence of increasing numbers of people, particularly more hunters, which leads to competition for increasingly scarce resources and a perception of danger as members feel that it is unsafe to be out on the land when so many people are shooting;
- Reduced access to and use of general areas due to reductions in wildlife populations in the area, diminishing an area's use for subsistence harvesting;
- Reduced access and use of general areas due to the contamination and perception of contamination of resources in the area;
- The direct disturbance of large areas of land that are used for cultural activities or teaching areas;
- The direct destruction of cultural features such as pack trails;
- A reduction in the connection members feel towards particular sites and the landscape in general due to changes in the visual aesthetics;
- Reduced opportunities for teaching culture and passing on oral history due to loss of connection with the land where that history is based; and
- Reduced opportunities for teaching how to hunt, fish and pick berries and medicinal plants, and associated cultural protocols, due to reductions in wildlife populations or contamination or perceived contamination of resources.

The TLU lists and maps a number of cultural site-specific value sites and well as transportation and habitation sites within the three study areas. Within the proposed Project footprint a reference is made to the camping site where Doig River First Nation first encountered white people. Other sites include teaching areas, food caches and campsites. Historic trails and waterways used by Doig River First Nation to travel to hunting, trapping and fishing areas as well as camping and berry picking sites. A reference is made to an old rafting route and an old horse trail from Hudson Hope to Fort St. John. Within the LSA, ceremonial, gathering places and place names are referenced. Trails to travel to Moberly Lake from Hudson Hope and to Halfway River Reserve are mentioned. The importance of teaching areas and other cultural/spiritual value sites are referenced in the RSA. Specific references to habitation sites (camp sites and cabins) and gathering sites are made in the study for the proposed Project footprint/LSA and the RSA.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's

characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to have minor impacts on Doig River First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Doig River First Nation

During the EA process, Doig River First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

18.1.3 Fort Nelson First Nation

Context

- Fort Nelson First Nation is a signatory to Treaty 8. It has four reserves that total 9,752.6 ha. The main community is located in Fort Nelson 2, a reserve on the confluence of the Muskwa and Nelson rivers, 6 km southeast of the community of Fort Nelson. Fort Nelson First Nation is comprised of 14 major families from 6 villages within the Traditional Territory: *Ttheke'eneh Kue* (Old Fort), *Fontas*, *Kahntah*, *Nadudhi Deeze* (Snake River), *Tlidli* (Nelson Forks), and *Tli Gohtche* (François).
- As of September 2013, Fort Nelson First Nation had a registered population of 887, with an on-reserve population of 454 people and an off-reserve population of 433 people. Fort Nelson First Nation has a Chief and five Councillors elected to two-year terms under the *Indian Act* electoral system.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project does not overlap with what the Province understands to be the Fort Nelson First Nation's area of traditional use.
- Given the distance of the proposed Project from the area understood to be Fort Nelson First Nation's area of traditional use, EAO listed Fort Nelson First Nation on Schedule C of the Section 11 Order.
- In response to the Section 11 Order, Fort Nelson First Nation expressed their desire to be on Schedule B of the section 11 Order and concerns relating to the impact of the potential upstream development on its Treaty 8 rights. EAO considered the potential for impacts to Fort Nelson First Nation Treaty 8 rights, and that the proposed Project is far from the area the Province understands to be

Fort Nelson First Nation's area of traditional use, and determined that the duty to consult remained at the low end of the *Haida* spectrum. However, EAO confirmed that the focus of consultation regarding upstream development would be considered for those particular proposed Projects as, and if, they emerge.

Summary of Consultation

The area understood to be the area of traditional use of Fort Nelson First Nation lies outside of the proposed Project area. Fort Nelson First Nation was provided with notification of key milestones in the EA, including issuance of the AIR and the acceptance of the Application to EAO for review. EAO also had a standing offer to meet with any Aboriginal Group on Schedule C.

The Proponent first met with Fort Nelson First Nation in January 2013 by providing formal notification of the proposed Project. In the initial meeting, Fort Nelson First Nation advised the Proponent that, while the proposed Project falls outside of their consultation area, as a member of the Treaty 8 Tribal Association, Fort Nelson First Nation wishes to be kept informed. Since that time, the Proponent has provided regular updates and also met with Fort Nelson First Nation twice.

Potential Impacts of the Proposed Project to Fort Nelson First Nation's Treaty 8 Rights and Other Interests

Fort Nelson First Nation's identified concerns related to the potential effect on water quality at a regional level that may affect fish populations and habitat as well as the potential effects on indicator fish species including change in habitat, change in mortality risk and change in water quality.

The area understood to be Fort Nelson First Nation's area of traditional use lies outside of the LAA and RAA for the Wildlife and Wildlife Habitat VC, Water Quality and Quantity VC, Fish and Fish Habitat VC, Terrestrial Vegetation VC, Wetland Function VC, Current Use of Land and Resources for Traditional Purposes VC and Heritage Resources VC.

The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAA are intended to capture the area where the influence of other land uses and activities could overlap with Project specific effects and result in cumulative adverse effects.

The effects of the proposed Project are expected primarily within the proposed Project footprint and LAA, therefore, it is not expected that residual adverse effects on any of

the above mentioned VCs would extend into Fort Nelson First Nation area of traditional use.

Taking into consideration the residual adverse effects from the proposed Project, and the distance of the proposed Project to Fort Nelson First Nation's area of traditional use, EAO concludes that the proposed Project is not expected to result in any adverse effects on Fort Nelson First Nation's Treaty 8 rights to hunt, trap and fish, nor are adverse effects expected to Fort Nelson First Nation's gathering activities or culturally important sites.

18.1.4 Halfway River First Nation

Context

- Halfway River First Nation is a Beaver or Dunne-Zaa speaking community and was originally part of the Hudson Hope Band, along with West Moberly First Nations, up until 1975. The Halfway River reserve is north of the Peace River and is 3990 ha in size. There are 160 members living on reserve out of a total population of 256.
- The traditional hunting and trapping territories of Halfway River First Nation are focused within the Halfway Valley, on the edge of the foothills and mountains of the Rocky Mountains. Hunting and trapping extend as far west as the Finlay River watershed, located on the western slope of the Rockies in the Rocky Mountain Trench in an area which lies outside what EAO understands to be the western boundary of Treaty 8 (recognizing that the western boundary of Treaty 8 is an area of dispute and subject to litigation between the Province and certain Treaty 8 First Nations). Traditional resource harvesting overlapped Prophet River First Nation Traditional Territory near Pink Mountain and the Sikanni Chief River.
- Halfway River First Nation is governed by a Chief and two Councillors elected for two year terms under the *Indian Act* electoral system.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- EAO understands that the proposed Project is expected to overlap 132 km of the area the Province understands to be Halfway River First Nation's area of traditional use, within the area recognized by BC as the western boundary of Treaty 8. Halfway River First Nation was listed on Schedule B of the Section 11 Order.
- There are three compressor stations proposed to be located within Halfway River First Nation's area of traditional use and four potential camp locations.

- Given the nature and location of the proposed Project, and EAO's assessment of the potential impacts to Halfway River First Nation's Treaty 8 rights as discussed below, EAO's view is that the duty to consult Halfway River First Nation lies in the middle of the *Haida* spectrum.
- Halfway River First Nation is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to five BC Treaty 8 First Nations residing in and around the Peace River Valley area of northeastern BC. EAO consults directly with member nations of the Treaty 8 Tribal Association regarding the potential effects of the proposed Project on their Treaty rights.

Summary of Consultation

Halfway River First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Halfway River First Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Halfway River First Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. In November 2013, the Proponent and Halfway River First Nation executed an MOU to engage in discussions regarding the proposed Project. In January 2014, the Proponent and Halfway River First Nation executed a TLU Protocol Agreement and Halfway River First Nation submitted an Interim TLU Report, which was used to help inform the Application, where appropriate. The final *Halfway River First Nation Traditional Land Use and Ecological Knowledge of TransCanada Pipeline's Limited's Proposed Prince Rupert Gas Transmission Project Final Report*, dated August 22, 2014, was received by EAO and considered in preparing this Assessment Report.

A site distribution map is provided in the final TLU. This map provides a numbered and coloured gradient system to identify hunting, trapping, fishing, berry picking and plant gathering activities along the proposed Project route. The map illustrates higher traditional use in the Peace River crossing, Hudson Hope and Beryl Prairie areas and diminishing use as the proposed route travels south west. In the final TLU, Halfway River First Nation suggested a multiple stage process for identifying impacts to traditional use locations and the mitigation of these impacts. In part, Halfway River First Nation requested avoidance of traditional sites, minimization of impacts, mitigation including cultural awareness, funding initiatives for community well-being, supporting programs to preserve the transfer of traditional knowledge, and supporting development

of cultural heritage programs as dictated by the community. Lastly, Halfway River First Nation suggested that where impacts cannot be avoided or mitigated, the final step is to provide compensation.

Halfway River First Nation provided comments to EAO on the EA including route selection, data requests and impacts from the proposed Project. Halfway River First Nation attended Working Group meetings on October 17, 2013, November 20 and 27, 2013, February 5 and 7, 2014 and July 28-31, 2014. Halfway River First Nation also attended a Treaty 8 Working Group meeting on July 18, 2014, to discuss potential impacts to Treaty rights. In addition, Halfway River First Nation participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

In addition to EAO-led consultation activities throughout the EA process, the Proponent provided updates to Halfway River First Nation including routing information; however, no specific issues were identified with respect to the proposed routing. Halfway River First Nation did identify general concerns regarding the proximity of proposed projects to the Halfway River First Nation's reserve as well as the cumulative effects of development occurring within their Traditional Territory that may affect moose and ungulate populations. Issues raised by Halfway River First Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Halfway River First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to Halfway River First Nation's Treaty 8 Rights and Other Interests

Halfway River First Nation expressed that they do not consider the proposed EA certificate condition not allowing fishing, hunting or trapping by proposed Project personnel during work hours as meaningful or responsive to their concerns regarding increased access and recreational hunting and fishing.

Hunting

Halfway River First Nation stated key concerns regarding wildlife, wildlife habitat and hunting including:

- Effects on wildlife habitat and population;
- Potential destruction of beaver dams, mineral licks, bear dens, bird nests, migration routes, wildlife trails and crossings, old growth areas and calving areas;

- Disturbances of wildlife habitat and migration matters, including potential adverse cumulative effects, particularly for moose, caribou, black bears, Grizzly bears, wolves and other ungulates;
- Decrease in wildlife biodiversity;
- Increased access for predators and recreational hunters;
- Displacement of animals and birds due to construction activities and noise; and
- Removal of vegetation resulting in a loss of foraging habitat for terrestrial animals, specifically ungulates and bears.

In the Halfway River First Nation Interim and final TLU Report, Halfway River First Nation specified they hunt the following species: beaver, bighorn sheep, black bear, grizzly bears, buffalo (bison), caribou, coyote, elk, moose, mountain goat, mountain sheep, mule deer, porcupine, Stone sheep, whistler (hoary) marmot, white tail deer, wolf, blue grouse, ruffed grouse, and spruce grouse. Beaver is specifically hunted for medicinal uses.

The TLU provides that the point of origin of the proposed Project as well as the Halfway River watershed, Cypress Creek, Chowade River towards Williston Lake, the town of Hudson's Hope and the headwater region of the Sikanni Chief to the north are the traditional hunting areas of Halfway River First Nation. It was not possible to determine whether hunting areas fall within the LAA as the precise location of hunting areas were not identified.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report – the proposed Project is expected to result in minor impacts on Halfway River First Nation's Treaty 8 right to hunt in the area of the proposed Project.

Fishing

The Application states that Halfway River First Nation fishes various species of trout including brook, Dolly Varden and rainbow, in addition to burbot, flat head chub, goldeneye, grayling, large scale sucker, long nose sucker, squawfish, catfish, whitefish, squawfish, walleye and northern pike.

Halfway River First Nation stated key concerns regarding fish and fish habitat and fishing including:

- Increased fish mortality and disruption of critical life stages and/or critical habitat;
- Change in species morphology over time;
- Loss of income/livelihood;
- Damage to fish stocks and spawning from sediment turbidity and increased water temperature;
- Change in groundwater and surface water;
- Reduction of water quality in creeks, wetlands and bogs;
- Concerns for erosion and sedimentation;
- Interference of water crossings; and
- Improved access opportunities which increase recreational activity levels.

The proposed Project corridor would cross approximately 29 major watercourses with indicated fish presence in Halfway River First Nation's area of traditional use.

The TLU states that south along the Moberly River, from the 80 – 150 km marker of the proposed Project, is an area rich in creeks and rivers and is a significant fishing resource area for Halfway River First Nation.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects to fish and fish habitat, surface water, groundwater and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Halfway River First Nation's Treaty 8 right to fish in the area of the proposed Project.

Trapping

The Application states that traditionally Halfway River First Nation trapped beaver, coyote, ermine, fisher, fox, groundhog, hare/rabbits, lynx, marten, mink, muskrat, river otter, red squirrel, wolf, and wolverine.

Halfway River First Nation stated key concerns regarding wildlife, wildlife habitat and trapping including:

- Effects on wildlife habitat and population;
- Change in access to trapping areas;
- Changes to wildlife and wildlife biodiversity; and
- Increased risk of vehicle collisions.

The TLU provides that historically trapping was in the areas of Coal Creek, Chowade, Cypress, Stoney, Moose Creek, Horseshoe Creek and Blue Grave Creek, all of which are outside of the proposed Project area.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Halfway River First Nation's Treaty 8 right to trap in the area of the proposed Project.

Gathering

Halfway River First Nation stated key concerns regarding vegetation and gathering including:

- Potential effects and need to maintain traditional foods for cultural, spiritual, medicinal and subsistence purposes;
- Change in access and plant gathering areas;
- Herbicide use on traditional plants; and
- Damage to rare plants.

The Application states that traditionally Halfway River First Nation harvested many plants, including berries and medicinal plants, such as alder, aspen, baneberry, beaver ears/wintergreen, birch, black currant, black poplar, bluebell, blueberry, bunchberry/whiskeyjack berry, choke cherry, cloud berry, comandra, cottonwood, crow berry/marten berry, dandelion, Devil's club, dewberry, spiny fern root, fireweed, flat leaf plant, flat lichen, frog's blanket/colt's foot, fungus/willow and other tree fungus, goldenrod, gooseberry, highbush cranberry, horsetail, huckleberry, Indian carrot/wild

pea vine/bear root, Indian parsnip/sweet cicely, jack pine, juniper, kinnikinnik, Labrador tea/muskeg tea, lichen/tree moss, lowbush cranberry, mint, mountain ash/moose berry, puffball mushroom, mushroom, potentilla, raspberry, rat root, red osier dogwood, rhubarb, rose, rose hip, rotten wood, sage, saskatoon berry, silver berry/wolf willow, soapberry/bear berry, swamp currant/frog berry, wild cabbage, wild strawberry, willow, white spruce, and yarrow.

The TLU states that at the point of origin of the proposed Project, there are important berry picking and good plant collecting areas. Between 10 km to 40 km markers are regions indicated as important medicinal plant gathering areas.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project may have the potential to result in minor impacts on Halfway River First Nation's gathering activities in the area of the proposed Project.

Culturally Important Sites, trails and travelways

Halfway River First Nation has identified an interest in trails and travelways including transportation corridors such as overland trails and water routes. Halfway River First Nation identified a concern with possible alteration of trails in the areas of Bear Flats, Cache Creek, Halfway River, Moberly River, the PMT, and certain sites that are associated with specific stories. The TLU identified important transportation routes throughout the proposed Project footprint south of Ferrell Creek from the 0 km marker through to the 60 km marker. Three trails in the Beryl Prairie area transverse the proposed Project footprint.

Halfway River First Nation stated key concerns regarding culturally important sites, trails and travelways including:

- Alteration of trails and the consequent disassociation of oral history from landscape features specifically in the areas of Bear Flats, Cache Creek, Halfway River, Moberly River, and the PMT;
- Concern for potential destruction of, or damage to, gathering areas, habitation sites, archaeological and cultural resources including desecration of unmarked

- gravesites and other spiritual sites, and removal of place names; and
- The potential alteration of access to certain sites that is associated with specific stories. If the sites are not accessible, the stories may not be told and may get lost over time.

The TLU for Halfway River First Nation identifies that prior to 1961, the Stoney (Chowade) River was the main gathering site location. It also states that the entire Peace River region is connected by a series of trails and travel routes and that placenames, gravesites and other sites described as being of spiritual significance are found within the 2 km buffer from 0 – 40 km markers. This is the region from Farrell Creek to Tworidge Mountain. Village and campsites were found from the 0 – 140 km marker, excluding the 60-70 km markers. The TLU states that it is critical that the pipeline construction not prevent access to these camps, nor reduce the ability of people to hunt and fish nearby. Campsites are associated with areas rich in multiple resources.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, and EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to result in minor impacts to Halfway River First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Halfway River First Nation

During the EA process, Halfway River First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

18.1.5 McLeod Lake Indian Band

Context

- McLeod Lake Indian Band is an adherent to Treaty 8 pursuant to the 2000 McLeod Lake Indian Band Treaty No. 8 Adhesion and Settlement Agreement.
- Culturally, McLeod Lake Indian Band is part of the larger Sekani (*Tse'khene*) Aboriginal group and shares kinship with the Kwadacha First Nation and Tseh Kay Dene First Nation. It also has cultural ties with western *Dane-za* or *Dunne-za* (Beaver) groups, such as West Moberly First Nations and Halfway River First Nation.
- McLeod Lake Indian Band includes a 108,000 km² area with 21 reserves totaling

20,053 ha. The primary reserves are located about 150 km north of Prince George. Total Band membership is just over 500 people, with an on-reserve population of about 80 and an off-reserve population of about 433.

- The government of McLeod Lake Indian Band consists of a Chief and six Councillors. Elections are held every three years and conducted in accordance with the McLeod Lake Indian Band custom election code.
- Band members continue to use their reserve land and land described under the Adhesion and Settlement Agreement, for a variety of cultural activities, including camping, travel, fishing, hunting, trapping, plant gathering and heritage activities.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to cross 200 km of the McLeod Lake Indian Band's territory.
- There are three compressor stations proposed to be located within McLeod Lake Indian Band's traditional territory and four potential camp locations.
- EAO's consideration of the potential impacts of the proposed Project on McLeod Lake Indian Band's Treaty rights is discussed below.
- EAO is of the view that the duty to consult McLeod Lake Indian Band lies at the middle end of the *Haida* spectrum. McLeod Lake Indian Band is listed in Schedule B of the Section 11 Order.

Summary of Consultation

McLeod Lake Indian Band was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. McLeod Lake Indian Band was also provided with opportunities to attend Working group meetings, workshops and to meet with EAO staff directly.

EAO provided McLeod Lake Indian Band with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. In March 2014, the Proponent and McLeod Lake Indian Band executed a MOU that provided capacity funding to facilitate McLeod Lake Indian Band's meaningful participation in the EA process. In association with the MOU, McLeod Lake Indian Band, in coordination with Sauteau First Nations and West Moberly First Nations, was provided funding to undertake a collective review and provide comment on the Application. In addition, in mid-March 2014, the Proponent and McLeod Lake Indian Band concluded a TLU Protocol Agreement.

McLeod Lake Indian Band, together with Saulteau First Nations and West Moberly First Nations, provided input to the EA process through written comments on the AIR. However, these comments were received two months after the AIR was issued. EAO shared these comments with the Proponent but did not make any changes to the AIR. Many of the comments received were already raised and considered by the Working Group. McLeod Lake Indian Band, together with Saulteau First Nations, West Moberly First Nations and Doig River First Nations, provided written comments on the Application, which are included where appropriate in the sections below. McLeod Lake Indian Band also participated in Working Group meetings on September 12, 2013, February 5 and 7, 2014, and July 29-30, 2014. McLeod Lake Indian Band also attended a Treaty 8 Working Group meeting on July 18, 2014 to discuss potential impacts to Treaty Rights. In addition, McLeod Lake Indian Band participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

In May 2014, the Proponent received McLeod Lake Indian Band's Traditional Knowledge and Use Study Interim Report. The Proponent met with McLeod Lake Indian Band to discuss the Report in June 2014. At this time, the Proponent also provided McLeod Lake Indian Band with a routing update.

As noted in section 18.1, Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project and EAO has proposed a condition in response to this independent technical review.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with McLeod Lake Indian Band in response to the concerns regarding the location of the proposed Johnson Creek compressor station. The Proponent undertook an assessment of an alternative compressor station location; however, it was determined that the location, which was chosen based on feedback from Aboriginal Groups, would not be feasible owing to geotechnical issues, potential adverse impact to habitat, and the construction of new road access with associated grade issues. In response to the concerns identified by McLeod Lake Indian Band and other Aboriginal Groups, the Proponent sought to incorporate specific mitigation measures to avoid or minimize the potential adverse effects identified by Aboriginal Groups into the design of the compressor station. In a June 2014 letter to McLeod Lake Indian Band, the Proponent committed to these mitigations, which include reducing the visual impact through:

- Reduction of the site footprint from 15 hectares to 7 hectares;
- Designing certain facility piping to be buried underground, where normally it would be constructed above-ground;
- Where the pipeline enters the compressor station, construct the pipeline as a

horizontal bore, which will avoid the clearing of trees on either side of the road, thus creating a visual screen down the ROW and acting to restrict access along the ROW at that location; and

- Screen the compressor station with existing and/or replanted trees to blend with the surrounding landscape.

In response to the Proponent's December 2013 application to the OGC to conduct geotechnical activities at Callazon Creek and Johnson Creek, McLeod Lake Indian Band expressed concerns to the OGC in March 2014 regarding the geotechnical investigations in these two areas. Specifically McLeod Lake Indian Band identified concerns with the location of the proposed Johnson Creek compressor station and its proximity to culturally sensitive locations, as well as geotechnical drilling at Callazon Creek and its potential impact to habitat, including wetlands, for bull trout and moose. McLeod Lake Indian Band expressed concern that disturbance to the local ecosystem due to the geotechnical drilling would further contribute to the decline of both species within the region. In response to this concern, a meeting was scheduled between the OGC, the Proponent and McLeod Lake Indian Band for April 2014. However, McLeod Lake Indian Band later cancelled the meeting and did not identify an alternative date.

The Proponent submitted an Application Addendum to EAO on July 31, 2014 that identified five route alternatives in McLeod Lake Indian Band traditional territory including Canyon Drive, Portage Creek, Peace River, Mackenzie, and Nation River. The Addendum considered potential adverse effects to the McLeod Lake Indian Band treaty rights assessed in the Application. Potential effects of the Canyon Drive, Portage Creek, Peace River, Mackenzie, and Nation River route alternatives were considered with respect to the sites, locations, species, and practices identified by McLeod Lake Indian Band in the Application. The Proponent concluded that the residual adverse effects to McLeod Lake Indian Band treaty rights did not change as a result of the Canyon Drive, Portage Creek, Peace River, Mackenzie, and Nation River route alternatives, nor were additional mitigation measures necessary. McLeod Lake Indian Band indicated to EAO that the Mackenzie route impedes the community forest blocks which receives a significant level of traditional use by McLeod Lake Indian Band members. McLeod Lake Indian Band commented that this alternate route has the potential for detrimental infringements on their ability to use this area and could have significant impacts on their Treaty 8 rights.

On May 7, 2014, the TLU was provided to EAO, and EAO's Assessment Report was updated to reflect site-specific details reported in the TLU. The TLU identified five categories of site-specific use values: cultural, environmental, habitation, subsistence

and transportation. It is not clear what proportion of specific-use sites relate to hunting rather than fishing, gathering, firewood or drinking water collection sites. Some interpretation was required by EAO linking site specific use values presented in the study to the discussion of potential impacts of the proposed Project on Aboriginal Interests. For example, site-specific values labelled as “subsistence” in the study could relate to hunting, fishing or gathering.

The TLU designated a “Project footprint” of 250 m as a zone of influence within which the abundance of wildlife and land use by humans may be altered. EAO understands the Project construction corridor to be approximately 50 m in width, with a permanent ROW of 32 m during operations.

The TLU designated a LSA of 5 km, as “a reasonable approximation of the area of regularly relied-upon resource use surrounding a given transportation or habitation value”. The spatial boundaries depicted in the TLU that are used in relation to cultural, environmental, habitation, subsistence and transportation site-specific use values for the Project Footprint, LSA and RSA differ from those used by EAO for wildlife (in section 17.2.1 and 17.2.3), fish and fish habitat (section 17.2.2), vegetation (section 6.3.4), and archaeology and cultural heritage (section 17.2.5). EAO’s assessment of effects on Aboriginal Interests are informed, in part, by the spatial boundaries for the VC’s that could correspond with a particular Aboriginal Interest.

The TLU provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations were randomized and shown with a 1 km buffer. The information provided to EAO does not allow EAO to conclude definitively whether a reported value point location will be intersected by the proposed Project footprint or be within 250 m of the centerline in the discussion of potential impacts of the proposed Project on Aboriginal Interests.

The TLU identifies 30 subsistence site-specific use values within 250 m of the proposed Project in the proposed Project footprint, 77 within 5 km of the proposed Project in the LSA, and 385 within 25 km of the proposed Project in the RSA. The TLU also identifies six environmental site-specific use values within 250 m of the proposed Project in the proposed Project footprint, 12 within 5 km of the proposed Project in the LSA, and 56 within 25 km of the proposed Project in the RSA. No details are provided as to the specific activities that take place within the proposed Project footprint. Environmental and subsistence feature values are noted to include highly valued habitat for moose, elk and deer, harvesting and kill sites, plant collection areas, and trapping areas. Therefore these site-specific use values could be relevant to McLeod Lake Indian Band’s hunting, fishing, trapping or gathering activities. The authors of the TLU indicate that the

proposed Project would limit McLeod Lake Indian Band members' ability to meaningfully practice a way of life consistent with rights under Treaty 8, in areas adjacent to and within the proposed Project footprint.

Issues raised by McLeod Lake Indian Band and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with McLeod Lake Indian Band as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to McLeod Lake Indian Band's Treaty 8 Rights and Other Interests

Hunting

In the McLeod Lake Indian Band Interim TLU Report, McLeod Lake Indian Band identified they hunt grouse, groundhog, moose, caribou and elk. There are harvesting areas "from Nation Arm south along the Williston Lake to the southern end of McLeod Lake". Important hunting sites were noted east of the Williston Lake, in the Mugaha Valley. Mount Morfee and the surrounding area were identified as important hunting sites for grouse, groundhog and other game. Areas around Nation Arm, the Williston Lake, Tsedeka Creek, Mugaha Creek and the Mugaha Valley were identified as important habitat for moose, beaver, marten, fisher, elk and other wildlife. It was identified that a loss of key small game hunting areas could result from the proposed Project footprint and construction of the proposed Project ROW.

McLeod Lake Indian Band has raised concerns about the proposed pipeline crossing at Callazon Creek due to the sensitive nature of the terrestrial habitat. Callazon Creek provides terrestrial habitat for moose, caribou and Grizzly bear. McLeod Lake Indian Band is also concerned about a compressor station at Callazon Creek as it would impact hunting activities linked to vegetation removal, riparian area erosion, noise effects on wildlife, and increased access.

McLeod Lake Indian Band raised key concerns regarding changes to wildlife, wildlife habitat and hunting, including:

- Loss of key small game hunting areas;
- Impacts on moose, deer and elk licks;
- Changes to animal health, particularly moose as a result of changes to wildlife habitat;
- Critical/sensitive life periods for ungulates, marine mammals and birds affected by aerial patrols;

- Use of chemical sprays and effect attributed to poor moose health;
- Noise effects from compressors and construction;
- Movement of animals away from preferred harvest areas;
- Changes to bears and bear dens;
- Increased access to recreational hunters and predators; and
- Cumulative impacts of ongoing industrial development.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use - as discussed in section of 17.2.1 of this Assessment Report - the proposed Project is expected to have minor to moderate impacts on McLeod Lake Indian Band's Treaty 8 right to hunt in the area of the proposed Project.

Fishing

In the McLeod Lake Indian Band TLU Interim Report, McLeod Lake Indian Band identified fishing, particularly along Mugaha Creek. Other areas identified as important include around Nation Arm, the Williston Lake and Tsedeka Creek. The assessment of the proposed Project on effects considers effects on Dolly Varden, rainbow trout, bull trout and other culturally critical species.

During a February 2014 meeting with the Proponent, McLeod Lake Indian Band raised a concern regarding water quality and the effect of water crossings on bull trout. In addition, McLeod Lake Indian Band raised concerns about the proposed pipeline crossing at Callazon Creek due to the sensitive nature of the aquatic habitat and surrounding terrestrial habitat which may have an impact on fishing activities. McLeod Lake Indian Band reiterated their concern during Application Review. McLeod Lake Indian Band indicated that they do not support any stream disturbance at Callazon Creek as it has sensitive habitat and should be classified as high-risk. During Application Review, the Proponent indicated to EAO and FLNR that a HDD crossing would now be their preferred crossing method at this location, and that the crossing location would avoid sensitive bull trout habitat.

McLeod Lake Indian Band raised key concerns regarding fishing activities, including:

- Increased access for recreational fishing;
- The potential effect on fish health, movement, habitat and species composition in in Peace River, Halfway River and Moberly Lake through construction related contaminants, accidental releases and spills, riverbank erosion and toxic chemicals from insect and plant control sprays; and

- Cumulative impacts of ongoing industrial development.

The proposed Project corridor would cross approximately 27 major watercourses with indicated fish presence in McLeod Lake Indian Band's area of traditional use. The Proponent states that the proposed Project will not intersect the shoreline areas of any of the lakes described above. Similarly, no compressor station development would occur within 100 m of any major watercourse. However, local habitat alteration would occur at creek and river crossings where the proposed route crosses some of the watercourses.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use – as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to result in minor impacts on McLeod Lake Indian Band's Treaty 8 right to fish in the area of the proposed Project.

Trapping

McLeod Lake Indian Band identified trapping of grouse, groundhog, beaver, marten, and fisher in their Interim TLUS Report. Important trapping sites were noted around Nation Arm, the Williston Lake, Tsedeka Creek, Mugaha Creek and the Mugaha Valley. These were identified as important habitat for beaver, marten, fisher, and other wildlife. These harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. It was identified that a loss of key small game trapping areas could result from the proposed Project footprint and construction of the ROW. Additionally, during operation and maintenance phases, it was identified that animals may move away from preferred areas for harvesting due to noise and increased traffic. McLeod Lake Indian Band noted that an increase in non-Aboriginal use of the area due to improved road access would put pressure on wildlife populations.

The assessment of the effects of the proposed Project on McLeod Lake Indian Band trapping interests provided in the Application specifically takes into account effects on species including fisher, wolverine, rabbit, muskrat, beaver and other small furbearers.

McLeod Lake Indian Band is concerned about a compressor station at Callazon Creek as it would impact trapping activities linked to vegetation removal, riparian area erosion, noise effects on wildlife, and increased access.

McLeod Lake Indian Band raised key concerns regarding wildlife, wildlife habitat and trapping, including:

- Loss of key trapping areas;
- Movement of animals away from preferred harvest areas;
- Disruption of trapping practices resulting in loss of active traplines;
- Change in access to trapping areas; and
- Cumulative impacts of ongoing industrial development.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in minor impacts on McLeod Lake Indian Band's Treaty 8 right to trap in the area of the proposed Project.

Gathering

In the McLeod Lake Indian Band Interim TLU Report, McLeod Lake Indian Band identified activities related to plant gathering, particularly gathering berries and other plant materials. Wetlands were identified as important harvesting areas for plants, including rhubarb, fiddleheads, stinging nettles, wild rice, wild onion, Devil's club and Labrador tea. Plant gathering was identified from Nation Arm south along the Williston Lake to the southern end of McLeod Lake as well as in the Mugaha Valley east of the Williston Lake. McLeod Lake Indian Band identified concern about contamination of berries, medicines and other plants in conjunction with the proposed Project as well as a concern related to the loss of gathering sites for berries, medicines and other plants.

McLeod Lake Indian Band raised key concerns regarding gathering activities, including:

- Loss of key food gathering sites;
- Concern with use of chemical sprays;
- Change to native plans as a result of introduction of invasive species; and
- Cumulative impacts of ongoing industrial development.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on McLeod Lake Indian Band gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

In the McLeod Lake Indian Band Interim TLU Report, McLeod Lake Indian Band identified trails and travelways including transportation corridors such as traditional trail systems. Fifteen transportation sites were identified within 250 m of the proposed Project footprint, 29 transportation sites were identified within 5 km of the proposed Project footprint, and 67 transportation sites were identified within 25 km of the proposed Project footprint.

In the McLeod Lake Indian Band Interim TLU Report, McLeod Lake Indian Band identified that the parts of the proposed Project footprint are intensively used for camping. The Mugaha Valley, east of the Williston Lake, is identified as an important area for camping. Two habitation sites were identified within 250 m of the proposed Project footprint, 14 habitation sites were identified within 5 km of the proposed Project footprint, and 107 habitation sites were identified within 25 km of the proposed Project footprint.

The McLeod Lake Indian Band Interim TLU Report did not provide specific information about the location or use of sacred areas. However, nine cultural and sites described as being of spiritual significance were identified within 250 m of the proposed Project footprint, 22 cultural and sites described as being of spiritual significance were identified within 5 km of the proposed Project footprint, and 132 cultural and sites described as being of sacred significance were identified within 25 km of the proposed Project footprint.

McLeod Lake Indian Band raised key concerns culturally important sites, trails and travelways, including:

- Reduced sense of peace and connection to the area;
- Constrained knowledge and use of the area for multiple generations; and
- Reduced inter-generational transmission of cultural knowledge.

Sixteen habitation sites were identified as being within 5 km of the proposed pipeline route. Thirty-one cultural and sites described as being of sacred significance were identified as being within 5 km of the proposed pipeline and 44 trails and travelways were identified as being within 5 km of the proposed route.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is

expected to result in minor impacts to McLeod Lake Indian Band's use of culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to McLeod Lake Indian Band

During the EA process, McLeod Lake Indian Band raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

18.1.6 Prophet River First Nation

Context

- Prophet River First Nation is a signatory to Treaty 8 and a member of the Treaty 8 Tribal Association. Prophet River First Nation, also known as Dene Tsaa tse K'Nai First Nation, is part of the wider Dane-za or Dunne-za language group and was historically known as the Beaver Tribe.
- Prophet River First Nation has one reserve that is located 100 km south of Fort Nelson at Mile 233 of the Alaska Highway in the Northern Rockies Regional District of BC.
- In August 2014, Prophet River First Nation had a registered population of about 267. The on-reserve population was 104, with 9 individuals living on other reserves, 153 individuals living off reserve, and one individual living on Crown land. Prophet River First Nation's custom electoral system elects its Chief and two Councillors. The Nation has been affiliated with the Treaty 8 Tribal Association since it formed in 1982.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project does not overlap with what the Province understands to be Prophet River First Nation's area of traditional use.
- Given the distance of the proposed Project from Prophet River First Nation's area of traditional use, EAO determined that the duty to consult Prophet River First Nation is at the low end of the *Haida* spectrum. Prophet River First Nation is listed in Schedule C of the Section 11 Order.
- In response to the Section 11 Order, Prophet River First Nation expressed their desire to be on Schedule B of the Section 11 Order and to be consulted at the same level as their neighboring Aboriginal Groups with whom they share a network of kinship ties and land use. EAO considered the information provided by letter from Prophet River First Nation on June 3 and July 21, 2014 and the

emails of August 13, September 1 and September 22, 2014, and determined that the duty to consult remained at the low end of the *Haida* spectrum. In making this determination, EAO considered the seriousness of potential impacts on Prophet River First Nation treaty rights including the traditional use of the proposed Project area, nature of potential impacts of the proposed Project on Prophet River First Nation's exercise of treaty rights, proximity to existing reserves or areas where members reside, current use, and frequency or intensity of any such current use.

- EAO's consideration of the potential impacts of the proposed Project on Prophet River First Nation's Treaty 8 rights is discussed below.

Summary of Consultation

Prophet River First Nation was provided notification of key milestones for the proposed Project, to review and provide comments on the draft Assessment Report and a standing offer to meet EAO staff directly, intended to provide opportunities for Prophet River First Nation to discuss specific information about its uses in the Project area and to identify potential impacts of the proposed Project on its Treaty 8 rights. In addition, Prophet River First Nation was invited to participate in Working Group meetings; a representative of Prophet River First Nation attended the wildlife Working Group meeting on July 29, 2014.

The Proponent first met with Prophet River First Nation in January 2013 by providing formal notification of the proposed Project. In the initial meeting, Prophet River First Nation advised the Proponent that, as a member of Treaty 8 Tribal Association, Prophet River First Nation wishes to be kept informed of the proposed Project. Since that time, the Proponent has provided regular updates and also met with Prophet River First Nation twice.

As noted in section 18.1, Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project and EAO has proposed a condition in response to this independent technical review. Prophet River First Nation indicated to EAO that they would also like to participate in this independent technical review.

Potential Impacts of the Proposed Project to Prophet River First Nation's Treaty 8 Rights and Other Interests

Prophet River First Nation identified concerns including:

- Potential effect on wildlife population, habitat and biodiversity;

- Potential effects on caribou;
- Potential effects on fish population, habitat and biodiversity;
- Increased access for recreational hunters leading to increased pressure on resources; and
- Potential effect of multiple pipelines fragmenting their territory.

The area understood to be Prophet River First Nation's area of traditional use lies outside of the LAA and RAA for the Wildlife and Wildlife Habitat VC, Water Quality and Quantity VC, Fish and Fish Habitat VC, Terrestrial Vegetation VC, Wetland Function VC, Current Use of Land and Resources for Traditional Purposes VC and Heritage Resources VC.

The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAA are intended to capture the area where the influence of other land uses and activities could overlap with project specific effects and result in cumulative adverse effects.

The effects of the proposed Project are expected primarily within the proposed Project footprint and LAA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into the area understood to be Prophet River First Nation's area of traditional use.

Taking into consideration the residual adverse effect from the proposed Project, and the distance of the proposed Project to Prophet River First Nation's area of traditional use, EAO concludes that the proposed Project is not expected to result in any adverse effects on Prophet River First Nation's Treaty 8 rights to hunt, trap and fish, nor are adverse effects expected to Prophet River First Nation's gathering activities or culturally important sites in the area of the proposed Project.

18.1.7 Saulteau First Nations

Context

- Saulteau First Nations are a signatory to Treaty 8 and a member of the Treaty 8 Tribal Association. The Saulteau is a Dunne-Zaa, Anishnaubemowin (Saulteau), and Nēhiyawēwin (Cree) speaking community.
- Saulteau First Nations' reserve is located at the east side of Moberly Lake. The reserve is 3,026 ha in size and the total on-reserve population is 394 out of a total of 914 members. Leadership includes one Chief and four Councillors. The Chief and each of the Councillors represent one of the five founding Saulteau

First Nations families. Each family nominates a representative who becomes a Councillor. The general Saulteau First Nations membership elects a Chief every three years from among these five families.

- Moberly Lake and most of the West Moberly and Saulteau First Nations reserve lands lie within the PMT. The PMT comprises approximately 1,090 km² of land lying between Moberly Lake and the Peace River in North-eastern British Columbia.
- The PMT lies within a larger Area of Critical Community Interest (ACCI), which extends further in both the eastern and westerly directions from the PMT.
- Hunting, trapping and fishing remain integral to community members' lifestyles.
- Saulteau First Nations continue to use their traditional territory for fishing, hunting, trapping, berry picking and plant gathering. Wildlife quality and abundance, water and air quality, access to undisturbed lands, the ability to meaningfully practice treaty rights for traditional food and medicine harvesting and cultural continuity have all been identified as essential.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to cross 81 km of the area the Province understands to be Saulteau First Nations' area of traditional use.
- There are three compressor stations proposed to be located within Saulteau First Nations area of traditional use and four potential camp locations.
- Saulteau First Nations expressed concerns relating to EAO's interpretation of Treaty 8. However, EAO and Saulteau First Nations agree that Treaty 8 was intended to allow signatories to continue their "mode of life" and that proper consultation and accommodation, where required, must accompany any taking up of land.
- Saulteau First Nations is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to five BC Treaty 8 First Nations residing in and around the Peace River Valley area of northeastern BC. EAO consults directly with member nations of the Treaty 8 Tribal Association regarding the potential effects of the proposed Project on their treaty rights.
- Given the nature and location of the proposed Project, and EAO's assessment of the potential impacts to Saulteau First Nations' Treaty 8 rights as discussed below, EAO is of the view that the duty to consult Saulteau First Nations lies in the middle part of the *Haida* spectrum.
- Saulteau First Nations is listed on Schedule B of the Section 11 Order.

Summary of Consultation

Saulteau First Nations was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Saulteau First Nations was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Saulteau First Nations with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. In October 2013, the Proponent provided capacity funding through a MOU to Saulteau First Nations for participation in consultation and engagement activities associated with the proposed Project. In addition, Saulteau First Nations, in coordination with McLeod Lake Indian Band, and West Moberly First Nations, requested funding to jointly review and provide comment on the Application. The Proponent provided funding to Saulteau First Nations to conduct this joint review. The Proponent has also provided funding to Saulteau First Nations to conduct a TLU study.

Saulteau First Nations, together with McLeod Lake Indian Band, and West Moberly First Nations, provided input to the EA process through written comments on the AIR. However, these comments were received two months after the AIR was issued. EAO shared these comments with the Proponent but did not make any changes to the AIR. Many of the comments received were already raised and considered by the Working Group. Saulteau First Nations met with EAO on July 22, 2013, in relation to the EA. Saulteau First Nations raised concerns about the location of the proposed pipeline and requested that a common corridor be contemplated. Saulteau First Nations indicated that the proposed route impacts the most significant and culturally sensitive areas within their territory with potentially serious and long-term impacts on traditional resources.

As noted in section 18.1, Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project and EAO has proposed a condition in response to this independent technical review.

In addition to EAO-led consultation, the Province is in negotiations with Saulteau First Nations to establish a strategic approach to land and resource development in Saulteau First Nations Territory in relation to treaty rights, which will include a recommendation the provincial government expand the current boundaries of Klin-Se-Za (Twin Sisters) Provincial Park.

Saulteau First Nations, together with McLeod Lake Indian Band, West Moberly First Nations and Doig River First Nation, provided written comments on the Application, which are included where appropriate in the sections below. Saulteau First Nations participated in Working Group meetings on February 5 and 7, 2014 and July 29-30, 2014, and participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

On January 6, 2014, the Proponent received Saulteau First Nations' Interim TLU Report, which was used to help inform the Application. In February 2014, the Proponent and Saulteau First Nations concluded a TLU Protocol Agreement for the proposed Project. In addition, the Proponent met with Saulteau First Nations on two occasions in April 2014 to discuss contracting opportunities. Saulteau First Nations provided the Proponent with a socio-economic study proposal in September 2013.

The Proponent provided Saulteau First Nations with the opportunity to be involved in the collection of data for the TEK fieldwork; Saulteau First Nations Knowledge Holders participated in TEK archaeology fieldwork. The Stantec TEK fieldwork notes were provided to Saulteau First Nations for review and approval. On January 29, 2014 Saulteau First Nations released edited version of the TEK field notes for inclusion in this Application.

The Proponent met with Saulteau First Nations to share Project-related information, to determine the community's interest in the proposed Project and to develop a process for the community's involvement in proposed Project activities. In the Proponent's initial meetings with Saulteau First Nations, the key concern identified was with the proposed corridor through Saulteau First Nations' traditional territory and the potential effect of the proposed Project on Saulteau First Nations' ability to conduct traditional activities, in addition to its proximity to the Twin Sisters mountain range. Saulteau First Nations requested that the Proponent look at the Pine Pass as a potential route alternative. At the request of Saulteau First Nations, the Proponent provided an engineering report that explained why Saulteau First Nations' suggested route through the Pine Pass was unfeasible. In response, Saulteau First Nations requested funding to conduct an independent routing review. The Proponent provided funding to Saulteau First Nations and in September 2013, the Proponent received a memo with a preliminary list of issues and concerns from Saulteau First Nations with respect to the proposed route and was asked to comment on the items therein. The Proponent provided comments on this memo and is awaiting a final report.

During Application Review, Saulteau First Nations indicated that they do not support the currently proposed Williston/Moberly Alternative, and that further routing consultation would be required post EA.

In addition, the Proponent met with Saulteau First Nations in response to the concerns regarding the location of the proposed Johnson Creek compressor station, described in section 2.4 of this Report. In a June 2014 letter to Saulteau First Nations the Proponent committed to these mitigations, which include reducing the visual impact through:

- Reduction of the site footprint from 15 ha to 7 ha;
- Designing certain facility piping to be buried underground, where normally it would be constructed above-ground;
- Where the pipeline enters the compressor station, construct the pipeline as a horizontal bore, which would avoid the clearing of trees on either side of the road, thus creating a visual screen down the ROW and acting to restrict access along the ROW at that location; and
- Screen the compressor station with existing and/or replanted trees to blend with the surrounding landscape.

As discussed in section 2.4 of this document, the Proponent proposed an alternative location for the Johnson Creek compressor station in a memo dated October 21, 2014 in response to concerns raised by West Moberly First Nations and Saulteau First Nations. After seeking input from Aboriginal Groups on this memo, EAO determined that the compressor station location alternative proposed by the Proponent provides a reasonable accommodation of potential impacts to Aboriginal Interests in this area, particularly in relation to West Moberly First Nations and Saulteau First Nations..

Issues raised by Saulteau First Nations and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Saulteau First Nations as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to Saulteau First Nations' Treaty 8 Rights and Other interests

Hunting

Saulteau First Nations indicated that they hunt moose, elk, deer, caribou, black bear, grizzly bear, lynx, wolf, wolverine, beaver, marten, muskrat, rabbit, grouse, ducks, and geese. Saulteau First Nations identified hunting sites and areas at: Dabbit Lake; between the Peace and Pine Rivers; between Dinosaur Lake and the Pine River,

including the Upper Moberly Watershed; and in the arc from Upper Halfway River to Hudson's Hope to Moberly Lake to Upper and Lower Pine watershed and the Boucher Lake/Peace Moberly Tract area. Moberly Lake has been central to traditional resource use. The Pine River area, Moberly River, and Cameron and Boucher Lakes are used for hunting.

Saulteau First Nations commented on the Application that they are extremely concerned with the location of the Johnson Creek Compressor station near Moose Call Lake. This location is important for subsistence activities and many other traditional land uses including hunting. Saulteau First Nations is also concerned about a compressor station at Callazon Creek as it would impact hunting activities linked to vegetation removal, riparian area erosion, noise effects on wildlife, and increased access.

Saulteau First Nations raised key concerns regarding changes to wildlife, wildlife habitat and hunting, including:

- Impacts on moose, deer and elk licks;
- Impacts to beaver dams and animal dens;
- Noise effects from compressors and construction;
- Critical/sensitive life periods for ungulates, marine mammals and birds affected by aerial patrols;
- Change in species abundance;
- Change in wildlife behaviour;
- Increased access to hunting areas by recreational hunters;
- Effect on ability to harvest food and other resources; and
- Effects on water quality and wildlife health.

Saulteau First Nations Interim TLU Report recorded sites pertinent to hunting. These include sites labelled as subsistence harvesting values, including kill locations for large game (moose, elk, deer, lynx, caribou, grizzly bear, black bear, wolf, and wolverine) and small game (beaver, marten, grouse, and rabbit). Fishing and berry picking sites were also included under subsistence harvesting values, although the report does not specify the particular type of harvesting activity for each site. As such, the following numbers include more than hunting sites. The Saulteau First Nations Interim TLU Report identified 203 subsistence harvesting values within the project footprint, 364 within the TLU LSA, and 734 within the TLU RSA. Within the LSA, the area between Dinosaur Lake and the Pine River, including the Upper Moberly Watershed and roads along the Upper Moberly River are regularly used for hunting. Mammals and birds hunted in this area include moose, elk, grizzly bear, beaver, muskrat, rabbit, grouse, ducks, and geese. Between the Peace and Pine Rivers, the proposed Project crosses through the

ACCI and PMT. Saulteau First Nations relies “heavily upon these areas for sustenance, cultural, commercial, and socio-economic purposes. Continued activities in the ACCI are in accordance with Treaty 8 rights, and include hunting for large and small game...” All current activities in these areas are considered vital by Saulteau First Nations due to the areas’ proximity to the reserve. Saulteau First Nations has stated a desire to continue to access and use these lands, and describes the ACCI as “vulnerable” due to other industrial developments, logging, and declining moose populations. Dabbit Lake was noted by Saulteau First Nations during the TEK Program as an important moose harvesting location.

Saulteau First Nations recommendations to reduce the potential adverse effects on hunting rights include:

- Substantial clearance for moose, deer, and elk ticks;
- Use horses rather than ATVs or other vehicles when possible; and
- Respect and avoid beaver dams and animal dens.

The Proponent has provided mitigation measures to address these recommendations including implementing the Access Management Plan to reduce unauthorized motorized access and the Environmental Management Plan to reduce the potential adverse effects on subsistence hunting activities and wildlife habitat.

EAO notes that the hunting areas identified by Saulteau First Nations in the Saulteau First Nations Interim TLU Report, such as those between Dinosaur Lake and the Pine River, those in the Upper Moberly watershed and those along the Moberly River, fall within the proposed Project footprint and LSA. Other sites fall outside of the proposed Project LSA and would not be directly affected by proposed Project activities or physical works.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO’s analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to have moderate impacts on Saulteau First Nations’ Treaty 8 right to hunt in the area of the proposed Project.

Trapping

Although it was not specified which species were hunted vs. trapped, the Saulteau First Nations Interim TLU Report listed the following furbearing or bird species as harvested by the Nation within the TLU Footprint and TLU LSA: lynx, black bear, wolf, wolverine, beaver, marten, grouse, and rabbit.

Trapping areas identified by Saulteau First Nations include a traditional activities camping ground in a forested area north of the Moberly River and south of West Moberly Lake Road. This was a prime trapping area where trappers would stay all winter. There are Saulteau First Nations' traplines located along logging roads near the proposed Project ROW, along a creek running northeast of Doonan Lake and near Chetwynd.

Saulteau First Nations Interim TLU Report include sites labelled as *cultural/spiritual values*, including trapping areas and other sites such as burials, sweat lodges, place names, and medicinal plant gathering sites. The Saulteau First Nations Interim TLU Report does not specify the particular use of each cultural/spiritual value site. Sixty-nine cultural/spiritual use values were recorded within the footprint, 91 within the TLU LSA, and 237 within the TLU RSA. *Subsistence harvesting values* sites were also recorded in the Saulteau First Nations Interim TLU Report, including kill locations for furbearing species including lynx, black bear, wolf, and wolverine and small game (beaver, marten, grouse, and rabbit). Fishing and berry picking sites were also included under subsistence harvesting values; as such, the following numbers include more than trapping sites. The Saulteau First Nations Interim TLU Report identified 203 subsistence harvesting values within the project footprint; 364 within the TLU LSA, and 734 within the TLU RSA. The Saulteau First Nations Interim TLU Report stated that the proposed Project passes through two areas of importance to Saulteau First Nations, the ACCI and the PMT. Continued activities in the ACCI include "trapping for fur bearing animals."

Saulteau First Nations commented on the Application that they are extremely concerned with the location of the Johnson Creek Compressor station near Moose Call Lake. This location is important for subsistence activities and many other traditional land uses including trapping. Moose Call Lake is located within the RSA and is not expected to be directly affected by the proposed Project. Although Hudson's Hope was not specifically addressed in the Application, trapping in this area was also considered as it is located within the LSA. Saulteau First Nations is also concerned about a compressor station at Callazon Creek as it would impact trapping activities linked to vegetation removal, riparian area erosion, noise effects on wildlife, and increased access.

Saulteau First Nations raised key concerns regarding wildlife, wildlife habitat and trapping, including:

- Change in habitat;
- Change in species abundance;
- Change in wildlife behaviour;
- Change in access to trapping areas; and
- Effect on ability to harvest food and other resources.

EAO notes that some trapping areas identified by Saulteau First Nations may be within the proposed Project footprint.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and conditions proposed by EAO, and EAO's analysis of residual and cumulative effects on and on current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have minor impacts on Saulteau First Nations' Treaty 8 right to trap in the area of the proposed Project.

Fishing

Saulteau First Nations identified that they fish rainbow trout, bull trout (Dolly Varden), lake trout, cod, carp, grayling, salmon, jackfish, and whitefish. Fishing areas identified in the Saulteau First Nations Interim TLU Report include Moberly Lake and the Upper Moberly River; use along the Upper Moberly River is described as "frequent" and "extensive". Pete Lake is identified in the Aboriginal Consultation Report #3 as a lake used for fishing which falls within the LSA.

Recorded sites pertinent to fishing documented in the Saulteau First Nations Interim TLU Report include sites labelled as *subsistence harvesting values*. Hunting and berry picking sites were also included as subsistence harvesting values, although the particular type of harvesting activity was not specified for each site. There were 203 subsistence harvesting value sites identified within the proposed Project footprint, 364 within the TLU LSA, and 734 within the TLU RSA. Alteration to sites recorded as subsistence use values could indicate an effect on fishing.

The proposed Project corridor would cross approximately 29 major watercourses with indicated fish presence in Saulteau First Nations traditional territory.

Saulteau First Nations commented on the Application that they are extremely concerned with the location of the Johnson Creek Compressor station near Moose Call Lake and the compressor station at Callazon Creek. These locations are important for subsistence activities and many other traditional land uses including fishing. Saulteau First Nations raised key concerns regarding fishing activities, including:

- Change in habitat;
- Change in species abundance;
- Change in fish behaviour;
- Change in access to fishing areas; and
- Effect on ability to harvest food and other resources.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have minor impacts on Saulteau First Nations' Treaty 8 right to fish in the area of the proposed Project.

Gathering

Plants are gathered by Saulteau First Nations as medicinal, food, and material resources. Plants identified by Saulteau First Nations that are gathered as *food sources* include: beaked hazelnut, rosehip (rose buds), wild mint, Labrador tea (muskeg tea, trapper's tea), dandelion, birch sap (sweet water), birch bark, spruce pitch (gum) pine and poplar sap, and berries, such as huckleberry, raspberry, saskatoon berry, strawberry, chokecherry, current, gooseberry, dewberry, lingonberry (lowbush cranberry), lowbush blueberries, and highbush blueberries. Plants gathered by Saulteau First Nations for *medicinal purposes* include: cattail, spruce gum, bearberry (kinnikinnick), rosehip (rose buds), poplar sap, two-leaved Solomon's seal, and red willow. Plants gathered by Saulteau First Nations as *material sources* include: birch (pack sacks), birch bark (baskets, moose calls), decomposing trees (dying hides), bushes by the water (likely willow) (hoops to stretch hide), willow (bows), deadfall along the water (rafts), alder (mats), and 'growth on pine trees' (pipes). Caribou weed and

lichen are identified by Saulteau First Nations' members as important but the use was not specified.

Recorded sites pertinent to plant gathering documented in the Saulteau First Nations Interim TLU Report include sites labelled as *subsistence harvesting values*, including berry picking sites. Fishing and hunting were also included as subsistence harvesting values, although the particular type of harvesting activity was not specified for each site. There were 203 subsistence harvesting value sites identified within the TLU footprint, 364 within the TLU LSA, and 734 within the TLU RSA. Sites noted as *cultural/spiritual values* sites were also recorded, and include medicinal plant gathering sites. Again, the particular use of each cultural/spiritual value site is not specified in the report. Sixty-nine cultural/spiritual use values were recorded within the TLU footprint, 91 within the TLU LSA, and 237 within the TLU RSA. Alteration to sites recorded as subsistence use values or cultural and spiritual use values could indicate an effect on plant gathering.

In the TEK Program and the Saulteau First Nations Interim TLU Report, Saulteau First Nations stated the importance of protecting existing plant picking areas, especially those near camping, fishing, and hunting sites. The Upper Moberly was used before the 1940s every spring and fall for berry picking; this use continues today and is vital due to its close proximity to the Saulteau First Nations' reserve. The roads along the Upper Moberly River are also frequently traveled for picking berries and medicinal plants; another berry picking location was identified where a trail heading north of West Moberly Lake Road leads to a small clearing with a cultural cabin, standing tipi poles, and a horse corral.

Saulteau First Nations commented on the Application that they are extremely concerned with the location of the Johnson Creek Compressor station near Moose Call Lake and the compressor station at Callazon Creek. These locations are important for subsistence activities and many other traditional land uses including gathering. Saulteau First Nations raised key concerns regarding gathering activities, including:

- Change in habitat;
- Change in species abundance;
- Change in plant gathering areas;
- Change in access to plant gathering areas;
- Effects of invasive species;
- Effects of vegetation control such as herbicides;
- Effect on ability to harvest food and other resources; and
- Effects on the health and quality of gathered plants.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use - as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on Saulteau First Nations' gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Culturally important sites

During the TEK Program, Saulteau First Nations provided information on camps, camping areas, current use cabins, and other habitation areas. Saulteau First Nations members explained that camps are usually located near water sources. There is a large camp upriver from Moberly River. There is a trail leading north from the Dabbit Lake hunting grounds to a traditional campground area. The traditional campground and trail area are still in use and are 0.2 km from the ROW. Along the Moberly River is a camping area which has a small creek where campers can collect fresh water. There is a traditional activities camping ground in a forested area north of the Moberly River and south of the West Moberly Lake Road. A trail heading north of West Moberly Lake Road leads to a small clearing with a cultural cabin, standing tipi poles, and a horse corral.

Also during the TEK Program, Saulteau First Nations described a cabin at the cultural campground that is approximately four years old but the area has been used for gatherings for longer than this. A pack trail leads from the cabin to the Twin Sisters. The Elder's campground is located nearby, along the logging road. There is a trapper's cabin or a cabin from an old settlement near the proposed ROW with old cooking pots, a horse post, and a cellar. There is a cultural camp at the base of the Twin Sisters. The Saulteau First Nations Interim TLU Report identified 48 habitation value sites within TLU footprint, 83 within TLU LSA, and 212 within the TLU RSA.

One type of site, recorded in the Saulteau First Nations Interim TLU Report, is labelled *cultural/spiritual values*, which include community culture camps and other sites such as burials, sweat lodges, place names, medicinal plant gathering sites, and trapping areas. The Saulteau First Nations Interim TLU Report does not specify the particular use of each cultural/spiritual value site. Sixty-nine cultural/spiritual use values were recorded within the TLU footprint, 91 within the TLU LSA, and 237 within the TLU RSA. In a past

study, potential alteration to ancestral gathering places was identified as an issue. Bear Flat, Cache Creek, Halfway River, Moberly River, and PMT were identified as important congregating areas for Saulteau First Nations members.

The Twin Sisters are noted in the Saulteau First Nations Interim TLU Report as a spiritual site of “crucial significance” to Saulteau First Nations. Other ceremonial sites were identified in the Saulteau First Nations Interim TLU Report along the Johnson Creek Road, including sweat lodges, sun dance lodge sites, and prayer flag and offering sites.

One type of recorded site in the Interim TLU Report is labelled *cultural/spiritual values*, including burials, drying racks, sites of sun dances, prayer flags, sweat lodges, place names, teaching areas, medicinal plant gathering sites, community culture camps, and trapping areas. The particular use was not specified for each site. There were 69 cultural/spiritual value locations identified within the TLU footprint, 91 within the TLU LSA, and 237 within the TLU RSA.

Saulteau First Nations provided written comments on the application related to a concern about a compressor station at Callazon Creek as it would impact a camping area.

Trails and travelways

Saulteau First Nations provided information on several trails during the TEK Program. There are trails originating by Moberly Lake and running south towards Trapper Mountain and through Saulteau First Nations' members traplines. Much of this area is being clearcut, which has an effect on existing trails. The roads along the Upper Moberly River are frequently traveled for hunting. There is an old trail leading to pictographs along Moberly Lake, near Williston Lake. This area has been disturbed by clear cutting. The Moberly Lake area used to be a "highway" with people travelling up to the mountains. There is a trail leading north from the Dabbit Lake hunting grounds to a traditional campground area. The traditional campground and trail area is still in use and is located 0.2 km from the ROW. There is a trail leading from the traditional campground north of Dabbit Lake to Twin Sisters (Beattie Peaks) within the ROW and another trail that runs around the Twin Sisters mountains. Moberly Falls are a landmark for Saulteau First Nations navigation. A trail heading north of West Moberly Lake Road leads to a small clearing with a cultural cabin and standing tipi poles. A pack trail continues north alongside Mount Roy Creek to Twin Sisters. The “Upper Moberly Original Pack Trail” leads to an old settlement and to a place where members of the settlement would traditionally hunt, trap, and harvest other resources. Axe-cut logs indicate human presence in the creation of the trails. There is a game trail overlying an old logging road

near the proposed ROW and there is a wildlife trail in the proposed ROW buffer, leading to Williston Lake.

One type of recorded site is *transportation values*, including hunting routes, bush roads, and old pack horse trails. There are 39 transportation areas within the TLU footprint, 52 within the TLU LSA, and 115 within the TLU RSA.

Saulteau First Nations raised key concerns regarding cultural sites, trails and travelways, including:

- Effects to habitation, gathering, and sacred areas;
- Change in ability to use or access habitation, gathering and sacred areas;
- Change in cultural heritage features associated with habitation, sacred areas trails and travelways;
- Change in trails and travelways; and
- Change in ability to use trails and travelways.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to have minor to moderate impacts on Saulteau First Nations' culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Saulteau First Nations

During the EA process, Saulteau First Nations raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10.

18.1.8 West Moberly First Nations

Context

- West Moberly First Nations is a signatory to Treaty 8 and a member of the Treaty 8 Tribal Association. West Moberly is a Beaver, or Dunne-Zaa, speaking community and was originally part of the Hudson Hope Band, along with Halfway River First Nation, up until 1975.
- The West Moberly community is located on the west side of Moberly Lake and

the reserve occupies 2,034 ha. As of September 2013, West Moberly First Nations had a total registered population of about 887 people, with 454 members living on reserve and 433 members living off reserve. West Moberly First Nations are governed by a Chief and four Councillors.

- Moberly Lake and most of the West Moberly and Saulneau First Nations reserve lands lie within the PMT. The PMT comprises approximately 1,090 km² of land lying between Moberly Lake and the Peace River in north-eastern BC.
- The PMT lies within a larger ACCI, which extends further in both the eastern and westerly directions from the PMT.
- Hunting, trapping and fishing remain integral to community members' lifestyles.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to cross 123 km of the area the Province understands to be West Moberly First Nations' area of traditional use.
- Some of the proposed Project lies outside what EAO understands to be the western boundary of Treaty 8, recognizing that the western boundary of Treaty 8 is an area of dispute and subject to litigation between the Province and certain Treaty 8 First Nations.
- There are three compressor stations proposed to be located within West Moberly First Nations area of traditional use and three potential camp locations.
- West Moberly First Nations is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to five BC Treaty 8 First Nations residing in and around the Peace River Valley area of northeastern BC. EAO consults directly with member nations of the Treaty 8 Tribal Association regarding the potential effects of the proposed Project on their Treaty rights.
- EAO's assessment of the potential impact to Treaty 8 rights is discussed below. EAO is of the view that the duty to consult West Moberly First Nations lies at the middle level of the *Haida* spectrum.
- West Moberly First Nations was listed in Schedule B of the Section 11 Order.

Summary of Consultation

West Moberly First Nations was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. West Moberly First Nations was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided West Moberly First Nations with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. In March 2014, the Proponent provided capacity funding through a MOU to West Moberly First Nations for participation in consultation and engagement activities associated with the proposed Project. In addition, West Moberly First Nations, in coordination with McLeod Lake Indian Band, and Saulneau First Nations, requested funding to jointly review and provide comments on the Application. The Proponent provided funding to conduct this joint review. In addition, the Proponent provided funding to West Moberly First Nations to conduct a TLU study for which an Interim Report was received and used to inform the Application. The Proponent also provided West Moberly First Nations with the opportunity to be involved in the collection of data for the TEK fieldworks, and the collection of socio-economic data.

West Moberly First Nations, together with McLeod Lake Indian Band, and Saulneau First Nations, provided input to the EA process through written comments on the AIR. However, these comments were received two months after the AIR was issued. EAO shared these comments with the Proponent but did not make any changes to the AIR. Many of the comments received were already raised and considered by the Working Group. West Moberly First Nations, together with McLeod Lake Indian Band, Saulneau First Nations and Doig River First Nations, provided written comments on the Application, which are included where appropriate in the sections below. West Moberly First Nations participated in Working Group meetings on September 12, 2013, November 27, 2013, February 5, 2014, and July 29-30, 2014. West Moberly First Nations participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014. In addition, West Moberly First Nations met with EAO on June 11, 2014 and discussed concerns relating to synchronous permitting, First Nation Independent Technical Review, EA timelines, the utility of Working Group meetings and the desire to meet with smaller regional groupings of Aboriginal Groups.

During initial consultation meetings on the proposed route, West Moberly First Nations noted that the proposed corridor was too close in proximity to the Twin Sisters, an area of important spiritual significance and traditional value to West Moberly First Nations, in addition to core caribou habitat. In response, the Proponent revised the proposed route to the alternative route identified during the route review meeting, which exhibited less of a potential adverse impact on known areas of interest to West Moberly First Nations. In response to the concerns identified by West Moberly First Nations, the Proponent contributed funding to West Moberly First Nations' Caribou Protection Program in February 2014. During Application Review, West Moberly First Nations indicated that

they do not support the currently proposed Williston/Moberly Alternative, and that further routing consultation would be required post EA.

West Moberly First Nations' Interim TLU Report identified two key concerns, including the location of the Johnson Creek compressor station and its potential adverse effect on West Moberly First Nations' hunting rights in the area and the potential adverse effect of the proposed Project on woodland caribou core habitat. The Proponent undertook an assessment of an alternative compressor station location; however, it was determined that the location would not be feasible owing to geotechnical issues, potential adverse impact to habitat, and the construction of new road access with associated grade issues. In response to the concerns identified by West Moberly First Nations and other Aboriginal Groups, the Proponent sought to incorporate specific mitigation measures to avoid or minimize the potential adverse effects identified by Aboriginal Groups into the design of the compressor station. In a June 2014 letter to West Moberly First Nations the Proponent committed to these mitigations, which include reducing the visual impact through:

- Reduction of the site footprint from 15 ha to 7 ha;
- Designing certain facility piping to be buried underground, where normally it would be constructed above-ground;
- Where the pipeline enters the compressor station, construct the pipeline as a horizontal bore, which would avoid the clearing of trees on either side of the road, thus creating a visual screen down the ROW and acting to restrict access along the ROW at that location; and
- Screen the compressor station with existing and/or replanted trees to blend with the surrounding landscape.

A meeting was held with West Moberly First Nations in August 2014 to discuss rationale for route and site selection and to continue discussions on proposed mitigation measures, including both the Johnson Creek compressor station and water crossings at Moberly River. At that time West Moberly First Nations identified a new alternative location for the proposed compressor station. The Proponent is currently investigating the feasibility of this proposed site.

As noted in section 18.1, Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project and EAO has proposed a condition in response to this independent technical review.

In addition to technical comments provided with other Treaty 8 First Nations, West Moberly First Nations provided comments on this Assessment Report specifically

related to the recent approval of the Site C Energy Project. West Moberly First Nations raised concerns that EAO's assessment of cumulative effects in general, and cumulative effects to West Moberly First Nations Treaty 8 rights specifically, do not appear to have considered cumulative effects associated with the Site C Energy Project. These concerns are also discussed above in section 18.1.

Issues raised by West Moberly First Nations and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with West Moberly First Nations as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to West Moberly First Nations' Treaty 8 Rights and Other Interests

Hunting

West Moberly First Nations indicated that they hunt moose, elk, deer, caribou, bison, Stone sheep, black bear, grizzly bear, wolf, grouse, ptarmigan, migratory birds, ducks, geese, and waterfowl. West Moberly First Nations identified the following important hunting areas:

- Twin Sisters;
- Peace River islands;
- the arc from the Upper Halfway River to Hudson's Hope to Moberly Lake to Upper and Lower Pine watershed, northwest of Hudson's Hope;
- West Moberly Traditional Territory;
- Farrell Creek area;
- Johnson Creek and Moberly River networks; and
- Moose Call Lake.

West Moberly First Nations note that the Johnson Compressor station is within the Moose Call Lake area, an area typically used by community members for hunting. During consultation activities, West Moberly First Nations identified issues with regard to the potential routing of the pipeline in proximity to the Twin Sisters area and core caribou habitat; the Proponent subsequently re-routed the pipeline away from that area. In addition, West Moberly First Nations raised key concerns regarding changes to wildlife, wildlife habitat and hunting, including:

- Increased access for recreational hunters which may increase pressure on resources;

- Potential for land instability, erosion and sloughing to harm wildlife who climb reservoir banks;
- Critical/sensitive life periods for ungulates, marine mammals and birds affected by aerial patrols;
- Noise effects from compressors and construction;
- Effect on water quality and wildlife health;
- Impacts on mineral licks; and
- Impacts to beaver dams and animal dens.

West Moberly First Nations identified 567 areas used for hunting and 360 cultural land use areas within the Johnson Creek Network that may potentially be adversely affected, either directly or indirectly, during the construction and operation phases of the proposed Project. It is not clear which proportion of these hunting and cultural land use areas relate to hunting, making the identification of any proposed Project footprint specific concerns a general estimation. However, the Proponent has implemented routing adjustments at Twin Sisters and core caribou habitat areas to minimize ROW development in areas of important spiritual significance, traditional value, and sensitive habitat.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to have moderate impacts on West Moberly First Nations' Treaty 8 right to hunt in the area of the proposed Project.

Fishing

West Moberly First Nations indicated that they fish lake trout and bull trout. In addition, 209 fishing sites were identified in the West Moberly First Nations Interim TLU Report within the Johnson Creek Network. These fishing sites are identified within a large geographic feature, making any project footprint specific concerns a general estimation. Sites identified include:

- Halfway River;
- Moberly Lake;

- Moberly River;
- Lynx Creek;
- Cache Creek;
- Peace River;
- Mackenzie River;
- Salt River;
- Peace-Athabasca Delta;
- Peace River downstream of Farrell Creek;
- Downstream of Hudson's Hope; and
- North bank of Peace River.

The proposed Project corridor would cross approximately 29 major watercourses with indicated fish presence in West Moberly First Nations traditional territory.

West Moberly First Nations raised key concerns regarding the treaty right to fish, including:

- Change in riparian and wetland habitat;
- Change in species abundance;
- Change in fish behaviour;
- Concern for potential sedimentation to alter or change aquatic and terrestrial habitat;
- Concern for change in water flow and water levels in the Peace River, Mackenzie River, Salt River, and the Peace-Athabasca Delta;
- Change in access to fishing areas; and
- Effect on ability to harvest food and other resources.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have minor impacts on West Moberly First Nations' Treaty 8 right to fish in the area of the proposed Project.

Trapping

West Moberly First Nations indicated that they trap fisher, wolverine, rabbit, muskrat, and beaver. The following three specific traplines were identified:

- TR0731T008 – “Moose Call Trapline”;
- TR0731T009 – “Moberly River Trapline”; and
- TR0731T006 – “*Klinse-Za* Trapline”.

The West Moberly First Nations Interim TLU Report identified 360 cultural land use areas as having the potential to be adversely affected either directly or indirectly during the construction and operation phases. It is not clear which proportion of these cultural land use areas relate to trapping, making the identification of any proposed Project footprint specific concerns a general estimation. West Moberly First Nations commented on the Application that they are extremely concerned with the location of the Johnson Creek Compressor station near Moose Call Lake. This location is important for subsistence activities and many other traditional land uses including trapping. Moose Call Lake is located within the RSA and is not expected to be directly affected by the proposed Project. West Moberly First Nations is also concerned about a compressor station at Callazon Creek as it would impact trapping activities linked to vegetation removal, riparian area erosion, noise effects on wildlife, and increased access.

West Moberly First Nations identified in their Interim TLU that there is an important communal aspect to harvesting and that there is a communal trapline in the Upper Moberly Watershed available for use by all members. In addition, West Moberly First Nations identified 220 trapping locations in the Johnson Creek Network.

West Moberly First Nations raised key concerns regarding wildlife, wildlife habitat and trapping, including:

- Increased pressure on habitat;
- Disruption of access to trapping areas;
- Increase in public access and traffic;
- Changes to trapping opportunities
- Change in density in the populations of furbearers including fisher, wolverine, rabbit, muskrat and beaver;
- Construction related noise will scare away wildlife; and
- Concern for change in dens and mineral licks.

EAO notes that trapping areas identified by West Moberly First Nations are within the proposed Project footprint.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have minor impacts on West Moberly First Nations' Treaty 8 right to trap in the area of the proposed Project.

Gathering

West Moberly First Nations indicated that they gather rare and medicinal plants and berries. In the West Moberly First Nations Interim TLU Report, 406 plant gathering locations were identified as well as 360 cultural land use areas in the Johnson Creek Network. West Moberly First Nations identified old-growth forests, south aspect grassland, shrub and aspen slopes as plant gathering interests.

West Moberly First Nations raised key concerns regarding gathering activities, including:

- Change in habitat and the potential disturbance of rare and important ecosystems including old-growth forests, south aspect grassland, shrub and aspen slopes;
- Change in species abundance;
- Change in plant gathering areas;
- Change in access to plant gathering areas;
- Effects of invasive species;
- Effects of vegetation control such as herbicides;
- Effect on ability to harvest food and other resources; and
- Effects on the health and quality of gathered plants.

EAO notes that West Moberly First Nations gathering areas identified by West Moberly First Nations may be located near the proposed Project route.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use - as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on West Moberly First Nations' gathering activities in the area of the proposed Project.

Culturally important sites, trail and travelways

West Moberly First Nations identified Spirit Cabin, connected to Moose Call Lake, as an important habitation site. West Moberly First Nations also identified 26 areas used for spiritual purposes in the *Klinse-Za* area, Johnson Creek and Moberly River networks, as well as the Spirit Cabin at Moose Call Lake, burial sites on the south side of Peace River, and multiple unmarked areas in the Peace River valley. West Moberly First Nations also identified 360 cultural land use areas within the proposed Johnson Creek Network. On another proposed project, West Moberly First Nations identified Bear Flats, the Peace River Valley and areas along the Peace River as important trails and travelways (WCGT 2014).

West Moberly First Nations identified important gathering areas used for camping and habitation, fishing and hunting, travelways, ceremonial and sacred areas, burials, trails, freshwater springs, and associated oral history specifically in the areas of:

- Bear Flat;
- Cache Creek;
- Halfway River;
- Moberly River;
- the PMT;
- ACCI;
- Twin Sisters;
- Johnson Creek;
- Moberly River networks; and
- 81 sites for teaching purposes in the Twin Sisters and 360 cultural land use areas within the Johnson Creek Network.

In the West Moberly First Nations Interim TLU Report, West Moberly First Nations indicated that the Twin Sisters is a culturally significant land base that is heavily relied on for many cultural activities. West Moberly First Nations noted that the segments of the proposed Project that traverse the Johnson Creek and Moberly River networks directly affect West Moberly First Nations traditional values, including the physical uses

of the land and spiritual practices associated with the sacredness of Twin Sisters as a foundation of culture of West Moberly First Nations.

West Moberly First Nations raised key concerns regarding habitation sites, cultural sites, trails and travelways, including:

- Effects to habitation, gathering, and sacred areas;
- Change in ability to use or access habitation, gathering and sacred areas; and
- Change in cultural heritage features associated with habitation, cultural and sacred areas.

In consideration of the information available to EAO, the Proponent's proposed mitigations, proposed conditions of any EA Certificate issued, and EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to have moderate impacts to West Moberly First Nations' culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to West Moberly First Nations

During the EA process, West Moberly First Nations raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised by West Moberly First Nations and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Concern about quality of drinking water as project route crosses the Moberly River 4 or 5 times	MNGD clarified that HDD stream crossings are completed using non-toxic drilling fluid comprised of bentonite clay, water and a small amount of polymer. The loss of containment of drilling fluids during HDD involves the fluid migrating from the pipeline bore to the surface through fractures in the overlying rock or through pore space in the overlying till. OGC indicated that there is no significant potential for human health impacts. This type of accident could result in a temporary increase in turbidity or clay deposition within the streambed and resulting adverse effects to fisheries. MNGD explained that the loss of drilling fluids is considered a spill, and that all appropriate procedures would be required in the event of the

Key Issue Raised	EAO Response
	loss of drilling fluids from an HDD including notification, response, and mitigation measures. In addition to preventative measures undertaken by the Proponent, regulatory prevention measures include the submission of geotechnical crossing information to OGC during permitting which are reviewed for fish habitat, riparian issues and geotechnical information by qualified specialists.

18.1.9 Treaty 8 Tribal Association

The Treaty 8 Tribal Association is an administrative body that provides support and advice to five BC Treaty 8 First Nations residing in and around the Peace River Valley area of northeastern BC. These member Aboriginal Groups include: Doig River First Nation, Halfway River First Nation, Prophet River First Nation, Saulteau First Nations, and West Moberly First Nations.

EAO has consulted directly with Treaty 8 Tribal Association member nations regarding the potential effects of the proposed Project on their Treaty rights and other interests. All Treaty 8 Tribal Association member nations were provided with opportunities to meet with EAO staff directly and review and comment on the Section 11 Order for the proposed Project, as well as engage with EAO in government to government meetings during the EA.

The Proponent has provided Treaty 8 Tribal Association with monthly proposed Project updates and will continue to provide updates as the proposed Project moves forward.

During the EA process, Treaty 8 Tribal Association raised a number of concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10.

18.2 Carrier First Nations

In consideration of the historic and current context of the Carrier provided in section 13.2 of this Assessment Report and information gathered throughout the consultation process, the following sections are intended to set out, in relation to each Carrier Aboriginal Group:

- A summary of concerns related to that Aboriginal Group's Aboriginal Interests;
- EAO's evaluation of potential effects of the proposed Project to that Aboriginal

- Group's Aboriginal Interests; and
- EAO's evaluation of whether proposed accommodation measures are adequate.

18.2.1 Carrier Sekani Tribal Council

Context

The Carrier Sekani Tribal Council provides political and technical support to eight interior BC First Nations. These member First Nations include: Nadleh Whut'en First Nation, Nak'azdli Band, Saik'uz First Nation, Stellat'en First Nation, Takla Lake First Nation, Tl'azt'en Nation, Ts'il Kaz Koh First Nation (Burns Lake Band), and Wet'suwet'en First Nation.

- The population of the combined Carrier Sekani Tribal Council member Nations is more than 10,000 people. The Council serves as an advocate for its member Nations to provide technical, professional and political support in the disciplines of fisheries, education, economic development, community and infrastructure planning, forestry, mining, oil and gas, financial management, mapping, and language resources. Carrier Sekani Tribal Council is a forum for Chiefs to work collectively to address issues affecting member communities, including employment, health, resource development, and treaty negotiations.
- The Council is governed by a Tribal Chief (Chair), Vice-Tribal Chief and eight directors who are the Chiefs of each of the member Nations. Its main office is located in Prince George.
- EAO consulted directly with Nak'azdli Band, Takla Lake First Nation, and Tl'azt'en Nation for the proposed Project. EAO did not consult directly with the other member Aboriginal Groups, as their asserted traditional territories were over 30 km from the proposed Project. EAO consulted Carrier Sekani Tribal Council as per Schedule C of the Section 11 Order.
- Carrier Sekani Tribal Council requested an extension to the draft AIR review timeline on behalf of their member nations. EAO granted that extension. The Carrier Sekani Tribal Council attended the Working Group on February 5, 2014 as well as Natural Gas Pipeline Workshops on November 26, 2013, and May 29-30, 2014.
- The Proponent entered into a capacity funding agreement with Carrier Sekani Tribal Council to assist with engaging with the Proponent and facilitating information exchange with member Nations.
- In January 2013, the Proponent met with Carrier Sekani Tribal Council and member groups for an "Introduction to LNG" session. In May 2014, representatives from the Carrier Sekani Tribal Council toured a TransCanada compressor station and visited a water crossing and value station. The

Proponent also provides the Carrier Sekani Tribal Council monthly project updates.

Carrier Sekani Tribal Council submitted a letter to EAO and the Premier on January 27, 2014 expressing a number of concerns with the EA process, the potential impacts on Aboriginal Groups from the development of the LNG industry, and a lack meaningful consultation with Aboriginal Groups on this and other proposed pipeline projects. EAO responded to that letter on March 13, 2014.

During the EA process, Carrier Sekani Tribal Council raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised Carrier Sekani Tribal Council and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Lack of meaningful consultation	EAO provided Nak'azdli Band, Takla Lake First Nation, and Tl'azt'en Nation, and the Carrier Sekani Tribal Council with consultation opportunities as described in section 7.
Involvement in EA Working Groups – inclusion of different Aboriginal Groups on the Working Groups for the proposed projects and lack of meaningful consultation	In forming its Working Groups, EAO considered the nature of an Aboriginal Group's Aboriginal Interests in conjunction with the nature of the potential effects of the proposed Project, based on available information. EAO provided Aboriginal Groups on the Section 11 Orders for review and comment. EAO further refined its understanding based on its initial assessments of strength of claimed Aboriginal rights and title, and any additional information provided by Aboriginal Groups. EAO issued Section 13 Orders to modify the Section 11 Order, adding Aboriginal Groups to the Order, or changing the level of consultation, based on additional ethnohistoric information provided by Aboriginal Groups.
Aboriginal Perspective on Impacts and Effects	EAO provides opportunities for Aboriginal Groups perspectives to be brought forward in identifying potential Project effects and developing measures to avoid or mitigate those effects to Aboriginal Groups.

18.2.2 Lake Babine Nation

Context

- The people of Lake Babine Nation are speakers of the *Nedut'en* dialect of the Carrier family and are a member of the Athabaskan (Dene) language family.
- Lake Babine Nation traditional territory includes the area around Babine Lake and along the Babine River, as well as several smaller lakes. It lies northeast of Highway 16 and stretches from Burns Lake in the south to north-east of Hazelton.
- Lake Babine Nation consists of five communities: Woyenne, Fort Babine, Tachek (also known as Tachet, Tache or Tachie), Old Fort (Nedo'ats), and Donald's Landing. Babine Nation has 27 parcels of reserve land and three main communities. The main population of Lake Babine Nation resides in Woyenne, which is located outside of the Lake Babine Nation asserted territory.
- Before 1957, Lake Babine Nation was two separate bands: the Old Fort Band and the Fort Babine Band, both situated on Babine Lake. At the time, approximately 12 communities were inhabited year round. In 1957, the Department of Indian Affairs amalgamated the two Bands.
- As of September 2013, Lake Babine Nation had a registered population of 2,419 people, with an on-reserve population of 1,420. The Nation is governed by a custom electoral system with one Chief and nine Councillors elected for three-year terms. It has a Council of Elders and an Office of Hereditary Chiefs.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would traverse through approximately 120 km of Lake Babine Nation's asserted territory. There are two proposed construction camps (sites 115 and 119A), one proposed future compressor station (at Hautete Lake) and seven ancillary sites proposed within Lake Babine Nation asserted territory. The proposed Project would involve the construction of 4.47 km of new permanent roads, 2.2 km of new temporary roads, and upgrades to existing roads and highways.
- The Province understands the Lake Babine Nation is a modern entity with descendants from the subtribe of the Carrier historically associated with Babine Lake, focused at the lake's northern end. The Carrier subsisted from fishing, hunting, trapping and gathering resources.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)* which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based

on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO continues to be of the view that there is information indicating sufficient and exclusive occupation in the vicinity of Fort Babine to support a strong *prima facie* claim of Aboriginal title by Lake Babine Nation. The proposed Project corridor would be located within approximately 3 km of Fort Babine. EAO is of the view that Lake Babine Nation has a strong *prima facie* claim to Aboriginal rights to fish, gather, hunt and trap within and near the area of the proposed Project where it overlaps with Lake Babine Nation's asserted territory.

- EAO's consideration of the potential impacts of the proposed Project on Lake Babine Nation's Aboriginal Interests is discussed below. Given the location and nature of the proposed Project, EAO is of the view that the duty to consult Lake Babine Nation lies at the deeper end of the *Haida* spectrum.
- Lake Babine Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Lake Babine Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening version of the Application and the Application. Lake Babine Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Lake Babine Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA, and \$10,000 in capacity funding during the Application Review phase of the EA for the proposed Project.

Lake Babine Nation became actively involved in the EA process in November 2013, and in December of 2013 formed an internal LNG working group, to support their review of the proposed Project. Prior to this Lake Babine Nation did not provide feedback on the draft AIR or Section 11 Order. Lake Babine Nation participated in EAO's Working Group meetings on February 4-5, February 7, July 23-24 and July 28-31, 2014. On August 1, 2014, EAO held a First Nations regional Working Group meeting for the northern interior Aboriginal Groups, however Lake Babine Nation did not attend. Lake Babine Nation provided comments on the Application, which are included where appropriate in the sections below. In addition, Lake Babine Nation participated in the Natural Gas Pipeline Workshops on November 26, 2013 and May 29-30, 2014. Although EAO offered to meet directly with Lake Babine Nation, to discuss the impacts of the proposed Project, Lake Babine Nation did not seek to meet with EAO.

Lake Babine Nation provided information to EAO primarily through written correspondence as detailed below. Lake Babine Nation sent a letter to EAO on

July 9, 2014 requesting that EAO confirm that consideration of the *Tsilhqot'in* decision would be taken into account in the review of the proposed Project and requesting that EAO suspend EA reviews for LNG projects in response to the decision. EAO's response to this issue is provided in section 12.1 of this Report.

Proponent Consultation with Lake Babine Nation

The Proponent had ongoing consultation with Lake Babine Nation between January 2013 and October 2014 to discuss issues and concerns regarding the proposed Project. During this period the Proponent had 28 in-person and 41 teleconference meetings with Lake Babine Nation to discuss the proposed Project including routing, fieldwork and permitting, provision of capacity funding and business opportunities, and collection of Traditional Knowledge and Use information.

Lake Babine Nation and the Proponent signed a Letter of Agreement to provide capacity funding to participate in ongoing consultation, signed a TLU protocol agreement, and are actively engaged in ongoing information sharing with respect to the proposed Project. The Proponent funded an interim and final Traditional Knowledge and Use Study (TUS).

Lake Babine Nation participated in proponent-lead biophysical field studies, and TEK fieldwork associated with archeology. The Proponent funded Lake Babine Nation's knowledge and use work which was not complete at the time of submission of the Application. Prior to submission of the Application, Lake Babine Nation indicated to the Proponent that discussions with the Proponent were not sufficiently advanced to discuss Aboriginal Interests, therefore a summary of publically available information was provided within the Application.

Following submission of the Application, Lake Babine Nation and the Proponent undertook extensive discussions related to the proposed Project route. Early in these discussions, Lake Babine Nation identified concerns with the crossing of Nilkitkwa Lake, an area of critical importance to Lake Babine Nation, indicating the risk to Lake Babine Nation Aboriginal Interests would be unacceptable. Lake Babine Nation requested that the Proponent work with them to identify an alternative crossing location. Lake Babine Nation also identified concerns with the proposed Project route and a camp in the vicinity of the Morrison Headwaters and the proposed crossing of the Tahlo Creek.

The Proponent took Lake Babine Nation members on a helicopter flyover of the proposed route within Lake Babine Nation's asserted Territory, including the proposed future compressor station, the proposed camp and stockpile yards sites, the proposed Nilkitkwa water crossing location and a proposed alternative water crossing location. In

follow up to this helicopter flyover, the Proponent also conducted a virtual flyover of the proposed route and possible alternative watercourse crossing with the Lake Babine Nation LNG Working Group.

In response to discussions between the Proponent and Lake Babine Nation, two alternative routes are under consideration described in more detail in section 2.4. The following description of these route alternatives was provided to EAO and Lake Babine Nation by the Proponent in their memo entitled *Response to Information Request Regarding Proposed crossing of the Nilkitkwa Lake and the Morrison Headwaters* and associated figures (October 10, 2014):

- Lake Babine Route Alternative - To avoid Nilkitkwa Lake, an 8.2 km route (additional route length of 0.4 km when compared with the Application) has been proposed that would cross Babine Lake using HDD. This route's associated pullback/lay down area is proposed within the route alternative footprint on the east side of Babine Lake (Figure 1). Several, small route options are presented within this alternative in relation to the crossing of Tsezakwa Creek.
- Morrison Headwaters Route Alternative - A 4.1 km route (additional route length of 300 m when compared with the Application, see Figure 1) has been proposed that would avoid the wetland at the Morrison Headwaters crossing, which would allow for an alternative crossing location of Tahlo Creek at a flatter and narrower area. An HDD crossing method is being considered for Tahlo Creek, which would then require additional temporary workspace to accommodate a pullback/laydown area.

The Proponent has indicated that a final routing would be determined following detailed engineering and additional consultation with Lake Babine Nation.

Issues raised by Lake Babine Nation during Application Review and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Lake Babine Nation and the Proponent's proposed mitigation to issues raised is provided in the Proponent's Application and in the Aboriginal Consultation Report #3.

Information Provided by Lake Babine Nation

During the review of the Application, Lake Babine Nation provided information to the Proponent and EAO regarding their Aboriginal Interests.

Lake Babine Nation responded to EAO's letter of January 18, 2014, stating that in regard to the proposed Project, Lake Babine Nation disagreed with EAO's initial assessment of strong *prima facie* claim to aboriginal rights to fish, gather, hunt and trap,

arguing that Lake Babine Nation has a very strong *prima facie* claim supported by past traditional land use and cultural practices that continue into the present day.

Lake Babine Nation provided EAO a memo entitled LBN Critical Cultural Zone, Lake Babine Nation (Lake Babine Nation, May 6, 2014) and in an interim TUS study entitled Interim Report for the Lake Babine Nation Knowledge and Use Study for TransCanada's Proposed Prince Rupert Gas Transmission Project (Candler, Yung and Firelight Group, June 27, 2014) during Application review.

The Lake Babine Nation Critical Cultural Zone memo discusses the connection between Lake Babine Nation culture, subsistence and Aboriginal Interests. The memo includes a map of the Critical Cultural Zone (CCZ) and describes the significance of the area identified. The proposed Project route, including one construction camp (site 115) near Fort Babine, is shown to intersect approximately 20 km of Lake Babine Nation's CCZ between KP marker 435 and KP 455. Key points outlined in the report are as follows:

- Lake Babine and its watershed have very high fish values and are a major producer of chinook, pink, sockeye, coho and steelhead salmon;
- Lake Babine Nation's identity and way of life depends on a continued healthy fishery and environmental integrity;
- Fish and their habitats are at risk within Lake Babine Nation asserted territory from forestry and mining;
- The protection of Lake Babine Nation's rights requires the maintenance of excellent surface and ground-water quality (including temperature) and quantity;
- Lake Babine Nation members harvest food and medicines within the CCZ; and
- The CCZ includes numerous cultural sites.

The interim TUS provided descriptions of Lake Babine Nation's Aboriginal Interests and uses, and identified practices through their asserted territory. Key details and concerns raised in the document included:

- Project impacts on subsistence resources (including hunting and trapping, fishing, and berry or food plant gathering);
- Constraints on the ability to access cultural and ceremonial areas, traditional foods, and the ability to conduct potlatches (Balhats) and traditional ceremonies.
- Impacts to transportation routes, cabins and habitation areas, including grease trails, and concerns associated with increased access of non-Lake Babine Nation members to Lake Babine Nation territories;
- Particular concerns were identified for areas around Nilkitkwa Lake, Morrison Lake and Tochcha Lake;
- Adverse social and economic impacts, especially for women and youth,

associated with short term in-migration and high paying but temporary jobs, and the lack of community readiness or capacity to benefit;

- Long term cumulative effects from contaminants, especially herbicides, and habitat loss; and
- Challenges to Lake Babine Nation's governance systems, including respect for Lake Babine Nation's management of resources.

The interim TUS recommended that the Proponent identify an alternate crossing for Nilkitkwa Lake, re-site the proposed camp 115 and its associated infrastructure to reduce potential effects to caribou and caribou habitat near Tochcha Lake; and identifying an alternate location for the Hautete Lake compressor station.

On October 9, 2014, EAO received a traditional use study (TUS) entitled *Lake Babine Nation Knowledge and Use Study for TransCanada's Proposed Prince Rupert Gas Transmission Project* (Candler, Yung and Firelight Group with LBN, Oct 3, 2014).

The TUS identified five categories of site-specific use values: cultural, environmental, habitation, subsistence and transportation. It is not clear what proportion of specific-use sites relate to hunting rather than fishing, gathering, traditional plants collection sites. Some interpretation was required by EAO linking site specific use values presented in the study to the discussion of potential impacts of the proposed Project on Aboriginal Interests. For example, site-specific values labelled as "subsistence" in the study could relate to hunting, fishing or gathering.

The TUS designated a "Project footprint" of 250 m as a zone of influence within which the abundance of wildlife and land use by humans may be altered. EAO understands the proposed Project construction corridor to be approximately 50 m in width, with a permanent ROW of 32 m during operations.

The TUS designated a LSA of 5 km, as "a reasonable approximation of the area of regularly relied-upon resource use surrounding a given transportation or habitation value". The LAA used by EAO for wildlife, fish and fish habitat, and vegetation is a 2 km wide corridor intended to capture the direct and indirect impacts from the proposed Project.

The TUS discussion is focused on an alternative route which includes a crossing of Babine Lake, rather than the Nilkitkwa crossing presented in the Proponent's Application. EAO notes that the spatial area covered by the TUS encompasses both routes proposed in the Application and those proposed as alternative routes.

The spatial boundaries depicted in the TUS that are used in relation to cultural, environmental, habitation, subsistence and transportation site-specific use values for

the proposed Project footprint, LSA and RSA differ from those used by EAO for wildlife (in section 17.2.1 and 17.2.3), fish and fish habitat (section 17.2.2), vegetation (section 17.3.4), and archaeology and cultural heritage (section 17.2.5). EAO's assessment of effects on Aboriginal Interests is informed, in part, by the spatial boundaries for the VC's that could correspond with a particular Aboriginal Interest.

The TUS provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations were randomized and shown with a 1 km buffer. The information provided to EAO does not allow EAO to conclude definitively whether a reported value point location will be intersected by the proposed Project footprint or be within 250 m of the centerline in the discussion of potential impacts of the proposed Project on Aboriginal Interests.

The Table below shows the number of site-specific use values identified during mapping interviews with Lake Babine Nation knowledge holders, within three distinct study areas.

TLU Study Area	Distance from proposed Project	# of Site Specific Use Values
Project footprint	250 metres	81
Local Study Area	5 km and 20 km in the CCZ	224
Regional Study Area	25 kilometres	532

A number of maps are presented in the study generally locating the site specific use values within the study areas in relation to the proposed Project. Time of use of sites ranged from the 1800s to the present (2014).

The TUS provided additional detail to that presented in the Interim Report. The TUS reported Lake Babine Nation's use through most of the study area with particularly intense use in areas surrounding Fort Babine including East and West of Nilkitkwa Lake and Babine Lake and in a corridor between Fort Babine and the north end of Morrison Lake. Use is also reported in the vicinity of French Peak.

Lake Babine Nation submitted a socioeconomic report entitled *Lake Babine Nation Socioeconomic Impact Study for the Proposed Prince Rupert Gas Transmission Pipeline Project* (Gibson et. al. and the Firelight Group, October 2014). The study presented a review of possible effects of the proposed Project including a 1000-man work camp on Lake Babine Nation's society, economy, culture and governance.

Potential Impacts of the Proposed Project to Lake Babine Nation's Asserted Aboriginal Interests

Aboriginal title

EAO has addressed potential impacts to Lake Babine Nation's asserted Aboriginal title by ensuring that Lake Babine Nation is meaningfully consulted and accommodated around the potential effects of the proposed Project. As discussed above, the Proponent is proposing significant route adjustments in response to concerns raised by Lake Babine Nation.

The Province and the Proponent have approached Lake Babine Nation to discuss initiatives that would provide financial, environmental and training benefits as outlined above in section 16.7. To this end, economic benefits of the project are being discussed amongst other accommodations, including those arising on potential Aboriginal title lands and Lake Babine Nation has a role in considering the proposed use for those lands. A discussion of the potential impacts of the proposed Project on Aboriginal title is provided in section 17.2.7 of this Assessment Report.

Given the potential impacts to Aboriginal title described in 17.2.7 and considering the potential re-siting of several components of the proposed Project, in EAO's opinion, the proposed Project is expected to have minor to moderate impacts on Lake Babine Nation's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Lake Babine Nation relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Moose, caribou, deer, grizzly bear, mountain goat, beaver, duck, geese and other small game and groundhog are hunted by members of Lake Babine Nation. The TUS indicates that sustenance activities including hunting are "essential for food security, cultural continuity and as part of the financial livelihood of Lake Babine Nation members".

The following hunting areas have been identified by Lake Babine Nation as being traversed by or adjacent to the proposed Project:

- Prime moose habitat and hunting areas between KM 400 and KM 450 to the north and east of Morrison Lake;
- Wetlands to the north of Morrison Lake at Tahlo Creek and Haul Lakes;
- East and west of Nilkitkwa Lake (moose, bear, deer and other species); and
- West of Nilkitkwa Lake in the vicinity of French Peak (preferred mountain goat and groundhog hunting areas).

The proposed Project alignment crosses through an area used by the Takla Caribou herd, and passes approximately 1.7 km from core winter habitat range. Lake Babine Nation have identified caribou as critically important to their culture, despite the fact that caribou numbers have declined to such an extent that they are not widely hunted. Lake Babine Nation has identified caribou habitat along the east side of Tochcha Lake between the lake and Tsitsutl Mountain and in the vicinity of the proposed location of Camp 115. This herd, including a group of approximately 40 caribou observed by Lake Babine Nation members in 2013, actively uses the ROW area and is understood to be the only remaining caribou herd available for practice of Lake Babine Nation hunting in Lake Babine Nation territory. Lake Babine Nation raised concerns with additional linear disturbance in this area impacting caribou habitat including the lake and adjacent wetlands.

During the Application Review, Lake Babine Nation raised concerns about the proposed Projects potential impacts to critical wildlife habitat for caribou and moose, and particularly intact forests, wetland, calving and winter range within their asserted territory. It was noted that the proposed Project could impact moose populations which Lake Babine Nation members have noticed declining. In response to concerns raised by Lake Babine Nation, the Proponent has proposed re-aligning the proposed Project corridor to avoid wetland habitat at the Morrison Headwaters. Habitat and wildlife concerns are further discussed in section 17.2.1 of this Assessment Report and in part B, wildlife and vegetation sections.

It is anticipated that direct impacts to hunting could occur during the second year of construction activities, if limiting access to certain areas along the proposed Project corridor cannot be avoided. It is not anticipated that Lake Babine Nation hunters would be limited in all areas simultaneously; however it is possible that a preferred hunting area could be inaccessible during a preferred time period. These impacts are anticipated to be restricted to the immediate construction area, to be several months to a year in duration and to be reversible.

In consideration of the information available to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report – the proposed Project is expected to have moderate impacts on Lake Babine Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Lake Babine Nation community members trap muskrat, mink, beaver, squirrel, lynx, wolf and wolverine in the winter as part of their traditional economy. The TUS indicates that sustenance activities including trapping are “essential for food security, cultural continuity and as part of the financial livelihood of Lake Babine Nation members”. The TUS identified trapping kill sites for mink, wolf, wolverine and lynx in the LSA, but not within the proposed Project footprint.

The *Lake Babine Nation Interim Report* identified trapping interests with important trapping sites and traplines located at Tochcha Lake, Morrison Lake, Tahlo Lake, Haul Lake, Nilkitkwa Lake, and Babine Lake.

In addition to notifying and compensating economic losses for registered trappers, the Proponent has agreed to maintain access to identified traplines, where possible or to move trapline equipment prior to construction or use other alternative site-specific strategies identified by Lake Babine Nation.

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO’s analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report – the proposed Project is expected to have minor impacts on Lake Babine Nation’s asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Throughout Application Review, Lake Babine Nation has strongly stated that the status of salmon and freshwater fish within the Babine watershed and the Skeena system is key to their Aboriginal and cultural identity and to their livelihood as individuals and as a Nation. Lake Babine Nation characterizes the Babine watershed as a biological powerhouse which supports an abundance of animals and birds and is unique because of the large number of salmon that return annually to spawn in this area. Lake Babine Nation is actively involved in the management of fisheries resources within their territory. These resources are and have always been a central focus of Lake Babine Nation’s sustenance and trading economies. As such, any potential adverse impacts to aquatic resources are of great concern to Lake Babine Nation.

The TUS identifies salmon, char, lake trout, Dolly Varden, rainbow trout, whitefish, suckers, lingcod and other fish as important for sustenance within Lake Babine Nation’s asserted territory.

The proposed Project corridor would traverse 15 major watercourses including a large crossing at Natlan Creek, which would be crossed by aerial crossing. The Application proposed an underground trenchless crossing (HDD) of Nilkitkwa Lake (currently under reconsideration, see routing discussion above).

Lake Babine Nation engaged in technical discussion with EAO and the Proponent throughout the review of the Application related to the management of potential effects to fish and fish habitat. Detailed technical comments regarding the assessments of hydrology, surface and groundwater quality and quantity, freshwater aquatic resources and accidents and malfunctions in the aquatic environment were received during the EA. Lake Babine Nation provided specific information related to fish and fish habitat within the streams, lakes and watersheds in their asserted territory and identified Tochcha Lake, Talho Creek and Lake, and Rainbow Alley at Nilkitkwa Lake as watercourses of particular concern.

A technical discussion of fisheries related concerns is captured in section 5.5 (Freshwater Fish and Fish Habitat) of this Assessment Report and the following is an overview of issues raised by Lake Babine Nation:

- Impacts to freshwater fish and particularly salmon (Sockeye, Coho, Chinook and Steelhead) from stream crossings and disturbance to riparian habitat;
- Impacts to salmon spawning and rearing areas;
- That a full assessment of proposed Project effects to aboriginal fisheries, including the reversibility of these effects has not been completed;
- Requested consultation occur with Lake Babine Nation related to any proposed offsetting for adverse fisheries impacts as well as notification of timing of watercourse crossings, and access to review all crossing plans and reports;
- Inappropriate identification of timing windows for in-stream works;
- Effects on water quality related to construction including: watercourse crossings, equipment maintenance and potential spills and the risk of contaminants entering watercourses from the ROW, including herbicides;
- Impacts to salmon rearing habitat from LNG export facilities proposed for the mid and outer Skeena Estuary; and
- Cumulative effects to fish and fish habitat from this proposed Project in combination with past and future forestry, fishing and mining developments within Lake Babine Nation asserted territory.

In response to Lake Babine Nation concerns, the Proponent indicated that they would continue to work with Lake Babine Nation to obtain specific local knowledge including pre-construction TUS studies, and to identify appropriate mitigation, restoration and

offsetting measures within their asserted Territory. The Proponent also committed to continuing discussions with Lake Babine Nation related to fish presence and construction timing windows at specific locations proposed within their asserted Territory and shared additional technical information with Lake Babine Nation during Application Review.

Nilkitkwa Lake was identified by Lake Babine Nation as of critical importance for the annual harvest of sockeye and spring salmon. Fish weirs, traps and net locations are located at the point where Nilkitkwa Lake narrows which was the proposed location for crossing by the Project in the Application. In response to concerns raised by Lake Babine Nation, the Proponent has proposed an alternative crossing to the Nilkitkwa Lake crossing which would be located approximately 2 km south of Fort Babine and would involve an HDD crossing of Babine Lake.

Tahlo creek was identified by Lake Babine Nation as important Chinook habitat and concern was raised with the proposed isolated crossing of this creek. The Morrison Lake headwaters alternative route has been designed to allow the proposed Project to cross Tahlo Creek at a flatter and narrower area and HDD crossing is also being considered.

Morrison Lake was identified as a fishing area but specific fishing locations were not described. Morrison Lake is located approximately 500m south of the proposed ROW (over 1km south should the Morrison Headwaters re-route be implemented), and as such it is not anticipated that there would be direct impacts to fishing from the proposed Project. If an EA Certificate is issued, the Proponent would implement communication plans with users identified by Lake Babine Nation in the vicinity of the proposed Project corridor prior to and during construction to ensure that access to fishing is not prevented for Lake Babine Nation members and that appropriate mitigation is implemented to manage access by non-Lake Babine Nation fishers.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, the proposed alternative routing to avoid important fish habitat at Nilkitkwa Lake and at the headwaters of Morrison Lake, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have minor impacts on Lake Babine Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Lake Babine Nation identified plant gathering for medicinal, subsistence and cultural purposes. The TUS identifies blueberries, gooseberries, huckleberries, chokecherries, soapberries, raspberries, cranberries and saskatoons as important for sustenance of Lake Babine Nation members.

The following plant gathering areas have been identified by Lake Babine Nation as being crossed by the proposed Project:

- East and west of Nilkitkwa lake is important for berry, plant and medicine harvesting;
- The vicinity of French Peak for harvesting areas for berries; and
- The 4000 road is used extensively for harvesting berries, and collecting other resources.

Potential impacts to plant gathering identified in the TUS included habitat change from disturbance and the introduction of reclamation species and chemical spraying that could directly impact resources. The proposed Project may intersect or be close to important plant gathering areas, and access roads and the new ROW may alter current access conditions to harvesting sites. It is not anticipated that French Peak would be impacted directly or indirectly by the proposed Project, however areas east and west of the proposed crossing at Nilkitkwa Lake could be impacted by staging and construction activities.

The Proponent will be undertaking pre-construction TUS studies to identify important sites, including plant gathering sites, and has committed to work with Lake Babine Nation to address impacts including identifying and avoiding particular plant communities of importance, if practicable. The Proponent has agreed to work with Lake Babine Nation to find alternatives to herbicides for vegetation control.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued and EAO's analysis of residual and cumulative effects on vegetation – as discussed in section 17.2.4 of this Assessment Report – the proposed Project is expected to have minor impacts on Lake Babine Nation's gathering activities in the area of the proposed Project.

Culturally Important Sites, Trails and Travelways

Habitation and Cultural Sites

The TUS identified 10 habitation values and 19 cultural values within the TUS footprint. Habitation values included numerous currently used cabins and camping sites and

cultural values included medicinal plant gathering sites, place names, CMTs, food processing areas including smokehouses and teaching areas. Reported use of these areas was from the 1800s to present.

Cabins were identified in the vicinity of Morrison Lake and near Tahlo Lake, Haul Lake, and French Peak. The proposed Project may intersect or fall in close proximity to cabins located near Morrison Lake and Haul Lake and that local habitat alteration may occur as a result of the proposed Project at creek and river crossings and upland terrestrial areas. It is not anticipated that the cabins located near Tahlo Lake and French Peak would be directly affected by the proposed Project activities or physical work.

The TUS identified that Nilkitkwa Lake and the proposed alternative crossing at Babine Lake is within Lake Babine Nation's CCZ. The Nilkitkwa Lake route includes a number of habitation sites including camps, smoke houses, and cultural and ceremonial areas which would be intersected by the proposed ROW. Specific habitation sites have not been identified as overlapping with the alternative route across Babine Lake.

The Proponent has proposed a suite of mitigation measure to avoid impacts to habitation values and cultural sites, and has agreed to continue to work with Lake Babine Nation regarding the implementation of site specific mitigation measures and to incorporate, where possible, mitigation proposed by Lake Babine Nation.

Access and Transportation

The proposed Project would cross a Forest Service Road known locally as the '4000 road' which provides the only access to Fort Babine. Lake Babine Nation explained that access along this road is critical since the community has few essential services, and members need to travel that road for medical and other services. Lake Babine Nation raised concerns with safety and access along this road as a result of increased traffic from the proposed Project.

The proposed Project would involve construction of a camp (camp 119A) and associated infrastructure approximately 2 km north (within walking distance) of Fort Babine that would house an average of 200 to 300 workers and would peak at more than 1100 workers in 2017. Lake Babine Nation explained that Fort Babine is an important reserve 'mother camp' as many people from the Lake Babine Nation community return to this area in summer to prepare for winter. Lake Babine Nation raised serious socio-economic concerns with the close proximity of the proposed construction camp to the small isolated community of Fort Babine, whom they consider a vulnerable community. Lake Babine Nation's Socioeconomic Report (Gibson et. al.,

Oct 2014) predicted that the proposed Project may change transportation patterns and that the changes would be neutral (neither negative nor positive).

In response to these concerns, the Proponent agreed to collaborate with Lake Babine Nation regarding management of camp 119A including related to traffic and worker access management. The Proponent also reiterated a strong commitment to maintaining safety and clarified that community security and worker interaction with local areas falls into this category within TransCanada's company policies.

With the implementation of ongoing communication and collaboration between the Proponent and Lake Babine Nation, EAO believes that impacts to access would be temporary and reversible.

Trails and Travelways

Many trails cross Lake Babine Nation asserted territory, and they link important traditional use areas. Trails are also used for harvesting or trade. Trails and travelways are recognized as important cultural heritage features and there is a potential for heritage and archaeological artifacts to be associated with trails and travelways (e.g., CMTs).

Lake Babine Nation raised concerns with potential impacts to trails, particularly historic grease trails, which are important to their cultural heritage. Lake Babine Nation identified important trails that intersect with the proposed Project corridor as follows:

- Transportation routes around Tochcha Lake that intersect with the proposed Project alignment;
- Areas immediately west and north of Morrison Lake that intersect with the proposed ROW, including the proposed location of the compressor station near Hautete Lake;
- An important Grease Trail segment, portions of which remain in active use, connects Fort Babine and Takla Lake to the east (the proposed ROW crosses the grease trail segment at least three times);
- Trails surrounding Nilkitkwa Lake; and
- A historic grease trail or trade route south of French Peak which is still in use for hunting runs approximately parallel to the proposed ROW.

The proposed Project could destroy portions of traditional trails, impede Lake Babine Nation's ability to use trails during construction, and could also alter current access conditions through the creation of access roads and the new ROW.

Mitigation measures proposed in the Application include detailed recording and mapping of trails identified during pre-construction TUS surveys, consultation with Lake Babine Nation on the relative importance of the trails and if warranted and discussions on how best to maintain or control access to trails. The Proponent has agreed to work with Lake Babine Nation to schedule construction during periods of least effect and discuss other means of mitigating effects to trail users.

Archaeological Sites

Lake Babine Nation stated that archaeological sites are culturally important and requested that they be apprised of all archaeological finds. At the request of the Lake Babine Nation, fieldwork within their asserted territory was directed and supported by a preferred archaeological consultant.

The Proponent has agreed to work with Lake Babine Nation towards an information sharing agreement related to archaeological, heritage and cultural finds (including trails and travelways) within their territory and has committed to share archaeological information with Lake Babine Nation as and when available.

The Proponent has proposed a suite of mitigation measures to address potential impacts to Aboriginal Interests including gathering site-specific TUS information prior to construction and developing site-specific mitigation measures to address specific sites and activities, where possible. The Proponent would implement communication plans with Lake Babine Nation and would maintain access control measures to reduce unauthorized motorized access to important cultural areas.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report – the proposed Project is expected to have minor to moderate impacts on Lake Babine Nation's culturally important sites in the area of the proposed Project.

Other Matters of Concern to Lake Babine Nation

During the EA process, Lake Babine Nation raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns rose by Lake Babine Nation and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
The '4000 road' is a forest service road which	The Proponent confirmed that the road

Key Issue Raised	EAO Response
provides the only road access to Fort Babine and is used extensively for hunting of moose and bear, harvesting berries, and collecting other resources. Lake Babine Nation raised a concern that this road would have to be carefully managed in order to keep the road safe for their members and other users. Lake Babine Nation notes that because it is not maintained by the Ministry of Transportation and Infrastructure, it can be a treacherous road, especially during the winter when it is not regularly ploughed by the forestry company.	would be used for proposed Project construction activities for transportation of materials and machinery, and for access to camp 115, and that it would be upgraded and maintained for this purpose. The Proponent also stated that safety is a primary concern and committed to continue discussion with Lake Babine Nation on ways to maintain safety along this road.

18.2.3 Nak'azdli Band

Context

- Nak'azdli Band is made up of Diehl-speaking members of the Carrier people.
- Clan territories (*kayos*) are governed under Hereditary Chiefs in a matrilineal line of clan Elders. There are 42 kayos within Nak'azdli Band, and the clan system is a strong part of the Nak'azdli Band's community organization and identity. Chief and Council are elected to two-or three-year terms.
- Nak'azdli Band has 17 reserves. Nak'azdli (Nicosia) IR 1, Sochi IR 3 and Williams Prairie Meadow IR 1A are currently occupied. Nak'azdli (Nicosia) IR 1 is the administrative center and most populated reserve. In 2013, Nak'azdli Band had a registered population of 1,850, with 695 living on reserve.
- A key value identified by Nak'azdli Band is access to undisturbed land to practice traditional livelihoods and culture. Band community members continue to hunt, fish, and gather staple country foods in the region.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would cross approximately 114 km of the central portion of Nak'azdli Band asserted traditional territory, entering its asserted eastern border near Mackenzie and west of Parsnip Reach and travelling in a southwesterly direction, exiting southwest of Insane Lake.
- The Witter Lake compressor station would be located within Nak'azdli Band's traditional territory.
- Camp 113 would be located in Nak'azdli Band traditional territory, as well as Ancillary sites 114A and 114B.
- The Province understands that the Nak'azdli Band is a modern entity with

descendants from the pre-contact Necosilweten Carrier subtribe, the people of Nak'raztli of southern Stuart Lake and Stuart River. The proposed Project corridor overlaps with an area that was considered the traditional territory of the Necosilweten/people of Na'krzatli. It is also understood that fishing, hunting and gathering practices were historically, and continue to be an important part of Carrier culture, with fish having primary importance.

- As articulated in an EAO letter to Nak'azdli Band on December 20, 2013, available information supports a strong *prima facie* claim to Aboriginal rights to fish, gather, hunt and trap in the areas around Pinchi, Tezzeron, and Inzana Lakes, which are in the vicinity of the proposed corridor.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)* which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that there is no information indicating sufficient or exclusive occupation that supports a *prima facie* claim of Aboriginal title within or near those portions of the proposed Project route.
 - o In a letter sent to EAO on September 5, 2014, Nak'azdli Band indicated that EAO had not consulted with Nak'azdli Band on this topic and requests that the evidence used and rational for the Crown's preliminary findings on strength of title claims be provided. EAO provided a letter to Nak'azdli Band on December 20, 2013 discussing an initial assessment of strength of claims, which included in Appendix B a list of references that was relied on that assessment, enclosing a 2009 ethnohistoric report.
 - o Nak'azdli Band expressed concerns that the assessment of title claim did not consider Nak'azdli Band's perspective, nor did it use a culturally sensitive approach to consider sufficiency of occupation as called for in the *Tsilhqot'in* decision including Nak'azdli Band's laws and practices, number of people, technologies, and character of the land and water as essential considerations. EAO's letter of December 20, 2013 specifically asked Nak'azdli Band to provide EAO with any information regarding any traditional use of the areas within or near the initially proposed corridor routes for the proposed Project, including use of the area around the time of contact (between 1793 and 1806) and at 1846. No additional information was provided to EAO in this regard.
- Given the nature and location of the proposed Project and the potential impacts to Nak'azdli Band's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult Nak'azdli Band lies in the middle part of the *Haida* spectrum. EAO included Nak'azdli Band on Schedule B of the Section 11 Order for the proposed Project.

Summary of Consultation

Nak'azdli Band was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application, and on the Application. Nak'azdli Band was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

In January 2014, EAO and OGC met with the Nak'azdli Band and other Carrier Sekani Tribal Council Aboriginal Groups for a community meeting. Nak'azdli Band participated in EAO's Working Group meetings from February 4-5, 2014, February 7, 2014, and July 28-31, 2014. On August 1, 2014, EAO held a Working Group for the northern interior Aboriginal Groups, attended by Nak'azdli Band and Burns Lake Band, as well as the OGC. Nak'azdli Band has indicated that their attendance at the workshops could not be construed to constitute consultation on this or any other proposed Project.

EAO provided Nak'azdli Band with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. The Proponent provided initial capacity funding for Nak'azdli Band to engage in discussions regarding the proposed Project under a Letter of Agreement dated June 2013. Nak'azdli Band and the Proponent have finalized an MOU. The Proponent provided Nak'azdli Band funding to undertake a TLU and socioeconomic study for the proposed Project.

The Proponent provided Nak'azdli Band formal notification of the proposed Project in January 2013. The Proponent and Nak'azdli Band have had several meetings to discuss the proposed Project, as well as to discuss the interim TLU Report and identified 14 areas of concern in their interim TLU report. Key issues raised at meetings include routing, effects to water bodies, fisheries, wildlife, increase trails and access, plant gathering, and proximity of the route to cabins and traplines. The Proponent took Nak'azdli Band representatives on a helicopter flyover and site tour of the areas of interest identified in their TLU. Based on feedback from the flyover and site tour, Nak'azdli Band provided the Proponent with a *PRGT Addendum: Nak'azdli Preliminary Report* in February 2014.

The Proponent's engineering fieldwork contractors engaged Nak'azdli Band regarding field opportunities. Nak'azdli Band members participated in fieldwork as employees, including line cutting, wildlife monitors, cultural monitors, medics, and field support

technicians. Nak'azdli Band representatives participated in the biophysical fieldwork for the purpose of employment and career building opportunities, and did not provide TEK.

The Proponent met with Nak'azdli Band to discuss the Proponent's Aboriginal contracting program and related opportunities for qualified Aboriginal businesses, as well as additional employment and contracting opportunities.

At the request of Nak'azdli Band, fieldwork within the territories of these groups was directed and supported by a preferred archaeological consultant, Archer CRM.

During the EA, the Proponent took part in 36 meetings with Nak'azdli Band, two community meetings, and two flyovers.

In July 2014, the Proponent submitted an addendum to EAO with a number of route alternatives. Two of those route alternatives, the Nation River and Sasklo Dome route alternatives, were in direct response to concerns raised by Nak'azdli Band. The Proponent moved the proposed Nation River route farther east and south from the original route. The Proponent moved the proposed route 0.7 km further away from the Sasklo Dome area than the original route. The Proponent stated in their third Aboriginal Consultation Report that they conducted ground truthing at the Nation River site, and Nak'azdli Band did not identify concerns with this route change, and found the Proponent's reroutes acceptable, in principle. Nak'azdli Band stated that this is not necessarily the case, and had requested to defer discussion on routing to the fall, when Nak'azdli Band would have more capacity to engage.

In addition to the reroutes included in the addendum, the Proponent has stated that after meeting with Nak'azdli Band, eight of Nak'azdli's routing concerns have been resolved, confirming that no reroutes were required in the vicinity of Cripple Creek/Lake, Tzagay Lake, Chuchi Lake East, Sheshehadji Lake, Dolphin Lake, Chichnojih Lake, Inzana Mountain and Inzana Lake South/Talinocheko Creek. Nak'azdli Band has stated that they do not view these routing concerns as being resolved.

Of the remaining six areas of concern, the Proponent is proposing microrouting options in the vicinity of Hatdudatehl Lake, Philips Creek/Lake, and Rainbow Creek, which the Proponent states were considered acceptable by Nak'azdli Band. Nak'azdli Band has stated that they do not view these routing concerns as being resolved.

The Proponent has stated that the Kalder Lake routing issue requires further discussion.

Nak'azdli Band submitted several letters (December 19, 2013, April 23, 2014, June 26, 2014 and August 15, 2014) to EAO with extensive comments and concerns regarding EA documents and the EA process. EAO considered Nak'azdli Band's comments on the draft Assessment Report received on October 29, 2014, and incorporated them into the final version of this Assessment Report where appropriate. Nak'azdli Band's comments on the draft Assessment Report were primarily regarding their ability to practice their Aboriginal Interests in the proposed Project area including those identified in their TUS, the EA process and EAO's conclusions, and included a social and economic impact assessment report.

Key concerns raised by Nak'azdli Band in meetings and correspondence are included in the common issues section (section 16.10 above), potential impacts sections below, as well as the issues tracking tables (Appendix 2).

Regarding several potential effects of the proposed Project on their Aboriginal Interests, Nak'azdli Band has recommended that the Proponent:

- Avoid Sasklo Dome/Ridge, Inzana Lake, Taslincheko Creek, and Inzana Mountain and reroute south, closer to Hatdudatehl Creek/Dolphin Lake, south of Chius Mountain;
- Reroute north of Phillip Creek/Lake and Rainbow Creek;
- Reroute east of Nation River, maintaining a minimum 2 km distance from Nation River;
- Minimize ROW width and stagger ROW near Chichnojih Lake, Kalder Lake, Sheshehadji Lake, and Cripple Creek/Lake;
- Provide monitoring results to potentially affected First Nations for the duration of the proposed Project;
- Restrict all workers' movements to designated work zones and designated camp zones; and
- Avoid fuel storage and fuelling in wet areas and areas with evidence of animal use.

Potential Impacts of the Proposed Project on Nak'azdli Band's Asserted Aboriginal Interests

Nak'azdli Band has emphasized the continued importance of the practice of their Aboriginal Interests for traditional purposes, as well as to support their traditional economy. Nak'azdli Band continues to rely heavily on traditional foods. A healthy and undisturbed natural environment is key for Nak'azdli Band. Nak'azdli Band puts high value on the ability to meaningfully exercise their Aboriginal Interests in preferred locations within their traditional territory.

Hunting

In correspondence with EAO and the Proponent, as well as in their TLU, Nak'azdli Band stated key concerns and information regarding wildlife, wildlife habitat, and the asserted right to hunt including:

- Hunting caribou and other culturally critical species including beaver, moose, grizzly bear, deer, elk, grouse, ducks, Canada geese, and grebes;
- Effects to moose calving and grizzly bear denning habitat in vicinity of the proposed Kazcheck Creek Crossing;
- Effects to moose wintering habitat near Hatdudatehl Lake;
- Effects to important caribou habitat and refuge located in the northern region of Nak'azdli Band's traditional territory;
- Concern regarding EAO's conclusion of significant adverse effects to caribou and the potential effects to Nak'azdli Band's right to hunt;
- Effects to keystone species and need for adequate studies and effective mitigation measures if the proposed Project was approved;
- Effects of habitat fragmentation and loss to wildlife;
- Effects to wildlife as a result of the Witter Lake compressor station;
- Increased access resulting in increased harvest pressure (mortality) on important species by predators and hunters;
- Adverse impacts to wildlife distribution and abundance which would, in turn, disrupt Nak'azdli Band's hunting interests;
- Effects on predator/prey interactions and distribution, including increased predatory opportunities and reduced or impoverished habitats, with corresponding effects to wildlife;
- Adverse effects to wildlife as a result of contaminated land or water as a result of the proposed Project;
- Change in habitat;
- Change in hunting areas;
- Wildlife health;
- Real or perceived contamination risk; and
- Change in wildlife behaviour.

Key species hunted include caribou, moose, elk, deer, bear, rabbit, beaver, muskrat, grouse, ducks, Canada geese, and grebes. Nak'azdli Band notes that a creek south of Stuart Lake is important for caribou migration.

Nak'azdli Band stated that hunting areas include Upper Nation River, Rainbow Creek, Chichnojih Lake, Kalder Lake, Sheshehadji Lake, Tzagay Lake, Cripple Creek, Cripple

Lake, Sasklo Dome, Sasklo Ridge, Inzana Lake (south), Taslinoheko Creek, Inzana Mountain, Kazcheck Creek, Phillip Creek, and Phillip Lake.

In addition to Nak'azdli Band's recommendations common to all Aboriginal Interests, Nak'azdli Band recommended that the Proponent:

- Ensure no damage, effect to water flow, or contamination to Nation River;
- Protect the Hatdudatehl Lake area, and impact this area as little as possible during construction and operations of the proposed Project, block the ROW along the lake and kept rugged to minimize hunter access;
- Avoid the lower reaches of the Kazchek Creek and ensure consultation regarding water crossings within this region;
- Provide specific measures to mitigate proposed Project effects to abundance and quality of furbearers in preferred Nak'azdli Band hunting areas to Nak'azdli Band members;
- Avoid withdrawals from waters where beaver reside and avoid drilling under beaver dams or lodge crossings where possible, or engage Nak'azdli Band members to trap out these locations prior to any damage occurring;
- Avoid fuel storage and fuelling in wet areas and areas with evidence of animal use; and
- No physical works or activities to be conducted within 1 km of identified mineral licks or 500 m from game trails. Where avoidance would not be possible, locations must be marked in advance by Aboriginal Group's monitors and knowledgeable land users, and an Aboriginal Group environmental monitor must be present during construction activities in locations with mineral licks or game trails.

The Proponent would develop their Access Management Plan in consultation with Nak'azdli Band.

In their Application, the Proponent stated that planning protocols between the Nak'azdli Band and the Proponent could be developed to limit disruption of Nak'azdli Band's ability to exercise their hunting interests.

The Nak'azdli Band is partnered with the John Prince Research Forest on the Khuda huwa'oodli (Let's Protect the Moose) Project. The project's objective is to better understand moose and moose habitat in the central interior and identify potential conservation measures. In support of this project, the Proponent has provided funding to support the moose collaring program.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to have minor impacts on Nak'azdli Band's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

In correspondence with EAO and the Proponent, as well as in their TLU, Nak'azdli Band stated key concerns and information and regarding wildlife, wildlife habitat, and the asserted right to trap including:

- The proposed Project would cross two *Keyoh* members' traplines and would approach their cabins (cabins 2 km and 0.3 km from the proposed Project route);
- Decline in population of furbearers and culturally critical species including beaver;
- Increased access by non-Nak'azdli Band members to important trapping areas which could increase trapping pressure and increase animal mortality;
- Real or perceived contamination risk; and
- Decreased access of Nak'azdli Band to traplines, and cumulative effects of development on traplines, resulting in a decrease in cultural knowledge transmission and alienation.

Species trapped by Nak'azdli Band include beaver, muskrat, lynx, squirrel, fisher, marten, fox, and wolverine.

The Proponent is having ongoing discussions with Nak'azdli Band to avoid disturbance to the cabins resulting from the Proponent's activities. Nak'azdli Band states that cabins are bases for activities within at least a 5 km radius around them.

Important trapping grounds include Upper Nation River, Chichnojih Lake, Sheshehadji Lake, Tzagay Lake, Cripple Creek, Cripple Lake, Phillip Creek and Phillip Lake.

Nak'azdli Band raised issues regarding routing in the Phillip Creek area.

In addition to Nak'azdli Band's recommendations common to all Aboriginal Interests, Nak'azdli Band recommended that the Proponent:

- Avoid withdrawals from waters where beaver reside and avoid drilling under beaver dams or lodge crossings where possible, or engage Nak'azdli Band members to trap out these locations prior to any damage occurring;
- Avoid fuel storage and fuelling in wet areas and areas with evidence of animal use; and
- No physical works or activities to be conducted within 1 km of the centreline of any traditional trails, excluding where they cross the proposed Project route. Where these trails intersect the proposed Project, Aboriginal environmental monitors would be required to conduct pre-construction surveys and construction-stage monitoring.

The Proponent will continue to engage with Nak'azdli Band on site-specific measures required near the two trappers' cabins.

The Proponent would develop their Access Management Plan in consultation with Nak'azdli Band.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have minor impacts on Nak'azdli Band's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

In correspondence with EAO and the Proponent, as well as in their TLU, Nak'azdli Band raised the following key concerns related to potential effects to fish and fish habitat:

- Routing in the Nation River and Phillip Creek areas;
- Effects on fish habitat, especially salmon, including sockeye and chinook;
- Effects to Nechako white sturgeon, lake trout (char), and bull trout, Dolly Varden, kokanee, lingcod, and other coarse fish;
- Concern that Nak'azdli Band's significant cultural and financial investment in

rehabilitating salmon and white sturgeon will be undone by the proposed Project;

- Effects of water crossings to fish;
- Risk of waterway contamination from the proposed Project;
- Potential for compressor stations to affect watercourses (specifically Middle River compressor station), including the effects of continuous noise and vibrations on fish spawning;
- Effects of stream and river diversion, during proposed Project construction, on fish eggs and fry;
- adverse effect of leaks and spills on fish health and fish mortality, including in areas that may not be readily accessible for repair, particularly at the Middle River confluence into Trembleur Lake;
- Increased sedimentation and turbidity as a result of water diversion during proposed Project construction;
- Real or perceived contamination risk;
- Potential for ROW to facilitate increased access to fishing areas and could influence the level of fish harvest;
- Increased access by non-aboriginal fishing practices;
- Potential effects of construction personnel fishing; and
- Potential effects of long-term access on Nak'azdli Band's fishing interests.

Salmon, primarily sockeye and chinook, are important to Nak'azdli Band's seasonal round, as they provide subsistence for several months, and were used for trade with Aboriginal Groups located further north. Whitefish, arctic grayling, kokanee, char, trout, including bull trout, white sturgeon, Dolly Varden, coarse fish, and lingcod are also important species used by Nak'azdli Band.

The proposed Project corridor would cross approximately 29 major watercourses with indicated fish presence in Nak'azdli Band's area of traditional use.

Important fishing sites include Chichnojih Lake, Kalder Lake, Sheshehadji Lake, Chuchi Lake, Tzagay Lake, Cripple Creek, Cripple Lake, Phillip Lake, Phillip Creek, Upper Nation River, Inzana Lake, Taslinoheko Creek, Rainbow Creek, Middle River, Trembleur Lake, Kazchek Creek, and Stuart Lake.

The Proponent stated that the proposed Project would not intersect or encroach on the shoreline areas of any of the lakes identified by Nak'azdli Band as important, but would, however, intersect some of the other important waterbodies. No compressor station development would occur within 100 m of any major watercourse. The Proponent stated that access roads and the ROW created by the proposed Project could alter current access conditions near many fishing areas.

In addition to Nak'azdli Band's recommendations common to all Aboriginal Interests, Nak'azdli Band recommended that the Proponent:

- Ensure no damage, effect to water flow, or contamination to Nation River;
- Develop a long-term monitoring program to assess the effectiveness of mitigations for preferred species, locations, and means of aquatic resources; and
- No instream water crossing construction work shall occur between April to June and September to November.

The Proponent would develop their Access Management Plan in consultation with Nak'azdli Band.

In their application, the Proponent stated that planning protocols between the Nak'azdli Band and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to fishing activities near watercourse crossings.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish and fish habitat, current and traditional land use – as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have minor impacts on Nak'azdli Band's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

In correspondence with EAO and the Proponent, as well as in their TLU, Nak'azdli Band raised the following key concerns related to potential effects to Nak'azdli Band's gathering practices:

- The proposed Project would intersect an important plant gathering area;
- Changes in habitat;
- Potential for the ROW to infringe on plant gathering areas;
- Potential for ROW to facilitate increased access to harvesting areas including plant gathering areas;
- Potential effects to culturally critical species and species available for harvest or

trade;

- Real or perceived contamination of traditional Nak'azdli Band food and medicinal plants;
- Effects on the health and viability of traditional medicines and traditional food plants and habitat;
- Reduced plant diversity and increased invasive species;
- Potential effects to pine mushrooms used for traditional purposes; and
- Issues related to routing and the Project footprint for the Nation River and Phillip Creek areas.

Important plants gathered by the Nak'azdli Band include pine cambium, berries, including blueberry, huckleberry, Saskatoon berry, soapberry, bearberry, salmon berry, and wild raspberry. Bark, roots, leaves and the wood of trees were also used as medicines and materials for housing, household utensils, clothing, weapons, and tools.

Important gathering sites include Sasklo Dome, Sasklo Ridge, Inzana Lake (south), Inzana Mountain, Phillip Creek, Upper Nation River, Rainbow Creek, Chichnojih Lake, Kalder Lake, Sheshehadji Lake, Chuchi Lake (east), Tzagay Lake, Kazchek Creek, Cripple Creek, and Cripple Lake, as well as an important traditional medicine plant habitat in the wetlands to the east of the Nation River.

Nak'azdli Band's preliminary use and occupancy study stated that the proposed Project would intersect several key berry and plant harvesting sites.

The Proponent stated that the proposed Project would be 21 km away from the important plant gathering site at its closest point (a bridge). The proximity to the plant gathering area was confirmed as acceptable, contingent on mitigation measures, which Nak'azdli Band and the Proponent are discussing.

In addition to Nak'azdli Band's recommendations common to all Aboriginal Interests, Nak'azdli Band recommended that the Proponent:

- Not use herbicides or pesticides within 5 km radius of Phillip Creek/Lake, Upper Nation River, Rainbow Creek, Chichnojih Lake, Kalder Lake, Sheshehadji Lake, Cripple Creek/Lake, unless prior notification and approval from affected First Nations has been received;
- Use hand spraying only, no broadcast spraying of invasive plants, with commitment to use affected Aboriginal Group members for this activity;
- Work closely with the Proponent in the planning of the proposed route in the Nation River area to minimize potential effects to traditional medicines in the

- area;
- Conduct long-term monitoring of impacts to specific wetlands, old forests, rare ecosystems, and culturally important plants; and
- Work with the Proponent to identify mitigations to avoid impacting the ability of Nak'azdli Band members to maintain sufficient harvesting levels or traditional plants.

In their Application, the Proponent stated that planning protocols between the Nak'azdli Band and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to plant gathering interests.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on Nak'azdli Band's gathering activities in the area of the proposed Project.

Impacts to culturally important sites, trails, and travelways

In correspondence with EAO and the Proponent, as well as in their TLU, Nak'azdli Band raised the following key concerns related to potential effects to Nak'azdli Band's culturally important sites:

- Effects of new long-term access and the potential effects this could have on their trails and travelways interests;
- Effect of watercourse crossing construction to navigation on the water;
- The proposed Project would be close to two *Keyoh* members' cabins (2 km and 0.3 km from the proposed Project route);
- Increased access by non-Aboriginal Groups or decreased access by Nak'azdli Band members to cabins as a result of construction and operations activities;
- The proposed Project would disturb several of Nak'azdli Band's overnight sites;
- Concern that access to overnight sites would be limited by construction and operations activities;
- Potential to affect locations of cultural importance, including viewpoints from sacred places, acoustic effects, and changes in meaning of sacred places;

- Increased access to sacred places by non-traditional visitors as a potential issue;
- Potential effects of noise on the use of sacred areas;
- Effects to Nak'azdli Band's Aboriginal Interests causing effects to Nak'azdli Band's governance systems; and
- Potential damage to important sacred sites.

The Proponent acknowledges that the proposed Project may intersect or be close to traditional trails, and that access roads may alter current access conditions.

Nak'azdli Band recommends that the Proponent not conduct physical works or activities within 1 km of identified traditional trails, excluding where they intersect the proposed pipeline. Where these intersections occur, Aboriginal Groups environmental monitors would be required to conduct pre-construction surveys and construction-stage monitoring.

Nak'azdli Band identified habitation sites at Inzana Lake (south), Taslinoheko Creek, Phillip Creek, Phillip Lake, Upper Nation River, Rainbow Creek, Chichnojih Lake, Chichnojih Creek, Kalder Lake, Sheshehadji Lake, and Chuchi Lake (east).

The Proponent has stated that many of these habitation areas would fall outside the proposed Project's LAA.

Nak'azdli Band has identified the Sasklo Dome and Sasklo Ridge formation region is sacred land, and that there are numerous sites described as being of sacred significance and ceremonial material harvesting areas in the Nak'azdli Band's traditional territory.

Nak'azdli Band identified sites described as being of sacred significance at Hatdudatehl Lake, Phillip Creek, Phillip Lake, Sasklo Dome, Sasklo Ridge, Inzana Mountain, Inzana Lake (south), Upper Nation River, Rainbow Creek, Chichnojih Lake, Dolphin Lake, Kalder Lake, Sheshehadji Lake, Chuchi Lake (east), Tzagay Lake, Cripple Creek, Cripple Lake, and Taslinoheko Creek.

The Application states that many of the sites described as being of sacred significance identified in the Nak'azdli Band TLU report fall outside the proposed Project's LAA. However, the Proponent acknowledges that the proposed Project may intersect or be close to Nak'azdli Band sacred areas, cultural sites, or material harvesting areas, including Sasklo Dome and Ridge.

For habitation sites, Nak'azdli Band recommends that the Proponent avoid conducting physical works or activities within 500 m of any identified Aboriginal cabin or cabin foundation.

The Proponent would develop their Access Management Plan in consultation with Nak'azdli Band.

In their Application, the Proponent stated that planning protocols between the Nak'azdli Band and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption Nak'azdli Band members' ability to exercise their sacred area Aboriginal Interests.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Report - the proposed Project may result in minor impacts on Nak'azdli Band's culturally important sites, trails, and travel ways in the area of the proposed Project.

Other Matters of Concern to Nak'azdli Band

During the EA process, Nak'azdli Band raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised by Nak'azdli Band and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Routing near creeks and rivers southeast of Inzana Lake	The Proponent has selected proposed Project routing to reduce the number of water crossings, where possible, and that further discussions with Aboriginal Groups are possible for discussion on water crossing location preferences.
Routing crosses steep embankments at Phillips Creek	As identified in their July 2014 Addendum, the Proponent rerouted the proposed Project so it would cross at a narrow part of Phillips Creek with a less severe slope.
BC Government to carry out regional land use planning in relation to all natural gas projects	EAO considers cumulative effects during the EA, which considers past, existing and reasonably foreseeable projects in the vicinity of the proposed Project. Refer to Common Concerns Section 16.5 for more information on EAO's cumulative effects

Key Issue Raised	EAO Response
	assessment.
Potential effects to visual quality – used to communicate history, knowledge, and elements of culture to next generations	EAO considered visual quality in the proposed Project EA. Please see section Part B, Section 7.4 for EAO's assessment on visual quality.
Request to suspend the EA/Project timelines	The application review stage of the EA process has a legislated time period of 180 days. Occasionally, EAO may suspend or extend the timeline of a project EA to allow time for the outcome of processes or the provision of information that could materially affect the conclusions of the EA. EAO does not anticipate issuing a suspension or extension for the proposed Project. Refer to Common Concerns, Section 16 about proposed Project timelines.
Effects to groundwater for Inzana Lake (Inzana Lake is spring-fed)	EAO considered effects of groundwater in the proposed Project EA. Refer to Part B, Section 5.6 for EAO's assessment on groundwater.
Noise	EAO considered proposed Project-related noise in the proposed Project EA. Refer to Part B, Section 5.1 for EAO's assessment on noise.
Effluents from previous disturbances	Mine effluent, such as from Mount Milligan, needs to be treated and settled so it is not expected that dissolved metals will settle out in sediment that would accumulate in the ROW. In the Binche Mine area, of 66 samples, only 2 showed detection of Hg, and both were below detection limits. The Proponent has noted this location and would reference location to see if the data collected is sufficient for that area.
Lack of meaningful integration of ATK/TEK	EAO understands that the Proponent incorporated ATK/TEK into the Application where that information was made available to them before submission of the Application to EAO. During the EA, EAO considered all ATK/TEK provided by Aboriginal Groups.
Lack of proper consideration of socio-economic effects, and consideration of Nak'azdli Band's socioeconomic impact	The potential social effects of the proposed Project are discussed in Part B, Section 7 of the Assessment Report.

Key Issue Raised	EAO Response
assessment (SEIA)	Nak'azdli Band provided this information to EAO on October 14, 2014 and EAO considered this information in this Assessment Report.
Contamination from drilling mud during HDD	HDD stream crossings are completed using non-toxic drilling fluid comprised of bentonite clay, water, and a small amount of polymer. The loss of containment of drilling fluids during HDD involves the fluid migrating from the pipeline bore to the surface through fractures in the overlying rock or through pore space in the overlying till. OGC indicated that there is no significant potential for human health impacts. This type of accident could result in a temporary increase in turbidity or clay deposition within the streambed and resulting adverse effects to fisheries. A loss of drilling fluids is considered a spill, and that all appropriate procedures would be required in the event of the loss of drilling fluids from an HDD including notification, response, and mitigation measures. In addition to preventative measures undertaken by the Proponent, regulatory prevention measures include the submission of geotechnical crossing information to OGC during permitting which are reviewed for fish habitat, riparian issues and geotechnical information by qualified specialists.
Nak'azdli Band recommends that additional TK studies be undertaken to supplement their preliminary use and occupancy study and to assess potential cumulative effects and impacts. Nak'azdli Band recommends that the Proponent meaningfully engage with Nak'azdli Band on all aspects of the proposed Project and ensures that Nak'azdli TK informs all stages of the proposed Project.	EAO will not be requiring a TK study for Nak'azdli Band. However, EAO has proposed a condition that would require the Proponent to consider additional TUS or TEK, if provided by Aboriginal Groups, in authorization applications related to the construction or operation of the proposed Project, if an EA Certificate were issued. In addition, EAO has also proposed a condition that requires the Proponent to report on their consultation with Aboriginal Groups during construction and the first year of operations that includes the participation of Aboriginal groups in the Proponent's construction monitoring activities.

Key Issue Raised	EAO Response
Nak'azdli Band recommends that the Proponent fund a full workforce survey to fill gaps in Nak'azdli Band social and economic information.	
Nak'azdli Band recommends that their TK is used to evaluate, monitor and manage cumulative impacts, and make changes to the proposed Project including existing plans and regulatory applications.	In addition to the proposed condition regarding TUS and TEK, the EAO has proposed a condition that requires the Proponent to develop their EMP in consultation with Aboriginal Groups. In addition, EAO has also proposed a condition that requires the Proponent to report on their consultation with Aboriginal Groups during construction and the first year of operations that includes the participation of Aboriginal groups in the Proponent's construction monitoring activities. The reports must be provided to Aboriginal Groups, EAO and OGC.
Nak'azdli Band recommends that the Proponent work with Nak'azdli Band to establish native plant nurseries to preserve significant native plants removed during proposed Project construction and operation phases.	Vegetation mitigation and conditions, including the Proponent's Reclamation Plan and the Proponent's commitment to avoid, salvage, conserve, or transplant traditionally or culturally-important plant species, when possible, and to continue to consult with the appropriate agencies and Aboriginal Groups in development of the Reclamation Plan, is described in section 17.2.4. EAO has proposed a condition that requires the Proponent to have a Qualified Professional conduct site habitat assessment surveys for all relevant locations within the Certified Pipeline Corridor, and propose mitigation to address adverse effects to any red- and blue-listed plants and ecological communities identified by the BC Conservation Data Centre. The Proponent would be required to include survey results and mitigation in relevant permit applications. EAO has proposed a condition that would require the Proponent to develop their Environmental Management Plan in consultation with Aboriginal Groups, including their Plan Species and Ecological Communities of Concern Contingency

Key Issue Raised	EAO Response
	Plan.
Nak'azdli Band recommends that clear, comprehensive emergency response plans and strategies be developed and be readily available to Nak'azdli Band and its members. Nak'azdli Band is concerned about insufficient and delayed emergency response to explosions and forest fires caused by the proposed Project. Nak'azdli Band is concerned about inadequate emergency response strategies to evacuate Nak'azdli Band members that are exercising Aboriginal rights across their traditional territory.	The Proponent's EMP would address emergency response. EAO has proposed a condition that requires the Proponent to develop their EMP in consultation with Aboriginal Groups. If an EAC was issued for the proposed Project, the OGC requires the Proponent's emergency response plan to ensure quick, effective and appropriate response to emergencies in order to protect public, company, and contact personnel from fatalities and irreversible health effects and the environment from damage. A permit holder for a sweet natural gas pipeline is required by OGC to prepare an Emergency Response Plan (ERP). As part of their ERP the Proponent will be required to determine an Emergency Planning Zone (EPZ). For a sweet gas pipeline the EPZ distance is not prescribed under the regulation but is established by the permit holder taking into consideration the types of hazards and risks arising from the gas activity that is the subject of the ERP. The ERP must clearly describe procedures that will be implemented during an incident to contact and maintain communications with directly impacted members of the public in order to keep them informed of the situation and actions being taken. This includes plans for communicating and implementing public protection procedures, such as evacuating and sheltering occupants within and beyond the EPZ. In the event of a pipeline incident requiring notifications or evacuation of the EPZ the ERP communications plan would identify members practicing Aboriginal Interests in their traditional territories within the determined EPZ zone through one of the requirements below or if the activity is outside those identified below, through the direct discussions between the permit holder and Nak'azdli Band. The permit holder will identify all persons,

Key Issue Raised	EAO Response
	residents, local authorities, and publicly used facilities within and immediately adjacent to the EPZ that should be consulted and included in the ERP, such as: - Permanent and part-time residents, including those residing on dead end roads beyond the EPZ where occupants must egress through the EPZ; - Private and public recreational property owners, operators, and occupants; - Business owners and operators and industrial operators; - Registered trappers, guides, outfitters, and grazing lease allotment users; - Any individuals known to the licensee who may have special needs and should be included in the ERP based on previous industry experience in the area; - Publicly used facilities, such as schools, community centres, senior citizen centres, registered and random campgrounds, and picnic areas; and - Non-resident landowners that don't live on the property within the EPZ.
Noise – cumulative effects of compressor stations in Nak'azdli Band's traditional territory	EAO considered proposed Project-related noise in the proposed Project EA. Please see Part B, Section 5.1 for EAO's assessment on noise.
Nak'azdli Band will never support the conversion of the proposed Project to an oil or a water pipeline	Please see section 16.3 for EAO's response to conversion of a natural gas pipeline to an oil or bitumen pipeline. The CPD, which is a schedule of the EA Certificate, describes the components of the proposed Project, and specifically states that the proposed Project would be a sweet natural gas pipeline, not a water pipeline. If an EA Certificate is issued for the proposed Project, the Proponent must adhere to the EA Certificate, including the legally-binding CPD. Conversion of the proposed Project to a water pipeline would require a new EA.
Nak'azdli Band is dissatisfied with EAO's responses to their concerns, including EAO's consideration of the seriousness of the proposed Project's impacts to	EAO considered Nak'azdli Band's concerns, as well as the concerns raised by other Aboriginal Groups, during the EA. EAO's responses to Nak'azdli Band's concerns are provided in this

Key Issue Raised	EAO Response
Nak'azdli Band's Aboriginal Interests.	section, section 16.10 of this Assessment Report, as well as in correspondence for the proposed Project.

18.2.4 Takla Lake First Nation

Context

- Takla Lake First Nation's asserted traditional territory is located in north central BC and includes the areas around Takla Lake south to Trembleur Lake, east including the Nation River and to the Parsnip Arm of the Williston Lake.
- Takla Lake First Nation has a total of 17 reserves, of which North Takla Lake Indian Reserve 7 is the main reserve, and a registered population of 741, with 392 living on reserve.
- Takla Lake First Nation is a member of the Carrier Sekani Tribal council.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project overlaps 303.7 km of Takla Lake First Nation's asserted traditional territory.
- There would be three compressor stations in Takla Lake First Nation's asserted traditional territory: the Middle River, Witter Lake and Hautete Lake.
- Camp sites 111, 113 and 115 would be located within Takla Lake First Nation's asserted traditional territory, as well as ancillary sites 110, 112A, 112B, 114A, 114B, 116C, 117A, and 117B.
- There would be 6.12 km of permanent roads, 4.45 km of temporary roads, 712.4 km up upgraded permanent roads and 60.32 km of upgraded temporary roads in Takla Lake First Nation's asserted traditional territory.
- As articulated in the letter from EAO on January 28, 2014, EAO understands that Takla Lake First Nation is a modern entity with descendants from the pre-contact central Carrier group identified as the Stuart Lake people as well as the pre-contact Sasuchan Sekani of Fort Connolly (Bear Lake).
- Takla Lake First Nation identifies its members to be descendants of Carrier and Sekani (Sasuchan and Yutuwichan) Aboriginal groups. Although information supporting this ancestral claim is not available to the Province, the Province's assessment has proceeded on the basis of the asserted Sasuchan and Yutawichan ancestry.
- Based on the available information sources reviewed, the area and vicinity of the

proposed Project does not overlap with the descriptions of the asserted traditional territory of the Stuart Lake people at the time of contact (understood to be around 1806). This area does overlap with what is understood to be the asserted traditional territory used by the Sasuchan Sekani people at the time of contact (understood to be around 1806). The Sekani are also understood to have used Takla Lake at various times throughout the year, to harvest resources such as fish, game and plants. This would support a strong *prima facie* claim to aboriginal rights to fish, hunt/trap and gather along the proposed Project route.

- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)* which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view there is information indicating sufficient or exclusive occupation that supports a *prima facie* claim of Aboriginal title by Takla Lake First Nation to the area around the village site Dzitline-lee (as identified on a 1904 map) and nearby areas used regularly for harvesting resources. The Province has assessed Sekani (Yutuwichan) *prima facie* claims to Aboriginal title north east of Mount Milligan to Williston Lake as weak to moderate. Although there is evidence of camping sites, harvesting locations and interconnecting trail systems in this area, there is also information that questions whether the Yutuwichan had the intention or capacity to exclude non-members, particularly the Carrier, who moved into the area of the proposed Project in the late 1800s. In response to being provided a draft of this Report for comment, on October 29, 2014 Takla Lake First Nation provided EAO with reports, two of which¹⁹ provide information relating to the Yutuwichan Sekani claim, noting that the Yutuwichan Sekani had intention and capacity to exclude Carrier at time of contact and 1846.
- Given the nature and location of the proposed Project, and the potential impacts on Takla Lake First Nation's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult lies in the middle to deep part of the *Haida* spectrum. Takla Lake First Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Takla Lake First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application, and on the Application. Takla Lake First Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly. EAO met with Takla Lake First Nation in September 2013.

¹⁹ 1. "Takla Lake First Nation Ethnohistory Summary Report" dated September 2014 (Littlefield and Cullon) and; 2. "Review of Part C – Consultation with Aboriginal Groups (PRGT)" by Littlefield and Cullon

Takla Lake First Nation attended Working Group meetings on September 12, 2013, October 17, 2013 and November 27, 2013, and February 7, 2014. In addition, Takla Lake First Nation participated in the Natural Gas Pipeline Workshop on February 4, 2014.

EAO provided Takla Lake First Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. The Proponent provided capacity funding for participation in consultation activities via a letter of agreement signed June 2013. The Proponent and Takla Lake First Nation signed a TLU protocol agreement in March 2014, a socioeconomic agreement in June 2014 and an MOU in July 2014.

The Proponent provided formal notification to Takla Lake First Nation about the proposed Project in January 2013, and provided monthly updates regarding the proposed Project since that time.

Takla Lake First Nation expressed concern regarding the original route, and the Proponent explored the feasibility of the south central route. Early in the EA, the south central route was outside of the area EAO understood to be Takla Lake First Nation's asserted traditional territory. In October 2013, Takla Lake First Nation provided EAO with a revised spatial boundary of their asserted traditional territory and additional ethnohistoric information regarding their practices in this area for consideration during the EA. Subsequent to the application being submitted, and in response to the information provided by Takla Lake First Nation, EAO revised our understanding regarding Takla Lake First Nation's asserted traditional territory and continued consultations with Takla Lake First Nation on the basis of its revised claim.

At the request of Takla Lake First Nation, fieldwork within its traditional territory was directed and supported by a preferred archaeological consultant, Archer CRM.

Takla Lake First Nation Knowledge Holders participated in TEK fieldwork associated with fisheries for the original proposed project corridor. Takla Lake First Nation opted to not to release the TEK information for inclusion in the Application.

The Proponent and Takla Lake First Nation had 38 meetings, and one site visit at an existing operation, and 1 flyover of the initial northern proposed Project route in their asserted traditional territory during the EA.

On October 29, 2014, Takla Lake First Nation provided a preliminary socio-economic report entitled *Socio-Economic Study for Proposed Prince Rupert Gas Transmission Pipeline Project, Takla Lake First Nation* (Vardacostas, C., October 29, 2014) and a preliminary TLU Study entitled *Prince Rupert Gas Transmission Project Traditional Land use Study, Takla Lake First Nation* (Sharp, K and L. Krebs, October, 2014). The socio-economic study provides an overview of Takla Lake First Nation's values and interests as they relate to their economic, social and land and resource use conditions. The socio-economic report also identifies potential Project effects and a summary of recommendations is provided with respect to the proposed Project.

EAO considered Takla Lake First Nation's comments on the draft Assessment Report received on October 29, 2014, and incorporated them into the final version of the Assessment Report where appropriate.

Potential Impacts of the Proposed Project to Takla Lake First Nation's Asserted Aboriginal Interests

During the EA, the Proponent issued an addendum for the proposed Project that identified five route alternatives in Takla Lake First Nation's asserted traditional territory, including the Mackenzie, Nation River, Sasklo Dome, Grostete Creek and Middle River route alternatives.

Takla Lake First Nation offered the following recommendations, as presented in the Application and in subsequent comments provided in review of the draft of this Assessment Report:

Consultation

- Initiate an environmental management committee (EMC) for the Proponent and Takla Lake First Nation to identify gaps in baseline information, refine mitigation and compensation measures, develop a long-term monitoring program, address Takla Lake First Nation's no net loss expectations and regulatory requirements, as well as developing training strategies and community consultation programs;

Training

- Training for Aboriginal Groups on pipeline construction, operation, maintenance and maintenance guidelines, water quality testing;
- Funding for Aboriginal Groups monitor training, safety and other certification programs;

Monitoring

- Long-term on-site monitoring by Aboriginal Groups during all phases of the proposed Project, that includes long-term monitoring and gathering baseline data prior to construction, particularly baseline data on fish and wildlife populations of concern, and that also includes the identification of environmental features to ensure commitments are being maintained;
- Inclusion of Aboriginal Groups in the development of criteria to assess results of pre- and post-construction monitoring of wetlands;
- Aboriginal Groups involvement in marking critical wildlife habitat and features, such as trails;
- Provide Aboriginal Groups monitors with stop work capacity at pre-identified sensitive water course crossings and any known or suspected environmental or cultural heritage sites during construction;

Community Updates

- Meet with community members before developing the Environmental Protection Plan, and share plan with Takla Lake First Nation representatives during for feedback;
- Provide overflight footage of the pipeline route in traditional territories of Aboriginal Groups to support traditional use discussions;
- Identifying, surveying and mapping game trails to maximize avoidance of these areas, and ensure game trails are not restricted during or after construction;
- Pre-construction site visits for land users for land users to provide additional information on areas that need access for safe crossing, TU sites, or environmental features that may require special mitigation during construction;
- All results of monitoring to be provided to affected Aboriginal Groups for the life of the proposed Project;
- Bi-annual meetings with affected Aboriginal Groups to review monitoring results and communicate how the Proponent has responded to Aboriginal Groups concerns;

Regulations

- No physical works/activities to be conducted within:
 - o 1 km of any identified Aboriginal cabin or cabin foundation;
 - o 500 m of the centreline of any traditional trails, excluding where traditional trails intersect the proposed Project (see monitoring recommendations);
 - o 500 m of any identified mineral licks or game trails. Where avoidance is not possible, see recommendations on monitoring and marking wildlife features;
- Avoid withdrawals from waters where beaver reside and avoid drilling under

beaver dams or lodge crossings where possible, or engage Takla Lake First Nation members to trap out these locations prior to any damage occurring;

- Avoid fuel storage and fuelling in wet areas and areas with evidence of animal use;
- Not use herbicides or pesticides within 30 m of an open body of water unless prior notification and approval by affected Aboriginal Groups unless prior notification and approval from affected Aboriginal Groups has been received;
- Use hand spraying only, no broadcast spraying of invasive plants, with commitment to use affected Aboriginal Groups' members for this activity;
- Environmental Monitors or the Proponent to notify potentially affected Aboriginal Groups of any known or suspected TLU sites encountered during construction within 24 hours, and make site assessment opportunity available prior to resuming construction;
- Proponent to provide Aboriginal Groups with environmental data sheets including areas marked off-limits to workers travel or construction activity prior to preconstruction;
- Restrict all workers' movements to designated work zones and designated camp zones;
- Proponent and prime subcontractors to implement no fishing policy for workers at or around any work or camp sites associated with the proposed Projects, EMC will enforce;
- Retain habitat-enhancing trees and brush where possible along ROW, reduce sightlines of predators and non-traditional hunters via methods to be determined by the EMC, encourage revegetation;
- Establish tree and shrub blinds along roads to reduce sightlines of predators and non-traditional hunters;
- Avoid widening existing ROWs any further than absolutely necessary, make new ROWs narrower than previous ones, with frequent non-linearity and shrub blinds;
- Retain habitat-enhancing brush 2-3 m high, EMC to determine what is grown;
- Roll back woody debris where it forms a ROW barrier;
- No instream watercrossing construction between July and October;
- Provide draft environmental protection plans to affected Aboriginal Groups at least three months prior to construction and implement feedback on the plans. EMC to develop these plans;
- Provide notice to affected Aboriginal Groups of any found or suspected archaeological sites identified during construction and support Aboriginal Groups field investigations of these sites or the development of an appropriate mitigation plan with the Proponent and government agencies;
- Report all spills, accidents or malfunctions with releases to the environment, within 1 day to affected Aboriginal Groups;

- Enhancement for specified sensitive watercrossing areas for 100 m on either side of the crossing point, relative to the preconstruction conditions, via implementation of instream mitigation to increase overhanging vegetation and instream depth, or through other suitable habitat enhancements determined in consultation with affected Aboriginal Groups;
- During reclamation, only use native plant mixes approved by Aboriginal Groups;
- Establish a traditional food and medicines plant nursery on Takla Lake First Nation territory, and provide opportunity to Aboriginal Groups to collect medicinal plants identified along the proposed Project route prior to construction;

Studies and Research

- Proponent to financially support regional caribou and fisher population studies with participation with potentially affected Aboriginal Groups;
- Monitor TSS and turbidity for one year after construction at Tahlo Creek, Morrison River, Haul Creek and Middle River, involving Aboriginal Groups environmental monitors and reporting results to affected Aboriginal Groups including the communities;
- Proponent financial and logical support for an Aboriginal Groups-driven cumulative effects assessment in Aboriginal Groups' territories, Takla Lake First Nation's recommendations provided by EMC. Focus on salmon-bearing watersheds, Takla and Scott caribou herds, and regional grizzly and moose populations;
- Proponent financial contribution toward program of VC-based cumulative effects assessment of increased industrial activity in northwest Alberta and Northeast BC, and effects on the exercise of Aboriginal Interests;
- Water quality studies and ongoing testing near watercourse crossings;

Compensation

- Proponent funding to support rehabilitation and enhancement for traditional use system within the study areas supporting Aboriginal Groups work crew, field investigations, and culture camps, ideally before construction.

Takla Lake First Nation also recommended:

- A minimum mapping and recording zone of 400 m, as mapping and photography of the affected area is smaller than the construction footprint; and
- Existing and potential future clear cuts in the LAA and RAA should be mapped and delineated to determine past, present and future impacts to vegetation, fish and wildlife. Appropriate spatial and temporal scales should be determined based on traditional knowledge and scientific rigor for species in question.

Aboriginal title

EAO has addressed potential impacts to Takla Lake First Nation's asserted Aboriginal title by ensuring that Takla Lake First Nation is meaningfully consulted and accommodated around the potential effects of this proposed Project. Significant route adjustments (particularly with the northern route, as noted above) responded to routing concerns raised, in part, by Takla Lake First Nation. Takla Lake First Nation does not agree with the adequacy of consultation relating to their asserted title claims and indicates there is no written record expressing the concerns with the original routing.

Further to the discussion in section 17.2.7 of this Assessment Report regarding the potential impacts of the proposed Project on Aboriginal title claims, and the routing consideration relating to the Middle River crossing, in EAO's opinion, the proposed Project is expected to have minor to moderate impacts on Takla Lake First Nation's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Takla Lake First Nation relating to potential benefits, including economic benefits, for LNG-related projects.

In their October 29, 2014 submission, Takla Lake First Nation indicated they disagree with EAO's assessment and, and suggested any impact should be considered significant given the current state of Takla Lake First Nation's values.

Hunting

Takla Lake First Nation raised the following key issues related to hunting:

- Habitat fragmentation and loss, with corresponding wildlife impacts, particularly migration and habitat loss;
- Caribou, moose and grizzly bear between Lake Babine Nation and Takla Lake First Nation, as well as in the Middle River and Nation River watersheds;
- Grizzly habitat, mountain goat habitat, caribou habitat, including for the Takla caribou herd, fisher habitat;
- Declining moose population;
- Deer, lynx, marten, fisher;
- Geese, swans and ducks;
- Moose, fisher and grizzly bear habitat in Old Growth Forests;
- Population, health and habitat of ungulates and other hunted species;
- Lack of robust healthy populations of wildlife (i.e. to historic levels) in which the community depends.
- Disturbance to migration patterns and winter feeding areas leading to further population declines;

- Altered migration patterns and changes to species' behavior, population or health decline, wildlife mortality as a result of accidents, and loss, damage and fragmentation of habitat;
- Creation of new forest openings could affect landscapes that are already substantially fragmented, affecting mountain caribou, mountain goat, grizzly bear, fisher, lynx and deer;
- Sensory disturbance (noise and vibration) and land disturbance due to construction and work including long-term effects of construction noise on wildlife;
- Wildlife collisions during construction;
- Impacts on terrestrial species of concern due to increase in road and air traffic (i.e. helicopter use);
- Increase in recreational hunters and recreational hunter success rates, which would put pressure on subsistence hunting, as well as potentially make Takla Lake First Nation feel unsafe when travelling in their traditional territory;
- Contamination impacts on wildlife relying on polluted lands, waters, or both;
- Impacts on predator/prey interactions and distribution, including human; and
- Improved access for natural predators and people (e.g. via sightlines).

Important hunting sites include Tahlo Lake, Haul Lake, Tahlo Creek, Middle River and its tributaries, the Trembleur Lake area, Nation River, Inzana Lake, and Natowite Lake. All sites except for Tahlo Lake are within the proposed Project LAA. Takla Lake First Nation notes that further TLU study is required in particular in the Nation and Parsnip Arm sub-basins with the asserted Takla Lake First Nation traditional territory.

Primary animals that are harvested by the Takla Lake First Nation members include moose, caribou, deer and mountain goat, rabbit, black bear, groundhog, and beaver. Hides from large game are still processed and tanned for clothing and sold to generate income. Large and small game continues to comprise a large portion of most Takla Lake First Nation members' diet.

The Proponent would develop their Access Management Plan in consultation with Takla Lake First Nation. In their application, the Proponent stated that planning protocols between the Takla Lake First Nation and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to hunting practices.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A

discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to result in minor to moderate impacts on Takla Lake First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Takla Lake First Nation raised the following key issues related to trapping:

- Extend notification time to trappers to more than two weeks' notice;
- Potential effects to fisher habitat throughout the at-risk ecosystem of SBSdk08 (cottonwood red osier dogwood);
- Potential effects to wolverine, squirrel, lynx, and fisher;
- Potential for loss of habitat, breeding and nesting trees and resulting loss of furbearers;
- Lynx, marten and fisher, as well as other commercially-important furbearers dependent on old growth forests;
- Trapping is an important economic activity for Takla Lake First Nation members;
- Loss or disturbance to habitat resulting in short and long term disturbances to wildlife and wildlife habitat;
- Long-term effects of construction noise on wildlife, including during reproductive periods;
- Concern regarding direct mortality via collisions as a result of the proposed Project;
- Altered migration patterns and changes to species' behavior, population or health decline, wildlife mortality as a result of accidents, and loss, damage and fragmentation of habitat;
- Impacts on beaver, particularly where dams and lodge crossings exist;
- Reduction in Old Growth forests resulting in potential effects to furbearers;
- Access to traplines impeded by construction of roads; and
- Increase in recreational hunters and recreational hunter success rates, which could potentially make Takla Lake First Nation members feel unsafe when travelling in their traditional territory.

Important trapping sites were identified at Tahlo Lake, Haul Lake, Tahlo Creek and Natowite Lake, Middle River and Trembleur Lake. All these areas are in the LAA, except

Tahlo Lake. Trapping and harvesting areas are primarily found in close proximity to waterways and habitation sites in Takla Lake First Nation territory. In the area of the proposed Project, trapping and harvesting sites are found along the Middle River to Trembleur Lake as well as Haul Lake and Nilkitkwa Lake. Additional sites located more than 2 km away were identified in the TLU study.

The most commonly trapped species include beaver, muskrat, lynx, squirrel, fisher, marten, fox, and wolverine. Trapping still provides supplemental income for many families and is important to their economic sustainability. In addition, pelts are still used in the making of traditional garments, which are worn and sold, providing additional income.

The Proponent would develop their Access Management Plan in consultation with Takla Lake First Nation. In their application, the Proponent stated that planning protocols between the Takla Lake First Nation and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to trapping practices.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. Takla Lake First Nation indicated that the Proponent's mitigations are not adequate to address potential impacts on trapping. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife and wildlife habitat - as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Takla Lake First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Takla Lake First Nation raised the following key issues related to fishing:

- Salmon between Lake Babine Nation and Takla Lake First Nation, as well as in the Middle River, Upper and Lower Trembleur subbasin watersheds;
- In the Nation River watershed, concern with fisheries values related to the Arctic watershed (i.e. Arctic Greyling);
- Impacts to and loss of fish and fish habitat;
- Lack of robust healthy populations of fisheries resources (i.e. to historic levels) in

which the community depends;

- Salmon, white sturgeon, Dolly Varden, bull trout, Omineca River Rocky Mountain whitefish, and grayling;
- Effects of watercourse crossings on sedimentation, TSS, and water temperatures on downstream fish populations;
- Impacts on fish eggs and fry during the diversion of rivers and streams in the Project construction phase;
- Long-term effects of contaminants or anything that may contaminate salmon, sturgeon, or river tributaries;
- Effects of the Middle River compressor station and the Middle River watercrossing on salmon;
- Proposed Project effects in combination with climate change, erosion, current and forecasted forest practices and thresholds could have repercussions on the salmon population in Middle River, Nation Lakes, Takla Lake, and the Trembleur Lake sub-basins;
- Cumulative Effects thresholds of metal concentration, turbidity and increased temperatures (in combination with Climate Change) on watersheds that could potentially stress some valued fisheries resources to the brink of extirpation and/or reduce populations; change in populations and habitat of Dolly Varden, bull trout, sockeye salmon, Omineca River Rocky Mountain whitefish, and grayling;
- Potential effects to spawning grounds for salmon, bull trout, and Nechako white sturgeon;
- Potential for disruption to fishing due to construction, including changes to fishing opportunities, particularly for salmon;
- Removal of aquatic plants may affect individual and community levels of fish species;
- Spread of invasive aquatic species can be detrimental to fish species, particularly spawning grounds;
- Potential for the Middle River watercourse crossing to disrupt Takla Lake First Nation's ability to harvest salmon;
- Effects of turbidity and sedimentation on aquatic life, in particular, key local species including Chinook salmon, being at a higher risk of predation;
- Clearing of vegetation at watercourse crossings can cause surface water to increase and cause undue additional stress on fish stocks;
- TSS effects to downstream plants and aquatic invertebrates, contributing to effects throughout the food web;
- Improperly installed culverts resulting in potential for blocking fish passage toward upstream habitat as well as alteration of habitat;
- Impacts of vibrations under waterways, on fish health;

- Effects of gas leaks on water quality, especially if leaks occur under a major waterway and the damaged section of the pipeline is not readily accessible for repair;
- Reduced overall aquatic diversity;
- Increased vehicle, trails and ROW access to many waterbodies that were previously inaccessible or difficult to access;
- Increased access by recreational anglers; and
- Increased pressure by increase access influencing the level of fish harvest and mortality.

The proposed Project corridor would cross approximately 38 major watercourses with indicated fish presence in Takla Lake First Nation's asserted traditional territory.

The Proponent would develop their Access Management Plan in consultation with Takla Lake First Nation. In their application, the Proponent stated that planning protocols between the Takla Lake First Nation and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to fishing activities near watercourse crossings.

Important fishing sites include Tahlo Lake and Creek, Haul Lake, Middle River, Trembleur Lake sub-basins, Nation River, Nation Lakes, Takla Lake, Babine River, Nilkitkwa Lake, Inzana Lake, and Natowite Lake. Middle River and its tributaries were identified as important salmon habitat and spawning sites. These areas are within the proposed Project LAA with the exception of Tahlo Lake.

Fish that are most commonly harvested by the Takla Lake First Nation's members include Dolly Varden, kokanee salmon, coho salmon, mountain whitefish, rainbow trout, lake trout, burbot and arctic greyling.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use – as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to result in minor impacts on Takla Lake First Nation asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Takla Lake First Nation raised the following key issues related to gathering:

- Wild berries, traditional medicines, and traditionally used trees and other plants;
- Alteration of rare plants, plant communities and plant gathering areas resulting in disruption of plant gathering activities;
- Impaired root development, increased runoff rates, increased erosion potential as a result of soil compaction from construction equipment and other vehicles;
- Introduction of noxious weeds and other invasive plants to previously unaffected areas, resulting in exclusion of native grasses or preferred forbs;
- Shedding of water from pipeline footprint exacerbates drought and has implications for soil development and the reestablishment of surface vegetation;
- Reduced plant diversity and increase in invasive species;
- Increase in recreational users in the area, which could potentially make Takla Lake First Nation members feel unsafe when travelling in their traditional territory for plant gathering; and
- Increased vehicle, trails, and ROW access into important plant gathering areas, including an increase in recreational activity levels in these areas.

Important gathering sites include Tahlo Lake, Haul Lake, Tahlo Creek, Middle River and the Trembleur lake area, as well as important trails. These areas are within the proposed Project LAA with the exception of Tahlo Lake. Takla Lake First Nation notes that further TLU study is required in particular in the Nation and Parsnip Arm sub-basins with the asserted Takla Lake First Nation traditional territory.

In addition to the recommendations above, Takla Lake First Nation recommends that the Proponent:

- Increase rigor in pre-construction identification of rare plants in the Vegetation and Wetlands Mitigations, the Environmental Management Plan, Access Management Plan, and Chemical and Waste Management Plan;
- Have qualified personnel on site to identify rare plants, contaminated soils; and
- Ensure adequate measurements of edge effect on tree structure and identify potential effects on surrounding communities.

Over 60 plant species are still widely used by Takla Lake First Nation members for subsistence, traditional medicinal and material purposes. Takla Lake First Nation recommends that more work be done to inventory the plant species impacted by the project.

The Proponent would develop their Access Management Plan in consultation with Takla Lake First Nation. In their application, the Proponent stated that planning protocols between the Takla Lake First Nation and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to gathering activities.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts to Takla Lake First Nation's gathering activities.

In their October 29, 2014 submission, Takla Lake First Nation indicated they disagree with EAO's assessment for numerous reasons provided to EAO and the Proponent throughout the EA process.

Culturally important sites, trails and travelways

Takla Lake First Nation raised the following key issues related to culturally important sites:

- Potential effects to travelways;
- Potential effects of the proposed Project crossing important trails;
- Concern regarding potential destruction of trails during construction;
- Concern regarding restricted access to trails as a result of the proposed Project;
- Concern that the proposed Project would intersect the Grease Trail system (allowed trade between Takla Lake First Nation and Coastal First Nations);
- Long-term effects on trail use, trail integrity, travelways and way of life;
- Proposed Project may disrupt *Keyoh* land and cabins;
- Concern that sacred places, birth sites, and ceremony sites may be affected in the area between Takla Lake and Babine Lake;
- Increase in recreational users in the area, which could potentially make Takla Lake First Nation members feel unsafe when travelling in their traditional territory for ceremonial purposes; and
- Trails and ROW created by the proposed Project would alter access to important

cultural areas and restrict Takla Lake First Nation's ability to access sacred areas.

Takla Lake First Nation identified an Aboriginal Interest in archeological, cultural, or sacred heritage sites, including CMTs and burial sites, as well as cultural transmission, including stability of the food chain, subsistence practices, cultural and traditional activities and practices, and passing down of traditional knowledge.

Takla Lake First Nation stated that extensive traditional trail systems are found between Takla Lake and Babine Lake, including areas near Tahlo Lake, Haul Lake, Middle River, Nilkitkwa Lake, Nation River, Inzana Lake, and Sasklo Lake. The Kaza Lake Trail is a multi-use historic trail running from Takla Landing to Kaza Lake. These trails connect family and clan houses, gathering locations, and harvesting areas. These areas are within the LAA, except for Tahlo Lake and the Kaza Lake Trail, which are outside the LAA. Takla Lake First Nation notes that further TLU study is required in particular in the Nation and Parsnip Arm sub-basins with the asserted Takla Lake First Nation traditional territory.

Takla Lake First Nation identified habitation sites at Tahlo Lake, Middle River and Nation River. These sites are within the LAA, except for Tahlo Lake.

No gathering places were identified for Takla Lake First Nation, and no site-specific mitigation was requested for gathering places by Takla Lake First Nation.

Takla Lake First Nation noted that there is a desire from community members that this information remain private.

Takla Lake First Nation identified sites described as being of sacred significance are Tahlo Lake, which is located outside the LAA, as well as the area between Takla Lake and Babine Lake (which was included in the LAA). Takla Lake First Nation indicated their preference for AIA site investigations to be completed prior to an EA Certificate being issued.

The Proponent would develop their Access Management Plan in consultation with Takla Lake First Nation. In their application, the Proponent stated that planning protocols between the Takla Lake First Nation and the Proponent could be developed leading up to and extending throughout the construction period to reduce disruption to culturally important sites, trails and travelways. Takla Lake First Nation notes that without commitment from the Crown to resolve issues that come with increased access, Access Management Plans will likely fail in their objectives.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to result in minor impacts to Takla Lake First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

In their October 29, 2014 submission, Takla Lake First Nation indicated they disagree with EAO's assessment, and suggested the impacts are significant given the numerous trails, sites, and travelways crossed by the proposed Project.

Other Matters of Concern to Takla Lake First Nation

During the EA process, Take Lake First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in the table below and section 16.10.

Key Issue	EAO's response
Loss of amphibian habitat	The following amphibian species were assessed: • Pond-dwelling Amphibians • Western Toad • Northwestern Salamander • Coastal Tailed Frog The magnitude of residual effects to amphibians is considered low because of the amount of habitat disturbance in the LAA and the mitigation proposed to minimize habitat disturbance and fragmentation is expected to reduce the residual adverse effects. Refer to Section 5.9 of the Assessment Report for more information on potential impacts to amphibians.

18.2.5 Tl'azt'en Nation

Context

- Tl'azt'en Nation is part of the Carrier, or Dakelh, Aboriginal Group. The Dakelh language is part of the larger Athapaskan language family. The main communities of Tl'azt'en Nation are Tache, K'uzche, Binche and Dzitl'ainli.

Tl'azt'en Nation follows a custom electoral system and is represented by a Chief and six Councillors.

- Tl'azt'en Nation is centered around Stuart Lake, approximately 45 km northwest of Fort St. James.
- As of September 2013, Tl'azt'en Nation had 1,724 registered members, with about 546 members living on Tl'azt'en reserves. Tl'azt'en Nation has 46 reserves, the most populated being Tache.
- Tl'azt'en Nation community members continue to live off the land by hunting for moose, deer, bear, caribou, mountain goats and small furbearing animals; fishing for several species of salmon, white fish, trout and ling cod; and gathering a variety of plants. Community members travel to campsites in the summer and gather food for the winter. Elders are recognized for their effort to share and perpetuate their language and culture.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project is expected to cross 93 km of the traditional territory of Tl'azt'en Nation. The proposed Project would enter at a point near the east end of Inzana Lake, crosses the Tl'azt'en Nation's traditional territory north of Trembleur Lake, and continues to the west border near Tildesley Creek.
- There is one compressor station proposed to be located within Tl'azt'en Nation's traditional territory and four potential camp locations.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)*, which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO continues to be of the view that there is information indicating sufficient or exclusive occupation that supports a strong *prima facie* claim of Aboriginal title within or near portions of the proposed Project areas, which overlap with the asserted traditional territory of Tl'azt'en Nation.
- Given the nature and location of the proposed Project and the potential impacts to Tl'azt'en Nation's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult Tl'azt'en Nation lies in the middle to deep part of the *Haida* spectrum. Tl'azt'en Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Tl'azt'en Nation was invited to review and provide comments on the draft AIR, Section 11 order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Tl'azt'en Nation was also provided with

opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Tl'azt'en Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. Tl'azt'en Nation and the Proponent concluded two letters of agreement, dated October 2013 and March 2014, which provided Tl'azt'en Nation with capacity funding to participate in consultation.

Tl'azt'en Nation provided input on the Valued Components document, draft AIR, Application and consultation reports through written correspondence with EAO on July 11, 2013, and September 10, 2014. In addition, EAO met with Tl'azt'en Nation on February 3, 2014 and EAO attended a community meeting with Tl'azt'en Nation members on February 24, 2014. Through correspondence and meetings, Tl'azt'en Nation noted that their primary concerns related to the proximity of the compressor station and the crossing of the proposed pipeline across the Middle River, which had the potential to impact salmon. Tl'azt'en Nation requested that an alternate route be considered.

In addition to EAO consultation, the Proponent carried out regular meetings (fourteen plus numerous teleconferences) with key Tl'azt'en Nation representatives. In response to routing concerns raised by Tl'azt'en Nation, the Proponent moved a proposed compressor station near Middle River to an alternative location. The Proponent also rerouted a proposed crossing at *Ningwus Koh* (Groteste Creek) at the Tl'azt'en Nation's request.

Tl'azt'en Nation and the Proponent concluded a TLU Protocol Agreement in November 2013 to provide for collection of TLU information, and a Fisheries/Aquatic and wildlife Agreement in July 2014. Tl'azt'en Nation knowledge holders participated in TEK fieldwork from August to October 2013, which included archaeology work (through a preferred archaeological consultant), terrestrial ecosystem mapping, and vegetation and fisheries surveys. The Proponent held several discussions with Tl'azt'en Nation regarding socio-economic data collection.

Also, Tl'azt'en Nation and Nak'azdli Band partnered with the John Prince Research Forest on the Khuda huwa'oodli (Let's Protect the Moose) Project. The project's objective is to better understand moose and moose habitat in the central interior and identify potential conservation measures. In support of this Project, the Proponent has provided funding to support the moose collaring program.

TI'azt'en Nation prepared a *Preliminary TI'azt'en Nation TLU Summary* which requested that the Proponent consider Middle River crossing alternatives identified in the report. The Proponent committed to exploring the alternatives. TI'azt'en Nation also submitted the document, *Traditional Knowledge Study Schedule 1 – Areas Recommended for archaeological assessment* which was used to inform analysis of potential adverse effects in the Application.

TI'azt'en Nation submitted a Fisheries/Aquatic and Wildlife Interim Report which was used by the Proponent in their analysis of potential impacts to TI'azt'en Nation's Aboriginal Interests related to fishing.

The Proponent arranged a site tour and fly-overs of the proposed route through the proposed Tsendzut protected area with the potentially affected *Keyoh* Holder. Three areas were jointly identified where micro routing could occur. TI'azt'en Nation requested that two proposed alternatives (Middle River Route Alternative and HDD crossing route) remain available until further discussion, and confirmed that the original proposed route through the proposed Tsendzut Protected area was acceptable. The Proponent will continue to discuss concerns and proposed mitigation measures with TI'azt'en Nation Leadership including *Keyoh* Holders.

Issues raised by TI'azt'en Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with TI'azt'en Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project on TI'azt'en Nation's Asserted Aboriginal Interests

Requests for Route Changes

With respect to TI'azt'en Nation's concerns about potential impacts on its Aboriginal Interests, TI'azt'en Nation specifically requested that the proposed route avoid the Middle River crossing and that the proposed compressor station be moved. In response, the Proponent rerouted a proposed crossing at *Ningwus Koh* (Groteste Creek) and moved the proposed compressor station near Middle River to an alternative location approximately 5 km east. The Proponent refined the proposed Project route within TI'azt'en Nation's traditional territory to reduce impact to TI'azt'en Nation's traditional activities and resources.

Following these discussions, TI'azt'en Nation requested that the two proposed alternatives (Middle River Route Alternative and HDD crossing route) remain available until further discussion, and confirmed that the original proposed route through the

proposed Tsendzut Protected area was acceptable. The Proponent will continue to discuss concerns and proposed mitigation measures with Tl'azt'en Nation Leadership including *Keyoh* Holders.

Aboriginal title

EAO has attempted to address potential impacts to Tl'azt'en Nation's asserted Aboriginal title by ensuring that Tl'azt'en Nation is meaningfully consulted and accommodated around the potential effects of this proposed Project, which has included consideration of the significant route adjustment noted above in response to routing concerns raised by Tl'azt'en Nation.

Given the potential impacts to Aboriginal Title described in 17.2.7 and considering the routing consideration relating to the Middle River crossing, in EAO's opinion, the proposed Project is expected to have minor to moderate impacts on Tl'azt'en Nation's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Tl'azt'en Nation's relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Tl'azt'en Nation members historically and currently hunt wolves, black bear, moose, elk, deer, caribou, mountain goat, rabbit, marten, fisher, otter, weasel, mink, beaver, squirrel, wolverine, lynx, porcupine, and grouse. Tl'azt'en Nation identified moose, caribou, lynx and bear as culturally significant species of interests.

In the Tl'azt'en Nation Interim TLU Report, Tl'azt'en Nation identified the potential of pipeline construction to adversely affect the health and habitat of wildlife. Tl'azt'en Nation expressed concern that their territory is already highly impacted by industrial activity resulting in degraded or diminished aquatic resources and wildlife values.

Tl'azt'en Nation stated key concerns regarding wildlife, wildlife habitat and hunting including:

- Impacts to the health and habitat of wildlife, in particular the state of health of moose, elk, mule, whitetail deer and caribou;
- Impacts to sensitive moose areas, particularly the proposed *Tsendzut* Protected Area;
- Effects on migratory birds, particularly near the Kettle Lakes;
- Potential for disruption of lifecycle behaviors of wildlife, such as moose calving and grizzly bear pre-hibernation feeding, due to construction disturbance;
- Health effects associated with disturbance-avoidance behavior and resultant

- potential for wildlife to reside in suboptimal foraging habitat;
- Absence of Provincial or Federal thresholds for altering terrestrial habitat;
- Baseline impacts and effects must be accurately described and considered as they portray the manner in which the meaningful exercise of Aboriginal rights may already be constrained;
- “Suitable” thresholds to habitat, mortality risk and movement are of considerable concern;
- Disagreement with “no significant residual effects” conclusions for wildlife indicators;
- Potential for decline and displacement of locally occurring wildlife species essential to the subsistence of community members as a result of construction, disturbance during operations and increased access by predators; and
- Tl’azt’en Nation’s inability to meaningfully harvest caribou due to conservation concerns.

With respect to project pipeline crossings, the Tl’azt’en Nation Interim TLU Report referenced three specific areas of issue:

- Proposed crossing of Middle River, considered to be a critical feature of the natural and cultural landscape, providing habitat for many species of vital importance to Tl’azt’en Nation’s livelihood;
- Proposed pipeline crossing at *Ts’iya Koh* (Kazchek Creek), a valuable subsistence area with a rich and extensive riparian ecosystem; and
- *Ningwus koh* (Grosette Creek), a sensitive wildlife corridor.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO’s analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to have minor impacts on Tl’azt’en Nation’s asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Tl’azt’en Nation indicated they trap wolves, black bears, marten, fisher, otter, porcupine, rabbit, weasel, wolverine, mink, beaver, squirrel and lynx. Tl’azt’en Nation identified

important trapping areas at Middle River, *Ts'iyá Koh* (Kazchek Creek), and *Ningwus koh* (Grostete Creek). Through the Tl'azt'en Nation interim TLU report, Tl'az'ten Nation identified fisher, marten and lynx as culturally significant animals of interest.

Tl'azt'en Nation's key concerns regarding trapping include:

- Need for further biophysical baseline data to quantify and describe habitat and population changes resulting from the proposed Project;
- Threat of the proposed Project to Tl'azt'en Nation members ability to collect wild food sources;
- Potential for negative consequences of the long-term ecological integrity of the land;
- Issues related to routing and the potential impacts from the Middle River compressor station; and
- Noise related disturbance that may result in wildlife relocation.

The Tl'azt'en Nation Interim TLU Report referenced the following potential watercourse crossings sites of relevance to trapping:

- *Ts'iyá Koh* (Kazchek Creek) is a valuable subsistence area with a rich and extensive riparian ecosystem, supporting a number of valuable keystone species including a variety of furbearers; and
- *Ningwus koh* (Grostete Creek) is a sensitive wildlife corridor, and the pipeline crossing at the present location is considered an unnecessary disturbance. The Tl'azt'en Nation Interim TLU Report recommended relocation to the north to limit disturbance.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have negligible impacts on Tl'azt'en Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Tl'azt'en Nation identified they fish rainbow trout, steelhead trout, and lingcod, as well as culturally significant species, including sockeye salmon, spring salmon, kokanee salmon, char, white sturgeon, Dolly Varden, bull trout, and whitefish.

Tl'azt'en Nation's key concerns regarding fishing include:

- Effects on and protection of certain species in specific locations including the white sturgeon in Trembleur Lake and sockeye salmon (33 spawning grounds) in the Middle River;
- Changes to sensitive fish species including char, rainbow trout, kokanee salmon, white sturgeon, whitefish, steelhead, trout and ling cod;
- Any development that would compromise or harm the "heritage sockeye salmon spawning Ground" in the Late Stuart;
- Potential for contamination of and disturbance to waterways and fish habitat due to project construction;
- Increased access for recreational anglers in previously undeveloped areas;
- The *Fisheries Act* is relied upon extensively in terms of informing criteria and thresholds for characterizing effects. Recent amendments to the *Fisheries Act* (through Bills C-38 and C-45) weaken protection to fish and fish habitat, and have significant implications for the EA process;
- The former Fisheries Act prohibition on harmful alteration, disruption or destruction (HADD), for which authorization and habitat compensation was previously required, has been removed, and with it the concept of 'no net loss';
- Based on amendments to the *Fisheries Act*, the new threshold for protection is "serious harm", defined as "death of fish or permanent alteration or destruction of fish habitat". This threshold is too low and allows for temporary alterations with incremental impacts to fish and habitat and losses of habitat productive capacity, without any requirement for offsetting or compensation to provide 'no net loss';
- Threshold for assessing significance of residual and cumulative effects to fish and fish habitat is too low based on the definition of "serious harm". This does not capture the various HADDs to fish habitat (e.g., temporary alteration of instream habitat) that will be created at fish bearing stream crossings during construction and operations of the proposed project;
- Effectiveness of proposed mitigation measures has not been adequately assessed;
- The proposed Conceptual Fish Habitat Offsetting Plan is insufficient. For this plan to be in line with Tl'azt'en Nation's interests, the plan would need to achieve the objectives of DFO's previous no-net-loss policy (e.g., Pacific Trails Pipeline

Project as an example), in which HADDs to fish habitat are offset (rather than "serious harm" or permanent alteration or destruction of fish habitat). Disagreement with "no significant residual effects" conclusions for aquatic indicators;

- Characterization of baseline conditions of fish and fish habitat which does not reflect decades of large scale development regionally and the demonstrably damaged condition of fish population health and habitat;
- Characterization of "context" for fish habitat, fish health and water quality is inaccurate. Tl'azt'en Nation has observed significant impacts to fish habitat, fish health, and water quality within its territory;
- Inability to meaningfully exercise their right to harvest white sturgeon;
- Nechako White Sturgeon ranking by COSEWIC was downgraded from Species of "Special Concern" to "Endangered" in November 2003. Federally listed as "Endangered" under the *Species At Risk Act* in August of 2006;
- Harvest constraints due to limited abundance and reduced harvest success due to low densities for early Stuart sockeye, chinook salmon and lake trout;
- The full suite of fish species and fish habitat within Tl'azt'en Nation territory must be contemplated in the EA process;
- Issues related to routing, the Project footprint and sites of various compressor stations;
- Potential negative consequences on the long-term ecological integrity of the water and generational impacts of water quality impacts on fish; and
- Need for further biophysical baseline data to quantify and describe habitat and population changes resulting from the proposed Project.

Tl'azt'en Nation identified the following sites as pertinent to fishing:

- Sydney Creek and Tildesley Creek (sockeye salmon, rainbow trout, and spawning habitat of the early Stuart sockeye run);
- Nechako watershed: Fraser River, Middle River, Takla and Trembleur Lakes (sockeye stocks including early Stuart sockeye);
- Nechako River, Nautley River, Stellako River and Francois Lake (Nadina sockeye);
- Middle and Taichie River, Stewart and Trembleur Lakes (Late Stuart sockeye);
- Naina, Endako, Driftwood and Chilako Rivers (chinook);
- Nechako watershed in the Nechako River and the Stuart system (coho salmon);
- Lower Salmon River and the Nechako River (pink salmon);
- Nechako watershed including the lower Stellako River, Fraser Lake, Nautley River, Nechako River from Diamond Island to the Stuart River confluence, Stuart Lake, Trembleur Lake and Takla Lake (white sturgeon);

- Nechako plateau (lake trout);
- Upper Fraser and Nechako watershed (bull trout);
- Nechako River watershed and within the Stuart system between Stuart, Trembleur and Takla Lakes and their tributaries (rainbow trout);
- Nechako basin in Francois, Fraser, Takla, Trembleur, and Stuart Lakes (kokanee); and
- Nechako Watershed (burbot, lake whitefish, brook trout, various species of sucker, pikeminnow, chub, peamouth and other resident species).

The proposed Project corridor would cross approximately 11 major watercourses with indicated fish presence in Tl'azt'en Nation's traditional territory:

The Tl'azt'en Nation Interim TLU Report noted the following watercourse crossings sites to be of relevance to sustaining fishing practices:

- Middle River HDD crossing - habitat for many species of importance to Tl'azt'en Nation including salmon; and
- Ts'iya Koh (Kazchek Creek) - supports valuable keystone species including a variety of fish species and chinook salmon.

The harvesting areas as identified are large geographic features, making the identification of any Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have a negligible impact on Tl'azt'en Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Tl'azt'en Nation gather medicinal, material, and food source plants, including soapberry, raspberry, juniper, kinnikinnick, strawberry, huckleberry, cranberry, blueberry, Labrador tea, wild rose, alder, red willow, devil's club, balsam fir, cottonwood trees, and white bark pine trees. Tl'azt'en Nation identified important plant gathering locales at *Ts'iya Koh* (Kazchek Creek) and within the proposed route along the northern ridge (KP140-150).

Tl'azt'en Nation's key concerns regarding gathering include:

- Damage to important harvesting areas and reduction in abundance and predictability of culturally valued plant species;
- Reduce access to preferred plant harvest locations;
- Potential negative consequences on long-term ecological integrity of the land;
- Further vegetation inventories required to inform decisions;
- Effect of northern ridge route (KP 140-150) on whitebark pine tree (including dead trees which are used); and
- Continued availability of medicinal, material, and food plants.

The Tl'azt'en Nation Interim TLU Report identified issues with the project pipeline crossing at *Ts'iyá Koh* (Kazchek Creek).

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects - as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Tl'azt'en Nation's gathering activities in the area of the proposed Project.

Culturally Important Sites, Trails and Travelways

Trails and Travelways

Tl'azt'en Nation identified that trails and travelways will be crossed by the proposed route. Tl'azt'en Nation's key concerns regarding trails and travelways include alteration of old trails used by those who live off the land, and disturbance to trails and traditional use areas.

Trail systems include the *Ts'iyá koh* (Kazchek Creek) trails that consist of two potential trails between *Ts'iyá koh* and *Dzitl'ainli* (Middle River), as well as the *Whelulh t'oh* (Kazchek Lake) trails that consist of several potential trails. Other trails identified in the Tl'azt'en Nation Traditional Land Use Report include the Dzint'izdli-Tildesley Creek Trail and the Baptiste Lake-to-Dzitl'ainli Trail.

Habitation areas

Tl'azt'en Nation did not identify any issues related to disturbance or reduced use of habitation areas.

Sacred Sites

Tl'azt'en Nation identified key concerns regarding sacred sites include:

- Potential for tourism to allow recreational visitors to access (uninvited) sacred grounds or burial sites, or to interrupt traditional rituals and events; and
- Potential project-related effects on burial grounds.

A stand of culturally modified trees with writing (arborglyphs) is present near the eastern edge of *Lhetank'ut* (Klaytahnkut Lake). Potential adverse effects to sacred areas near *Lhetank'ut* were assessed in the Application as *Lhetank'ut* is located within the LAA. Since Application submission, the Proponent has been made aware of Tl'azt'en Nation's specific sacred areas near *Lhetank'ut* including the stand of arborglyphs.

Cultural transmission

Tl'azt'en Nation identified a concern related to cultural transmission and the potential loss of traditional ecological knowledge and the ability to transmit traditional stories because of physical changes in the land.

Tl'azt'en Nation identified a traditional travel corridor between the *Dzitl'ainli* (Middle River Village) settlement and seasonal occupation sites north at *Tsazcheh* (Kazchek Lake), as well as a trail at *Ts'iya Koh* (Kazchek Creek). These areas have the potential to be classified as important cultural transmission areas.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Tl'azt'en Nation's use of culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Tl'azt'en Nation

During the EA process, Tl'azt'en Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

18.2.6 Tsay Keh Dene First Nation

Context

- Tsay Keh Dene First Nation is made up of Sekani-speaking members of the Carrier people. The Carrier Sekani have occupied a territory in north-central BC for an estimated 4,000 years.
- Tsay Keh Dene First Nation has 3 reserves with a combined area of 201 hectares and two federal land parcels that are to be converted to reserves. Tsay Keh Dene First Nation had a registered population of 459, with about 250 individuals living on reserve.
- Tsay Keh Dene First Nation has a Chief and four Councilors and uses a custom electoral system.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project is not expected to overlap Tsay Keh Dene First Nation's asserted traditional territory. The proposed Project would pass within approximately 4 km southeast of the southern boundary of Tsay Keh Dene First Nation's asserted territory.
- Given the nature and location of the proposed Project, EAO is of the view that the duty to consult Tsay Keh Dene First Nation lies at the low end of the *Haida* spectrum. Tsay Keh Dene First Nation is listed in Schedule C of the Section 11 Order.

Summary of Consultation

The asserted traditional territory of Tsay Keh Dene First Nation lies outside of the proposed Project area. Tsay Keh Dene First Nation was provided with notification of key milestones in the EA, including issuance of the Application Information Requirements and the acceptance of the Application to EAO for review. Tsay Keh Dene First Nation was also provided an opportunity to review and comment on the draft Assessment Report; no comments were received by EAO.

In addition to activities undertaken by EAO, the Proponent initiated discussions with Tsay Keh Dene First Nation in January 2013 by providing formal notification of the proposed Project. Since then, the Proponent has given Tsay Keh Dene First Nation proposed Project information including, but not limited to, information on environmental field programs, regulatory documents and proposed Project updates. In July 2013, Tsay Keh Dene First Nation advised the Proponent of their decision to disengage from the consultation process in respect of the proposed Project and stated that they do not

want the Proponent to report on any consultation activities. In September 2013, the Proponent notified Tsay Keh Dene First Nation of the decision to pursue the South-Central route option, which is located outside of Tsay Keh Dene First Nation's traditional territory. The Proponent will continue to send proposed Project updates to Tsay Keh Dene First Nation.

Potential Impacts of the Proposed Project on Tsay Keh Dene First Nation's Asserted Aboriginal Interests

Potential impacts of the proposed Project on Aboriginal Interests, including Aboriginal Groups' hunting, trapping, gathering, fishing, and use of culturally significant sites, are characterized in general terms in Section 17 of this Assessment Report.

Tsay Keh Dene First Nation's asserted traditional territory lies outside of the LAA for the marine resources VC, freshwater aquatic resources VC, vegetation and wetland resources VC, wildlife and wildlife habitat VC, land and resource use VC, heritage and archaeological resources VC . It is also outside the RAA for the above VCs.

The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAAs are intended to capture the area where the influence of other land uses and activities could overlap with Project specific effects and result in cumulative adverse effects.

The effects of the proposed Project are expected primarily within the proposed Project footprint and LAA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into Tsay Keh Dene First Nation's asserted traditional territory.

Taking into consideration the residual adverse effect from the proposed Project, and the distance of the proposed Project to Tsay Keh Dene First Nation's asserted traditional territory, EAO concludes that the proposed Project is not expected to result in any impacts on Tsay Keh Dene First Nation's Aboriginal Interests.

18.2.7 Yekooche First Nation

Context

- Yekooche First Nation is part of the Carrier, or Dakelh ("people who travel upon water"), Aboriginal Group. Dakelh is part of the wider Athabaskan language family.

- The ethnographic sources indicate that Carrier sub-tribes were politically and economically autonomous communities with their own villages and territories. The Province understands that the Yekooche First Nation is a modern entity with descendants from the pre-contact group, known as the Portage Band, and ethnographically part of the Stuart Lake Carrier. It is understood that the Stuart Lake people originally consisted of five groups with villages beside or near Stuart Lake. It is also understood that in 1959, the inhabitants of Pinchi, Tachie, Portage (Yekooche) and the Grand Rapids and Middle River were amalgamated into one large band called the Stuart-Trembleur Lake Band. The Portage Band subsequently left the Tl'azt'en Nation in 1994 to form their own community, becoming Yekooche First Nation.
- Yekooche First Nation is located at the north end of Stuart Lake, about 75 km northwest of Fort St. James. There are four Yekooche First Nation reserves: Nan Tl'at, Ucausley, Ye Koo Che, and Ye Koos Lee. Yekooche First Nation can be reached by road or by boat across Stuart Lake.
- As of September 2013, Yekooche First Nation had about 224 registered members, 100 of whom lived on reserve and 124 off reserve. Yekooche First Nation is governed by a Chief and three Councillors.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- EAO understands that the proposed Project would overlap approximately 24 km in the northeast boundary of Yekooche First Nation's asserted traditional territory.
- There is one compressor station proposed to be located within Yekooche First Nation's traditional territory.
- As articulated in a letter dated December 20, 2013, EAO assessed the Yekooche First Nation's Aboriginal rights claims, based on currently available information related to the activities, practices, traditions and customs integral to the distinctive culture of the Portage Band/Stuart Lake Carrier prior to contact with Europeans (understood to be around 1806). The route of the proposed Project overlaps a northeast portion of Yekooche First Nation's asserted territory, and is in proximity to the north and northwest portion of that territory. Available information indicates that at the time of contact, the Stuart Lake people utilized fishing stations on the shores of Trembleur Lake, and utilized adjacent areas for hunting and gathering. This usage would support strong *prima facie* claims of aboriginal rights to hunt, fish, trap and gather in this area.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)*, which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based

on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that there is information indicating sufficient or exclusive occupation that supports a strong *prima facie* claim of Aboriginal title within or near those portions of the proposed Project areas in close proximity to the village site, *Dzitline-lee*, and nearby harvesting areas.

- Given the nature and location of the proposed Project and the potential impacts to Yekooche First Nation's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult Yekooche First Nation lies in the middle to deep part of the *Haida* spectrum. Yekooche First Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Yekooche First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Yekooche First Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Yekooche First Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. The Proponent provided initial capacity funding for Yekooche First Nation to engage in discussions regarding the proposed Project under a Letter of Agreement dated July 2013, and under a MOU dated November 2013. The Proponent and Yekooche First Nation finalized a TLU Protocol Agreement on November 12, 2013. Yekooche First Nation provided an Interim TLU Report to the Proponent in January 2014 which was used to inform the Application. A final report was submitted in June, 2014 and considered in the Aboriginal Consultation Report #3. Yekooche First Nation is also collecting socio-economic information under a Socio-Economic Agreement with the Proponent signed July 2013.

Yekooche First Nation provided EAO with comments on the AIR related to routing concerns, effects on fish and fish habitat, a compressor station at Middle River and effect of access on wildlife. Yekooche First Nation participated in Working Group meetings on October 17, 2013, November 19, 20 and 27, 2013, and February 5, 7, 2014 and July 28-31, 2014 and participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Yekooche First Nation several times to discuss proposed Project related subjects.

Issues raised by Yekooche First Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Yekooche First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project on Yekooche First Nation's Asserted Aboriginal Interests

Routing Concerns

The Proponent submitted an Application Addendum to EAO that identified a proposed alternative to the Middle River water crossing which was developed as a result of concerns raised by Tl'azt'en Nation. Yekooche First Nation sent a letter to the Proponent and EAO highlighting concerns with this proposed alternative and stated that their preferred crossing would be the original proposed crossing of Middle River. At a July 10, 2014 meeting with Yekooche First Nation, the Middle River route alternative was discussed. Potential effects to Yekooche First Nation's asserted Aboriginal Interests were considered with respect to the sites, locations, species, and practices identified by Yekooche First Nation in the Application. The Proponent indicated to EAO, that after discussions, Yekooche First Nation concluded that they did not have concerns with the alternate Middle River crossing.

Aboriginal title

EAO has addressed potential impacts to Yekooche First Nation's asserted Aboriginal title by ensuring that Yekooche First Nation is meaningfully consulted and accommodated around the potential effects of this proposed Project, which has included consideration of the significant route adjustment noted above in response to routing concerns raised by Yekooche First Nation.

Given the potential impacts to Aboriginal title described in 17.2.7 and considering the routing consideration relating to the Middle River crossing, in EAO's opinion, the proposed Project is expected to have minor to moderate impacts on Yekooche First Nation's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Yekooche First Nation's relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Yekooche First Nation hunt moose, bear, caribou, deer, mountain sheep, mountain goat, coyote, lynx, wolf, beaver, muskrat, porcupine, hoary marmot, marten, wolverine, fisher, ground hog, hare, grouse, mink, migratory birds and waterfowl.

The Yekooche First Nation Final Traditional Land Use Report provided to the Proponent in June 2014 indicates that important bear and moose habitat is present in the Trembleur Lake and surrounding area, as well as in the Middle River area, particularly on the western side. The Middle River area is within the LAA. Trembleur Lake is located immediately south of the LAA, but within the RAA.

Yekooche First Nation stated key concerns and information regarding wildlife, wildlife habitat, and the asserted right to hunt including:

- Disruption of access which will impact the ability to practice traditional livelihood;
- Increased access by recreational users may reduce populations of moose, bear and deer;
- Impact on wildlife movement along the Middle River corridor;
- Potential disruption to wildlife habitat and migration patterns, especially of moose and caribou;
- Potential increase of predator access to ungulate population;
- Possible degradation of water quality in freshwater creeks, wetlands and bogs leading to the contamination of water and food sources for wildlife;
- Temporary and permanent disruption/destruction of riparian habitat, freshwater creeks, bogs and wetlands (beaver habitat);
- Change in ability to hunt moose (important for cultural activities), caribou, mountain sheep, mountain goat, hoary marmot, groundhog, and hare;
- Possible effects on black and grizzly bears as a species at risk. Impact on high values spring grizzly bear habitat in wetlands and lower slopes; and
- Issues regarding migratory birds may impact aboriginal interest in harvesting same.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use - as discussed in section 17.2.1 of this Assessment Report - the

proposed Project is expected to have minor impacts on Yekooche First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Yekooche First Nation trap beaver, muskrat, black bear, marten fisher, wolverine, lynx, fox, wolf, coyote, porcupine, ermine and mink.

Trapping areas identified in the Yekooche First Nation TLU include regions surrounding Trembleur Lake, particularly the east end. The Middle River, southwest of the LAA was also identified as an important area for trapping.

Yekooche First Nation stated key concerns and information regarding wildlife, wildlife habitat, and the asserted right to trap including:

- Alteration of wildlife movement along the Middle River corridor will alter wildlife movement;
- Construction and operational activities may restrict access to traditional trapping areas;
- Increased access by recreational users;
- Construction and operational noise and traffic will impact local terrestrial animal population (beaver, lynx, beaver and disrupt movement and habitat); and
- Potential for contamination of water and food sources in fresh water creeks, wetland and bogs from construction related effluent discharges and pipeline crossings.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use - as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have negligible impacts on Yekooche First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

The Yekooche First Nation fish for culturally important species such as salmon, char, rainbow trout, steelhead, Dolly Varden, whitefish and suckers.

The Yekooche First Nation Final TLU report identified the southwest area of Trembleur Lake, in addition to an area immediately north of the LAA, as an important area for fishing salmon.

The proposed Project corridor would cross approximately 4 major watercourses with indicated fish presence in Yekooche First Nation's area of traditional use.

Yekooche First Nation's concerns regarding fishing include:

- Potential damage to riparian habitat, freshwater creeks, bogs and wetland, and subsequently to aquatic species' habitat;
- Effects of sulphur dioxide on aquatic ecosystems;
- Increased erosion, sediment and water temperatures in streams may damage fish stocks and spawning areas;
- Marine activity could impact salmon runs; and
- Increased access to recreational users.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate, and EAO's analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to have a negligible impact on Yekooche First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Yekooche First Nation gather plants for food, medicinal and material uses.

Yekooche First Nation's key concerns regarding gathering activities include:

- Potential effects to gathering due to damage to soil, land or water;
- Effect of sulphur dioxide on terrestrial ecosystems;
- Increased access which will result in the disruption of the communities ability to practice their traditional livelihood;
- Fugitive dust on vegetation; and
- Harm to vegetation from contaminants.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use - as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Yekooche First Nation's gathering activities in the area of the proposed Project.

Culturally Important Sites, Trails and Travelways

Use of Trails and Pathways

In the Final TLU Report, Yekooche First Nation identified a transportation trail located on the east end of Trembleur Lake. Trembleur Lake is located immediately south of the LAA, within the RAA, therefore no direct potential adverse effects outside of the LAA are anticipated.

Habitation Areas

In the Yekooche First Nation Final TLU Report, Yekooche First Nation identified habitation areas on the north shore of Trembleur Lake and the mouth of the Middle River where village sites are present.

The Middle River is located with the LAA and was addressed in section 33.15 of the Application. Trembleur Lake is located immediately south of the LAA, but within the RAA, therefore no direct potential adverse effects are anticipated.

Gathering Areas of Interest and Culturally Important Sites

In the Yekooche First Nation final TLU Report, Yekooche First Nation identified the north shore of Trembleur Lake and the mouth area of Middle Lake as important gathering areas as they are recognized as family birth places and named places. Trembleur Lake is located immediately south of the LAA, but within the RAA.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is

expected to result in negligible impacts to Yekooche First Nation's use of culturally important sites, trails, and travelways in the area of the proposed Project.

Other Issues Raised by Yekooche First Nation

During the EA process, Yekooche First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

18.3 Wet'suwet'en

In consideration of the historic and current context of Wet'suwet'en provided in section 13.3 of this Assessment Report and information gathered throughout the consultation process, the following sections are intended to set out, in relation to each Wet'suwet'en Aboriginal Group:

- A summary of concerns related to Wet'suwet'en Aboriginal Interests; and
- EAO's evaluation of potential effects of the proposed Project to Wet'suwet'en Aboriginal Interests.

18.3.1 Office of the Wet'suwet'en

Context

- The Office of the Wet'suwet'en is a non-profit society created as a central office of the Wet'suwet'en people. The Office provides service through the traditional territories, focusing on lands and resources, fisheries and wildlife, human and social services, and treaty negotiations.
- The Office of the Wet'suwet'en centres on a hereditary system of governance based on five clans that divide into 13 houses. Each house is led by a Hereditary Chief and is responsible for managing distinct sections of the territory and fishing sites, with additional wing-chiefs who assist with decision-making in each house territory. The Office acts as a representative of the traditional Wet'suwet'en hereditary governance system and is governed by the Wet'suwet'en Hereditary Chiefs.
- Two member Bands defer to the Office of the Wet'suwet'en in respect of Aboriginal rights and title matters off of reserve: the Hagwilget Village Band and Moricetown Band. Although members of other bands, including Nee-Tahi-Buhn, Wet'suwet'en First Nation, Ts'il Kaz Koh First Nation and Skin Tyee First Nations, are also connected to the Wet'suwet'en hereditary system through clan and

house affiliations, these groups are not formally represented by the Office of the Wet'suwet'en in consultations with the Province.

- Hagwilget Village Council (Band No. 534) is made up of two reserves, the largest located on the Bulkley River at Hagwilget, 2 km north of New Hazelton and 8 km east of Hazelton. While located outside of Wet'suwet'en asserted traditional territory, this reserve is known to be a shared reserve with Wet'suwet'en and Gitksan members. As of August 2014, the total population was 768, with 229 living on reserve and 539 living off reserve. Hagwilget Village Band is administered under the *Indian Act* electoral system and is governed by a Chief and three Council members.
- Moricetown Band (Band No. 530), also known as Kya Wiget, is the largest of the Wet'suwet'en communities. The Band is located about half way between Smithers and Hazelton, and is made up of seven reserves located on about 1,427 ha of land. As of September 2013, the total population was 1,984, with 709 members living on reserve and 1,275 members living off reserve. Moricetown Band is administered under the *Indian Act* electoral system and is governed by a Chief and 12 Council members.
- Wet'suwet'en rely heavily on salmon-bearing watersheds.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project's pipeline is not expected to pass through what is understood to be the Wet'suwet'en traditional territory, asserted by the Office of the Wet'suwet'en. The closest point would be approximately 3 km north of the northeastern tip of Wet'suwet'en asserted traditional territory, north of Hazelton. The Office of the Wet'suwet'en is listed in Schedule C of the Section 11 Order for the proposed Project.
- Given the nature and location of the proposed Project and the potential impacts to Office of the Wet'suwet'en Aboriginal Interests as discussed below, EAO is of the view that the required scope of the duty to consult the Office of the Wet'suwet'en is at the low end of the *Haida* spectrum.

Summary of Consultation

Office of Wet'suwet'en was provided notification of key milestones for the proposed Project, to review and provide comments on the draft Assessment Report and a standing offer to meet EAO staff directly, intended to provide opportunities for Office of Wet'suwet'en to discuss specific information about its uses in the Project area and to identify potential impacts of the proposed Project on its asserted Aboriginal rights.

On May 8, 2014, EAO and OGC met with the Office of the Wet'suwet'en along with other government agencies including MARR at Moricetown. Issues discussed were primarily centred on the regulatory processes of EAO and OGC and the Pacific Trail Pipeline Project; general Wet'suwet'en concerns relating to LNG-related projects including the proposed Project, compliance and enforcement, and synchronous permitting were discussed.

The Proponent initiated consultation with the Office of the Wet'suwet'en in November 2013 by providing formal notification of the proposed Project. The Proponent sent the Office of the Wet'suwet'en a follow-up letter with information on proposed Project infrastructure in proximity to Wet'suwet'en traditional territory. The Proponent continues to provide the Office of the Wet'suwet'en with regular updates. The Proponent did not meet with the Office of the Wet'suwet'en for the proposed Project.

During the EA, the Office of the Wet'suwet'en did not engage with EAO regarding the proposed Project.

***Potential Impacts of the Proposed Project to Office of the Wet'suwet'en's
Asserted Aboriginal Interests***

The spatial boundaries for the following VCs overlap with Wet'suwet'en traditional territory:

- Project footprint for transportation due to an access road;
- LAA for community infrastructure and services; and
- RAA for acoustic environment, terrestrial wildlife (including within the Omineca/Babine assessment area for grizzly bear), visual quality, land and resource use, archaeology, and health.

The LAAs are intended to capture the direct and indirect impacts from the proposed Project, while the RAA are intended to capture the area where the influence of other land uses and activities could overlap with proposed Project-specific effects and result in cumulative adverse effects.

The effects of the proposed Project are expected primarily within the proposed Project footprint and LAA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into Wet'suwet'en traditional territory. Specific concerns raised in reference to access roads would be considered at permitting.

Taking into consideration the residual adverse effect from the proposed Project, and the distance of the proposed Project to the Office of the Wet'suwet'en's asserted traditional territory, EAO concludes that the proposed Project is not expected to result in impacts to Wet'suwet'en hunting, gathering, fishing or trapping, and culturally important sites.

EAO did not receive any comments from the Office of the Wet'suwet'en regarding the proposed Project's potential effects to their Aboriginal Interests during the EA. However, information is provided in the Application regarding the use of their traditional territory. Further discussion of impacts to specific Wet'suwet'en Aboriginal Interests is discussed below.

Hunting

The Application included the following information on Wet'suwet'en hunting practices:

- Larger prey, such as bear, caribou, mountain goats, deer and moose were hunted, and continue to be hunted;
- Moose, deer and bear are a primary source of food; and
- Fur, hide, bones and antlers are also used.

Trapping

The Application included the following information on Wet'suwet'en trapping practices:

- Beaver, lynx, muskrat, marten, rabbit and marmot were trapped and snares during the winter months;
- Larger prey, such as bear, caribou, mountain goats, deer and moose were trapped in deadfalls or pits;
- Otter, wolf, fisher, mink, ermine and wolverine were trapped, sold or traded;
- Beaver is a primary source of food; and
- Fur, hide, and bones are also used.

Gathering

The Application included the following information on Wet'suwet'en gathering practices:

- Over 80 rare plant communities have been identified within the traditional territory of the Office of the Wet'suwet'en;
- Many plants are used including berries, leaves, roots, bark, bulbs, and stalks;
- Berry gathering locations include Hudson Bay Mountain talus slopes (huckleberries), near Twin Falls, the foot of mountainside slopes (highbush cranberries), and Glacier Gulch (salmon berries); and
- Hazelnuts are collected in the locations surrounding Hagwilget Village.

Fishing

The Application included the following information on Wet'suwet'en fishing practices:

- Species of importance include salmon, kokanee, whitefish, trout, char, suckers, freshwater lingcod, lamprey eels, and eulachon runs in the Nass River estuary;
- The lifecycle of salmon is very important;
- Salmon fishing sites include Moricetown Canyon and areas near Hagwilget Village and Moricetown, and the Bulkley River; and
- Harvesting of steelhead trout, lake trout and Dolly Varden is known to occur at McDonnell Lake.

Culturally important sites, trails and travelways

The Application included the following information on Wet'suwet'en's culturally important sites, trails and travelways:

- A network of traditional trails crosses the northeastern slopes of Hudson Bay Mountain, including the Silvern Lakes trail.

Other Matters of Concern of Office of the Wet'suwet'en

EAO did not receive any comments from the Office of the Wet'suwet'en with respect to the proposed Project. General concerns from Wet'suwet'en participants at an LNG-related workshop held at Moricetown on May 8, 2014 were considered by EAO but were not specific to the proposed Project.

18.4 Tsimshian

In consideration of the historic and current context of the Tsimshian provided in section 13.4 of this Assessment Report and information gathered throughout the consultation process, the following sections are intended to set out, in relation to each Tsimshian Aboriginal Group:

- A summary of concerns related to that Aboriginal Group's Aboriginal Interests; and
- EAO's evaluation of potential effects of the proposed Project to that Aboriginal Group's Aboriginal Interests.

EAO acknowledged that confusion, raised by several Tsimshian Aboriginal Groups, has been created by previous use of the term "Coast Tsimshian" throughout the EA to represent the surviving nine Tsimshian Tribes who previously had winter villages in the

lower Skeena River and relocated their winter villages to Prince Rupert Harbour area prior to contact. EAO understands that the Coast Tsimshian term has been used by different linguists, ethnographers and historians in different ways to include different groups. To avoid this confusion, EAO will use the term “Nine Allied Tsimshian Tribes” to refer to the surviving nine tribes who previously had winter villages in the lower Skeena River and relocated their winter villages to Prince Rupert Harbour prior to contact. References to Southern Tsimshian similarly have been revised.

18.4.1 Gitxaala Nation

Context

- Gitxaala Nation is a Tsimshian group based at Lach Klan, also known as the village of Kitkatla on Dolphin Island, located 45 km south of Prince Rupert, BC. Kitkatla is only accessible by boat or float plane.
- Gitxaala Nation has 21 registered reserves, settlements, or villages with a total area of 1885.2 ha. Gitxaala Nation has a registered population of 1,912, with 423 members living on-reserve.
- The Gitxaala Nation refer to themselves as *Git Lax Moon*, meaning “People of the Salt water”. Traditionally, the seasonal runs of salmon, herring and eulachon set the pattern for the yearly cycle of Gitxaala Nation’s economic activities. Gitxaala Nation also harvest a number of other resources, including sea mammals, various plant species including seaweed and the bark of several species of trees, seabird eggs, land mammals such as bear, deer and goat, and shellfish. The harvesting and consumption of traditional foods continues to be very important to Gitxaala Nation members living at Kitkatla and elsewhere.
- Gitxaala Nation is governed by a Council with a Chief Councilor, Deputy Chief and five Councilors, under a custom electoral system.

Aboriginal Interests and EAO’s Strength of Claim Assessment and Depth of Consultation

- The Gitxaala Nation’s asserted traditional territory is presented in the Strategic Land Use Planning agreement between Gitxaala Nation and the Province.
- The proposed Project marine pipeline route through Chatham Sound to Lelu Island would cross 27 km of the Gitxaala Nation’s asserted traditional territory.
- The proposed Project would not cross through the portion of Gitxaala Nation’s asserted territory near Red Bluff on the north side of Nass Bay. The proposed Project corridor would follow the south side of Nass Bay approximately 3 km south of Gitxaala Nation’s asserted territory.
- Within their traditional territory, Gitxaala Nation assert Aboriginal title, and

Aboriginal right to fish and gather marine resources, and associated rights of access and travel, governance over lands and waters, and rights to teach and pass on traditional activities to maintain Gitxaala Nation's way of life (those interests characterized above as associated rights are often otherwise described as incidental to the right to fish and harvest marine resources).

- As articulated in its letter dated January 31, 2014, EAO assessed Gitxaala Nation's Aboriginal rights claim, based on currently available information related to the activities, practices, traditions and customs integral to the distinctive culture of the Gitxaala people prior to contact with Europeans (understood to be around 1787). The Province understands that, based on the information reviewed, EAO's assessment is that the Gitxaala Nation has a:
 - o Strong *prima facie* claim to Aboriginal rights to fish, hunt, trap and gather marine and terrestrial resources in the area of Porcher Island, approximately 10-15 km south of the terminal point for the proposed Project; and
 - o Moderate to strong *prima facie* claim to the Aboriginal right to fish in the area around Red Bluff, where Gitxaala Nation participate in the annual Nass River eulachon fishery.
- With respect to the area of the proposed Project overlapping the northern portion of Gitxaala Nation's asserted traditional territory, north of Porcher Island, including the lower Skeena River, Prince Rupert Harbour, and the east side of Chatham Sound to Lax Kw'alaams, this area is located outside of what was considered by ethnographers as within the pre-contact traditional territory of the Gitxaala Nation. EAO's assessment is that Gitxaala Nation has a weak to moderate *prima facie* claim to Aboriginal rights to fish and gather, and activities incidental to those rights in this area of the proposed Project. While it is possible that Gitxaala Nation may have utilized campsites and harvested resources along the coast en route to or from the eulachon fishery on the Nass River each year, use of this area at the time of contact (1787) likely conditional on permission or kinship ties of the Nine Allied Tsimshian Tribes.
- Gitxaala Nation provided several letters expressing concerns and disagreement with EAO's initial strength of claim assessment, including:
 - o Disagreement with views relating to the northern limit of Gitxaala Nation territory and villages, as well as Gitxaala Nation requiring permission or compensation payment to the Nine Allied Tsimshian Tribes in relation to Gitxaala Nation camps and use of resource harvesting sites en route to the Nass River; and
 - o Information and clarification regarding Gitxaala Nation occupation and use in the areas of Tsimpsean Peninsula, Digby Island, and Kaien Island to Port Edward.

- The Province conducted a thorough review of information provided by Gitxaala Nation – detailed analysis of this information is captured in three separate memos developed by the Ministry of Justice's Aboriginal Research Division, provided to Gitxaala Nation by EAO on March 12, 2014, October 24, 2014 and October 28, 2014. While the information provided by Gitxaala Nation indicated current and historic use of these areas by Gitxaala Nation, based on a review of all available ethnographic information, including that provided by Gitxaala Nation, the Province continued to be of the view that Gitxaala Nation use of these areas was likely conditional on permission of, or kinship ties to the Nine Allied Tsimshian Tribes. It is recognized that the Gitxaala Nation use of the lower Skeena River and adjacent coast is important to Gitxaala Nation today, and had increased in importance to Gitxaala Nation after several Gitxaala Nation members joined the Christian mission at Metlakatla established in 1862, and after the establishment of canneries and other industries in the Prince Rupert region.
- EAO also reviewed information provided by Gitxaala Nation and obtained ethnohistoric materials relating to the use of sites in Nass Bay, and has modified its initial assessment as above, in relation to their eulachon fishery sites.
- On June 26, 2014, the *Tsilhqot'in Nation v. British Columbia (Tsilhqot'in)* decision was released by the Supreme Court of Canada. The decision clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation at 1846.
- Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that Gitxaala Nation have a weak *prima facie* claim of Aboriginal title within or near those portions of the proposed Project areas in the vicinity of the Prince Rupert Harbour which overlap with the asserted traditional territory of Gitxaala Nation as the evidence available suggests Gitxaala Nation use of these lands was for transitory purposes and conditional on permission of, or kinship ties to, the Nine Allied Tsimshian Tribes. Gitxaala Nation significantly disagrees with this view (as described below). EAO is of the view that Gitxaala Nation has a strong *prima facie* claim of Aboriginal title at the historic eulachon fishing camp, in the Stoney Point area, and a lower *prima facie* claim to title at Red Bluff owing to uncertainty of the time that use of this site by Gitxaala Nation was established, and whether such use could have extended from permission by Nisga'a Nation at this site.
- Given the nature and location of the proposed Project, EAO is of the view that its duty to consult Gitxaala Nation is at the low end of the *Haida* spectrum. Gitxaala Nation is listed in Schedule B of the Section 11 Order. Gitxaala Nation was consulted at the deeper consultation level.

Summary of Consultation

Gitxaala Nation was invited to review and provide comments on the draft AIR, draft Section 11 Order (August 23, 2013), the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and the Application. Gitxaala Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided \$5,000 in capacity funding to Gitxaala Nation during the Pre-Application Stage of review and \$10,000 during the Application Review phase of the EA process to assist with costs associated with participation in the EA review.

Capacity funding was also provided by the Proponent. The Proponent and Gitxaala Nation finalized a Socio-economic Agreement to provide funding for collection of socio-economic information for the proposed Project in early August 2014. In late August 2014, Gitxaala Nation provided the Proponent with their Socio-economic Impact Study.

The Proponent and Gitxaala Nation also entered into a Traditional Land Use Protocol Agreement on June 24, 2014, and a MOU was concluded on June 27, 2014. At the end of June 2014, Gitxaala Nation provided the Proponent with the *"Port Edward Area LNG Projects Gitxaala Use Study Draft Report"* (Gitxaala Use Study) and the *"Port Edward Area LNG Projects Gitxaala Valued Components Draft Report"* (Gitxaala VC Report). The final VC Report and Gitxaala Use Study were provided to the Proponent.

The final Gitxaala Use Study, Socio-economic Report and Gitxaala VC Report (Calliou Group, 2014) were provided by Gitxaala Nation to EAO on September 24, 2014 and have been reviewed and included in EAO's assessment on Gitxaala Nation's Aboriginal Interests summarized below. The Proponent's final Aboriginal Consultation Report #3 (September 2014) included information from these documents, also discussed in the following sections on Aboriginal Interests. These reports form the basis for on-going dialogue between the Proponent and Gitxaala Nation to inform detailed planning and ongoing discussions of mitigation measures during all phases of the proposed Project.

The Proponent provided Gitxaala Nation with shapefiles of routing through their asserted traditional territory on May 9, 2013; June 13, 2013; August 6, 2013; September 24, 2013; January 2, 2014; and February 20, 2014. Gitxaala Nation provided additional input to the EA process including through meeting with the Proponent to discuss routing. The Proponent continues to be available to meet with Gitxaala Nation to discuss routing through their traditional territory and mitigation measures.

Gitxaala Nation was invited by EAO to participate in all Advisory Working Group Meetings and information sessions. Gitxaala Nation attended Working Group meetings on October 17, 2013, November 19, 2013; February 4 and 13, 2014; and July 23-24, 2014. Gitxaala Nation also attended a meeting with EAO and other coastal Aboriginal Groups in Prince Rupert on July 25, 2014.

Gitxaala Nation provided extensive review comments on the Application (see tracking table in Appendix 2 for details).

Gitxaala Nation provided several letters to the Proponent with extensive comments and concerns during Pre-Application and Application Review, including:

- Requesting a response to their MOU in relation to the proposed Project;
- Comments on the draft Aboriginal Consultation Plan for the proposed Project;
- Concerns regarding the unrealistic timeframe expected by the Proponent for Gitxaala Nation to complete a TLU study for the proposed Project;
- The Proponent's misuse and misrepresentation of traditional use information in the Application, provided by Gitxaala Nation for other regulatory processes or projects (e.g., Northern Gateway Pipeline Project, "NGP"), to identify potential impacts from the proposed Project. Gitxaala Nation noted they prohibited the use of this information for other projects and that, because there is no overlap between the NGP study area and the study area for the proposed Project, the Application does not accurately describe or assess potential effects of the proposed Project on Gitxaala Nation's current and traditional use including marine harvesting areas, particularly in areas north of Porcher Island (i.e., Skeena River estuary, Prince Rupert Harbour, Chatham Sound and Nass Bay) within the proposed Project Area. Gitxaala Nation requested EAO take immediate steps to require the Proponent to remove the traditional use information of concern to Gitxaala Nation from the Application; and EAO has acknowledged Gitxaala Nation's concerns regarding the Proponent's misuse and misrepresentation of traditional use information in the Application. As noted above, and further discussed below, the final Gitxaala Use Study, Socio-Economic Report and VC Report (Calliou Group, 2014) provided by Gitxaala Nation to EAO on September 24, 2014 have been reviewed and considered in EAO's assessment of potential impacts on Gitxaala Nation's Aboriginal Interests.

Gitxaala Nation also provided several letters to EAO with extensive comments and concerns during Pre-Application and Application Review, including:

- Concerns regarding EAO's initial strength of claim assessment letter;

- Providing comments and responses to the Proponent's approach and rationale in their selection of VCs (and the importance for Gitxaala Nation to be involved in the selection of VCs being studied in Gitxaala Nation's asserted traditional territory), comments on the proposed Project Description, Aboriginal Socio-Economic Data Collection: Terms of Reference, and Project-First Nation Environmental Participation Opportunities Update;
- Concerns regarding the draft Section 11 Order for the proposed Project;
- Requesting EAO review be put on hold until a timeline and process was determined for a Canadian Environmental Assessment Agency (CEAA) review;
- October 31, 2013, indicating concerns about the potential for the proposed Project to adversely impact and infringe Gitxaala Nation's section 35 Aboriginal rights. The letter also provided information regarding Gitxaala Nation's asserted traditional territory, occupation and use supporting claims to Gitxaala Nation Aboriginal rights and title in the proposed Project area;
- Concerns that Gitxaala Nation is faced with addressing a substantial number of large EA processes associated with proposed LNG projects in the Prince Rupert and Kitimat area;
- Application Review comments (see tracking table in Appendix 2 for details).
- A follow-up letter from a consultation meeting with Gitxaala Nation, EAO and OGC in June 2014 expressing concerns, including:
 - o Lack of coordination between LNG-related applications;
 - o Lack of a credible approach to assessing potential cumulative effects on Gitxaala Nation's rights and culture;
 - o Lack of clarity around the consideration of Gitxaala Nation's TLU information; and
 - o Ongoing concerns regarding strength of claim analysis.
- Comments on the Proponent's responses to IRs for the proposed Project and to indicate concerns around the sufficiency of responses;
- Challenging timelines for TLU and socio-economic studies;
- Concern regarding putting confidential information in TLU studies;
- Ensuring a clear articulation of how meaningful consultation related to the proposed Project will be carried out by the Crown and how results of such consultation will be fully incorporated within the proposed Project's EA; and
- Inadequate assessment of proposed Project's marine route, potential effects from marine pipeline construction, dredging and potential cumulative effects in the marine environment with potential impacts on Gitxaala Nation's Aboriginal rights including harvesting marine resources and marine navigation.

The Proponent is continuing to engage with Gitxaala Nation regarding business opportunities from the proposed Project and held meetings in April and May 2014 to discuss procurement and business opportunities.

The Gitxaala Use Study and Gitxaala VC Report include extensive information regarding Gitxaala Nation's current and traditional land use, including: fishing, hunting, trapping, culturally important sites and marine travel routes within the proposed Project area.

The Gitxaala VC Report identifies potential direct effects and interactions of the proposed Project on Gitxaala Nation's Aboriginal Interests on four Gitxaala-studied "VC"s including:

- Governance;
- Cultural Identity;
- Harvesting Rights; and
- Sacred Places.

Gitxaala Nation considers the Application incomplete and requested assessment of cumulative effects on Gitxaala Nation's four VCs (i.e., Governance, Cultural Identity, Harvesting Rights and Sacred Places). With reference to the number of proposed projects Gitxaala Nation is being consulted on, they requested regional and qualitative cumulative effects assessment on the four VCs. The Gitxaala Use Study, Socio-Economic Report and VC Report have been reviewed and considered in EAO's assessment on Gitxaala Nation's Aboriginal Interests summarized below.

As will be discussed below, the information provided in the Gitxaala VC Report that identified potential direct effects and interactions of the proposed Project on Gitxaala Governance, Cultural Identity, Harvesting Rights and Sacred Places, was considered in EAO's assessment of potential impacts on harvesting rights (i.e., hunting, trapping, fishing, gathering); as well as culturally important sites, sacred areas, habitation areas, trails and travels ways. This assessment was done in consideration of potential effects to Gitxaala Nation's cultural identity, harvesting rights and sacred places.

EAO considered Gitxaala Nation's comments on the draft Assessment Report received on October 30, 2014 and incorporated them into the final version of this Assessment Report where appropriate.

In a meeting on October 30, 2014 between EAO and Gitxaala Nation, Gitxaala Nation continued to emphasize to EAO its significant disagreement relating to the adequacy of consultation and accommodation, particularly regarding EAO's assessment of the

strength of Gitxaala Nation's claims of Aboriginal rights and title to the Prince Rupert Harbour area. Gitxaala Nation placed strong emphasis on their views that EAO has not sufficiently considered the oral evidence that has been provided relating to their claims in the Prince Rupert area, and that such evidence in relation to the proposed Project needs to be considered at face value, rather than allegedly being discounted by EAO.

EAO acknowledges the information provided in the Gitxaala Nation's statutory declarations derives from attestations of a Gitxaala Nation presence in the vicinity of Prince Rupert, largely beginning in the 1880s but with some references to members living in this area prior to that time. EAO has considered this evidence in the context of the ethnohistorical record, which includes a recording of other oral history, a majority of which suggests that Gitxaala Nation (like Gitga'at First Nation and Interior Tsimshian groups) may have started using the area on a regular and consistent basis at some point after 1846, including after the establishment of the mission village of Metlakatla in 1862.

There was discussion of the challenges related to the differing information regarding which group occupied and/or had control of specific sites within the Prince Rupert Harbour area, the time period when different groups used or occupied that area, and whether any such use or occupation was by permission of another group. Gitxaala Nation raised concerns regarding EAO's reliance on Beynon's work, particularly where it attributes use, occupation or control of areas in the Prince Rupert Harbour area to the Nine Allied Tsimshian Tribes but not also to Gitxaala Nation. EAO is of the view that all information needs to be considered. EAO noted that responses to these issues were conveyed in one of the two provincial October 28, 2014 memoranda provided to Gitxaala Nation in advance of the meeting, which built on information previously shared by EAO in March, 2014.

Although Gitxaala Nation was provided consultation opportunities at a deeper level by having been listed on Schedule B, Gitxaala Nation raised the concern that its Aboriginal Interests were not appropriately accommodated because of EAO's assessment of its strength of claims.

There was a discussion of measures to mitigate or avoid impacts on Aboriginal Interests developed during the EA. A particular concern that Gitxaala Nation raised was regarding the potential social and economic effects that Gitxaala Nation members could experience. EAO confirmed that the proposed EA Certificate SEEMP condition would include Gitxaala Nation in relation to the proposed Project, as captured by "Aboriginal Groups".

This plan must be developed and approved in accordance with defined timelines outlined in the proposed condition. It was noted that there is no distinction made among the Aboriginal Groups to be engaged in the development of this plan such that some would be engaged more than others. It was also noted that BC had an initial discussion with Gitxaala Nation regarding benefits to Gitxaala Nation related to LNG projects. BC does not direct Proponents in relation to benefit negotiations, and had shared the summary of EAO's strength of claim assessments to inform delegated aspects of consultation.

Gitxaala Nation emphasized its concerns regarding the proposed Project timeline and requested a suspension of time limits pursuant to section 24(4) of the *EA Act* to allow for more consultation to address or reconcile Gitxaala Nation's outstanding concerns. EAO acknowledged the request, but continues to be of the view that the consultation and accommodation process has been reasonable and adequate in the circumstances.

Potential Impacts of the Proposed Project to Gitxaala Nation's Asserted Aboriginal Interests

Aboriginal title

As indicated above, EAO has assessed that Gitxaala Nation have a strong *prima facie* claim of Aboriginal title at the historic eulachon fishing camp, in the Stoney Point area, on the north shoreline of the Nass River – an area that would not be overlapped by the route of the proposed Project which would traverse the south shore. Further to the discussion in section 17.2.7 of this Assessment Report regarding the potential impacts of the proposed Project on Aboriginal title claims, and given the absence of overlap between the project route and the Stoney Point location, in EAO's opinion, the proposed Project is expected to have minimal impacts on Gitxaala Nation's Aboriginal title claim.

EAO has addressed potential impacts to Gitxaala Nation's asserted Aboriginal title by ensuring that Gitxaala Nation is meaningfully consulted and accommodated around the potential effects of this proposed Project.

Further, the Province and the Proponent are involved in separate discussions with Gitxaala Nation's relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Throughout Gitxaala Nation's asserted traditional territory there are many areas that are important for hunting a variety of marine and terrestrial wildlife species. The Gitxaala

Use Study and Gitxaala VC Report identified Gitxaala Nation hunting areas within the proposed Project area that were not identified in the Application.

Gitxaala Nation members engage in hunting throughout the year, with the exception of certain times to allow wildlife reproduction to occur. Deer hunting primarily takes place in the spring. Other wildlife species hunted include: wolf, moose, bear, mink, beaver, marten, weasel, ducks, geese, puffins, seabird eggs, seals and sea lions.

Key terrestrial hunting areas include deer hunting habitat in the vicinity of the proposed Project footprint at Lelu Island and within approximately 2 km on Smith Island in Tsum Tsadai Inlet, and the beaches west of Holland Rock. Within approximately 5 km, sites include the south part of Ridley Island and Porpoise Channel, in between Lelu and Ridley Islands. Areas further than 5 km away include: Porcher Island; Philips Cove;²⁰ Stephens Island; along the Skeena River; between Hunt Point and Creak Islands; Hunt Point; and the Kinahan Islands.

The Gitxaala Use Study identified seal and sea lion hunting habitat in the vicinity of the proposed Project not identified in the Application. Areas within approximately 2 km of the proposed Project landfall include: the southern part of Lelu Island, potentially overlapping with the proposed Project landfall. Within approximately 2 km of the proposed route, hunting sites include: Smith Island and Porpoise Channel; the beaches west of Holland Rock; and between the Kinahan Islands and Kitson Island. Within approximately 5 km, sites include Ridley Island and the Lucy Islands.

Seal and sea lion hunting habitat areas further than 5 km from the proposed route include: the Lawyer Islands and the sandbar south of the Lawyer Islands; base sand in Marcus Passage; Kloiya Bay; around the Kinahan Islands; Stephens Island; the Tree Nob Group; Genn Islands; Gull Rocks; the north coast of Porcher Island; and Hunt Point.

The Gitxaala Use Study also identified harvesting areas for sea bird eggs which were not included in the Application. Areas within approximately 2 km of the proposed Project route include around Smith Island including to Lelu Island, and Holland Rocks.

Areas within approximately 5 km include: the Kinahan Islands; Greentop Islet; Rachael Islands; Lucy Islands; and Alexandra Rocks. Areas further away than approximately 5 km include: the Lawyer Islands; the south end of Digby Island; Gull Rocks; the north

²⁰ The Proponent's third consultation report mentioned Phillips Island, although this was not available on GeoBC. Phillips Cove is northeast of Digby Island.

coast of Porcher Island; around Stephens Island; the Tree Nob Group; Genn Islands; and Bribery Island.

The Gitxaala Use Study identified additional hunting areas associated with important bear habitat not identified in relation to the Application, including within 5 km at Ridley Island and duck habitat off Lima Point within approximately 8 km on Digby Island. Gitxaala Nation also identified an interest in hunting Canada geese for medicinal purposes.

Concerns expressed by Gitxaala Nation related to hunting include:

- Disruption of hunting activities during construction and operation, including due to increased traffic, effects on navigability of watercourses, barriers to anchorage, routing and travel routes, and reduced access to culturally critical species;
- Loss or avoidance of preferred hunting or teaching locations;
- Potential adverse effects on terrestrial and marine wildlife species, including culturally critical species, such as:
 - o Change to species abundance;
 - o Change in wildlife behaviour; and
 - o Change in wildlife health, including Project-related accidents;
- Potential adverse effects on terrestrial and marine wildlife habitat, including culturally critical wildlife habitat, such as:
 - o Alteration of habitat during construction and operation;
 - o Marine pipe lay areas and shoreline entry and exit points;
 - o Grizzly bear foraging, security and bedding locales;
 - o Alteration of species habitat;
 - o Project-related air and noise pollution decreasing quality of habitat for continued reproduction of species; and
 - o Permanent alteration on culturally critical marine species;
- Effects on species availability for harvest or trade, and food types available at cultural gatherings;
- Contamination of wildlife species resulting in decreased food safety/quality;
- Potential effects on the navigability of watercourses and travel routes in the marine environment and the ability to exercise Gitxaala Nation's asserted right to hunt; and
- Perceived adverse effects on wildlife including permanent alteration to culturally critical species, availability of species including loss of species habitat and reduced quality of habitat.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, marine ecosystems, current and traditional land use – as discussed in sections 17.2.1 and 17.2.6 of this Assessment Report - the proposed Project is expected to have negligible impacts on Gitxaala Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Gathering

The traditional Gitxaala Nation plant diet consisted of sea and forest products. Harvesting is done in spring summer and fall. Harvested plants found along the shorelines of Gitxaala Nation traditional territory include food and medicinal plants such as: salmon berries, devil's club, yew wood, hemlock, wild rice and rhubarb, Chinese slippers, salal, stink currant, and various types of teas.

Marine plants harvested include: kelp, sea prunes, sea grass, rock weed and seaweed.

The proposed Project marine corridor would intersect Gitxaala Nation's marine plant gathering areas, and alter habitat in marine pipe lay areas and shoreline entry and exit points. The Proponent indicated they would implement site-specific mitigation measures where conflicts with sensitive plant gathering areas are identified.

The Gitxaala Use Study identifies key medicinal plant and berry gathering areas within approximately 2 km of the proposed Project route landfall including throughout Lelu Island and the western shoreline of Inverness Passage. Areas within approximately 5 km include Ridley Island and the northwest shoreline of Inverness Passage. Areas further than approximately 5 km include: the Kinahan Islands; two sites on Kaien Island; southeast Smith Island; Stephens Island; and north Porcher Island.

Kelp is primarily harvested in areas surrounding Stephens Island and Prescott Island located within 20 km southwest of the proposed Project's Lelu Island landfall. Seaweed is primarily harvest in areas surrounding Lelu Island within approximately 2 km of the proposed Project landfall, on the Lucy Islands within 5 km of the proposed Project route, and Stephens Island which is approximately 18-20 km southwest of the proposed Project route.

Potential impacts and key concerns raised by the Gitxaala Nation regarding plant gathering, including vegetation and plant communities used for ceremonial, medicinal, and food source purposes are:

- Reduced access to harvesting areas including:

- o During construction, due to pipe laying vessels and support vessels;
 - o Seaweed, harvested primarily from rocky shorelines, due to industrial development; and
 - o Reduced harvest efficiency;
- Loss of traditionally harvested plants and berries during construction;
- Introduction or spread of invasive plant species;
- Changes in habitat for culturally critical species including:
 - o Species harvested for trade;
 - o Loss of wetland habitat, function and water quality affecting vegetation during construction; and
 - o Air and noise disturbances reducing quality of habitat for continued reproduction of species and loss or avoidance of preferred locations;
- Real and perceived effects on food safety and quality, due to impacts on transportation and access, air, noise, construction activities, accidents, malfunctions, and operational discharge/garbage; and
- Adverse cultural effects related to plant gathering including:
 - o Change in food type available at cultural gatherings;
 - o Change in level of feasting;
 - o Reduction in trade and/or trade network; and
 - o Permanent alteration of cultural components of harvesting.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have negligible impacts on Gitxaala Nation's gathering activities in the area of the proposed Project.

Fishing and other marine uses

Gitxaala Nation has year-round dependence on fishing and harvesting marine resources for subsistence food, social, cultural, and economic livelihoods. Gitxaala Nation raised a number of key concerns related to potential effects of the proposed Project on fish, fish habitat and fishing activities. The proposed Project route and LAA in the marine environment is an important fishing area for Gitxaala Nation.

The Gitxaala Use Study and Gitxaala VC Report include information regarding Gitxaala Nation's Aboriginal Interests related to fishing. The Proponent's Aboriginal Consultation Report #3 and EAO's Assessment Report included consideration of the information identified in these reports.

Gitxaala Nation members have developed a system of seasonal fish harvesting within their traditional territory that provide resources that are the primary contributor to Gitxaala Nation's marine economy and an important part of Gitxaala Nation's culture.

The Application notes that the proposed Project may intersect or approach important fishing areas, and alteration of fish habitat would occur in marine pipe lay areas and shoreline entry and exit points.

Key fish species harvested by Gitxaala Nation members include: all five species of salmon, steelhead, eulachon, halibut, black cod, ling cod, rock cod, herring and herring roe on kelp, and snapper. Other marine species harvested include: crabs, prawn, shrimp, abalone, clams, geoduck, cockles, chitons, mussels, octopus, scallops, barnacle, sea cucumber, sea cucumber, and sea urchins.

Salmon (including sockeye, Coho, chinook, chum and pink salmon) are fished in several areas throughout their traditional territory including: the lower Skeena River, Skeena estuary, Chatham Sound, Principe Channel, Porcher Inlet and Kitkatla Inlet, as well as salmon spawning streams in the area. Salmon are typically harvested in July, August and September.

Eulachon are an important fish species harvested by Gitxaala Nation for food, social and ceremonial purposes. Gitxaala Nation currently and traditionally harvests eulachon in the Nass River eulachon fishery near Red Bluff in the Nass River estuary. Eulachon are typically harvested in March and April during the spawning migration to the Nass River. The proposed pipeline Route crosses on land along the south side of the Nass River valley approximately 3 km south of the Red Bluff and Stoney Point area where Gitxaala Nation has a historic eulachon fishing camp on the north shoreline of the Nass.

Key areas for fishing identified in the Gitxaala Use Study include the Skeena River estuary and surrounding areas within 5 km of the proposed landfall near Lelu Island; and several areas throughout Chatham Sound including areas within 2 km of the proposed marine pipeline corridor.

Other fishing and marine harvesting locations identified in the Gitxaala Use Study in the within approximately 2 km of the proposed route include: around Lelu Island; Chatham Sound; Flora Bank; Inverness Passage; Smith Island; Agnew Bank; Horsey Bank; between Holland Rock and Kitson Island; Holland Rock; Smith Island; between Lelu Island and Smith Island; and Stapledon Island. Areas within approximately 5 km include: Lucy Islands; Porpoise Harbour; Greentop Islet; between the Rachael Islands; Porpoise Channel; west of Ridley Island; west of Smith Island to Greentop Islet; Port

Edward; Coast Island; Alexandra Rocks; north of the Rachael Islands; and around Kitson Island.

Fishing and marine harvesting areas further than 5 km away from the proposed route include: the Skeena River; Brown Passage; West of the Kinahan Islands; around Digby Island; Stephens Island; Lawyer Islands; Porcher Island; Seal Cove; Morse Basin; Wainwright Basin; Genn Islands; Gull Rocks; Kinahan Islands; the southern mouth of Prince Rupert Harbour; Frederick Point; between the Kinahan Islands and Greentop Islet; Malacca Passage; Marcus Passage; North of Hooper Point; Lima Point; North of the Kinahan Islands towards Digby Island; from Smith Island to the mouth of the Skeena River; by Havelock Rock; Robertson Banks; off Brooks Rock; Mason Point off Porcher Island; Avery Island; Kloiya Bay; by Humpback Bay; by Hunt Inlet; Tsimpsean Peninsula; from Porpoise Harbour to Seal Cove; through the Tuck Narrows; around Kaien Island near Barrett Rock; around Spire island; and off Island Point.

Gitxaala Nation expressed concern regarding potential effects on fish and fish habitat in the marine environment with potential effects to traditional fishing practices, including:

- Potential adverse effects on fish, fish habitat and water quality including:
 - o Disruption of salmon spawning migrations;
 - o Salmon and critical juvenile salmon habitat in the Skeena estuary associated with dredging;
 - o Increased construction vessel traffic and shipping traffic;
 - o From dredging and re-suspension of historically contaminated sediment around Lelu Island, and from dredging on fish spawning and habitat in Flora Bank, the Skeena River;
 - o Accidents and malfunctions leading to contamination, including from fuel spills during construction, at pipeline coatings, shipping accidents, and underwater pipeline ruptures; and
 - o Effects on the underwater acoustic environment;
- Barriers to access for harvesting, including:
 - o Disruption of navigability, interruption of marine travel ways and anchorages, and access to fishing areas;
 - o Changes to the ability to harvest traditional foods in Work Channel;
 - o Changes in ability to harvest shellfish and intertidal/marine resources;
 - o Avoidance of marine areas during dredging; and
 - o Increased pressure on the local fishing industry and a decrease in fish populations as a result of the proposed Project;
- Potential barriers to movement of harvested marine species including the pipeline on the seabed in Chatham Sound acting as a migration barrier for Dungeness and other crab species;

- Cumulative effects, on fish and fish habitat impacts to Aboriginal food fisheries and fish stocks and livelihood;
- Loss or damage to fishing gear;
- Potential adverse effects on fish and fish habitat and access to fishing, including cultural, recreational, subsistence, and commercial fisheries and aquaculture, and marine protected areas;
- Impacts to harvested food safety and quality; and
- Related cultural impacts, including permanent alteration of cultural components of harvesting, reduced access to culturally critical species, and change in species/availability of species harvested for trade.

Potential effects in the freshwater environment, including salmon and salmon habitat, and water quality related to construction of proposed pipeline watercourse crossings include:

- Alteration or loss of instream and riparian habitat, including spawning beds for salmonids, eulachon, and other fish, and rearing areas, due to proximity of roads;
- Fish mortality or injury;
- Increased erosion and impacts to water quality;
- Potential adverse effects on fish and fish habitat and access to fishing, including cultural, recreational, subsistence, and commercial fisheries;
- Impacts to harvested food safety and quality; and
- Air and noise effects permanently altering cultural components of harvesting and culturally critical species' habitat.

Gitxaala Nation expressed concern regarding the Proponent's proposed mitigations to avoid and reduce potential effects to fish and fish habitat, traditional land use and Aboriginal Interests related to fishing as well as EAO's assessment of the effectiveness of proposed mitigation. Gitxaala Nation noted that it is difficult to understand how the effectiveness of undeveloped mitigation for effects on fish and fish habitat could be considered to be "high" given that offsetting measures may be required by DFO for *Fisheries Act* authorizations.

A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing in freshwater and marine environments is provided in section 17.2.2 and 17.2.6 respectively. The proposed mitigations have been developed following industry best management practices, standards, guidelines, and federal and provincial regulatory compliance requirements associated with pipeline watercourse crossings and marine construction activities. Mitigation effectiveness is enhanced by Proponent's proposed construction and post-construction monitoring, management

plans and habitat reclamation measures identified in the EMP, and compliance with EA conditions.

In comments on the draft Assessment Report, Gitxaala Nation expressed concern that EAO's Assessment Report does not reference the Proponent's conclusion of moderate residual effects to Gitxaala Nation's fishing interests as identified in their Aboriginal Consultation Report #3. The Proponent's assessment of potential effects to Gitxaala Nation's fishing interests indicates that many of Gitxaala Nation's important fishing areas are located outside of the Marine Resources LAA and would not be directly affected by the proposed Project activities or physical works. However, several marine travelways which are used to access fishing areas are intersected by the proposed Project marine route and located within LAA.

EAO considered the Proponent's Aboriginal Consultation Report #3 in the assessment of potential impacts on Aboriginal Interests related to fishing. EAO also considered, several proposed EA conditions, including mitigation related to Aboriginal Interests in the marine environment. As a result of the comments provided by Gitxaala Nation on the draft Assessment Report relating to potential impacts to fishing, EAO revised its conclusion of impacts to Gitxaala Nation's asserted Aboriginal right to fish in the area of the proposed Project.

In comments on the draft Assessment Report, Gitxaala Nation expressed other concerns regarding potential impacts on Aboriginal Interests related to fishing, including:

- Inadequate assessment of residual and cumulative effects on fishing interests;
- Despite characterizing the impacts of construction activities associated with the Project as "short term, for a limited area and time" and limited in extent and duration, the Assessment Report fails to place this "limited" disruption in context by characterizing all other impacts associated with existing and reasonably foreseeable developments; and
- The Assessment Report relies upon the short duration and limited geographical extent of the impacts of the proposed Project to come to the conclusion that there are "no significant adverse effects" and portraying an incomplete assessment of the impacts to Gitxaala Nation's Aboriginal Interests by failing to assess cumulative impacts that will occur in the context of all other impacts associated with existing and reasonably foreseeable developments.

A discussion of cumulative effects considered in EAO's assessment of potential impacts of the proposed Project on Aboriginal Interests is provided in section 16.5 of this Assessment Report. A discussion of other factors considered in the assessment of

potential impacts on specific Aboriginal Interests related to fishing interests in the freshwater and marine environment is provided in section 17.2.2 and 17.2.6.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on freshwater and marine fish and fish habitat, marine transportation, current and traditional land use activities related to fishing - as discussed in sections 17.2.2 and 17.2.6 of this Assessment Report - the proposed Project is expected to result in minor impacts to Gitxaala Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Trapping

Trapping of fur-bearing animals provides a source of food and forms part of the Gitxaala Nation's economy. Trapping resources deemed culturally critical include mink, beaver, marten, bear, and weasel. Traditionally, Gitxaala Nation members engage in trapping throughout the year, with the exception of certain times to allow fur-bearer reproduction to occur.

Potential Impacts and Concerns:

- Disruption to trapping activities during construction and operation.
- Alteration of trapping sites during construction and operation.
- Effects on culturally critical species including habitat changes and changes in species for harvest or trade;
- Potential change in habitat, change in species abundance, change in wildlife behaviour and effects of project-related accidents on wildlife;
- Adverse effects on food safety and quality from harvested wildlife; and
- Reduced quality of habitat for continued reproduction of species and loss or avoidance of preferred locations.

The Application acknowledged the proposed Project may intersect or be close to trapping areas, specifically noting Lelu Island as a potential site of interaction. Specific trapping areas within the proposed Project area were not identified in the Application or the Gitxaala Use Study. However, trapping activities are assumed to occur in similar areas described in the hunting section above.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use related to trapping - as discussed in section 17.2.3 of this

Assessment Report - the proposed Project is expected to have negligible impacts on Gitxaala Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Culturally important sites, trails, and travelways

There are many culturally important sites, including sites described as being of sacred (or spiritual) significance, gathering areas, habitation areas, and marine travelways associated with current and traditional harvesting activities throughout Gitxaala Nation's asserted traditional territory. Trails and travelways identified in the Gitxaala VC Report include marine or terrestrial access to haul-outs, anchorages, or travel routes. Sacred areas identified include burials, old village sites, shell middens, cultural depressions, campsites, pictographs and petroglyphs, stone or wood fish weirs, stone canoe skids, trails, and quarry sites. Gathering areas included areas used for teachings. Lelu Island was identified as a sensitive location.

Travelways

Gitxaala Nation's VC Report indicated that potential proposed Project effects on transportation and access could adversely impact all four Gitxaala Nation-identified VCs, including sacred places, cultural identity, governance and harvesting.

Based on the Gitxaala Use Study and VC Report, there are extensive current and traditional marine travel routes used for transportation and access to marine harvesting activities (e.g., fishing, hunting, gathering), and culturally important sites throughout Gitxaala Nation's asserted traditional territory.

The Gitxaala VC Report indicates that 90 travel routes are intersected by the Study Area, 41 of which are within a 500 m buffer and 34 of which are intersected by the proposed pipeline route. The Proponent's Aboriginal Consultation Report #3 stated that Gitxaala Nation indicated in their VC Report that 51 travel routes are located within the LAA, including on and between Ridley Island and Lelu Island.

The Gitxaala Use Study identified preferred travel routes, alternate bad weather routes, and anchorage points in use and in the vicinity of the proposed Project. Those whose routes cross within 2 km of the proposed Project route include: from Porpoise Harbour out to Chatham Sound, or through the Inverness Passage; Prince Rupert to Inverness Passage; around Ridley Island; Smith Island to either side of Ridley Island or to Prince Rupert Harbour; east of Lelu Island; Kitkatla to Porpoise Harbour; Porpoise Channel; Soar Point; and Hicks Point on Smith Island.

Travelways within 5 km of the proposed route include: from Porpoise Harbour out to Chatham Sound, and to Prince Rupert Harbour; Prince Rupert to Kitkatla; Inverness Passage to Skeena River; Greentop Islet; Kinahan Islands; and Tsum Tsadai Inlet.

Those greater than 5 km away include: Malacca Passage; around Porcher Island; Skeena River around the west side of Porcher Island and Banks Island; Prince Rupert Harbour into Chatham Sound; Skeena River; west coast of Digby Island; and between Smith Island and De Horsey Island.

Habitation areas

Gitxaala Nation indicated several habitation areas in the vicinity of the proposed Project. Those within 2 km of the proposed route include: the north side of Smith Island; Kitson Island; and on the mainland close to where the Pacific North West LNG Project's bridge will connect to Lelu Island. Those within 5 km of the proposed Project route include: Porpoise Harbour south of Port Edward; Coast Island on the side closer to Ridley Island; Ridley Island; and Sunnyside Cannery.

Habitation areas greater than 5 km away from the proposed Project route include: Frog Creek near Casey Point on Kaien Island; the south end of Prince Rupert; Miller Bay on Kaien Island; the west side of the Tsimpsean Peninsula; Pillsbury Point, south of Prince Rupert; Sourdough Bay; Stephens Island; between Hunt Point and the Creak Islands; and Barrett Rock.

Several traditional land use sites associated with historic habitation areas were identified within the islands surrounding Stapledon Island and the east coast of Lelu Island was indicated to be located within the proposed Project LAA and has potential to be affected by project activities or physical works. Both locations fall within 2 km of the proposed route.

Gathering areas

Gitxaala Nation identified Kaien Island as an important gathering area where Aboriginal groups would trade their harvested resources before European contact. An historic fishing camp was identified at the Inverness Cannery, and the mouth of Porpoise Harbour (within approximately 5 km of the proposed landfall on Lelu Island) was identified as an area where all clans would come together. Canneries were places where Gitxaala people would come together every year and include the Sunnyside Cannery, the cannery across from Smith Island, the Cassiar Cannery in Inverness Passage, and the cannery on Hazel Point, on Smith Island. Several traditional land use sites associated with gathering areas were identified within the islands surrounding the LAA including historic trading places, fishing camps, canneries, and general meeting areas.

Areas identified as Sacred

Gitxaala Nation noted in their VC Report that the proposed Project would intersect 14 places identified as sacred in the LAA, and that these are strongly tied to harvesting. The Gitxaala Use Study identified locations of sacred places but did not disclose the specific type of sacred place, which Gitxaala Nation consider confidential.

Places in the vicinity of the proposed Project route described as being of sacred significance include: one sacred place on the northeast side of Lelu Island including Stapledon Island and surrounding waters - within approximately 1 km of the proposed Project marine pipeline landfall on Lelu Island; one sacred place on the northwest side of Smith Island in Tsum Tsadai Inlet - within approximately 2 km of the proposed Project landfall on Lelu Island; and two sacred places off the west side of Ridley Island near Coast Island - within 5 km of the proposed Project landfall on Lelu Island. There are no sacred sites located within a 500 m buffer; and no sites on the proposed Project pipeline route.

Sites described as being of sacred (or spiritual) significance further than 5 km away from the proposed Project route include: the northern point of Porcher Island; Kloiya; Butze Rapids; Prince Rupert Harbour; Casey Point; the west coast of Kaien Island; and Sourdough Bay.

Cultural areas in the vicinity of the proposed Project include: Veitch Point; and through Telegraph Passage and Inverness Passage, the latter of which is within 5 km of the proposed landfall.

Places identified in the Gitxaala VC Report described as being of sacred significance include: key historic locales: first contact sites, battle sites, important meeting or gathering sites; old village sites, camps, cabins, etc.; *Spanaxnox*: specific locations or events associated with supernatural beings (*Naxnox*); and *Adaawx* (the practice of telling stories or history in order to transmit knowledge related to morals, ethics or beliefs) which are often tied to specific geographic locations.

Gitxaala Nation raised the following key concerns:

- Disruption of the use of trails and travelways, including:
 - o Change in marine or terrestrial access and change to haul-outs, anchorages, or travel routes;
 - o Impediments to travel between places, transport goods and harvest preferred foods;
 - o Safer marine travel routes due to presence of ships and interference from lights at night, and due to increased wind from logging activities;

- o From terminals and infrastructure on Lelu island, the marine pipeline, safety exclusion zones, dredging, and increase in marine traffic; and
 - o Reduction in access to sacred places related to daily traffic volumes;
- Disruption to gathering areas, including:
 - o Potential changes to teaching areas or areas used for teaching, including due to contamination, loss or disruption of resources;
- Disruption to sites described as sacred, including:
 - o Access to sacred areas due to project-related activities;
 - o Changes to viewpoints and acoustic effects;
 - o Effects on cultural heritage resource values due to inappropriate behavioural practices around or in sacred areas due to increased recreational access by non-Gitxaala Nation users;
 - o Traffic volumes through identified sacred places and changes in existing conditions leading to avoidance; and
 - o Disruption to sense of place, impacting Gitxaala Nation connection to territory.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - and the relative proximity between the area of the proposed Project and culturally important sites, marine travel routes identified, the proposed Project is expected to result in minor impacts to Gitxaala Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Gitxaala Nation

During the EA process, Gitxaala Nation raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised by Gitxaala Nation, in addition to those in the Consultation Summary, are outlined below.

- Change in cultural practices such as traditional funerals, feasts, and resource sharing may change the teachings (stories, cultural, or traditional activities) and the areas used for teachings and contribute to disruption of a sense of place, which is necessary for Gitxaala Nation's connection to the traditional territory;
- Effects on and protection of traditional resources, sites, and cultural landscapes;

- Changes to Gitxaala Nation way of life and their ability to teach the next generation traditional practices due to contamination, loss, or disruption of resources;
- Changes to the forest limiting cultural use within Gitxaala Nation's traditional territory;
- Hereditary names, central to Gitxaala Nation governance, are rooted in traditional House territories that may be intersected by pipeline routes, resulting in a potential reduction to the number of and transfer of hereditary names;
- Potential degradation of resources important to tourists/tourism, including fish, wildlife, and quality of the natural environment, and concern for a potential reduction in the ability of Aboriginal Groups to develop the tourism industry; and
- Economic and employment opportunities.

Issues and concerns identified in the Gitxaala VC Report (2014) including:

- Reduction of community status in affected house territories due to effects of the proposed Project, including due to restricted access to House Territories or disruption in territory (e.g. loss of authority or control);
- Adverse potential effect on the status and position of hereditary leaders and production of traditional foods from particular house territories;
- Changes in access to and use of House Territories through physical obstacles or avoidance;
- Change in level of feasting, and in food type available at cultural gatherings;
- Change in species harvested for trade or availability of key species; and
- Adverse effects on the production of traditional foods from particular house territories as a result of changes in access to and use of house territories.

In comments on the draft Assessment Report, Gitxaala Nation expressed several concerns regarding the assessment of impacts to Aboriginal Interests including the following.

Gitxaala Nation expressed concern that one of the factors considered in Assessing Potential Impacts on Specific Aboriginal Interests (section 17.2 of Part C) "*The relative availability of other areas in reasonable proximity, within the traditional territory of each Aboriginal Groups, where the meaningful exercise of Aboriginal Interests could reasonably occur*" is inappropriate and should be removed. Gitxaala Nation noted the preferred means of exercising Aboriginal rights should be considered when determining the seriousness of potential impacts of proposed projects and it cannot be assumed that alternate areas are available for the exercise of Aboriginal rights.

EAO recognizes that areas within the traditional territory of each Aboriginal Group, including areas within the vicinity of the proposed Project, may be particularly important and valuable for specific qualities associated with traditional harvesting sites (e.g., hunting, fishing and gathering areas with specific resource values or cultural importance); and that some areas may be associated with traditional harvesting activities of specific Aboriginal Groups, individual members or families.

EAO's assessment of potential impacts on Aboriginal Interests considered several factors, as described in section 17.2 of this Assessment Report, including any specific TLU sites and activities identified in proximity to the proposed Project; and the duration and spatial scale of potential effects and interactions of the proposed Project on Aboriginal Interests.

Gitxaala Nation expressed concern regarding the lack of assessment of cumulative effects on Gitxaala Nation's Aboriginal Interests and the draft Assessment Report does not appear to contain any analysis of cumulative impacts on Gitxaala Nation's Aboriginal Interests of projects in the Prince Rupert area. Gitxaala Nation is of the opinion that introduction of the new Cumulative Effects Management Framework, which is expected to be fully implemented in 2016 does not address Gitxaala Nation's concerns with respect to cumulative effects of the proposed Project, or any of the other proposed projects currently progressing through the EAO's assessment process.

Gitxaala Nation expressed concern that EAO's analysis is only informed by the Application and does not appear to consider any of Gitxaala Nation's suggested VC's including Governance. As noted in the Summary of Consultation section above, EAO's assessment of potential impacts of the proposed Project on Gitxaala Nation's Aboriginal Interests included consideration of the final Gitxaala Use Study, Gitxaala VC Report and Socio-Economic Report provided by Gitxaala Nation to EAO on September 24, 2014.

Gitxaala Nation also indicated the methodology used by EAO to characterize effects on Aboriginal Interests is not included in Part C and it is unclear how EAO reached their conclusions with respect to the magnitude of potential effects and how EAO has considered cumulative effects on Gitxaala Nation's Aboriginal Interests.

Section 17.2 of this Assessment Report describes the methodology and factors considered with respect to assessing potential impacts of the proposed Project on Aboriginal Interests. Section 16.5 of this Assessment Report describes how cumulative effects have been considered with respect to potential impacts of the proposed Project on Aboriginal Interests.

In response to concerns raised by Gitxaala Nation and comments on the draft Assessment Report, EAO has proposed several conditions related to the marine environment and Aboriginal Groups. Additional information regarding these proposed conditions and other factors considered EAO's assessment of potential impacts on specific Aboriginal Interests is provided in section 17.2 of this Assessment Report.

18.4.2 Kitselas First Nation

Context

- Kitselas First Nation is located at the upper end of Kitselas Canyon on the Skeena River at Kitselas, just east of Terrace. Kitselas First Nation has 10 registered reserves, settlements or villages with an area of 1,885.2 ha. Kitselas First Nation has a registered population of 602, with 283 members living on reserve and 319 members living off reserve.
- Kitselas First Nation is governed by the Kitselas Band Council, made up of one Chief and five Councillors, under the *Indian Act* electoral system.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- Kitselas First Nation asserts both a traditional territory and a harvesting area. The asserted traditional territory is mostly terrestrial but also includes the mouth of the Skeena River, Smith Island, and Kennedy Island. Kitselas First Nation's asserted harvesting area is mostly marine and includes the northwest coastline, extending as far North as the borders of Alaska, and as far South as the southernmost tip of Banks Island.
- The proposed Project would traverse approximately 100 km of the marine portion of Kitselas First Nation's asserted harvesting area, but none of their asserted traditional territory. The proposed terminus on Lelu Island is approximately 2-4 km north of the boundary of Kitselas First Nation's traditional territory.
- Ethnographers described Kitselas First Nation traditional territory as centered on the Kitselas Canyon and noted that, at the time of contact, some Kitselas people may have taken a coastal route to get to and from the annual eulachon fishery on the Nass River. There is no indication that the proposed Project overlaps with what was considered the traditional territory of Kitselas First Nation at the time of contact (understood to be in the late 1700s or early 1800s).
- As articulated in its letter dated January 31, 2014, EAO understood that any Kitselas First Nation use of the coastal area at the time of contact, including at the mouth of the Skeena and the Prince Rupert Harbour area in the vicinity of the proposed Project, likely required permission of the Nine Allied Tsimshian Tribes.

EAO's assessment of the Kitselas First Nation's *prima facie* claims to Aboriginal harvesting rights to the proposed Project area is weak to moderate.

- Although Kitselas First Nation did not respond directly to EAO's strength of claim assessment, they did respond to MARR's analogous assessment, providing a report arguing that Kitselas First Nation claims to the Prince Rupert Harbour area are strong.
- The Province undertook a detailed analysis of the report, including another review of the available ethnohistoric information. The review did not uncover any information showing that Kitselas First Nation regularly harvested resources from established Kitselas First Nation habitation sites in the Prince Rupert region before contact, at contact, or at sovereignty, and therefore did not change EAO's view of the strength of Kitselas First Nation rights in the Prince Rupert Harbour region. The review did, however, indicate that there was a regular seasonal Kitselas First Nation presence on the coast between the Skeena River and Nass River for the purposes of accessing the eulachon fishery each spring. Access or use of that coastal area was likely conditional on the permission of, or kinship ties to, the Nine Allied Tsimshian Tribes.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)*, which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that Kitselas First Nation has a weak *prima facie* claim of Aboriginal title within or near those portions of the proposed Project areas that overlap with the asserted traditional territory of the Kitselas First Nation.
- EAO's consideration of the potential impacts of the proposed Project on Kitselas First Nation's Aboriginal Interests is discussed below.
- EAO has assessed that the duty to consult Kitselas First Nation lies at the low end of the *Haida* spectrum.
- Kitselas First Nation was listed in Schedule B of the Section 11 Order.

Summary of Consultation

Kitselas First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application, and on the Application. Kitselas First Nation was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided Kitselas First Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. The Proponent provided initial capacity

funding for Kitselas First Nation to engage in discussions regarding the proposed Project through a Letter of Agreement and under a MOU in November 2013. In August 2014, the Proponent and Kitselas First Nation executed the MOU and Negotiation Framework Agreement and the Proponent received Kitselas First Nation's Interim TUS.

Kitselas First Nation participated in many Working Group meetings on September 12, 2013, November 28, 2013, February 13, 2014, July 25, 2014, July 28-31, 2014, and participated in the Natural Gas Pipeline Workshops on February 4, 2014 and May 29-30, 2014.

Issues raised by Kitselas First Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Kitselas First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3. Additional information was provided in the Kitselas First Nation's Traditional Use Study Analysis: Lelu Island and the North Coast of British Columbia, 2014 (TUS). The TUS is an interim public version of a more substantive interim report submitted to Kitselas First Nation. Information from the TUS was incorporated into the second draft of the Proponent's Aboriginal Consultation Report #3.

Potential Impacts of the Proposed Project to Kitselas First Nation's Asserted Aboriginal Interests

Hunting

Kitselas First Nation members hunted moose, blacktail and mule deer, mountain goat, caribou, black and grizzly bear, ruffed, spruce, and blue grouse, ptarmigan, Canada goose, and mallard duck. In addition, the TUS indicated that Kitselas First Nation members also hunted seal and sea lion. Deer were hunted in the area around Mud Bay as well as on the coast of the mainland around Port Edward. Seal and sea lion were hunted from Port Essington to Smith Island to Port Edward. Between the mouth of the Skeena River and the Nass River, Kitselas First Nation hunted deer and hair seal.

Kitselas First Nation's TUS identified hunting areas in Metlakatla Pass, and on Smith Island and Kennedy Island. Smith Island was identified in the TUS as a harvesting area for seagull eggs, cockles, and clams, and for hunting seal, and straight across to the entrance of Eddy Pass. The TUS identified Work Channel as an important site for harvesting deer, as well as Digby Island.

None of the noted hunting areas above directly intersect with the proposed Project route. However, access for Kitselas First Nation and other hunters to the proposed

Project area to hunt may be affected in the short term, for a limited area and time during the construction phase, where access may be restricted for safety reasons. Pipe laying vessels and associated support vessels may disrupt navigability on marine waterways used to access Kitselas First Nation's hunting areas. There could be temporary disruptions to access to important hunting areas by the new or improved access roads and ROW created by the proposed Project.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to hunting – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitselas First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Gathering

Kitselas First Nation identified an Aboriginal Interest in plant gathering. During consultation, they expressed concern about potential adverse effects and issues related to the ability to gather plants, particularly the limitations on access to plant gathering areas.

The TUS identified a berry harvesting site extending from Port Essington to Smith Island to Port Edward, a carving wood gathering site in the Prince Rupert coastal area, and a seaweed gathering site at the mouth of the Nass River. In addition, archaeological reports show Lelu Island as an important source of wood, with a presence of numerous CMTs dating back to the 1830s. The TUS also identifies the Prince Rupert area as an important area for collecting wood along the coast and a seaweed gathering site at the mouth of the Nass River.

Kitselas First Nation stated that members gather black hawthorn, blueberry, bunchberry, cloudberry, crabapple, bog cranberry, lowbush cranberry, highbush cranberry, crowberry, black and red currant, devil's club, elderberry, black gooseberry, hazelnut, huckleberry, lily of the valley, raspberry, soapberry, salal, Saskatoon, strawberry, and thimbleberry. According to the TUS, Kitselas First Nation gathered native copper boulders at Cathedral Peak, berries from Port Edward to Cassier as well as along the Work Channel Road.

The proposed Project route will intersect Lelu Island, which is outside of Kitselas First Nation's traditional territory but within their asserted harvesting area (approximately 2-4 km from the northwest boundary of their asserted traditional territory). None of the other noted gathering areas will directly intersect with the proposed Project route.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to gathering – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitselas First Nation's gathering activities in the area of the proposed Project.

Fishing and other marine uses

Kitselas First Nation raised concerns surrounding the Aboriginal right to fish including:

- Concerns around dredging/trenching and tides, including sedimentation;
- Levels of metals and toxins in sediments and potentially transferring toxic compounds up through the food chain (e.g., Dungeness crab);
- Effects to fish and fish habitat (potential significant effects to critical salmon habitat);
- Soft sediment structure of Horsey, Agnew and Flora Banks at the outlet of Inverness channel - has the potential to seriously restrict commercial, recreational and traditional First Nations fisheries;
- Concerns of scour potential at hard point of pipe in a delta/river mouth;
- Ability to harvest marine plants during construction;
- Absence of monitoring plan to test water quality and monitor sediments (dioxin and furans);
- Concerns regarding impacts to estuaries, salt marshes, and mud flats - specifically the Skeena Estuary delta; and
- Concerns regarding impacts to eelgrass habitats (Flora Bank).

In the TUS, Kitselas First Nation identified an interest in fishing crab, halibut, and grey cod. Smith Island was identified as an important site for harvesting sockeye salmon and crab, herring eggs, cockles, clams, and abalone. Eulachon fishing stations were identified at the Nass River and at Red Bluff. A fishing site for halibut and grey cod was identified on Lucy Island, and other important marine sites were identified between the mouth of the Skeena River and the Nass, and at Dundas Island and Sandy Bay. In addition Lakelse River and Kitimat River Valleys contained fisheries. Kennedy Island was reportedly a harvesting area for crab and herring eggs and the mouth of the Skeena River and Metlakatla Pass were used in the winter as a harvesting site for cockles, clams, and mussels. The TUS identified Work Channel as an important site for spring salmon, rock-cod, red snapper and halibut. Rachel Island was important for halibut and rock-cod. The TUS also identified Arthur Island as important for harvesting a multitude of seafood, and Island Point, Stephen's Island and just outside Port Simpson for herring eggs. Several types of fish were caught in the waters between Lelu and Kinahan Islands.

Kitselas First Nation identified potential adverse effects to their fishing interest that include effects to trench and marine exit areas in the estuary of the Skeena River, which are used for traditional and commercial fishing activities. Kitselas First Nation further identified potential effects of increased nutrient flow from the Skeena River on Dungeness crab and pandalas shrimp at Lelu south and Lelu north. In addition, Kitselas First Nation identified potential adverse effects on the following Traditional Use Areas: Horsey, Agnew, and Flora Bank on Commercial, Recreational and Aboriginal (CRA) fisheries.

During consultation for the proposed Project, Kitselas First Nation provided comments on the Proponent's mitigation measures and identified specific mitigation measures:

- Avoid eelgrass beds if possible. If it is not possible, then remove eelgrass beds intact for replacement following the cessation of construction;
- Implement a comprehensive monitoring plan including sediment chemistry, marine water quality, and mobilization of sediment, benthic community structure, and toxicity;
- Create a Dungeness crab salvage protocol;
- Consult Kitselas First Nation in the development of any offsetting plans, sediment fate modeling for Lelu island, total suspended solids (tss), turbidity, and contaminated sediment mitigation planning; and
- Create eulachon mitigation measures which suspend dredging during spawning seasons and should include out-migration of larvae.

A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with the marine environment is provided in section 17.2.7 of this Assessment Report.

Through the effects assessment process, it was determined that many of the above noted fishing areas fall outside of the project LAA and would not be directly affected by proposed Project activities or physical works. Flora, Horsey, and Agnew Banks, are within Kitselas First Nation's harvesting area (though outside their territory) and may be temporarily impacted. The proposed Project will intersect Lelu Island, which is approximately 2-4 km from the northwest boundary of their asserted traditional territory, and will intersect or approach some of the other areas. Local habitat alteration will occur in marine pipe lay areas and shoreline entry and exit points. Pipe laying vessels and associated support vessels may disrupt navigability on marine waterways used to access Kitselas First Nation's fishing areas.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to fish, fish habit, marine uses, current and traditional land uses – as discussed in section 17.2.2 and 17.2.6 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitselas First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Trapping

Kitselas First Nation identified the potential for adverse effects on the population and habitat of species that are commonly harvested but did not specifically identify any trapping concerns or specific trapping locations.

Kitselas First Nation commonly trapped beaver, marten, mink, squirrel, weasel, wolverine, fisher, muskrat, otter, fox, coyote, and rabbit.

The Proponent acknowledges that the proposed Project may intersect or be close to trapping areas. The local displacement of wildlife and disruption of terrestrial habitat will occur as a result of the proposed Project at creek and river crossings and upland terrestrial areas. The Proponent also recognizes that access to important trapping areas may be disrupted by the new or improved access roads and ROW created by the proposed Project.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitselas First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Culturally important sites, trails, and travelways

Kitselas First Nation identified in the TUS potential adverse effects in relation to Lelu Island that would have been on the seasonal migration route used by Kitselas First Nation to travel by canoe from their Skeena River territories to a village site at Red Bluff. The TUS also identified a migration route from Skeena River to Red Bluff, Digby Island, Lelu Island, and Kaien Island. The TUS states that this migration route is still in use by Kitselas First Nation for contemporary harvesting practices. Kitselas First Nation identified numerous CMTs on Lelu Island, dating to the 1830s.

In the TUS, Kitselas First Nation identified habitation areas at Metlakatla Pass, De Horsey Island, Kennedy Island, Smith Island, Murphy's Point, and Spkshunt. De Horsey

and Kennedy Islands have been identified in the Kitselas TUS as seasonal use cycle habitation areas during Kitselas First Nation movement from the Skeena River to the Nass River. De Horsey and Kennedy Islands were additionally used for harvesting resources.

The TUS additionally identified habitation areas that overlapped with other Tsimshian peoples. These areas include:

- Metlakatla Pass: Metlakatla Pass contained Kitselas First Nation winter villages;
- De Horsey Island - identified in the TUS as a site occupied and used by the Tsimshian peoples, including Kitselas First Nation;
- Red Bluff - a seasonal village used to collect resources from the mouth of the Nass River below Greenville and above Kincolith;
- Kennedy Island - identified in the TUS as “common territory” used by the Tsimshian peoples; had spiritual and ceremonial significance to the Tsimshian peoples, including the Kitselas First Nation;
- Smith Island - one of the three islands at the mouth of the Skeena historically understood as Tsimshian “common territory”;
- Winter village located on Digby Island in Metlakatla Pass across from Wilgiapsh Island;
- Fortified village site at Murphy’s point and a secondary site at Murphy’s Point on Kaien Island;
- Spkshuut (Port Essington) - historical seasonal salmon harvesting and drying site;
- Tsunyow - canyon fortress village where a special feast was held; and
- Wilnu@elgesa@melt - a village upstream from the mouth of the Ecstall River; used during the early summer for salmon fishing; there was also a eulachon fishery and a hot spring at the site.

The migration route from the Skeena River to Red Bluff identified by Kitselas First Nation in the TUS falls within the project LAA and has the potential to be affected by proposed Project activities or physical works. Red Bluff, however, falls outside of both Kitselas First Nation’s asserted traditional territory and harvesting area. The proposed Project will intersect Lelu Island and will intersect or approach some of these areas. The likelihood of disturbance to an important cultural site is considered low, considering that the proposed Project traverses none of Kitselas First Nation’s traditional territory and has limited interaction with terrestrial sites more typically associated with habitation, gathering, and sacred areas.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to culturally important sites, trails and travelways – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitselas First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Kitselas First Nation

During the EA process, Kitselas First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10. Other concerns raised by Kitselas First Nation and responses from EAO, are outlined below.

Key issue raised	EAO response
HDD under rivers bentonite clay drilling mud considered deleterious substance, concerns about fracking upwards of lost drilling must to river bed, must have monitoring plan for fracking detection from drill head and log book of pressures	MNGD clarified that HDD stream crossings are completed using non-toxic drilling fluid comprised of bentonite clay, water and a small amount of polymer. The loss of containment of drilling fluids during HDD involves the fluid migrating from the pipeline bore to the surface through fractures in the overlying rock or through pore space in the overlying till. OGC indicated that there is no significant potential for human health impacts. This type of accident could result in a temporary increase in turbidity or clay deposition within the streambed and resulting adverse effects to fisheries. MNGD explained that the loss of drilling fluids is considered a spill, and that all appropriate procedures would be required in the event of the loss of drilling fluids from an HDD including notification, response, and mitigation measures. In addition to preventative measures undertaken by the Proponent, regulatory prevention measures include the submission of geotechnical crossing information to OGC during permitting which are reviewed for fish habitat, riparian issues and geotechnical information by qualified specialists.

18.4.3 Kitsumkalum First Nation

Context

- Kitsumkalum First Nation is located just west of the city of Terrace, east of the junction of the Kitsumkalum and Skeena rivers. Kitsumkalum First Nation has four registered reserves, settlements, or villages with an area of 597 ha. Kitsumkalum First Nation has a registered population of 736, with 237 members living on reserve and 499 members living off reserve.
- Kitsumkalum First Nation is governed by a Band Council with one Chief and seven Councillors, under the *Indian Act* electoral system.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would traverse approximately 113 km of the marine portion of Kitsumkalum First Nation's asserted territory.
- There is information indicating Kitsumkalum First Nation's historic use of the coastal portion of the proposed Project route, for annual eulachon fishing on the Nass River and travel to and from the Nass. A number of sources indicate that at the time of contact (late 1700s or early 1800s), the coastal areas were considered the territory of the Nine Allied Tsimshian Tribes and that any use of resource sites by Kitsumkalum First Nation in these coastal areas, at the time of contact or 1846, would have required permission of, as well as perhaps offering compensation to, that Nine Allied Tsimshian Tribes lineage head, or drawn on kinship ties.
- Kitsumkalum First Nation asserts Aboriginal rights and title to coastal areas including the mouth of the Nass River, the Prince Rupert Harbour area, the mouth of the Skeena river, and Grenville Channel, and has submitted to the Province a "Declaration of the Kitsumkalum First Nation of the Tsimshian Nation of Aboriginal title and rights to Prince Rupert Harbour and surrounding coastal areas" in October 2013. As articulated in EAO's letter of January 31, 2014, and based on a review of available information, EAO's initial assessment of the strength of Kitsumkalum First Nation's Aboriginal rights claim was weak to moderate in the coastal areas crossed by the proposed Project. Ethnographic sources characterize Kitsumkalum First Nation as one of the twelve tribes of the Coast Tsimshian cultural-linguistic group, but prior to contact, Kitsumkalum First Nation was one of the tribes that did not relocate its village from the Skeena River to the coast.
- Kitsumkalum First Nation significantly disagrees with EAO's conclusion assessment and assert strong claims of Aboriginal rights and title to this area.

Numerous exchanges have occurred, including sharing of additional primary source information. The Province conducted a thorough review of information provided by Kitsumkalum First Nation – detailed analysis of this information is captured in three separate memos developed by the Ministry of Justice's Aboriginal Research Division, provided to Kitsumkalum First Nation by EAO on October 1, 2014.

- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC (Tsilhqot'in)*, which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that Kitsumkalum First Nation have a weak *prima facie* claim of Aboriginal title within or near those portions of the proposed Project in the vicinity of the Prince Rupert Harbour which overlaps with the asserted traditional territory of Kitsumkalum First Nation as the available evidence suggests Kitsumkalum First Nation use of these lands was for transitory purposes and conditional on permission of, or clan-based kinship/social ties to, the other Nine Allied Tsimshian Tribes.
- It is recognized that the Kitsumkalum First Nation use of the lower Skeena River and adjacent coast is important to Kitsumkalum First Nation today, and had increased in importance to Kitsumkalum First Nation after several Kitsumkalum First Nation joined the Christian mission at Metlakatla established in 1862, and after the establishment of canneries and other industries in the Prince Rupert region.
- Given the nature and location of the proposed Project and the potential impacts on Kitsumkalum First Nation's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult Kitsumkalum First Nation lies at the lower end of the *Haida* spectrum.
- Kitsumkalum First Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Kitsumkalum First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application, and the Application. Kitsumkalum First Nation was invited to attend Working Group meetings and regional workshops related to the LNG projects, and to meet with EAO staff directly.

EAO provided Kitsumkalum First Nation with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. The Proponent provided initial capacity

funding for Kitsumkalum First Nation to engage in discussions regarding the proposed Project under a Letter of Understanding signed in June 2013.

Kitsumkalum First Nation provided input to the EA process through participation in Working Group meetings on November 19-20, 2013, February 13, 2014, July 25, 2014, July 23-24, 2014 and participated in the Natural Gas Pipeline Workshops on November 28, 2013 and February 4, 2014. Kitsumkalum First Nation also attended a meeting with EAO and several Aboriginal Groups in Prince Rupert on July 25, 2014.

Since May 2013, the Proponent consulted regularly with Kitsumkalum First Nation, including ten face-to-face meetings, to seek to negotiate capacity funding arrangements and to discuss and share information with respect to routing, environmental field programs, and Kitsumkalum First Nation's Aboriginal Interests. In addition, a TLU Protocol Agreement was signed to provide for the collection of TLU information. The Proponent received Kitsumkalum First Nation's draft TLU report in August 2014. Kitsumkalum First Nation also participated in marine fieldwork as a marine mammal observer.

Kitsumkalum First Nation submitted a final draft Traditional Use Study (TUS) report (Crossroads Cultural Resource Management Ltd., 2014) for the proposed Project to EAO on October 24, 2014. The TUS report has been reviewed by EAO and considered as supplemental information in EAO's assessment of potential impacts of the proposed Project on Kitsumkalum First Nation's Aboriginal Interests.

On November 10, 2014, Kitsumkalum First Nation submitted a final draft socioeconomic report entitled *Kitsumkalum First Nation Socio Economic Impact Analysis for the Prince Rupert Gas Transmission Project* (Crossroads Cultural Resource Management Ltd., 2014). The report presented a summary of a preliminary investigation to attempt to understand the socio-economic impacts of the proposed Project on Kitsumkalum First Nation. The report indicates that while many of the potential socio-economic impacts are perceived, their importance should not be diminished. The report concludes with a summary of management recommendations that include conducting a cumulative effects assessment on industrial and human activity, prepare emergency response plans for impacts of climate change and possible spills, and provide meaningful employment and economic development opportunities for Kitsumkalum First Nation.

EAO also considered a report provided by Kitsumkalum First Nation to EAO on October 24, 2014 entitled "No Permission Required: Title and Rights in the Traditional Territory of the Kitsumkalum Indian Band." EAO understands that Kitsumkalum First Nation has significant disagreement with the notion that historic Kitsumkalum First

Nation use of coastal areas, including in the vicinity of Prince Rupert area, is or was subject to permission by the Nine Tsimshian Allied Tribes, a notion that the Province has considered as weakening the strength of claims of Kitsumkalum First Nation in this area. As discussed in section 13.4, EAO understands that a house group, or *waap*, had a role in determining or controlling use of what was considered its territory. EAO also understand that there are complex system Tsimshian cultural and social systems involving a network of *huwaap* that share a matrilineal connection to a common ancestral group and that these affiliated matrilineal groups are called clans or crest. A Tsimshian person belonged (and belongs today) to one of four clans.

Central to Kitsumkalum First Nation's disagreement with EAO's strength of claim assessment is their position that Kitsumkalum First Nation is a Tsimshian tribe, and has been an integral member of a "Tsimshian Nation" collective, sharing common Tsimshian laws, customs and social organization, since time immemorial. Kitsumkalum First Nation refers to the 1993 statement of intent of the Tsimshian Tribal Council to support the idea of rights and title being held by a "Tsimshian Nation." Kitsumkalum First Nation also assert shared exclusive title to areas exclusively held by the Tsimshian Nation, areas regards as shared or held in common. Finally, Kitsumkalum First Nation asserts that it holds title and rights over specific locations within those shared areas, including a specific former village site at Casey Point in the Prince Rupert Harbour area.

Subsequent to population reductions (following, for instance, a smallpox epidemic occurring in this area in 1836), clan or *wilnaat'al* affiliations may have determined use of house territories, such that kinship or social ties to clan members of other Tsimshian-based Aboriginal Groups (not part of the Nine Allied Tsimshian Tribes) may have occurred with greater intensity in the coastal area. Although use of areas based on kinship ties, which may not have required formal permission to be sought or granted, appears to be a form of community acceptance that makes use of such areas conditional on clan-based kinship or social ties to corresponding clans of the Nine Allied Tsimshian tribes, which probably only occurred if its leadership determined there would be no detriment to the resource itself. Other nineteenth century development such as the presence of missionaries, and the establishment of an industrial economy may have disrupted these ties, and also enabled members of groups other than the Nine Allied Tsimshian Tribes to establish themselves much more freely on the coast around in the Prince Rupert.

Existing ethnographic and historical materials indicate that the coast between the Skeena River and the Nass River was, at contact and 1846, territory belonging to the Nine Allied Tsimshian Tribes, with all the ethnographically reported sites attributed to one or another of the groups which now make up the Lax Kw'alaams and Metlakatla,

and this information is not contradicted by the very specific descriptions of Kitsumkalum territory recorded in the twentieth century. While ethnographic and historical sources support the idea of a cultural-linguistic group known broadly as the Tsimshian, to which Kitsumkalum First Nation undoubtedly belongs, they do not support the notion of a traditional, overarching political Tsimshian collective at the time of contact or at 1846. More recent statements made through a statement of intent filed with the BC Treaty Commission in 1993, or statements made in 2002 by the Allied Tsimshian Tribes that they shared portions of their traditional territories with the Kitsumkalum and that Kitsumkalum has claims in these areas, needs to be considered in the context of all available information regarding use at time of contact and at 1846.

Available information indicates Kitsumkalum First Nation's regular and permanent Kitsumkalum First Nation presence in the vicinity of Prince Rupert, largely began in the 1880s, particularly after the establishment of the mission village of Metlakatla in 1862, but with some references to Kitsumkalum First Nation members living in this area prior to that time.

Issues raised by Kitsumkalum First Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Kitsumkalum First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the Aboriginal Consultation Report #3.

EAO considered Kitsumkalum First Nation's comments on the draft Assessment Report received on October 29, 2014, and incorporated them into the final version of the Assessment Report where appropriate. Kitsumkalum First Nation's comments on the draft Assessment Report were primarily regarding the Table of Conditions (Schedule B).

Potential Impacts of the Proposed Project to Kitsumkalum First Nation's Asserted Aboriginal Interests

Hunting

In the Kitsumkalum Community Marine Use Plan, Kitsumkalum First Nation identified an Aboriginal Interest in hunting marine mammals, waterfowl, deer, and goats. Marine mammals (e.g., seal and sea lion) are hunted for sustenance, cultural, or commercial purposes.

Kitsumkalum First Nation stated general concerns related to wildlife, wildlife habitat and hunting as a result of the proposed Project including:

- Potential for effects on marine mammals and migrating fauna, including seasonal and temporary changes;

- Potential for effects on marine fauna used for sustenance, cultural, or commercial purposes;
- Potential for changes in wildlife due to construction and proposed Project-related accidents;
- Concerns about construction activities in the approach to Lelu Island, and particularly areas in close proximity to Inverness Passage and the Skeena River estuary;
- Change in habitat;
- Change in species abundance;
- Change in wildlife behavior;
- Change in hunting areas;
- Change in access to hunting areas;
- Ability to harvest food and other resources;
- Effect of project-related accidents on wildlife;
- Perceived contamination of country foods from a spill;
- The need for a project-specific Traditional Use Study to inform the assessment of impacts to Kitsumkalum First Nation's land and marine resource use; and
- Any residual effects to land and resources should be considered significant.

Kitsumkalum First Nation also raised specific questions and concerns about marine birds, in particular the marbled murrelet. These concerns include:

- The impacts of disturbance and displacement for marine bird species that nest on cliffs or islands directly adjacent to the marine environment;
- Lack of linkage to any habitat offsetting for marine birds;
- The residual effects analysis should align with the *Recovery Strategy for the Marbled Murrelet in Canada*;
- Marine birds should be included in section 11.0 Marine Resources rather than section 14.0 Wildlife and Wildlife Habitat;
- Require a more comprehensive review of potential causes of mortality to address increases in mortality risk; and
- Lack of spring and summer sampling of species diversity and distribution.

In response to Kitsumkalum First Nation's concerns regarding marine birds, the Proponent submitted a "Technical Memo Update for Marine Bird Vessel Surveys, March 13 to 25, 2014", which is a supplemental report that provides the results of the March 2014 survey. The marine bird surveys provided data on seasonal variation in species abundance, diversity, and distribution within the marine bird LAA and RAA.

With respect to hunting, Kitsumkalum First Nation recommended several general mitigation measures and provided comments on the Proponent's proposed mitigation measures. These are found in section 17.8.7 of the Aboriginal Consultation Report #3 (second revision).

Settlement, government policies, and industrial development have resulted in significant alterations to Kitsumkalum First Nation's pre-contact hunting patterns and traditional hunting methods. Historically, Tsimshian people hunted major land fauna, including mountain goats, mountain sheep, bears, porcupines, raccoons, eagles, marmots, caribou, cougars, hares and lynx; waterfowl (swans, geese, ducks); and sea lions and sea otters.

As noted in the TUS, Kitsumkalum First Nation primarily hunted within the Kitsumkalum, Skeena, and Esctall River valleys and certain coastal islands. Wildlife species harvested as significant sources of food include: deer, elk, seal, sea lions, sea otter, mountain goat, mountain sheep, bear, porcupine, racoons, eagles, marmot, caribou, moose, cougar, hare, lynx, swan, geese, ducks and other waterfowl. Grizzly bear is identified as a species of great importance to the Tsimshian peoples. To ensure sustainability, traditional law and practice ensured resources would be maintained for future generations.

The TUS identifies potential impacts of the proposed Project on Kitsumkalum First Nation's traditional hunting activities, including:

- Pipeline construction would impact harvested resources along the coastline, including marine mammals such as seal, sea lion, otter and birds;
- Pipeline maintenance roads would allow easier access to hunting sites. Species that utilize these areas as breeding and mating grounds would be at increased risk by recreational hunting, thus reducing the population of that specific species within Kitsumkalum First Nation's traditional territory;
- The ability for the present and future generations of Tsimshian to utilize Lelu Island as a resource area would be lost; and
- Several terrestrial wildlife species are sensitive to noise pollution and may alter their territorial range to mitigate noise impacts.

Kitsumkalum First Nation identified concerns regarding construction activities and potential impacts to hunting activities regarding the approach to Lelu Island, Inverness Passage, and the Skeena Estuary.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's

analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitsumkalum First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Kitsumkalum First Nation raised the following concerns related to trapping:

- Change in species abundance;
- Change in wildlife behavior; and
- Effects on traplines.

A number of furbearers have been recorded as being trapped by Kitsumkalum First Nations members, including fox, beaver, marten, lynx, muskrat, river otter, squirrel, weasel, mink, hare, porcupine and wolf.

Kitsumkalum First Nation's trapping activities have been in decline since the 1950s. Forestry has affected access to traplines as well as habitat for a number of furbearing species. Provincial licensing requirements for registered traplines for aboriginal and non-aboriginal traplines has interfered with Kitsumkalum First Nation's traditional matrilineal system of inheritance of traplines. Many of Kitsumkalum First Nation's traplines have been abandoned.

The TUS report identifies potential impacts of the proposed Project on Kitsumkalum First Nation's traditional hunting and trapping activities. The TUS report does not identify any specific trapping activities or traplines within the proposed Project Area. The TUS report notes that the registered trapline system has seriously undermined the Tsimshian's ability to manage and control their resources based on their traditional governing structures. There is no other information available to EAO regarding more recent trapping activities by Kitsumkalum First Nation members in the area of the proposed Project.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Kitsumkalum First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Kitsumkalum First Nation raised the following key concerns related to potential effects to fish, fish habitat and the marine environment:

- Impacts to commercial fisheries and restriction in access during construction of the proposed marine pipeline route to Lelu Island;
- Damage to important fish habitat and harvesting areas;
- Impacts of shock waves/pressure waves on sponge colonies and coral colonies;
- Impacts to kelp and eel grass;
- Impacts to fish and invertebrates:
 - o Impacts to eulachon;
 - o Year round baseline data on fish presence, abundance, and habitat use should be collected and considered in the Application. There should be a fish health sampling program that continues during and after construction for the two pipeline and the facilities; and
 - o Change in behaviour of fish, marine mammals or species at risk due to elevated TSS during pipeline dredging / trenching and burial activities in the marine environment (avoidance of the construction area);
- Possible impacts for the destabilization of Flora Bank;
- The Marine Planning Partnership for the North Pacific Coast (MAPP) plans should be considered during the assessment of proposed Project effects;
- Timing windows for pipeline construction;
- Dredging and sedimentation during process of marine pipe laying:
 - o Effects on water quality;
 - o Contamination of seafood;
 - o Avoidance of areas by fish, marine mammals, and birds;
 - o Concerns with methodology of Application analysis of sedimentation;
 - o Concerns with content, consultation, and methodology of future monitoring;
 - o Disposal at Sea criterion for dioxins and furans (toxic equivalency) is now available from Environment Canada and should be included in the assessment effects to marine sediment / water quality;
 - o Uncertainty as to the conclusion reached regarding the potential for dioxins / furans over ISQG TEL at the Lelu Island landfall water quality monitoring during trenching in the marine environment to ensure that water quality guidelines for TSS are not exceeded; and
 - o The use of silt curtains (unclear whether silt curtains would be used in the marine environment) and sheet piles has been proposed, but there is no discussion of the allowance for fish passage;
- Marine cumulative effects assessment:

- o Kitsumkalum First Nation disagrees with the assessment of potential cumulative effects on Water Quality in the marine environment because of the inappropriate choice of range of the RAA, the lack of detail to the mitigation measure and the uncertainty of the level of residual effects;
- o Kitsumkalum First Nation wants to see a regional level approach to the cumulative effects assessment of construction noise on fish and marine mammals; and
- o Disagrees with the evaluation that cumulative effects to fish habitat from future planned projects in combination with the proposed Project is not likely to occur;
- No detailed habitat mapping is presented for the intertidal habitat baseline at landfall areas; and
- Habitat offsets need to be discussed and reviewed.

Kitsumkalum First Nation identified an Aboriginal Interest in fishing more than 100 fish species. Skeena salmon are particularly valued. Important eulachon harvesting areas include the lower Skeena River, as well as the Nass River estuary near Red Bluff. Historically, the Kitsumkalum First Nation participated in the eulachon fishery on the Nass River, alongside members of other Tsimshian tribes and Nisga'a Nation.

Marine foods are highly valued by Kitsumkalum First Nation members, who fish halibut and crab along the lower Skeena and the coast (particularly Grenville Channel, Chatham Sound, Eddy (Edye) pass and the Hecate Straits) throughout the winter, and all freshwater, saltwater, and anadromous species in the Kitsumkalum and Skeena Rivers. Kitsumkalum First Nation identified an Aboriginal Interest in fishing more than 100 fish species; Skeena salmon are particularly valued.

Currently, Kitsumkalum First Nation has two commercial fishing vessels. Kitsumkalum First Nation members participate in various commercial and Aboriginal fisheries including Skeena River salmon gillnet fisheries, as well as halibut and crab fisheries in Chatham Sound within five km of the proposed Project marine pipeline route and within one km of the landfall at Lelu Island in the Skeena River estuary.

Several other areas have been identified as important fishing or harvesting sites by Kitsumkalum First Nation through the Interim TLU and the Marine Use Plan. These include:

- Zymagotitz River;
- Lakelse River;
- Skeena River tributaries including: Khyex River, Ecstall River, Kasiks River, and Scotia River - important eulachon harvesting areas;

- Spookshute – historic village and fall fishing camp near Port Essington and the Ecstall River confluence with the lower Skeena River;
- Principe Channels;
- Kwinitsa – the tidal limits below are an ancient eulachon fishing site;
- China Bar in the Skeena River - important holding ground for eulachon;
- Fleming Bay (Mud Bay) - a traditional fishing site for crab;
- Porpoise Harbour - clams historically collected on the side of the bridge to Kaien Island;
- Kwel'maas (Island Point), Welcome Harbour, Prescott Pass - important marine harvesting areas;
- Portland Inlet - navigated by gillnet fishermen;
- Spa Xksuutks (Port Essington) at the mouth of the Ecstall River - an important commercial fishery for Kitsumkalum First Nation;
- Lax Spa Suunt (Arthur Island);
- Lelu Island - an important juvenile and larval eulachon migration and rearing habitat area, and an important salmon migration and rearing habitat area; and
- Nass River estuary near Red Bluff – an important eulachon fishing area.

The proposed Project marine pipeline route would cross through 113 km within Kitsumkalum First Nation's asserted traditional territory including Portland Inlet and Chatham Sound to the proposed terminal at Lelu Island. The other fishing areas identified above fall outside of the proposed Project LAA (i.e., greater than two km away from the proposed marine route) and would not be directly affected by proposed Project activities or physical works.

The proposed Project route on land would not cross through Kitsumkalum First Nation's asserted traditional territory, with the exception of a small portion near Nasoga Gulf which crosses Chambers Creek and several fish-bearing tributaries. Chambers Creek provides spawning and rearing habitat for salmon and steelhead.

The TUS report provides additional information regarding Kitsumkalum First Nation's current and traditional fishing activities, important fish harvesting areas and concerns regarding potential impacts of the proposed Project summarized below.

All five species of Pacific salmon (i.e., sockeye, coho, chum, chinook, pink) and steelhead are fished in the Skeena River and its tributaries including the Kitsumkalum, Zimagotitz and Lakelse Rivers, which are cited as inland salmon fishing areas. Salmon are also harvested by Kitsumkalum First Nation in the Skeena River estuary near Lelu Island and Inverness Passage, as well as coastal waters in Chatham Sound and Portland Inlet in commercial and Aboriginal fisheries.

Eulachon (Nass and Skeena River populations) are listed as a species of special concern. The final draft TUS report notes that it is of utmost importance to the Kitsumkalum First Nation's cultural heritage to see the habitat of this fishery restored and further destruction halted. Kitsumkalum First Nation has conducted several studies to monitor the success of the eulachon fishery, with data being collected on critical spawning habitats on the mainstem of the Skeena River. The proposed Project's marine pipeline landfalls on Lelu Island and Nasoga Gulf are located within important areas for eulachon identified in the Pacific North Coast Integrated Management Area (PNCIMA).

Archaeological evidence from an ancient village site in the Prince Rupert Harbour at McNichol Creek – located approximately 15 km north of Lelu Island - identified blue mussel, littleneck clams, butter clams, and basket cockles as the most abundant types of shellfish found, followed by horse clams, barnacles, and purple whelks.

Abalone is a highly valued shellfish that has not been available to be harvested in recent years due to declining numbers from overharvesting by commercial fisheries and ecosystem damage by industrial factors. Northern Abalone is listed as endangered species at risk under the *Species at Risk Act*.

Other marine fish species harvested by Kitsumkalum First Nation for food with the proposed Project area include: halibut, herring, herring eggs, Dungeness crab, red snapper, sea cucumber, shrimp, barnacles, and snails.

In the TUS report, Kitsumkalum First Nation express concern that development of the proposed LNG projects could be detrimental to several fish harvesting sites as construction may impact access, vessels may disrupt fishing and the overall impacts of the development may alter the ecosystem to a point where a sustainable fish harvest is unobtainable. Several discussions with local community members have identified access to and impacts on fishing resources, including the perceived risk of impacts, as a severe concern for Kitsumkalum First Nation.

The TUS report identifies potential impacts of the proposed Project on Kitsumkalum First Nation's traditional fishing activities, including:

- Several critical salmon habitats around the proposed Project near Lelu Island would be impacted by the proposed Project. Impacts to salmon spawning grounds, harvesting sites and migration routes have been identified as areas of concern;
- Specific areas around Flora Bank and Horsey Bank (within 1 km of the proposed Project landfall at Lelu Island) provide critical habitat for Skeena River salmon;

- Concerns about dredging on all habitats including contamination and habitat loss;
- Marine pipeline construction traffic would negatively impact the ability to fish along the pipeline corridor;
- Restricted and/or unsafe access along the pipeline corridor during construction would increase travel time/delays for fishing vessels accessing harvesting sites.
- Sub-marine pipeline may cause damage to fishing nets and gear;
- Sub-marine pipeline construction may irrevocably impact local fisheries. Delicate fish habitats would be damaged and certain species may be sensitive to the introduction of a pipeline in their natural environment, causing them to move elsewhere or jeopardize their existence in certain locations;
- Introduction of invasive species from discharge of ship ballast water and other transportation infrastructure could negatively impact or destroy local ecosystems;
- Industrial disasters could prove devastating to both local ecosystems and the Tsimshian culture that relies on fishing as the lifeblood of their culture;
- Construction and operation of facilities would produce noise and visual quality that would impact both the marine and human environments;
- Increased populations may increase recreational and commercial fishing pressure on already sensitive resources; and
- Concerns over climate change and oceans rising need to be included in environmental and marine planning.

With respect to some of Kitsumkalum First Nation's concerns regarding potential impacts to fish habitat and their Aboriginal right to fish, the Application includes mitigation measures to avoid and minimize potential effects to fish and fish habitat. The Proponent provided a conceptual fish habitat offsetting plan as a supplemental report during Application Review. Nearshore marine habitat areas temporarily altered from construction of pipe exit and entrance points would be restored following construction. As described in the conceptual fish habitat offsetting plan, construction activities resulting in serious harm to fish, including permanent alteration of fish habitat, would be offset if and as required by DFO for *Fisheries Act* Authorizations to maintain the ongoing productivity of commercial, recreational and Aboriginal fisheries.

Regarding Kitsumkalum First Nation's concerns of potential impacts of shockwaves or pressure waves from underwater blasting on glass sponge reef colonies and coral colonies, the proposed route in Chatham Sound has avoided areas of glass sponge reefs and other sensitive habitats identified in marine routing surveys. No underwater blasting is proposed in these areas. Additional information on effects on the marine environment can be found in section 17.2.6.

EAO has proposed several conditions regarding the marine environment including the development and implementation of a Crab Movement Mitigation and Monitoring Plan, a Marine Mammal Monitoring Plan, a Marine Sediment Management Plan, and a Marine Sediment and Water Quality Monitoring Plan (see Section 11 of this Assessment Report for further details).

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to fish, fish habitat, current and traditional land use – as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to result in minor impacts to Kitsumkalum First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Concerns raised by Kitsumkalum First Nation related to vegetation, wetlands, and gathering included:

- The potential for change to harvesting activities as a result of industrial activities;
- The potential for Project-related accidents to affect gathering areas and vegetation (including marine plants and marine flora used for sustenance, cultural, or commercial purposes); and
- Access to plant gathering areas.

In comments received during consultation, Kitsumkalum First Nation recommended habitat replacement for the effect of construction on landfall sites as a mitigation measure.

Kitsumkalum First Nation members traditionally harvested elderberry, salmonberry, salal, soapberry, strawberry, Saskatoon berry, raspberry, thimbleberry, blueberry, pacific crab apple, chokecherry, bearberry, rosehips, bunchberry, cloudberry, and low- and high-bush cranberry. In the Interim TLU Kitsumkalum First Nation also identified several species of trees as important resources used for building materials, tools, firewood, clothing, medicines, and art materials including red cedar, hemlock, coastal balsam, sitka spruce, lodgepole pine, cottonwood, red alder, and birch.

According to Kitsumkalum First Nation, important gathering sites include the Skeena River, Ecstall River, Spa Xksuutks (Port Essington), Casey Point, Greenville Channel, Welcome Harbour, and Prescott Pass. Edye Passage and Island Point are key areas for harvesting kelp and seaweed.

All of the above identified gathering areas fall outside of the project LAA and would not be directly affected by proposed Project activities or physical works. The proposed Project route on land does not cross through Kitsumkalum First Nation's asserted traditional territory, with the exception of a small portion near Nasoga Gulf. However, shoreline trenching and backfilling activities at the marine entry point of the pipeline at Nasoga Gulf and Lelu Island, as well as the placement of fill material as pipe support in shallow water could contribute to the localized loss or alteration of kelp and shoreline seaweeds of importance to Kitsumkalum First Nation.

The TUS report identifies traditional gathering resources within the proposed Project area including: abalone, crab, mussel, clams, cockles, sea cucumber and sea prune. These marine resources have been considered in the fishing section above. Traditional logging resources harvested within the proposed Project area include: red cedar, yellow cedar, cedar bark, cedar strips, pine, juniper, spruce, hemlock and hemlock bark.

Potential impacts of the proposed Project on traditional gathering activities identified in the final draft TUS report include:

- Destruction of marine plants and wildlife habitat throughout the marine pipeline route, and supporting pipeline infrastructure are inconsistent with Indigenous laws, values, and beliefs;
- Traditional gathering aspects in identified areas along the pipeline corridor will be lost;
- All aspects of traditional logging on Lelu Island will be lost for future generations;
- Impacts to one species will impact all species as there is a seasonal round that these species follow, typically feasting on the remains from the previous cycle;
- Kelp and eelgrass habitat will be impacted by construction of the pipeline;
- Transportation routes to harvesting areas will be negatively impacted; and
- Pipeline construction will impede access to these sites and may effect an entire season of berry harvesting, which plays a critical role in Kitsumkalum First Nation's sustenance activities.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Kitsumkalum First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Kitsumkalum First Nation raised the following concerns related to potential effects to culturally important sites:

- Change in trails and travelways;
- Change in ability to use travelways;
- Effects to habitation, gathering and sacred areas; and
- Change in ability to use or access habitation, gathering and sacred areas.

Habitation Areas

Kitsumkalum First Nation identified the following historical habitation areas:

- Kalum Mountain;
- Dalk Gylakyaw or “Robin Town” at the Canyon of the Kalum River;
- a habitation site named IR3 at Zimacord;
- a village at “Casey Point” at Prince Rupert Harbour;
- McNichol Creek;
- Lelu Island;
- Watson Island;
- Island Point;
- Port Essington; and
- Kwel’maas (Island Point).

Lelu Island is the only habitation area identified above that falls within the Project LAA and would not be directly affected by Project activities or physical works. Decreased navigability may temporarily affect Kitsumkalum First Nation’s ability to access some of the other important habitation areas.

Trails and Travelways

Kitsumkalum First Nation identified the following trails and travelways:

- Trails at Casey Point - central hub for travel from the interior to coastal areas;
- Trails at Edye Passage - important travel corridor used extensively to connect Kitsumkalum First Nation to some of the larger sites of Kwel’maas (Island Point), Lax Spa Suunt (Arthur Island), and Stephen’s Island as well as numerous other sites in between;
- Travelways between Island Point and Arthur Island;
- Spa Xksuutks (Port Essington) is a part of a travelway to other resource areas;
- Historical trail route used by the Kitamaats travelling to Kitsumkalum First Nation traditional territory This trail route extended from Kitimat Valley to Kitselas on the Skeena River; and

- Marine travelways in Portland Inlet, Chatham Sound and Prince Rupert Harbour are used to access various fishing areas.

The Kitamaat trail falls outside of the Project LAA and would not be directly affected by project activities or physical works. The Proponent acknowledges that the proposed Project will intersect or approach some of the other important areas in marine pipe lay areas and shoreline entry and exit points. The Proponent also acknowledges that pipe laying vessels and associated support vessels may temporarily disrupt navigability on marine waterways used to access Kitsumkalum First Nation trails and travelways areas.

Sacred Sites/Village Sites

Kitsumkalum First Nation identified the following sites described as sacred/village sites:

- Ancient village site in the Prince Rupert Harbour at McNichol Creek;
- Spookshute - historical Tsimshian village and fall camp on the Skeena River near Port Essington and the Ecstall River. Spookshute was shared with Kitselas Band but is currently abandoned;
- Modern Kitsumkalum village on highway 16, where the Kitsumkalum River flows into the Skeena;
- A settlement area on the northeast side of Lelu Island;
- Old settlement site on Watson Island;
- Campsites at Kwel'maas (Island Point);
- A permanent town site and a First Nations Reserve at Spa Xksuutks (Port Essington);
- Culturally modified trees (CMTs) on Lelu Island, Ridley Island and in the Casey Point area; and
- Spa Xksuutks (Port Essington) is considered sacred ground - many deceased Kitsumkalum First Nation members buried there.

With the exception of Lelu Island, the above sites identified by Kitsumkalum First Nation fall outside of the Project LAA and would not be directly affected by project activities or physical works. The proposed Project is close to the asserted settlement area on the northeast side of Lelu Island and may intersect or be close to the CMT's present on Lelu Island. Access roads and the new ROW created by the proposed Project would alter current access conditions into and near many of these areas.

The Proponent acknowledges that the proposed Project would intersect or approach some of the other important areas in marine pipe lay areas and shoreline entry and exit points. The Proponent also acknowledges that pipe laying vessels and associated support vessels may temporarily disrupt navigability on marine waterways used to

access Kitsumkalum First Nation sites described as sacred/village sites or other areas of cultural importance.

Gathering Places

Kitsumkalum First Nation identified Casey Point and Port Essington as gathering and trading sites.

The likelihood of disturbance to an important cultural site is considered low, considering that the proposed Project primarily traverses the marine environment of Kitsumkalum First Nation's asserted traditional territory and has limited interaction with terrestrial sites more typically associated with gathering and sacred areas.

In consideration of the information available to EAO, the Proponent's proposed mitigations and proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project may result in negligible impacts on Kitsumkalum First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Kitsumkalum First Nation

During the EA process, Kitsumkalum First Nation raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised by Kitsumkalum First Nation and responses from EAO, are outlined below.

Key issue raised	EAO response
Concern in respect of the proposed geotechnical investigative work for the Lelu Island Shore Transition	The Proponent committed to developing a Lelu Island Shore Transition Management Plan for the geotechnical activities and engaging with Kitsumkalum First Nation on that Plan.
Concern with the effect of the timing of the geotechnical activities at Lelu Island on the fisheries.	The Proponent delayed the geotechnical survey activities and has arranged for them to occur outside of the original timing. In July 2014, the Proponent provided Kitsumkalum First Nation with the Management Plan for the Lelu Island Shore Transition geotechnical investigative work.

18.4.4 Lax Kw'alaams Band

Context

- Lax Kw'alaams Band is made up of people from nine (originally 10) former Allied Tsimshian Tribes who, prior to contact, had relocated their winter villages from the lower Skeena River to the Prince Rupert area. They eventually moved their winter villages around the Fort Simpson Hudson's Bay Company trading post to take advantage of trade opportunities with European fur traders. As the village grew and the nine tribes amalgamated, the community name became the Port Simpson Band. In 1986, the Aboriginal Group name officially changed to Lax Kw'alaams Band.
- The village of Lax Kw'alaams (also referred to as Port Simpson) is located on the Tsimpsan Peninsula approximately 30 km northwest of Prince Rupert, BC and is accessible by ferry, road, sea and air.
- Lax Kw'alaams Band consists of 78 reserves, settlement, and villages with an area of 11,898.7 ha located primarily along the lower Skeena River, Portland Inlet and Work Channel. Seven of the 78 reserves are shared with Metlakatla First Nation. As of September 2013, Lax Kw'alaams Band had a registered population of 3,646, with 668 of those members living on their own reserve, 68 living on other reserves, and 2,910 living off reserve. Lax Kw'alaams Band is governed under the *Indian Act* electoral system and has a Mayor, a Deputy Chief, and 11 Councilors.
- As stated in the Interim Land and Marine Resources Plan of the Nine Allied Tsimshian Tribes of Lax Kw'alaams (2004 Interim Land Use Plan), over 2,000 traditional sites have been identified by the Nine Allied Tsimshian Tribes of Lax Kw'alaams. These sites include traplines, fishing areas, hunting area, forest harvesting areas, berry-picking areas, areas where medicinal plants are gathered, village sites, shell middens, burial grounds, battle areas, areas with pictographs, petroglyphs, culturally modified trees or stone fish weirs, and places with which traditional place names are associated. Many of these areas are still used for traditional purposes such as forest harvesting, fishing and hunting.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would cross a total of approximately 147 km within Lax Kw'alaams Band asserted traditional territory, including a total of approximately 120 km in the marine environment.
- The proposed Project route within Lax Kw'alaams Band asserted traditional territory in the marine environment includes: the Nass Bay Nearshore Marine and Iceberg Bay crossing, Nasoga Gulf, Portland Inlet and Chatham Sound to the

proposed pipeline terminal on Lelu Island near Prince Rupert Harbour.

- A small portion of the proposed Project route on land would cross through Lax Kw'alaams Band asserted traditional territory, including: the Nass Bay Connector on the south side of the Nass River estuary; and a portion on land from Iceberg Bay to Nasoga Gulf.
- The proposed marine pipeline route on the seabed in Chatham Sound is located approximately 6 km west of the village of Lax Kw'alaams.
- As articulated in its letter to Lax Kw'alaams Band on December 20, 2013, EAO initially assessed the strength of Lax Kw'alaams Band's *prima facie* claim of Aboriginal rights to fish, gather, hunt and trap marine and terrestrial resources, to be strong in the vicinity of portions of the proposed Project, and moderate to be strong in other portions which overlap its traditional territory.
- Lax Kw'alaams Band wrote a letter to EAO indicating disagreement with elements of the assessment of strength of claim, but did not disagree with the overall assessment of the required depth of consultation.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC* which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation at 1846. EAO is of the view that Lax Kw'alaams Band has a strong *prima facie* claim to Aboriginal title to the land surrounding Prince Rupert Harbour area, the mouth of Skeena River and the Tsimshian Peninsula area historically used by the Nine Allied Tsimshian Tribes. There is some overlap of use with other Tsimshian groups (inland and southern) in these areas, including for resource harvesting such as when travelling annually to and from the Nass River eulachon fishery. There is some uncertainty and conflicting claims regarding whether such use by other Tsimshian groups required Nine Allied Tsimshian Tribes permissions, however, EAO continues to be of the view that access was likely conditional on permission of, or kinship ties to, the Nine Allied Tsimshian Tribes.
- Given the nature and locations of the proposed Project, and the potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests as discussed below, EAO is of the view that EAO has determined that the duty to consult Lax Kw'alaams Band lies toward the middle to deep end of the *Haida* spectrum.
- Lax Kw'alaams Band is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Lax Kw'alaams Band was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Lax Kw'alaams Band was also

provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided \$5,000 in capacity funding to Lax Kw'alaams Band during the Pre-Application Stage of review and \$10,000 during the Application Review phase of the EA process to assist with costs associated with participation in the EA review. Lax Kw'alaams Band initially rejected the \$5,000 capacity funding offered in Pre-Application expressing concerns of insufficient funding and concerns regarding the Crown's duty to consult. However, this funding was later accepted.

The Proponent offered initial capacity funding to Lax Kw'alaams Band to facilitate their participation in the EA review process and to conduct TLU study for the proposed Project. Since May 2013, the Proponent has been engaged in discussions with Lax Kw'alaams Band for a capacity funding agreement.

Since early in the consultation process, Lax Kw'alaams Band has expressed a strong interest in business opportunities from the Project. In response, the Proponent has met with Lax Kw'alaams Band on several occasions to explore these interests and discuss possible opportunities.

In response to the Lax Kw'alaams Band's interest in a collaborative process to define routing options, the Proponent and Lax Kw'alaams Band discussed establishing a Joint Route Review through a Letter of Agreement in August 2013. The Proponent expressed a strong interest in having meetings and discussions with Lax Kw'alaams Band on marine routing in support of the Joint Route Review.

In September 2013, Lax Kw'alaams Band provided comments on the draft Section 11 Order expressing concerns regarding the proposed Project, including: consultation requirements, the scope of the EA, valued component selection, capacity funding and request to conduct an Aboriginal Interest and Use Study for the Application to identify and assess potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests.

Lax Kw'alaams Band communicated to the Proponent early in the consultation process that construction of a pipeline route option initially proposed through the conservancies near Khutzeymateen Inlet would have significant impacts, and the Lax Kw'alaams Band Rights and Title Committee expressed opposition to this route. In November 2013, the Proponent advised Lax Kw'alaams Band that route options through the conservancies were no longer being considered and that the Proponent would be focusing on the marine route from Nasoga Gulf.

In January 2014, the Proponent met with Lax Kw'alaams Band to discuss the draft Aboriginal Consultation Report #2, Lax Kw'alaams Band's Aboriginal Interests, a draft TLU Protocol Agreement, marine routing options and the Proponent's proposed mitigation measures. Lax Kw'alaams Band informed the Proponent based on review of the proposed TLU Protocol Agreement and that they would prefer to draft an Aboriginal Interest and Use Study (AIUS) Agreement.

Lax Kw'alaams Band provided the Proponent the '*Lax Kw'alaams' Laxyuup: Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams* (ATTTL 2004). The Interim Land and Marine Resource Plan and the Khutzeymateen Park Management Plan helped inform the Proponent's Application and Aboriginal Consultation Report for assessing potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests.

Additional TLU information was provided by Lax Kw'alaams Band following the filing of the Application through the consultation process and Application Review information request process. This information provided additional detail about Lax Kw'alaams Band's Aboriginal Interests, including: hunting, trapping, fishing plant gathering, use of trails, travelways, habitation areas and sacred areas.

In response to concerns raised by Lax Kw'alaams Band regarding the proposed pipeline route, the Proponent and Lax Kw'alaams Band met in early February 2014 to further discuss marine pipeline routing, construction methodology and mitigation measures.

Lax Kw'alaams Band provided additional written comments on the draft Aboriginal Consultation Report #2 in March 2014. The Proponent and Lax Kw'alaams Band finalized a Capacity Funding Agreement on June 7, 2014. Lax Kw'alaams Band expressed interest in completing a TLU study, and noted that a TLU study is only one component of a larger AIUS required to fully assess the potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests. However, the TLU study or AIUS has not been completed and has not been provided for consideration during Application Review or in EAO's Assessment Report. The Proponent has expressed continued interest in supporting Lax Kw'alaams Band in completing a TLU study.

In June 2014, the Proponent met with Lax Kw'alaams Band to discuss the proposed Lelu Island Shore Transitions geotechnical investigative work. In early July 2014, the Proponent and Lax Kw'alaams Band met to discuss marine pipeline construction, marine studies, marine routing and geotechnical surveys.

On July 21, 2014, the Proponent provided the draft Aboriginal Consultation Report #3 to Lax Kw'alaams Band for review and comment.

On July 30, 2014, the Proponent advised Lax Kw'alaams Band that it submitted an Addendum to the Application for route adjustments, identifying the Chatham Sound route alternative with a minor route re-alignment within Lax Kw'alaams Band traditional territory. The Addendum removed several alternate route options (approximately 30 km total) previously proposed in the Nass Bay Area, including: the Nasoga Tunnel, Nass Bay Shoreline, and Nass Bay Nearshore Alternative. The proposed route adjustments did not result in any changes to the characterization of residual adverse effects on Lax Kw'alaams Band's Aboriginal Interests identified in the Application.

Lax Kw'alaams Band was invited by EAO to participate in all Working Group meetings and information sessions. Lax Kw'alaams Band representatives attended Working Group meetings on October 17, 2013, November 19-20 and 27, 2013, February 5, 7 and 13, 2014 and July 23-24, 28-31, 2014 and participated in the Natural Gas Pipeline Workshops on February 4, 2014 and May 29-30, 2014.

Lax Kw'alaams Band provided several letters to EAO and the Proponent with extensive comments and concerns during Pre-Application and Application Review, including:

- Comments on the draft Aboriginal Consultation Reports and Section 11 Order;
- Insufficient capacity funding;
- Lack of meaningful consultation for assessment of potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests including rights and title including in and near the Tsimpsean Peninsula and the Prince Rupert Harbour area;
- Comments on the draft and final AIR noting the final AIR did not adequately address most of Lax Kw'alaams Band's comments, including: the scope of the EA, baseline information requirements, cumulative effects assessments, EA methodology, VC selection process, requests to include TLU/TEK information and consult with Lax Kw'alaams Band on residual effects characterization, and significance determination and thresholds for assessment of potential impacts on Lax Kw'alaams Band Aboriginal Interests;
- The scope of the EA, baseline information requirements, cumulative effects assessments, EA methodology, VC selection process, requests to include TLU/TEK information and consult with Lax Kw'alaams Band on residual effects characterization, significance determination and thresholds in assessment of potential impacts on Lax Kw'alaams Band Aboriginal Interests;

- Application Evaluation/Screening comments and conclusions that the Application does not meet the final AIR; and repeated concerns that the final AIR was deficient and did not incorporate comments submitted by Lax Kw'alaams Band;
- Application Review comments and concerns including, but not limited to:
 - o Insufficient consultation and assessment of potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests;
 - o Inadequate information regarding Lax Kw'alaams Band's Aboriginal rights;
 - o Potential impacts on marine resources with Lax Kw'alaams Band's traditional territory;
 - o Inadequate assessment of cumulative effects;
 - o Lack of baseline data, particularly in relation to TLU/TEK, marine navigation, fish and fish habitat, consumption of traditional foods and Nine Allied Tsimshian Tribes socio-economic conditions;
 - o Lack of meaningful consultation regarding the proposed route alternatives within Lax Kw'alaams Band's traditional territory;
- Insufficient time for reviewing the Application and providing comments;
- Insufficient time for reviewing supplementary materials provided by the Proponent, with concerns regarding the scale and scope of the supplemental reports provided late in the Application Review process;
- Concerns regarding cumulative effects from the existing level of industrial development and future projects proposed for the Prince Rupert Harbour area; and
- Inadequate consideration of the residual and cumulative impacts of multiple natural gas pipelines and LNG projects proposed in Lax Kw'alaams Band territory.

Lax Kw'alaams Band provided extensive comments and concerns in review of the Application. Detailed Application Review comments and the Proponent's responses are included in the tracking table (Appendix 2).

Potential Impacts of the Proposed Project on Lax Kw'alaams Band's Asserted Aboriginal Interests

Aboriginal Title

EAO has addressed potential impacts to Lax Kw'alaams Band's asserted Aboriginal title by ensuring that Lax Kw'alaams Bands are meaningfully consulted and accommodated around the potential effects of this proposed Project. The Province and the Proponent have approached Lax Kw'alaams Band's to discuss initiatives that would provide financial, environmental and training benefits as outlined above in section 16.7. To this end, economic benefits of the proposed Project are being discussed amongst other

accommodations, including those arising on potential Aboriginal title lands, and Lax Kw'alaams Band's has a role in considering the proposed use for those lands.

Given the potential impacts to Aboriginal Title described in 17.2.7, in EAO's opinion, the proposed Project is expected to have minor impacts on Lax Kw'alaams Band's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Lax Kw'alaams Band's relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Hunting is practiced by many Lax Kw'alaams Band members within their traditional territory. The Nine Allied Tsimshian Tribes actively hunt a wide variety of species of game, marine mammals and waterfowl that include: elk, sheep, deer, mountain goat, mountain lion, bear, sea lion, seal, sea otter, ducks, geese and swans. Several species of fur-bearing animals hunted include: lynx, raccoon, hare, porcupine, mink, beaver, marmot, muskrat and fox.

Lax Kw'alaams Band identified hunting areas in sensitive wetlands that are of cultural importance. The Tsimshian Peninsula Species Management Area and Kween (Kaien Island, Digby Island) Special Management areas - located approximately 5-10 km away from the proposed Project route - were identified as having important wildlife habitat and hunting areas.

The *Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams* (ATTIL 2004) identifies several areas of importance for current and traditional hunting activities within Lax Kw'alaams Band's asserted traditional territory.

Several islands are used by the Nine Allied Tsimshian Tribes for hunting various marine wildlife species. Ridley Island and Lelu Island, located within 2 km of the proposed Project area, have important hunting areas for hunting deer, waterfowl, seal, mink and otter.

There are several other hunting areas within 5-10 km of the proposed Project area including: Prince Rupert Harbour, Dundas Island, Melville Island, the lower Skeena River, Portland Inlet, Work Channel, Khutzeymateen Inlet, Pearce Island, Wales Island and the Nass Bay area.

Marine mammals, including sea lions and seals are hunted throughout the winter and spring. Hunting for seals traditionally occurred in the winter on Dundas Island - located approximately 10-15 km west of the proposed marine pipeline route in Chatham Sound.

The Lax Kwaxl/Dundas-Melville Islands Conservancy and the Ksgaxi/Stephens Island Conservancy are important ecological areas and traditional harvesting areas for marine mammals (e.g., seals, sea lions) other wildlife hunted by Lax Kw'alaams Band. These conservancy areas are located approximately 10-15 km east of the proposed Project marine route in Chatham Sound. The Marine Resources VC RAA boundary included the eastern shorelines of the conservancy islands.

Other conservancy areas within Lax Kw'alaams Band's asserted traditional territory with important current and traditional land use activities related to hunting include: Lucy Islands, Rachael Islands, Kinahan Islands, Ksi X'Anmas and Khutzeymateen Inlet. These conservancy areas are located approximately 5 km from the proposed Project marine route in Chatham Sound.

Lax Kw'alaams Band provided several comments on the Application regarding mitigation measures for wildlife, wildlife habitat and hunting.

Key issues raised by Lax Kw'alaams Band regarding wildlife and hunting included:

- Disruption to hunting activities during construction and operation;
- Alteration of hunting sites during construction and operation;
- Potential effects to marine and terrestrial wildlife and wildlife habitat;
- Effects to wildlife populations through increased risk of mortality, sensory disturbance, reduced habitat availability, changes to species distribution and population dynamics, and alteration of movement patterns, particularly during the construction phase;
- Potential access related effects to hunting during construction, including temporary restrictions in marine navigation and marine travel routes important for access and use of hunting grounds;
- Potential underwater noise effects from construction vessels and underwater blasting activities with potential injury, mortality and behavioural disturbance to marine mammals (e.g., seals, sea lions); and
- Construction timing and mitigation measures for potential effects to marine and terrestrial wildlife species must be developed in consultation with Lax Kw'alaams Band.

Lax Kw'alaams Band recommended additional mitigation measures for potential impacts to Lax Kw'alaams Band's Aboriginal Interests regarding hunting, including:

- The Proponent's EMP should include a commitment to include Aboriginal Community Environmental Monitors; and

- Construction timing windows should be planned to avoid impacts on Lax Kw'alaams Band seasonal navigation, harvesting and sensitive time periods for marine resources.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to have minor impacts on Lax Kw'alaams Band's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Current and traditional use activities include trapping for beaver, mink and river otter.

Trapping areas important for Lax Kw'alaams Band in proximity to the proposed Project include:

- Lelu Island, located within 1 km of the proposed Project marine pipeline landfall;
- Ridley Island within 2-3 km north of the proposed Project landfall on Lelu Island;
- Iceberg Bay area, located within 1 km of the proposed Iceberg Bay alternate route;
- Dundas Island and Melville Island located approximately 10-15 km west of proposed Project marine pipeline in Chatham Sound; and
- Tsimshian Peninsula Species Management Area, and Kween (Kaien Island, Digby Island) Special Management areas, located approximately 5-10 km away from the proposed Project Area.

Potential effects of the proposed Project related to hunting include:

- Disruption to trapping activities during construction and operation;
- Alteration of trapping sites during construction and operation; and
- Potential effects to marine and terrestrial wildlife and wildlife habitat.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have negligible impacts on Lax Kw'alaams Band's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Fishing is an important part of Lax Kw'alaams Band's culture. Lax Kw'alaams Band historically and presently rely heavily on harvesting a wide variety of fish species, shellfish, molluscs and other marine resources for their livelihood and sustenance. Fish are harvested throughout their traditional territory for food, social, spiritual and commercial purposes.

Lax Kw'alaams Band continues to use traditional fishing sites, primarily along and between the Lower Skeena and Nass Rivers, and the north end of the Grenville Channel. Skeena River salmon and Nass River eulachon fisheries remain important harvesting activities, and historically these fish species "dictated the movement of Coast Tsimshian peoples" (*Lax Kw'alaams Indian Band v. Canada* 2008).

Fish species harvested include: all five salmon species (sockeye, coho, chinook, chum and pink), steelhead, eulachon, herring, herring roe-on-kelp, halibut, ling cod, black cod, grey cod, red snapper, rock fish, abalone, octopus, sea urchin, sea cucumber, crab, clams, cockles, mussels, geoduck, shrimp and prawns. Freshwater fish species harvested include: rainbow trout, cutthroat trout and Dolly Varden.

Key areas for salmon harvesting include the Skeena River estuary and areas around Lelu Island, Flora Bank, Inverness Passage and Ridley Island located within 1-2 km of the proposed Project marine pipeline landfall on Lelu Island. Other key salmon fishing areas include: the lower Skeena River and its tributaries, Dundas Island, Stephens Island, Chatham Sound and several other areas throughout Lax Kw'alaams Band's traditional territory within 5-10 km of the proposed Project area.

Key areas for eulachon harvesting include the Skeena River estuary and the Nass River estuary (near Red Bluff and Fishery Bay). The proposed Project route on land along the south side of the Nass River estuary is located approximately 3 km south of Red Bluff. The proposed alternate land-based and marine routes to Nasoga Gulf including: Nass Bay Connector, Nass Bay Nearshore Marine and Iceberg Bay are located within 2-3 km of important eulachon fishing areas near Fishery Bay and the Nass River estuary.

Fishing for halibut occurs throughout Chatham Sound, primarily near Dundas Island which is located approximately 10-15 km west of the proposed Project marine corridor.

Crab and prawn are harvested throughout Chatham Sound with important harvesting areas within 2 km of the proposed Project marine route. Lax Kw'alaams Band identified key concerns regarding potential effects of the proposed Project to important Dungeness crab habitat and current and traditional crab harvesting areas, including:

- Potential pipeline barrier effects to crab migration from crab nursery areas in Chatham Sound, Iceberg Bay and Nass Bay;
- Specific concerns related to important crab breeding habitat and harvesting areas in Chatham Sound east of Dundas Island;
- Important marine and foreshore crab harvesting areas located at Kn'amas Cultural and Natural Area, Kts'mkta'ani Cultural and Natural Areas;
- Traditional crab harvesting area in Iceberg Bay; and
- Extensive crab harvesting areas near Ts'msedasx (Wales Island) Special Management Area.

In the freshwater environment, there are fish-bearing watercourse crossings proposed within Lax Kw'alaams' asserted traditional territory including several tributaries to the lower Nass River, Nass Bay, Iceberg Bay and Nasoga Gulf. Many of these watercourses provide spawning and rearing habitat for fish species harvested by Lax Kw'alaams Band including: salmon, steelhead and cutthroat trout.

The proposed Project corridor would cross approximately 19 major watercourses with indicated fish presence within Lax Kw'alaams Band's asserted traditional territory.

Lax Kw'alaams Band identified several concerns regarding potential adverse effects of the proposed Project effects on fish and fish habitat; as well as potential effects on navigation and access to fishing areas important for Aboriginal fisheries, including:

- Potential effects to fish, fish habitat and fish populations in the marine environment from marine pipeline construction and seabed modifications;
- Increasing marine traffic in the area and altering access to traditional fishing grounds. Potential effects on marine navigation and access during construction activities resulting in disruption to subsistence fishing activities;
- Potential barrier effect to crab movement from proposed marine pipelines in Iceberg Bay and Chatham Sound and other important crab harvesting areas;
- Potential injury or mortality to fish and effects to critical habitat for juvenile salmon and eulachon in the Skeena estuary during dredging for construction of the pipeline landfall onto Lelu Island near Flora Bank;
- Uncertainty in the assessment of potential effects depending on construction timing and effectiveness of mitigation measures proposed;
- Insufficient assessment of cumulative residual effects to fish and fish habitat and lack of consultation with Lax Kw'alaams Band on significance determinations;
- Potential cumulative effects on fish and fish habitat associated with existing and multiple proposed future projects;
- Lack of clarity regarding disposal at sea permits potentially required for dredging;

- Concerns of potential contamination of seafood from proposed dredging at the Lelu Island landfall site in marine sediments historically contaminated from the Skeena Cellulose Pulp Mill effluent discharges;
- Potential human health risks, including perceived risks by Lax Kw'alaams Band members, resulting in avoidance of fish harvesting in areas associated with potential contamination of seafood from historic and future industrial development;
- Potential effects from underwater noise and blasting during construction with potential injury, mortality and behavioural disturbance to fish and marine mammals;
- Request for additional information on mitigation measures, construction and post-construction monitoring, including cumulative effects monitoring to ensure effectiveness of proposed mitigation and validation of the predicted effects in the Application; and
- Potential effects to fish, fish habitat from construction of watercourse crossings.

Lax Kw'alaams Band provided comments on the Proponent's mitigation measures and recommended specific mitigation measures related to fishing, including:

- The Proponent to provide construction timing windows to avoid impacts on Lax Kw'alaams Band's seasonal navigation, harvesting, and sensitive time periods for fish and other marine resources;
- Minimize effects on adult salmon holding areas and areas important for juvenile salmon by defining committed-to construction timing windows; and
- Develop a follow-up program to confirm EA predictions regarding potential crab barrier effect and identify conceptual adaptive management plans that will be implemented if crab movement is impeded by pipelines on the seabed.

Lax Kw'alaams Band expressed concerns in Marine Technical Working Group meetings during Application Review regarding the uncertainty at the EA stage, pending confirmation with DFO in the permitting stage, as to which areas of the proposed Project pipeline in the marine environment may or may not require *Fisheries Act* Authorization and offsetting for serious harm to fish that are part of a commercial, recreational or Aboriginal fishery. Concerns were also raised by Lax Kw'alaams Band regarding the Proponent's proposed marine habitat offsetting measures and assessment of residual and cumulative effects to fish and fish habitat in the Skeena River estuary.

In August, 2014, Lax Kw'alaams Band expressed concerns to EAO regarding the Proponent's Conceptual Fish Habitat Offsetting Plan and revised marine cumulative effects assessment and other supplemental reports provided to the Working Group for

review and comment. Lax Kw'alaams Band expressed concerns on the timing and short notice of the supplemental reports provided late in the Application Review process - during a time when many Lax Kw'alaams Band members are away participating in seasonal fisheries - leading to insufficient time to review and provide comments. EAO provided additional time for review and expressed willingness to consider additional comments. However, Lax Kw'alaams Band did not provide any additional comments on the supplemental reports for consideration in this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish and fish habitat, current and traditional land use – as discussed in sections 17.2.2 and 17.2.6 of this Assessment Report - the proposed Project is expected to have minor impacts on Lax Kw'alaams Band's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Traditional and current activities include gathering a variety of marine and terrestrial plants throughout Lax Kw'alaams Band's traditional territory.

The *Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams* (ATTTL 2004) identifies several plant species and plant harvesting areas important to Lax Kw'alaams Band for food, medicinal and other spiritual and cultural uses.

Marine plants harvested included seaweeds and kelp. Bull kelp and giant kelp are important marine plant species gathered for harvest of herring roe-on-kelp. Red laver is an edible seaweed and culturally important marine plant species harvested for food.

Seasonal berry picking, medicinal plant gathering and cedar and hemlock bark collecting are important traditional land use activities still practiced by Lax Kw'alaams Band members. Many tree species are harvested for a wide variety of uses, including but not limited to spruce tree root, red cedar bark, yellow cedar, and alder tree (ATTTL 2004).

Species of berries typically harvested in the summer months include: salmonberries, gooseberries, elderberries, raspberries, bunchberries, high-bush cranberries, dwarf blueberries, black and red currants, soapberries and huckleberries. Food and medicinal plants harvested include: licorice fern root, hemlock bark, jackpine sap and needles, fireweed, cow parsnip and devil's club.

Lax Kw'alaams Band identified important plant harvesting areas in proximity to the proposed Project, including:

- Kts'ma'atiin (Khutzeymateen) Inlet and Khutzeymateen Inlet West Conservancy Cultural and Natural Area - located approximately 10 km from the proposed Project marine route in Portland Inlet; and
- Ts'msedasx (Wales Island) Special Management Area within the Wales Harbour Conservancy - located approximately 10 km from the proposed Project marine route in Portland Inlet.

Other important traditional land use areas for plant harvesting include several islands within 5-15 km of the proposed Project marine route, including:

- Lax Kwaxl (Dundas Island) Cultural and Natural Area within the Lax Kwaxl/Dundas Island-Melville Island Conservancy - located approximately 15 km west of the proposed Project marine route in Chatham Sound;
- Ksgaxl (Stephens Island) Cultural and Natural Area - located approximately 15 km southwest of the proposed Project marine route in Chatham Sound;
- K'ala Kwtuun (Work Channel) Special Management Area - located approximately 5 km from the proposed Project marine route in Portland Inlet; and
- Kts'mkta'ani Cultural and Natural Area north of the entrance to Work Channel - located approximately 5 km from the proposed Project route in Portland Inlet.

Lax Kw'alaams Band provided comments on the Proponent's mitigation measures and recommended specific mitigation measures related to plant gathering, including:

- Monitor impacts to specific wetlands, old forests, rare ecosystems and culturally important plants;
- Red laver (*Porphyra perforate*) is an important seaweed harvested for food and should be considered as a culturally important key indicator species;
- Ensure that no loss of use in traditional use areas by developing a comprehensive communications plan and monitoring of residual chemicals in Aboriginal Groups food;
- Confirm that native seeds only will be used for revegetating terrestrial portions of the pipeline that goes through Lax Kw'alaams Band's territory;
- Construct pre-clearing surveys during the flowering season to ensure any missed red or blue-listed ecosystems are identified; and
- Commit to no-net loss of wetland function and appropriate mitigation, including wetland compensation plans, should significant impacts to wetlands be unavoidable.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, and current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts on Lax Kw'alaams Band's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Lax Kw'alaams Band has culturally important sites, including habitation areas, campsites, archaeological sites, sites described as being of sacred significance, trails and marine travelways associated with current and traditional resource harvesting activities throughout Lax Kw'alaams Band's asserted traditional territory.

Culturally important sites and habitation areas within the vicinity of the proposed Project marine route in Chatham Sound include:

- The village of Lax Kw'alaams on the Tsimpsean Peninsula - located approximately 6 km from the proposed Project marine route in Chatham Sound;
- Winter villages and specific locations in the close vicinity of Prince Rupert Harbour – located approximately 10-15 km from the proposed Project marine route in Chatham Sound; and
- Summer villages on Dundas Island, Melville Island and Stephens Islands - located approximately 10-15 km west of the proposed Project marine route in Chatham Sound.

Other culturally important habitation areas and campsites within the vicinity of the proposed Project marine route in Portland Inlet include:

- Kts'ma'atiin (Khutzeymateen) Inlet Cultural and Natural Area including important camps and extensive traditional use sites - located approximately 10 km from the proposed Project marine route in Portland Inlet;
- K'ala Kwtuun (Work Channel) Special Management Area including important camps and extensive traditional use sites - located approximately 5 km from the proposed Project marine route in Portland Inlet; and
- Campsite at Red Bluff on the north shore of the Nass River associated with the Nass River eulachon fishery - located approximately 3 km north of the proposed Project route on land on the south side of the Nass River estuary.

During consultation activities with the Proponent, Lax Kw'alaams Band identified sacred areas, including:

- Kts'ma'atiin (Khutzeymateen) Inlet Cultural and Natural Area with several archaeological sites - located approximately 10 km from the proposed Project marine route in Portland Inlet.

Lax Kw'alaams Band expressed several concerns regarding the Proponent's Application and assessment of potential impacts on culturally important sites, including:

- The Proponent's assertion that "There are no recorded archaeological sites in the Northwest Coast culture region that are within 37.5 m of the pipeline centreline." is inadequate for a meaningful evaluation of potential impacts on culturally important site;
- Lax Kw'alaams Band requested the Proponent to provide detailed information, including distance from the proposed Project, of all cultural heritage sites within a minimum 1 km of the proposed Project footprint;
- The Proponent's correlation of heritage resources with physical evidence of human activity is too restrictive. Lax Kw'alaams Band requires recognition of a wider range of site types that includes places of spiritual significance, named locales, known travel routes, and other locations of cultural value regardless of the presence of physical remains. Lax Kw'alaams Band heritage sites with no physical remains are identifiable and culturally significant locations on the landscape;
- In many cases, Lax Kw'alaams Band considers the landscape or landform on which evidence of physical evidence of ancient activity is found to be part of the cultural heritage site; and
- Lax Kw'alaams Band recommended that provisions be developed for archaeological monitoring of construction activities in high potential areas in addition to the archaeology site discovery contingency plan.

Lax Kw'alaams Band also commented on potential adverse impacts to heritage resources and potential for boat wake to cause damage to archaeology sites along shorelines.

At the request of Lax Kw'alaams Band, baseline fieldwork within Lax Kw'alaams Band's territory for the Application's assessment of heritage and archaeological resources was directed and supported by a preferred consultant (Kleanza Consulting).

Marine Travelways

There are many marine travelways which provide boat access from the village of Lax Kw'alaams Band to culturally important sites, fishing, hunting, trapping and other

resource harvesting areas in the marine waters, islands and coastal lands throughout Lax Kw'alaams Band's asserted traditional territory, including:

- Prince Rupert Harbour area;
- Lelu Island, Kitson Island, Inverness Passage in the Skeena River estuary;
- Dundas Island, Stephens Island, Melville Island in Chatham Sound;
- Portland Inlet, Work Channel and Khutzeymateen Inlet; and
- Nass Bay and the Nass River estuary.

Marine travel routes within 5 km of the proposed Project marine pipeline route in Chatham Sound include:

- Marine travel routes from the village of Lax Kw'alaams to important fishing areas throughout Chatham Sound, including: Dundas Island and Melville Island.

Marine travel routes within 2 km of the proposed Project landfall on Lelu Island include:

- Marine travel routes associated with Skeena River salmon fisheries around Lelu Island, Kitson Island, Flora Bank and the Skeena River estuary.

Marine travel routes within 2 km of the proposed route in Portland Inlet include:

- Marine travel routes from the village of Lax Kw'alaams Band to resource harvesting areas and culturally important sites in Portland Inlet, Work Channel, and Khutzeymateen Inlet; and
- Marine travel routes in Portland Inlet to Nass Bay and the Nass River estuary and campsites at Red Bluff associated with the Nass River eulachon fishery and traditional crab harvesting areas near Iceberg Bay.

Lax Kw'alaams Band provided several comments on the Proponent's assessment of potential impacts related to Aboriginal Interests associated with marine travel routes, including:

- No baseline data was collected from Lax Kw'alaams Band marine users, who have a strong reliance on, practice of, and rights to, navigation throughout areas where the proposed Project pipeline would be constructed;
- The Application's baseline information and assessment of potential impacts on Lax Kw'alaams Band's Aboriginal Interests is deficient without identifying the degree and nature of use of marine areas by Lax Kw'alaams Band, current constraints and cumulative effects on marine navigation and access to traditional resource harvesting areas and culturally important sites within the proposed Project area; and

- Lax Kw'alaams Band identified a potential adverse effect to navigation specifically around Kitson Island, Lelu Island and Flora Bank - located within 1 km of the proposed Project marine pipeline trench and landfall on Lelu Island.

In consideration of the information available to EAO, the Proponent's proposed mitigations, proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests and Aboriginal Interests associated with the marine environment – as discussed in sections 17.2.5 and 17.2.6 of this Assessment Report - the proposed Project is expected to have negligible impacts on Lax Kw'alaams Band's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Lax Kw'alaams Band

During the EA process, Lax Kw'alaams Band raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10.

18.4.5 Metlakatla First Nation

Context

- The Aboriginal community of Metlakatla is located about 7 km northwest of Prince Rupert, BC on the Tsimpsen Peninsula and is only accessible by sea or air.
- Metlakatla First Nation has about 3,464.4 ha of land on 16 reserves. Seven of these reserves are shared with Lax Kw'alaams Band.
- As of September 2013, Metlakatla First Nation had a registered population of 860, with 85 members living on reserve and 775 members living off reserve. Metlakatla First Nation governance consists of one Chief and six Councillors, each of whom serves three-year terms according to the *Indian Act* electoral system.
- Traditionally seasonal rounds from village to winter/spring/summer/fall fishing camps dominated Coast Tsimshian life. The harvest of salmon and eulachon were supplemented by hunting, trapping, foraging and shellfish gathering. During summer and autumn months, various plants were gathered for food, materials and medicines.
- Metlakatla First Nation is actively involved in land use planning initiatives around land and resource use on their asserted traditional territory. In 2006, Metlakatla First Nation signed a Land and Resource Protocol agreement as well as a

Strategic Land Use Planning agreement with the BC government.

- Metlakatla First Nation has a Marine Use Plan and Co-Management Agreements with BC Parks for conservancies in their territory, including Dundas and Melville Islands, Stephens Islands, Lucy Islands, Rachael Islands and Kinahan Islands within the proposed Project's Marine Environment RAA.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would cross through approximately 125 km of Metlakatla First Nation's asserted traditional territory.
- Most of the proposed Project route within Metlakatla First Nation's asserted territory is in the marine environment.
- The proposed Project route within Metlakatla First Nation's asserted traditional territory includes approximately 110 km in the marine environment from Nasoga Gulf, through Portland Inlet and Chatham Sound, to the proposed pipeline terminal on Lelu Island near Prince Rupert Harbour.
- In addition, a portion of the proposed Project terrestrial route on land along the south side of the Nass River estuary and Nass Bay to Nasoga Gulf; and the Nass Bay Nearshore Marine and Iceberg Bay crossing in the marine environment is within Metlakatla First Nation's asserted traditional territory.
- The proposed marine pipeline route in Chatham Sound is located approximately 8 km west of the village of Metlakatla and within 5 km of the Tugwell Island reserve and other areas of Metlakatla First Nation's reserve lands.
- As articulated in its letter dated December 20, 2013, EAO's initial assessment of strength of Metlakatla First Nation's *prima facie* claims of Aboriginal rights to fish, gather, hunt and trap marine and terrestrial resources, in the vicinity of portions of the proposed Project, to be strong.
- On June 26, 2014, the Supreme Court of Canada released its decision in *Tsilhqot'in Nation v. BC* which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation at 1846. EAO is of the view that Metlakatla First Nation has a strong *prima facie* claim to Aboriginal title to the land surrounding Prince Rupert Harbour area, the mouth of Skeena River and the Tsimpsean Peninsula area historically used by the Nine Allied Tsimshian Tribes. There is some overlap with other Tsimshian groups (interior and Gitxaala Nation) in these areas, including for resource harvesting such as when travelling annually to and from the Nass River eulachon fishery. There is some uncertainty and conflicting claims regarding whether such use by other Tsimshian groups required permission from the Nine Allied Tsimshian Tribes, however, EAO continues to be of the view that access was likely conditional on permission of, or

kinship ties to, the Nine Allied Tsimshian Tribes.

- Given the nature and locations of the proposed Project, and the potential impacts of the proposed Project on Metlakatla First Nation's Aboriginal interests as discussed below, EAO is of the view that the required duty to consult the Metlakatla First Nation lies in the middle to deep part of the *Haida* spectrum.
- Metlakatla First Nation is listed in Schedule B of the Section 11 Order.

Summary of Consultation

Metlakatla First Nation was invited to review and provide comments on the draft AIR, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Metlakatla First Nation was also provided with opportunities to participate in Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided \$5,000 in capacity funding to Metlakatla First Nation during the Pre-Application stage of review and \$10,000 during the Application Review phase of the EA process to assist with costs associated with participation in the EA review.

The Proponent provided Metlakatla First Nation with formal notification of the proposed Project in January 2013.

The Proponent provided initial capacity funding for Metlakatla First Nation in July 2013. Capacity funding was provided to support completion of a socio-economic and traditional land use (TLU) study. The Proponent and Metlakatla First Nation have been negotiating a MOU to provide additional capacity funding for ongoing participation in the regulatory process. In addition, the Proponent has been negotiating a second MOU with Metlakatla First Nation to provide capacity to the Metlakatla Development Corporation (MDC) to support broader community engagement and ongoing discussions regarding Metlakatla First Nation's business and economic interests.

The Proponent and Metlakatla First Nation engaged in discussions throughout July and August 2014 with respect to finalizing the MOU for capacity funding.

During Pre-Application consultation activities, Metlakatla First Nation communicated to the Proponent early in the consultation process that they did not support the initial proposed land route option through conservancies near Khutzeymateen Inlet. In November 2013, the Proponent advised Metlakatla First Nation that the land route through the conservancies was no longer being considered.

In March 2014, Metlakatla First Nation provided the Proponent with an interim TLU report titled: *“Metlakatla First Nation Traditional Land Use and Ecological Knowledge Report of TransCanada Pipelines Ltd.’s Proposed Prince Rupert Gas Transmission Project Interim Report #2”* (DMCS and MFN 2014). The interim TLU report identified several resource harvesting areas within the proposed Project area and was considered in the Application’s assessment of potential impacts on Metlakatla First Nation’s Aboriginal Interests.

In April 2014, the Proponent provided Metlakatla First Nation with updated information in respect of the Proponent’s marine geotechnical investigative program at Nasoga Gulf, Iceberg Bay and Nasoga Bay Shore Transitions. In response to concerns raised by Metlakatla First Nation, the Proponent and Metlakatla First Nation met in May 2014 to discuss the proposed geotechnical investigative program, specifically the Lelu Island Shore Transition, Nasoga Gulf, Iceberg Bay and Nass Bay activities. The Proponent committed to developing a *Lelu Island Shore Transition Management Plan* for the geotechnical activities and engaging with Metlakatla First Nation for review of this plan. Metlakatla First Nation provided a final TLU Report (DMCS and MFN 2014) and a Socio-economic Impact Assessment report titled *“Impact Assessment of LNG and Other Development on the Metlakatla First Nation Final Report* (the Compass 2014

“Metlakatla Socio-economic Report”) to the Proponent and EAO on June 23, 2014. In addition to information in the Application, the final TLU and socio-economic reports were used to further inform the assessment of potential impacts on Metlakatla First Nation’s Aboriginal Interests as discussed in the Proponent’s final Aboriginal Consultation Report #3 and in EAO’s assessment.

On July 21, 2014, the Proponent provided the draft Aboriginal Consultation Report #3 to Metlakatla First Nation for review and comment. In August 2014, the Proponent responded to Metlakatla First Nation’s queries regarding the *Lelu Island Shore Transition Management Plan* for geotechnical investigative program on the island. The Proponent also notified Metlakatla First Nation of the Addendum to the Application.

On August 13, 2014, the Proponent and Metlakatla First Nation met to review and discuss Metlakatla First Nation’s final TLU Report. The Proponent also responded to Metlakatla First Nation’s comments on the draft Aboriginal Consultation Report #3.

Metlakatla First Nation was invited by EAO to participate in all Advisory Working Group meetings and information sessions. Metlakatla First Nation representatives attended Working Group meetings on October 17, 2013, November 19 and 27, 2013, February 5, 7 and 13, 2014, and July 23-24, 25, 28 and 30, 2014. Metlakatla First

Nation also participated in the Natural Gas Pipeline Workshops on November 28, 2013, February 4, 2014 and May 29-30, 2014.

In addition, there were several discussions and written correspondence with Metlakatla First Nation, EAO and the Proponent during Pre-Application and Application Review.

Metlakatla First Nation (Metlakatla Stewardship Office) provided several letters to EAO and the Proponent with extensive comments and concerns with the proposed Project, including:

- Comments on the Section 11 Order expressing several concerns including:
 - o Constraints on timelines and insufficient funding for reviewing multiple proposed LNG projects;
 - o Concerns regarding assessment of cumulative effects;
 - o Potential impacts on Metlakatla First Nation's Aboriginal Interests requires completion of a TLU report to be included in the Application;
 - o Aboriginal Groups should have input into the significance rating of identified residual and cumulative effects; and
 - o EAO should solicit and consider input of Aboriginal Groups (directly through consultation) before concluding on significance of adverse effects. Certain effects on Metlakatla First Nation's Aboriginal Interests (e.g., traditional land use) can only be appropriately assessed by Metlakatla First Nation;
- Comments on the Application Evaluation/Screening;
- July 2, 2014 letter to the Minister of Environment expressing concerns including:
 - o The EA process, timeline and capacity funding constraints with multiple proposed LNG projects within Metlakatla First Nation's traditional territory;
 - o Insufficient assessment of potential cumulative effects;
 - o The Crown's duty to consult; and
 - o Metlakatla First Nation requested extensions to the EA timelines for the proposed Project to address their concerns raised and allow for meaningful consultation.

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Metlakatla First Nation provided extensive comments in review of the Application. Detailed comments on the Application and the Proponent's responses are included in the tracking table (Appendix 2).

Key concerns identified by Metlakatla First Nation during Application Review included, but are not limited to:

- Impacts specific to Metlakatla First Nation's rights and interests. Section 33

provides an incomplete and inaccurate baseline assessment of Metlakatla First Nation's use and occupancy in their traditional territory and an inaccurate assessment of potential effects assessment of potential impacts of the proposed Project on Metlakatla First Nation's Aboriginal Interests;

- Request to include Metlakatla First Nation's final TLU and Socio-Economic Study in the baseline information and analysis of potential impacts on Metlakatla First Nation's Aboriginal Interests;
- Request for reconsidering baseline information, impact assessment, mitigation and cumulative effects by including specific characteristics of the marine environment and Metlakatla First Nation's use of marine areas to be impacted by pipeline construction;
- Inadequate assessment of potential cumulative effects and potential impacts on Metlakatla First Nation's Aboriginal Interests;
- Mitigation measures in the Application are overly general and undermine by non-committal phrasing (i.e. "where practical", "to the extent feasible"). A much more rigorous approach to mitigation development and assessment with Aboriginal Groups' participation is required before significance determinations can be deemed accurate;
- Incomplete and/or deferred baseline data collection; and
- Determination of significance of residual effects and cumulative impacts.

On July 25, 2014 in a meeting with EAO and coastal Aboriginal Groups, Metlakatla First Nation expressed ongoing concerns with the Application's assessment of potential cumulative effects in the marine environment. Metlakatla First Nation also re-emphasized the need to include the additional information provided on June 23, 2014 in the final TLU and socio-economic reports for assessing potential impacts on Metlakatla First Nation's Aboriginal Interests.

The Proponent's Aboriginal Consultation Report #3, and EAO's assessment below, includes the final TLU and socio-economic reports in the assessment of potential impacts of the proposed Project on Metlakatla First Nation's Aboriginal Interests.

The Proponent submitted an Application Addendum to EAO on July 31, 2014 including the Chatham Sound route alternative within Metlakatla First Nation's asserted traditional territory. The Chatham Sound Route Alternative would not result in any material change to the potential adverse effects, mitigations, or the characterization of the residual effects described in the Application or with respect to Metlakatla First Nation's Aboriginal Interests.

EAO considered Metlakatla First Nation's comments on the draft Assessment Report received on October 29, 2014, and incorporated them into the final version of the Assessment Report where appropriate. These included concerns relating to consultation:

- All meetings with the EAO on this Project have occurred in working group settings or with other Aboriginal Groups at regional workshops addressing multiple pipelines. No government-to-government meetings have occurred to date between EAO and Metlakatla First Nation regarding the proposed Project;
- Metlakatla First Nation expressed disappointment throughout the EA review regarding the Proponent's level and effectiveness of consultation and noted outstanding consultation obligations remain;
- Engagement from the Proponent regarding findings of Metlakatla First Nation's final TLU report, submitted to the Proponent in June 2014, is only just beginning. There has been no engagement between the Proponent and Metlakatla First Nation regarding findings of the final socio-economic impact report submitted in June 2014;
- Although EAO has incorporated some of the findings of the TLU and socio-economic reports into the Assessment Report, Metlakatla First Nation argues that much work remains to develop appropriate mitigation to address impacts of the proposed Project specific to Metlakatla First Nation's use of their territory; and
- Metlakatla First Nation re-emphasized concerns regarding EA timelines, consultation requirements and capacity constraints in reviewing multiple projects.

Potential Impacts of the Proposed Project on Metlakatla First Nation's Asserted Aboriginal Interests

Aboriginal Title

EAO has addressed potential impacts to Metlakatla First Nation's asserted Aboriginal title by ensuring that Metlakatla First Nation are meaningfully consulted and accommodated around the potential effects of this proposed Project. The Province and the Proponent have approached Metlakatla First Nation's to discuss initiatives that would provide financial, environmental and training benefits as outlined above in section 16.7. To this end, economic benefits of the proposed Project are being discussed amongst other accommodations, including those arising on potential Aboriginal title lands, and Metlakatla First Nation has a role in considering the proposed use for those lands.

Given the potential impacts to Aboriginal Title described in section 17.2.7, in EAO's opinion, the proposed Project is expected to have minor impacts on Metlakatla First Nation's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Metlakatla First Nation relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Hunting is practiced by many Metlakatla First Nation members throughout their traditional territory. The Nine Allied Tsimshian Tribes hunt a wide variety of species of terrestrial wildlife, marine mammals and waterfowl, including: elk, sheep, deer, mountain goat, mountain lion, black bear, grizzly bear, sea lion, seal, sea otter, ducks, geese and swans. Several species of fur-bearing animals hunted include: lynx, raccoon, hare, porcupine, mink, beaver, marmot, muskrat and fox.

Metlakatla First Nation's Final TLU Report (DMCS and MFN 2014) provided additional information regarding terrestrial and marine wildlife species harvested by Metlakatla First Nation for food, material, ceremonial, medicinal, and trade purposes, and culturally and/or socially significant species:

- Terrestrial wildlife harvested for food include: beaver, big horned sheep, black bear, black-tailed deer, caribou, elk, fox, grizzly bear, groundhog, marten, mink, moose, mountain goat, mountain lion, muskrat, rabbit, red squirrel, and weasel;
- Terrestrial wildlife harvested for material purposes include: beaver, black bear, black-tailed deer, fox, grizzly bear, lynx, marten, mink, mountain goat, muskrat, porcupine, rabbit, raccoon, red squirrel, and weasel;
- Terrestrial wildlife harvested for ceremonial purposes include: beaver, black bear, fox, marten, mink, mountain goat, muskrat, porcupine, rabbit, red squirrel, and weasel;
- Terrestrial wildlife harvested for trade purposes include: beaver, big horned sheep, fox, groundhog, marten, mink, muskrat, rabbit, red squirrel, and weasel;
- Wolf was identified as being a culturally and/or socially significant species;
- Other wildlife species of interest to Metlakatla First Nation include: coyote, land (river) otter, marmot, and wolverine; and
- Marine mammals hunted include: seal, sea otter and sea lion.

The Metlakatla First Nation Final TLU Report (DMCS and MFN 2014) identified several specific traditional land use areas associated with hunting. Marine and terrestrial hunting areas in Metlakatla First Nation's traditional territory within 2 km of the proposed Project marine corridor were identified throughout the waters and islands of Nass Bay, Portland Inlet, Chatham Sound, and Lelu Island (DMCS and MFN 2014).

Several islands (e.g., Lelu Island, Ridley Island, Stephens Island, Dundas Island, and Melville Island) are used by Metlakatla First Nation for hunting marine and terrestrial wildlife. Lelu Island provides important terrestrial and intertidal hunting areas for deer, waterfowl, and seal.

As noted in the final TLU Report (DMCS and MFN 2014), there are several marine and terrestrial hunting areas for killer whale, bear, mountain goat, and a variety of birds throughout Portland Inlet. The exact locations of these hunting areas are unknown, however are estimated to be within 5 km of the proposed marine pipeline corridor in Portland Inlet.

The Lax Kwaxl/Dundas and Melville Islands Conservancy and the Ksgaxl/Stephens Island Conservancy - located approximately 20 km west of the village of Metlakatla – are culturally important ecological areas and harvesting areas for wildlife including marine mammals (e.g., seals, sea lions), birds and other wildlife hunted by Metlakatla First Nation. The Application's Marine Resources VC RAA boundary included the eastern shorelines of Dundas, Melville and Stephens Islands. The proposed Project marine pipeline corridor in Chatham Sound is located approximately 10-15 km east of the conservancy islands and is not expected to result in any adverse effects to marine wildlife or wildlife habitat within the conservancies.

Other conservancy areas with important current and traditional land use activities related to hunting within Metlakatla First Nation's asserted traditional territory, include: Lucy Islands, Rachael Islands, Kinahan Islands, Manzanita Cove and Winter Inlet. These conservancies are located within the Marine Resources RAA and approximately 4-5 km away from the proposed marine pipeline route in Chatham Sound and Portland Inlet.

Other conservancy areas located immediately adjacent to the Marine Resources RAA boundary include: Ksi X'Anmas; Union Lake, Khutzeymateen Inlet and Inlet West. These conservancies are located approximately 5-10 km away from the proposed marine pipeline route in Chatham Sound and Portland Inlet.

Key issues raised by Metlakatla First Nation related to potential impacts of the proposed Project on wildlife, wildlife habitat and hunting activities include:

- Change in wildlife habitat and wildlife species abundance;
- Change in wildlife behaviour;
- Change in hunting areas;
- Change in access to hunting areas;

- Effect on ability to harvest food and other resources;
- Effect of Project-related accidents on wildlife; and
- Effects on wildlife health.

In the final TLU Report (DMCS and MFN 2014) and Metlakatla Socio-economic Report, Metlakatla First Nation noted the potential for negative impacts on marine and terrestrial wildlife and bird populations due to construction and development of the pipeline, including:

- Potential for disruption to marine birds during their critical life stages from aerial surveys and helicopters;
- Potential effect of increased vessel traffic through important marine resource harvesting areas and the associated impacts on marine wildlife; and
- Potential leaks and/or spills resulting in the loss of food resources and the ability of the Metlakatla First Nation community members to continue practicing their traditional livelihood were also noted.

In the final TLU Report (DMCS and MFN 2014), Metlakatla First Nation provided several comments on the Proponent's mitigation measures and recommended specific mitigation measures related to Metlakatla First Nation hunting interests, including:

- Further discussions with the Proponent are needed in order to accurately analyze proposed Project-specific impacts to traditional land use and access in order to develop impact-specific mitigation measures (DMCS and MFN 2014); and
- Metlakatla First Nation specifically requested that the Access Management Plan be modified so that it can be applied to impacts in the marine environment and that species-specific least risk construction timing constraints should be developed during the EA process, rather than waiting until permitting, to ensure adhering to timing windows is feasible during construction, and that timing restrictions will adequately mitigate residual impacts.

In comments received during consultation, Metlakatla First Nation recommended specific mitigation measures related to Metlakatla First Nation hunting Aboriginal Interests, including:

- Monitoring of low frequency noise from compressor stations in habitats critical for hunting;
- Measures to prevent wildlife entrapment in trenches in the event that trenches must be left open for any length of time;
- Noise restrictions at construction camps;
- Blasting restrictions in wildlife habitat during sensitive life cycle stages and for

- wildlife sensitive to noise;
- Monitoring is required to ensure that construction timing during “least risk” windows remain valid;
- Clarification on whether the Proponent intends on committing to mitigation measures outlined in the Application;
- Specific timing constraints should be developed during the EA process (rather than delayed until permitting);
- Ensure communication between proponents and the Metlakatla Stewardship Office regarding construction timing and how best to conduct project activities;
- Detailed recording, mapping and avoidance of traditional land use sites identified in the TLU study;
- Extend the applicable distance of the no wake zone in Metlakatla Pass;
- Establishment and enforcement of maximum boat speeds through Metlakatla Pass;
- Educate boat pilots on the timing of traditional harvests so that pilots can act appropriately when travelling near active harvesting areas; and
- Include information about traditional harvest practices and importance in any LNG employee training manuals and programs.

The Proponent’s mitigation measures provided in the Application include mitigation of potential effects on Aboriginal Interests related to hunting, including: marine and terrestrial wildlife and wildlife habitat; current and traditional land use; and transportation VCs. The Proponent intends to have further discussions with Metlakatla First Nation regarding Metlakatla First Nation’s comments and proposed mitigation measures.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with hunting is provided in section 17.2.1 of this Assessment Report.

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO’s analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in sections 17.2.1 and 17.2.6 of this Assessment Report - the proposed Project is expected to have minor impacts on Metlakatla First Nation’s asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Metlakatla First Nation’s current and traditional use activities include trapping for beaver, mink and river otter primarily on Ridley Island and Dundas Island.

Metlakatla First Nation's final TLU Report (DMCS and MFN 2014) identified several specific traditional land use sites associated with trapping throughout the waters and islands of Nass Bay, the Portland and Observatory Inlets, Chatham Sound, and Lelu Island.

Key issues raised by Metlakatla First Nation related to potential impacts of the proposed Project on trapping include:

- Potential adverse effects to wildlife and wildlife habitat;
- Disruption to trapping activities; and
- Alteration of trapping sites.

Metlakatla First Nation noted the potential for negative impacts on marine and terrestrial wildlife due to construction and development of the pipeline. The potential effect of increased vessel traffic through significant marine resource harvesting areas and the associated impacts on marine wildlife, as well as potential leaks and/or spills resulting in the loss of food resources and the ability of the Metlakatla First Nation community members to continue practicing their traditional livelihood were also noted.

Several areas within Metlakatla First Nation's asserted traditional territory described in the hunting section above, and noted in Metlakatla First Nation's final TLU report are also utilized for trapping, including:

- Lelu Island has important trapping areas for mink and otter within 1km of the proposed Project pipeline terminal;
- Ridley Island, located approximately 3-5 km north of the proposed Project terminal on Lelu Island, also has important trapping areas for mink and otter; and
- Dundas, Melville and Stephens Islands, located approximately 10-15 km west of the proposed Project marine route in Chatham Sound, are important areas for trapping area for beaver, mink and river otter.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with trapping is provided in section 17.2.3 of this Assessment Report.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.3 and 17.2.6 of this Assessment

Report - the proposed Project is expected to have negligible impacts on Metlakatla First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Fishing is an important part of Metlakatla First Nation's culture. Metlakatla First Nation historically and presently rely heavily on harvesting a wide variety of fish species, shellfish, molluscs and other marine resources for their livelihood and sustenance (DMCS and MFN 2014). Marine and freshwater fish are harvested throughout their traditional territory for food, social, ceremonial, medicinal, trade and commercial purposes.

Marine species harvested include: all five salmon species (sockeye, coho, chinook, chum and pink), eulachon, herring, herring roe-on-kelp, halibut, ling cod, black cod, grey cod, red snapper, rock fish, abalone, octopus, sea urchin, sea cucumber, crab, clams, cockles, mussels, geoduck, shrimp and prawns. Freshwater fish species harvested include: rainbow trout/ steelhead, cutthroat trout and Dolly Varden.

Metlakatla First Nation members participate in commercial and aboriginal fisheries including the Skeena River and Nass River salmon and eulachon fisheries. Metlakatla First Nation and its members also participate in herring and herring spawn-on-kelp fisheries, as well as groundfish, crab and geoduck fisheries throughout Chatham Sound and Portland Inlet. Fisheries provide an important source of employment for many Metlakatla First Nation members.

Metlakatla First Nation identified potential adverse effects on commercial, recreational Aboriginal (CRA) fisheries as a main concern (e.g., potential for adverse effects on harvest of pacific salmon, herring, herring spawn, chitons, sea urchins, sea cucumber, abalone, Dungeness crab, and shellfish).

Key areas for salmon harvesting include: the lower Skeena River and its tributaries, the Skeena River estuary, the Nass River estuary, Metlakatla Pass, Dundas Island, Melville Island, Stephens Island, Chatham Sound and several other areas throughout Metlakatla First Nation's traditional territory. The salmon harvesting season represents the main economic and subsistence activity within the Coast Tsimshian's annual cycle, lasting from June through October (DMCS and MFN 2014).

Lelu Island, the terminal point of the proposed marine pipeline Project, is an important area to Metlakatla First Nation with a high density of culturally important current and traditional use sites and fishing areas.

The marine waters between Lelu Island and Stapledon Island, over Flora Bank, and through Inverness Passage are some of the main sockeye salmon fishing areas (DCMS and MFN 2014) located within 2 km of the proposed Project marine pipeline landfall at Lelu Island. Flora Bank and other areas around Lelu Island and the Skeena River estuary provide highly productive and critical rearing habitat for juvenile salmon and eulachon.

The west side of Ridley Island near Coast Island, located approximately 5 km north of the proposed Project's landfall on Lelu Island, is also an important fishing area actively utilized by Metlakatla First Nation members for harvesting various salmon species.

Portland Inlet, Observatory Inlet and Chatham Sound areas were also identified as important marine harvesting and fishing areas in the Metlakatla First Nation Final TLU Report (DMCS and MFN 2014).

The Skeena River estuary is an important fishing area for harvesting eulachon, including areas within 2 km of the proposed Project marine pipeline terminal on Lelu Island. Other important fishing areas for eulachon harvesting include Nass Bay and the Nass River estuary located within 1-3 km of the proposed Project pipeline route on land along the south side of the Nass River estuary, and the alternate land-based and marine route options to Nasoga Gulf (e.g., Nass Bay Nearshore Marine, Iceberg Bay).

Fishing for halibut primarily occurs in Chatham Sound near Dundas Island within 10 km of the proposed Project marine corridor. Abalone was traditionally harvested around Stephens Island located approximately 15 km west of the proposed Project corridor.

Dungeness crab, shrimp and prawns are harvested throughout Chatham Sound, including areas within 2 km of the proposed Project marine corridor. Areas around Ridley and Lelu Islands are used extensively for fishing (including crab harvesting).

The proposed marine corridor crosses through the Pacific North Coast Integrated Management Area including: approximately 40 km through an important area for Dungeness crab; and approximately 50 km through an important area for shrimp. Potential effects of the proposed pipeline on the seabed include potential barrier effects to crab movement.

The TLU report noted intertidal zones and coastal beaches of the islands throughout Chatham Sound and Portland Inlet provide a rich variety of shellfish, fish and other food resources harvested by Metlakatla First Nation. Major shellfish harvesting beaches were

identified on Pearse Island in the Metlakatla Socio-economic Report, located approximately 2-3 km west of the proposed Project marine route in Portland Inlet.

Metlakatla First Nation owns Coastal Shellfish Corporation which currently has a commercial shellfish hatchery in Prince Rupert and several shellfish aquaculture facilities (e.g., scallop farms). Metlakatla First Nation also has a proposed future aquaculture facility within 2 km of the proposed Project corridor in Chatham Sound.

There are numerous anchorages located off the west shore of Digby Island. Metlakatla Socio-economic Report noted Kinahan and the western shore of Digby Island, located approximately 5 km of the proposed Project marine route, are important inter-tidal harvesting areas for shellfish including clams and cockles.

Metlakatla Pass, located approximately 7 km west of the proposed Project corridor in Chatham Sound, was identified as an area of critical importance to the Metlakatla First Nation for access to harvesting marine resources, including crab as a key species.

Tree Knob Group Management Zone, located north of Stephens Island (approximately 20 km southwest of the proposed Project marine route) was identified in the Metlakatla Socio-economic Report as a location where wakes from passing ships affect seasonal harvest at low tide where abalone, halibut and salmon are harvested.

In the freshwater environment, the proposed Project corridor on land would cross approximately six major watercourses within Metlakatla First Nation's asserted traditional territory near Nass Bay. These watercourses include Chambers Creek and fish-bearing tributaries flowing into Nass Bay, Iceberg Bay and Nasoga Gulf. Chambers Creek provides important spawning and rearing habitat for salmon and steelhead.

Metlakatla First Nation provided extensive comments to EAO on the Application of the proposed Project regarding potential effects to fish and fish habitat in the marine and freshwater environment, as well as other potential effects related to fishing including temporary restrictions in marine navigation and access to fishing areas during construction.

Metlakatla First Nation is concerned that construction and development activities of the proposed Project marine pipeline through Alice Arm, Portland and Observatory Inlets, and Chatham Sound to its termination point on Lelu Island may prevent access to important resource harvesting areas on surrounding islands and marine waters (DMCS and Metlakatla First Nation 2014).

Key issues raised by Metlakatla First Nation related to potential impacts of the proposed Project on fish, fish habitat and fishing activities included:

- Potential effects to fish, fish habitat and fish populations in the marine environment from marine pipeline construction and seabed modifications;
- Potential crab migration barrier effect from marine pipelines on the seabed;
- Potential injury or mortality and effects to critical habitat for juvenile salmon in the Skeena estuary and construction of the pipeline landfall on Lelu Island;
- Potential effects on marine navigation and access to fishing areas during construction, particularly around Lelu Island, Flora Bank, Inverness Passage Porpoise Channel and Port Edward;
- Potential cumulative effects on Flora Bank eelgrass and critical habitat for juvenile Skeena River salmon from proposed dredging at the Lelu Island landfall and the proposed Pacific Northwest LNG facility with potential cumulative impacts on Metlakatla First Nation's Aboriginal Interests;
- Potential effects to marine sediment, water quality, marine life, seafood harvesting areas associated with dredging at the Lelu Island landfall;
- Uncertainty regarding proposed construction timing for dredging at landfalls, fisheries timing windows and potential increased effects depending on timing;
- Modelling results for sediment re-suspension, dredging mitigation plans and effectiveness of proposed mitigation;
- Assessment of potential contamination effects to marine life and human health risk assessments for consumption of seafood harvested in the area;
- Potential underwater noise effects from construction vessels, dredging and blasting activities on fish and marine mammals (e.g., humpback whales, northern resident killer whales, harbour porpoise);
- Potential effects to fish and fish habitat from construction of pipeline watercourse crossings; and
- Requests for additional information on construction and post-construction environmental monitoring to ensure effectiveness of proposed mitigation.

As noted in the final TLU Report, the close proximity of the proposed Project footprint to Metlakatla First Nation's fishing grounds on the Skeena River estuary (including important fishing areas within 2 km of the proposed Lelu Island landfall) is of concern to Metlakatla First Nation Elders, as hydrocarbon leaks or spills and impacts on juvenile salmon rearing habitat may compromise the fisheries permanently.

In comments on the draft Assessment Report, Metlakatla First Nation expressed additional concerns regarding potential impacts on the Aboriginal right to fish, including:

- Inadequate assessment of potential cumulative impacts of multiple proposed

pipelines and LNG projects in combination with existing and other future projects on Metlakatla First Nation's Aboriginal right to fish and the cumulative reduction in access to fisheries; and

- The Metlakatla Socio-economic Report shows that traditional and commercial fishers are close to operating at a threshold of sustainability, therefore Metlakatla First Nation is of the view that any adverse impacts to fisheries would be significant.

The harvesting areas as identified are large geographic features, making the identification of any proposed Project footprint specific concerns a general estimation. A discussion of the potential impacts of the proposed Project on Aboriginal Interests associated with fishing is provided in section 17.2.2 of this Assessment Report. In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on fish and fish habitat, current and traditional land use – as discussed in sections 17.2.2 and 17.2.6 of this Assessment Report - the proposed Project is expected to have minor impacts on Metlakatla First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Metlakatla First Nation's current and traditional activities include gathering a variety of marine and terrestrial plants through their asserted traditional territory.

Seasonal berry picking, medicinal plant gathering and cedar and hemlock bark collecting are activities that are still practiced by Metlakatla First Nation. Cedar wood and bark is used for making canoes, totem poles and for weaving. Several islands (e.g., Lelu Island, Ridley Island, Dundas Island, Melville Island) are used by Metlakatla First Nation for berry picking and gathering food and medicinal plants.

Species of berries harvested in the summer months include: salmonberries, gooseberries, elderberries, raspberries, bunchberries, high-bush cranberries, dwarf blueberries, black and red currants, soapberries and huckleberries. Food and medicinal plants harvested include licorice fern root, Hudson Bay tea, hemlock bark, jackpine sap and needles, fireweed, cow parsnip and devil's club.

Marine plants including seaweeds and kelp are harvested in areas throughout Metlakatla First Nation's traditional territory including Tugwell Island, Big Bay and other areas in Chatham Sound within 5 km of the proposed Project corridor. As a substrate for herring roe-on-kelp, both bull kelp and giant kelp are important marine plants

gathered. Seaweed and kelp are primarily harvested near Dundas Island located approximately 10-15 km west of the proposed Project corridor in Chatham Sound.

As noted in Metlakatla First Nation's Final TLU Report (DCMS and MFN 2014), Lelu Island is an important berry picking, medicinal and food plant collecting area with a high density of TLU sites. Plant gathering sites on Lelu Island are located within 1 km of the proposed Project landfall on Lelu Island.

Ridley Island, located approximately 3-5 km north of the proposed Project landfall on Lelu Island, is also an important plant gathering area however is not within the proposed Project footprint or LAA.

In comments on the draft Assessment Report, Metlakatla First Nation indicated construction timing windows may help to reduce impacts to marine plant harvesting; however these mitigation measures need to be developed and assessed before conclusions can be finalized. Given the nature and type of gathering required to harvest marine plants, Metlakatla First Nation disagrees with EAO's assessment and expressed concern regarding potential impacts of the proposed Project on Metlakatla First Nation's Aboriginal right to gather.

The harvesting areas as identified are large geographic features, making the identification of any project footprint specific concerns a general estimation. A discussion of potential impacts of the proposed Project on Aboriginal Interests associated with gathering is provided in section 17.2.4 of this Assessment Report.

In consideration of the information available to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in negligible impacts to Metlakatla First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

The Application identified several culturally important sites, trails and travelways for Metlakatla First Nation within the vicinity of the proposed Project.

Metlakatla First Nation's final TLU report identified additional culturally important sites within 2 km of the proposed Project corridor.

Metlakatla First Nation expressed specific concerns regarding potential adverse impacts to heritage resources on Lelu Island from construction of the proposed Project and the proposed Pacific Northwest LNG Facility on Lelu Island.

As requested by Metlakatla First Nation, the Proponent hired Kleanza Consulting to conduct the heritage resource and archaeological resources baseline fieldwork in proposed Project areas within Metlakatla First Nation's asserted traditional territory.

Archaeology Sites

Metlakatla First Nation's TLU report identified 46 of a total 266 archaeology sites within the proposed Project's Marine Resources RAA. Areas of high archaeological site densities correlate with areas of high TLU site densities on Lelu Island, Ridley Island, Digby Island and Nass Bay (DMCS and Metlakatla First Nation 2014) located within 2-5 km of the proposed Project corridor.

There are several culturally important sites on Lelu Island, within 1km of the proposed Project landfall and terminal on Lelu Island. Within 2 km of the proposed Project pipeline route options to the Nasoga Gulf landfall, there are 4 archaeological sites near Nass Bay. There are also archaeological sites on Tree Nob Islands, Stephens Island, Triple Islands and an ancient Coast Tsimshian Village of Lax Gota, located approximately 20 km southwest of the proposed Project marine pipeline route in Chatham Sound.

In comments on the draft Assessment Report, Metlakatla First Nation noted that the total of 46 archaeology sites within the 2km buffer of the proposed Project does not include the results of the Proponent's AIA.

Metlakatla First Nation expressed concerned that there has been no opportunity to date to view or review the Proponent's AIA reports and is of the opinion that without an AIA to characterize the impacts of the project on heritage resources, the Assessment Report cannot conclude on the level of impact to archeological resources, residual effects and cumulative effects. Other concerns raised by Metlakatla First Nation included:

- Metlakatla First Nation is of the opinion that the proposed Project would result in residual adverse effects to archaeological resources, as indicated by the permanent loss of high value resources;
- There must be sufficient time provided for Metlakatla First Nation to review and comment on the final AIA report, as well as to make decisions regarding protection of archaeological resources;
- There should be a condition requiring the Proponent to continue to work with Aboriginal Groups to complete and share results of the AIA report and develop mitigations for heritage impacts; and

- The Heritage Resources Discovery Contingency Plan in the EMP needs to be consulted on with Aboriginal Groups, and an archaeological monitor should be with clearing crews while clearing in Metlakatla First Nation's traditional territory.

A discussion of the potential impacts of the proposed Project on Aboriginal Groups archeological resources and cultural heritage interests is provided in section 17.2.5.

EAO recognizes the importance of archaeological sites and heritage resources to Metlakatla First Nation. Archaeological sites in BC are protected under the *Heritage Conservation Act*. If any archeological sites are identified within the proposed Project footprint in the final AIA report, or during construction or operations, the Proponent would be required to develop mitigation in consultation with Metlakatla First Nation, and FLNR's Archaeology Branch and Heritage Branch, in accordance with the *Heritage Conservation Act*.

Marine Travel Routes

Metlakatla First Nation's final TLU report (2014) also includes marine transportation routes and overland trails and water routes connecting to TLU sites and resource harvesting areas. The TLU report also identifies specific campsites and habitation areas along marine travel routes, overland trails or at trail ends.

Metlakatla First Nation is concerned that construction and development activities of the proposed Project marine pipeline through Portland Inlet and Chatham Sound to its termination point on Lelu Island may affect marine travelways and prevent access to cultural important sites and resource harvesting areas on surrounding islands and marine waters.

There are several marine transportation routes that provide access to fishing and other resource harvesting areas in the waters around the village of Metlakatla, Prince Rupert Harbour, Lelu Island, Dundas Island, Melville Island, Tugwell Island, Chatham Sound, Portland Inlet and Nass Bay.

An important marine transportation route, originating at the village of Metlakatla connecting to marine harvesting areas around Dundas and Melville Island, was identified with very high TLU site densities. These marine travel routes cross perpendicular to the proposed Project marine pipeline corridor in Chatham Sound (DMCS and Metlakatla First Nation 2014).

An additional marine transportation corridor was indicated as an important seafood harvesting and seal-hunting route within 2 km of the proposed Project corridor in

Chatham Sound. This transportation corridor encompasses an area near Tugwell Island, and continues northwards to Portland Inlet.

A historical and current marine route for eulachon harvesting was also identified in the north end of Steamer Passage (DMCS and Metlakatla First Nation 2014), which is located on the east side of Somerville Island near the entrance to Khutzeymateen Inlet. This marine route is within approximately 2-5 km of the proposed Project marine route in Portland Inlet.

There are also several trails and culturally important sites on Lelu Island, within 1 km of the proposed Project landfall and terminal on Lelu Island.

In comments on the draft Assessment Report, Metlakatla First Nation expressed concern that increased marine traffic during construction will result in adverse effects on marine travelways and access to harvesting areas and culturally important sites. Metlakatla First Nation expressed concern that these effects have not been adequately assessed in consideration of Metlakatla First Nation's TLU information and cannot be concluded on without development of mitigation measures.

EAO has proposed a condition requiring the Proponent to develop and implement a Marine Access Traffic Management Plan to identify construction activities that have the potential to interfere with marine navigation in the Certified Pipeline Corridor.

In consideration of the information available to EAO, the Proponent's proposed mitigations, proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests and Aboriginal Interests associated with the marine environment – as discussed in sections 17.2.5 and 17.2.6 of this Assessment Report - the proposed Project is expected to have minor to moderate impacts on Metlakatla First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Metlakatla First Nation

During the EA process, Metlakatla First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

In comments on the draft Assessment Report, Metlakatla First Nation expressed several other concerns, including the following:

- Several baseline studies are incomplete and critical to assessing the significance

of impacts, designing appropriate mitigation, and assessing potential impacts on Metlakatla First Nation's rights and title. Of particular concern to Metlakatla First Nation are the incomplete archaeological assessments, TLU assessments and fisheries impact assessments (including disposal at sea). Granting an EA Certificate prior to completion of these assessments eliminates the possibility of Aboriginal Groups to determine impacts to their rights and title as a result of the proposed Project:

- o EAO Response: Section 16 of this Assessment Report provides EAO's response to common concerns raised by Aboriginal Groups regarding the adequacy of the effects assessment, VC selection and baseline study methodology. In addition, section 17 of this Assessment Report provides information on factors considered in EAO's assessment of potential impacts on specific Aboriginal Interests, including baseline studies and effects on VCs assessed in Part B of this Assessment Report. EAO has proposed several conditions requiring development and implementation of an EMP and various mitigation and monitoring plans in consultation with Aboriginal Groups.
- Cumulative effects assessment measures listed in section 16.5 in response to Aboriginal Groups' concerns regarding the lack of regional or strategic cumulative effects assessment are inadequate. The PCA, ESI and Cumulative Effects Management Framework tools are largely conceptual, have no commitments or concrete actions to assess or mitigate cumulative effects and cannot be viewed as helping to address concerns of Aboriginal Groups, nor has work been done to address the cumulative impacts to Aboriginal rights and title as a result of past, present and reasonably foreseeable projects:
 - o EAO Response: Section 16.5 of this Assessment Report provides additional information in response to common concerns raised by Aboriginal Groups regarding assessment of cumulative effects. In addition, section 17.2 of this Assessment Report provides information regarding the factors considered in EAO's assessment of potential impacts on specific Aboriginal Interests, including consideration of baseline conditions and cumulative effects on each VC assessed in Part B associated with the exercise of Aboriginal Interests.
 - o As identified in section 16.5, the Cumulative Effects Management Framework presented at a regional workshop for Aboriginal Groups on May 29-30, 2014 is intended to guide natural resource operational decisions in BC. This framework, along with the PCA and ESI, are intended to be used as tools by regulatory agencies (e.g., OGC, FLNR) in permitting application review and consideration for regulatory decisions and potential permitting conditions, in addition to EA Certificate conditions,

- for mitigation, monitoring and management of cumulative effects.
 - o EAO proposes a number of conditions that would require the Proponent to develop and implement an EMP as identified in the Application, and specific mitigation and monitoring measures (e.g., Grizzly Bear Mitigation Monitoring Plan; Crab Movement Mitigation and Monitoring Plan; and Marine Mammal Monitoring Plan) to address cumulative effects.
 - o EAO proposes a specific condition requiring the Proponent to continue to consult with and involve Aboriginal Groups in the development of the various plans and in refinements prior to submission of permitting applications to regulatory agencies; and also to consider any additional TEK/TUS information submitted during or subsequent to the EA process in the development of permit applications related to the construction or operation of the proposed Project.
- Metlakatla First Nation noted the Socio-Economic Effects Management Plan must consider the findings of Metlakatla First Nation's final socio-economic assessment, as well as obstacles to benefits-accrual by Aboriginal Groups, work for this inclusion has not occurred, therefore this section of the assessment cannot be considered complete.
 - o EAO Response: EAO proposed a condition for the Proponent to develop a Socio-Economic Effects Management Plan (SEEMP), including requirements for the plan to have effective consultation planning and implementation with affected Aboriginal Groups, which would allow opportunity to consider the findings of Metlakatla First Nation's final TLU and socio-economic assessment report. The condition also requires the plan to include monitoring and reporting on the effectiveness of mitigation set out in the Application; and if necessary, describe an adaptive management approach, including the implementation of alternative mitigation, to address unpredicted effects directly related to the proposed Project.

18.5 Gitxsan

Context

- The Gitxsan Nation (Gitxsan) claim a 33,000 km² traditional territory situated on the Skeena River above the Kitselas Canyon, and in the watersheds of the Babine, Kispiox, Gitsegukla, Lower Skeena, Middle Skeena, Nass, Suskwa, Sustut and the upper Skeena and their tributaries.
- Currently, there are approximately 13,000 Gitxsan Nation members, with 9,100 living within their asserted traditional territory. The five communities of the Gitxsan Nation are Gitanmaax, Gitsegukla, Gitwangak, Glen Vowell and Kispiox.

Gitxsan has 28 reserves covering approximately 8,038 ha, and governed by Indian Act Bands. The majority of reserves are located in valleys along the Skeena, Bulkley and Kispiox rivers, within a 40 km radius of Hazelton or New Hazelton.

- Traditionally, Gitxsan followed a seasonal round of resource procurement focused on fishing, hunting, trapping, and medicinal and food plant gathering within the Skeena and Nass watersheds. The basis of their economy was salmon, which was not only a dietary staple, but also an important trade item that was used to procure eulachon grease and other items from coastal First Nations. Salmon are harvested during the summer sockeye runs and the fall coho runs and steelhead trout are fished at various times throughout the year. In winter, char, Dolly Varden and cutthroat trout are harvested. Eulachon are also harvested on the lower Nass River in the early spring.
- Hunting and trapping was common, providing dried meat, hides and fur for personal consumption and trade. Gitxsan also harvested and processed a variety of berries, including soapberries, which were given to coastal First Nations in exchange for seaweed and shellfish.
- Gitxsan used trails and travelways as trade routes, or to connect villages to hunting, fishing, trapping and plant gathering sites. The Skeena River was also an important corridor for transporting goods and people between the coast and the interior by canoe, however, trails beside watercourses or overland were considered more reliable for year-round travel.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would consist of approximately 122 km of pipeline passing through Gitxsan asserted traditional territory. There is one potential future compressor station (Kispiox) proposed within Gitxsan asserted traditional territory in a Lax Yip *wilp* Guutkunuxw. One camp location (134) and two ancillary sites (133, 135) are proposed within Gitxsan asserted traditional territory. Proposed access development in Gitxsan asserted traditional territory includes 1.7 km of new permanent access roads, 276 km of upgraded permanent access roads, and 1.3 km of new temporary access roads and 57 km of upgraded temporary access roads.
- As articulated in a letter to Gitxsan dated April 7, 2014, EAO's initial assessment of strength of claims is that Gitxsan has a strong *prima facie* claim to Aboriginal rights to fish, gather, hunt and trap resources within Gitxsan asserted traditional territory within or near the proposed Project area.
- On June 26, 2014, the Supreme Court of Canada released its decision in

Tsilhqot'in Nation v. BC (Tsilhqot'in), which clarified the test for Aboriginal title relating to the elements of sufficient and exclusive occupation as at 1846. Based on the information reviewed and test for title as set out in *Tsilhqot'in*, EAO is of the view that there is information supporting a strong *prima facie* claim of Aboriginal title within or near those portions of the proposed Project areas that traverse the Babine, Skeena and Kispiox rivers, areas in proximity to the major village complex on Babine river (Kisgegas), other home site locations, and primary trail networks accessing house territories and resource harvesting areas.

- EAO met with several *Simgiigyet* on April 17, 2014 to discuss the initial strength of claim. At that meeting, EAO agreed to a request from Gitxsan for an additional 30 days to provide a written response to EAO. EAO has not received a coordinated response from Gitxsan; however, *wilp* Wii Gyet and *wilp* Mauus provided separate responses to EAO. EAO responded to *wilp* Wii Gyet on September 30, 2014.
- EAO received a letter from the Gitxsan Chiefs Office, signed by 17 *Simgiigyet* on August 12, 2014, expressing concerns about the consultation process. EAO provided a response on September 17, 2014. Upon review of the responses provided, EAO confirmed the need to consult the Gitxsan at the deeper end of the *Haida* spectrum.
- Gitxsan is listed on Schedule B of the Section 11 Order. EAO's consideration of the potential impacts of the proposed Project on Gitxsan's Aboriginal Interests is discussed below. Given the nature and location of the proposed Project, and in consideration of the responses provided from Gitxsan, EAO is of the view that that the duty to consult is at the deeper end of the *Haida* spectrum.

Summary of Consultation

While the courts have acknowledged the importance of houses to Gitxsan culture, they have yet to determine whether a Gitxsan house should be considered the rights holder for the purposes of consultation and accommodation. EAO has considered the potential impacts that were raised by individual *huwilp* during consultation as well as impacts on Gitxsan rights more generally. At the time of the EA, in the absence of a single entity with the mandate to represent the Gitxsan Nation as a collective, EAO consulted with the *Simgiigyet* whose *wilp* territories could be directly impacted by the proposed Project. As such, 13 *huwilp* (houses) were identified and were consulted at the deeper consultation level (see section 2 above for listing of *huwilp* consulted). EAO consulted with any *Simgiigyet* whose *wilp* territories are located up to 30 km away from the proposed Project area at the lower consultation level by notifying them of key milestones in the EA and meeting if requested. EAO also consulted any other *Simgiigyet* who requested it, by notification. EAO's assessment of potential impacts of

the proposed Project on Gitxsan's Aboriginal Interests considers information obtained by individual *huwilp*, but applies to the Gitxsan Nation as a whole.

EAO copied the Gitxsan Development Corp. (GDC) and the Gitxsan watershed facilitators on communications to the *Simgiigyeyet* in an attempt to ensure that the information would reach the correct individuals. EAO understood that GDC acted as a coordinator of information for some of the *Simgiigyeyet*, but did not speak on behalf of the Hereditary Chiefs. Gitxsan have identified a watershed facilitator for each of the 5 watersheds.

Communications were challenging with Gitxsan, especially earlier in the EA, as accurate contact information was difficult to obtain and many of the *Simgiigyeyet* did not use email. On several occasions, documents mailed to *Simgiigyeyet* by EAO were returned by Canada Post for various reasons, and EAO was required to investigate the address and resend them. At meetings with Gitxsan, EAO circulated contact sheets to request any updated contact information. The GDC assisted by helping to provide contact information and helped to deliver documents and correspondence to the *Simgiigyeyet*, including hand delivering hardcopies of key documents for review. Another complicating factor in consultation with Gitxsan is the complex nature of the internal dynamics of the Nation, including lack of clarity regarding governance structures and disputes related to *wilp* boundaries and *Simgiigyeyet* representation.

EAO met directly with Gitxsan on several occasions, with *wilp* and *huwilp*. These meetings included:

Pre-Application:

- On April 11, 2013, EAO met with several *Simgiigyeyet* and members of *huwilp* listed on Schedule B and C of the Section 11 Order to introduce EAO, provide an introduction to the EA process and to discuss how the Province proposed to consult Gitxsan. Issues discussed included the larger context of the LNG industry, Gitxsan culture and protocols, concern about cumulative effects and impacts on salmon fishing.
- On May 9, 2013, EAO met in Kitwanga with Gitwagak Hereditary Chiefs Dinimget, Hlengwax, and Lelt to provide an overview of the EA process. Concerns raised included capacity funding and traffic impacts and related community safety along Hwys 16 and 37.
- On July 9, 2013, EAO and OGC met with Gitxsan *wilp* Haiwaas in Kispiox to introduce the EA process. Haiwaas raised concerns about upstream gas development, potential future gas development in the Bowser Basin, Gitxsan Aboriginal rights and title and traditional laws, and cumulative effects.

- On July 30, 2013, EAO and OGC met in Hazelton with the *Simgiigyet* and several members of *huwilp* listed on Schedule B and C of the Section 11 Orders for the three proposed gas pipelines in Gitxsan traditional territory to discuss all proposed LNG projects, the EA process, and the draft AIR for the proposed Project.
- On October 8, 2013, EAO held an 'open house' drop-in meeting in Hazelton for the *Simgiigyet* and members of *huwilp* listed on Schedule B of the Section 11 Orders for the proposed gas pipelines in Gitxsan traditional territory to come and ask EAO any questions about the process and raise any concerns. Concerns raised included water and fish, cultural sites and trails, safety, upstream development and facility development in Prince Rupert.
- On October 9, 2013, EAO met in Smithers with *wilp* Gwininitxw to provide a status update of proposed pipeline projects in Gitxsan traditional territory, next steps in the EA process and to discuss EAO's proposed consultation approach with Gitxsan. The key concern raised by Gwininitxw was the potential impact on fish (salmon) on the Skeena River, Nilkitkwa River and Babine River.
- On October 9, 2013, EAO met in Kispiox with the Kispiox Band Council to provide a presentation about the proposed projects and EA process. Concerns raised included impacts on Salmon on the Skeena, access restrictions from construction and operations, upstream activities, and predator/prey dynamics along the pipeline corridor.
- On December 11, 2013, EAO met in Hazelton with *wilp* Delgamuukw to discuss concerns specific to the *wilp*. Topics discussed included Gitxsan culture and traditional laws and the Delgamuukw court decision. Concerns were raised about impacts to fishing and hunting from the proposed Project.

Application Review:

- On April 16, 2014, EAO and OGC met with *wilp* Haiwaas, Mauus, Gwininitxw, and Luutkudziiwus in Hazelton. Issues discussed included EA timelines, the role of the GDC, TUS funded by the Proponent and conducted through GDC, EAO's initial strength of claims assessment and the protection of culturally modified trees.
- On April 17, 2014, EAO and OGC met in Hazelton with several *Simgiigyet* and members of *huwilp* listed on Schedule B of the Section 11 Orders for the proposed gas pipelines in Gitxsan traditional territory. Approximately 40 people attended. The issues raised included need for wider and further consultation with Gitxsan, internal Gitxsan Nation matters, EAO's initial strength of claim assessment, and salmon on the Skeena River. EAO granted a 30 day extension for Gitxsan to respond to the initial strength of claim letter which had been sent

on April 7, 2014.

Gitxsan were invited to review and provide comments on the draft AIR, Section 11 Order, Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Gitxsan were also provided with the opportunity to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided \$1,000 in capacity funding during the Pre-Application stage of review and \$2,000 during the Application Review stage to each of the 13 *huwilp* to assist with costs associated with participation in the EA review.

The Proponent provided capacity funding through a Letter of Agreement (LOA) dated April 2013 with the GDC, representing the Hereditary Chiefs and members of the directly affected *huwilp* of the Gitxsan, together with an addendum to the LOA entered into in May 2013 and another in January 2014. Negotiations for a Capacity Funding Agreement are complete between the Proponent, GDC and 12 of the 13 of the Hereditary Chiefs of the *Huwilp* listed on Schedule B of the Section 11 Order (with the exception of *wilp* Gitgwinuxw). The Proponent is continuing to attempt to engage with *wilp* Gitgwinuxw regarding capacity funding and to discuss the proposed Project. The Proponent reports that in June 2014, the Proponent met with the *Gitgwinuxw Lax Yip* to discuss the capacity funding agreement, fieldwork within the *Lax Yip* and consultation process moving forward. At that time, and through subsequent correspondence, *Gitgwinuxw Lax Yip* confirmed its support for the proposed geotechnical and other investigative field activities within the *Lax Yip*.

Gitxsan Environmental Services, with support from the potentially affected Hereditary Chiefs, provided the Proponent with a socio-economic report, entitled *Gitxsan Environmental Services Socio-Economic Report for PRGT* and a Traditional Land Use (TLU) study entitled *PRGT Gitxsan TLU Project Summary Tables: Effects Concerns, Mitigation and Recommendations* (TLU Report), which were used to inform the Application, where appropriate and allowed under confidentiality provisions.

The Proponent provided information and had discussions with Gitxsan regarding the environmental program, including the scope, methods and timing of the field program. Gitxsan members have participated in the collection of the environmental fieldwork. At the Proponent's direction, its engineering fieldwork contractors engaged GDC regarding fieldwork opportunities. Subcontracting agreements were signed with each contractor and GDC. Through this arrangement, Gitxsan members have participated in fieldwork in positions, such as line cutters, wildlife monitors, cultural monitors, medics, and field support technicians.

Gitxsan Knowledge Holders participated in the TEK fieldwork associated with both archaeology and fisheries surveys. The TEK fieldwork notes were provided to Gitxsan for review and approval. Gitxsan had not at the time of Application submission released the TEK field notes.

The Proponent held several meetings with the *Simgiigyet* on Schedule B of the Section 11 Order. The Proponent provided several opportunities for the *Simgiigyet* to participate in helicopter fly overs of the proposed route. Discussion topics included: proposed route and infrastructure; stream and river crossings; geophysical surveys; contracting and employment opportunities; economic benefits; compressor stations; geotechnical drilling; upstream extraction methods; marine pipeline corridor landfall at Ridley island; pipeline maintenance; pipeline safety and emergency response; LNG plant and liquefaction process; construction practices; and routing of the proposed Project corridor through their asserted traditional territory. The Proponent reports that through several routing discussions, they have determined that the proposed route is not close to any of the identified cultural sites.

The Proponent held one Community meeting open to all Gitxsan community members to present information about the proposed Project and has committed to holding two more meetings. In addition, the Proponent met with each of the five Gitxsan Band Councils and will continue to meet, as appropriate, and provide Project information and monthly Project activity updates. A key concern that has been consistently raised by Gitxsan with the Proponent and EAO is the proposed watercourse crossings and their potential effect on fisheries, spawning habitat, and the ability to practice cultural traditions.

Issues raised by Gitxsan and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Gitxsan as well as the Proponent's proposed mitigation to issues raised is provided in the Proponent's Aboriginal Consultation Report #3.

Gitxsan did not provide written comments on the draft AIR and the VCs selection document. Gitxsan did not comment on the Application content for screening to EAO. Gitxsan did not provide written comments on the Proponent's Application during Application Review. Gitxsan were invited to participate on the Working Group and at least one Gitxsan representative was in attendance at the following Working Group and sub-Working Group meetings: February 26, 2013; January 28, 2014; February 4, 2014; February 5, 2014; and February 6, 2014. During Application Review, Gitxsan hired consultants who participated in the technical meetings on July 29 and 30, 2014, although none of the *Simgiigyet* attended. Gitxsan participants clearly noted at Working

Group meetings and LNG-related workshop meetings that in their view, their participation in these meetings did not comprise consultation.

On June 22, 2014, Gitxsan issued an eviction notice including several industries including proposed pipeline companies stating that no further discussions or activity related to potential projects would be permitted until the lands that overlap with asserted Gitxsan territory included in an Agreement-in-Principle with Kitselas and Kitsumkalum First Nations were removed. Since that time, Gitxsan have declined to meet with EAO or the Proponent regarding the EA, although meetings with the Province, through MARR, are on-going in an attempt to find resolution.

Potential Impacts of the Proposed Project to Gitxsan Nation's Asserted Aboriginal Interests

Aboriginal Title

EAO has addressed potential impacts to Gitxsan's Aboriginal title by ensuring that Gitxsan are meaningfully consulted and accommodated around the potential effects of this proposed Project, which has included a significant route adjustment in response to routing concerns raised by Gitxsan as described above. The Province and the Proponent have approached Gitxsan to discuss initiatives that would provide financial, environmental and training benefits as outlined above in section 16.6. To this end, economic benefits of the project are being discussed amongst other accommodations, including those arising on potential Aboriginal title lands, and Gitxsan has a role in considering the proposed use for those lands.

Given the potential impacts to Aboriginal title described in 17.2.7 and considering the routing north away from the Kispiox River, in EAO's opinion, the proposed Project is expected to have minor to moderate impacts on Gitxsan's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Gitxsan relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Gitxsan's key concerns regarding wildlife, wildlife habitat, and the asserted right to hunt include:

- Increased access could impact traditional activities such as hunting by opening up areas to hunters and therefore increasing wildlife mortality (Cranberry Connector noted as susceptible);
- Effects on wildlife and wildlife habitat;
- Potential impacts on moose and moose habitat and specifically, disruption of

moose during calving season and alteration of moose behaviour during operations and maintenance;

- Concern about cumulative effects on hunting grounds from multiple proposed projects;
- Concern about impacts to grizzly bear;
- Concern about noise disturbance on wildlife, particularly moose and Mountain goats;
- Project ROW corridor result in easier hunting of grizzly and black bear as well as moose;
- Concern about wildlife mortality due to collisions with vehicles;
- Direct loss of habitat and effects from disease;
- Concern about the potential for change in country foods due to development-related contamination; and
- Concerns that increased invasive plants species would attract prey wildlife species which would be at risk to predators.

Gitxsan hunt moose, goat, caribou, deer, porcupine, beaver, groundhog, lynx and rabbit in Gitxsan asserted traditional territory. Black bear and grizzly bear are less commonly hunted for sustenance. Birds, including blue grouse, grouse, goose, duck, ptarmigan, swan and on occasion, seagull are all traditionally harvested.

Key harvesting areas identified by Gitxsan include Cullen Creek, Sedina Mountain, Mitten and Elizabeth lakes, Salmon River, Pinenut Creek towards Suskwa, Sweetin River, Deep Canoe Creek, and Shegunia.

The Application listed the following areas of high value wildlife habitat and key hunting areas identified by Gitxsan in the vicinity of the proposed Project:

Approximate location in relation to the Proposed Project	Activity/Site Description
Hunting	
Cullen Creek Adjacent to Mitten and Elizabeth Lakes	Key moose hunting areas
KP 526.5 – 528 KP 540.4 – 541.2 KP 542.9 – 544.1 KP 576.9 – 577.8 KP 583.9 – 58	High value moose habitat

Approximate location in relation to the Proposed Project	Activity/Site Description
KP 473.8 – 491 KP 514 – 515 KP 543 – 544.5 KP 544 – 545 KP 563.2 – 563.8 KP 568.8 – 573.2, at Thurlow Creek KP 575.5 – 576.8 KP 579.7 – 579.8 to Little Fish Lake KP 578.9 – 581.2 KP 585 – 589.8	High value grizzly bear habitat
KP 524 – 532 KP 533.9 – 536.6 KP 566 – 567.2 KP 571.7 KP 572.2 – 573.5	High value deer habitat
Sedina Mountain from KP 518 – 538 KP 584 – 584.5 KP 586 – 587.5 KP 590.8 – 592 KP 592 – 594.9	High value mountain goat habitat
Sweetin River Beaver dams located at Stevens Lake and habitat along the Suskwa River	Beaver hunting areas
Salmon River, Pinenut Creek and extends to Suskwa	Hunting areas

EAO understands that the list of high value habitat areas identified in the table above represents wildlife habitat in the asserted traditional territory, within the vicinity of the proposed Project that has the potential to be used for hunting by Gitxsan members, and which was identified through the Gitxsan Final TLU Report.

The proposed Project would intersect several areas of high value wildlife habitat and may intersect or be close to important hunting areas. Local habitat alteration will occur as a result of the proposed Project at watercourse crossings and in upland terrestrial areas. Five deer hunting areas, 10 bear hunting areas, 5 moose hunting areas, 5 mountain goat hunting areas, 3 beaver hunting areas, and up to 3 other hunting areas would be crossed by the project. Proposed access roads and the ROW created by the proposed Project will alter current access conditions into and near some of these areas.

Gitxsan members' access to the proposed Project area to hunt may be affected in the short term, for a limited area and time during the construction phase, when access may be restricted for safety reasons, and to a lesser extent over the medium term during the operation of the pipeline. In the longer-term, access created by the maintenance of the

pipeline ROW has the potential to increase Gitxsan members' access to hunt in some areas. Increased hunting and predation on wildlife species as a result of increased access could reduce the populations of some species over time and impact the right to hunt in the future.

Gitxsan requested several mitigations including:

- Avoid spring, summer and fall feeding, mating and birthing areas of grizzly bear populations as well as hibernation areas;
- Avoid creating any further access to mountain goats;
- Environmental monitoring should be in place to ensure integrity of wildlife habitats;
- Involvement in development of the grizzly bear, moose and caribou mitigation strategies as part of the Access Management Plan;
- Involvement in the development of the Caribou Habitat Restoration Plan;
- Construction should be kept at least 100 m from waterways;
- Discourage 'spot and stalk' hunting;
- Prevent ATV and other motorized transport access;
- Avoid seasonally important areas including spring/summer/fall feeding areas, winter hibernation areas and mating and birthing areas;
- Beaver dams need to be preserved and damage to beaver dams should be included in the EMP; and
- Fund baseline studies for wildlife in the area so that the proposed mitigation efforts can be measured properly over the lifetime of the proposed Project.

The Proponent identified a number of mitigations and commitments, many adopted in response to Gitxsan's concerns, including:

- To involve Gitxsan in the development of an access management plan;
- To implement the Construction Environmental Management Plan (CEMP) which includes measures that:
 - o Along with associated management plans related to grizzly bear (i.e., Traffic Management Plan, Access Management Plan and Wildlife Species of Concern Discovery Contingency Plan), include measures that specifically address effects to year-round grizzly bear habitat. The Proponent has included specific mitigation (i.e., setbacks) for bear dens;
 - o Avoid the creation of new access within mountain goat WHA. The Proponent has included specific mitigation measures (i.e. setbacks) for mountain goat WHA in the CEMP, Traffic Management Plan, Access Management Plan and Wildlife Species of Concern Discovery Contingency Plan;

- o Along with associated management plans related to wildlife (i.e., Traffic Management Plan, Access Management Plan and Wildlife Species of Concern Discovery Contingency Plan) and the project's Post-construction Monitoring Program, address effects to habitat;
- o Minimize disturbance at stream crossings including compliance with setbacks specified by the relevant regulatory agency. While a 100 m setback may be achievable in some cases, the Proponent cannot practically implement a 100 m setback from all waterways;
- o Prohibit project workers from carrying firearms or hunting on the worksite. Further, access controls described in the Access Management Plan will minimize the ability of hunters to access the Project ROW;
- o Restrict all motorized vehicle traffic, including ATV, Argo and snowmobile traffic to the worksite; the recreational use of ATVs on the worksite will be prohibited;
- o Implement the CEMP and associated management plans related to wildlife (i.e., Traffic Management Plan, Access Management Plan and Wildlife Species of Concern Discovery Contingency Plan); and
- Beaver dams will be breached in accordance with regulatory requirements, where required. If the remainder of the dam can be preserved, (i.e., it does not interfere with pipe installation, preservation may be attempted. The Proponent cannot practically implement preservation of all beaver dams.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to result in minor to moderate impacts on Gitxsan's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Gitxsan raised the following concerns related to potential impacts of the proposed Project on trapping:

- General concerns about impacts to wildlife resources, including abundance, and implications for Aboriginal rights. Species of concern related to trapping include moose, bear, and wolverine;
- Construction and pipeline activity may force groundhogs from their established habitats;
- Potential for damage or interruption to traplines;

- Increased trapping pressure and direct mortality from the felling of large cottonwoods and spruce trees, which contain furbearer dens during birthing periods;
- Increased mortality as a result of collisions with proposed Project vehicles;
- Noise disturbances resulting in changes to habitat areas;
- Cumulative impacts of the project with other activities; and
- Potential impacts of the pipeline corridor on traplines.

Gitxsan trap porcupine, beaver, groundhog, lynx and rabbit for sustenance. Animals trapped for fur and used in traditional trading and for supplemental income include marten, fox, fisher, wolf, mink, coyote, otter, weasel, rat and mouse. Gitxsan reported that they trap mink and marten around the Kispiox River and Skunsnat Creek. Marten, mink, beaver, lynx, fox, rabbit and wolverine are trapped along 15 km of active trapline across the Shegunia River, Salmon River and Pinenut Creek to Suska. The degree to which these traplines directly intersect with the pipeline route was not disclosed.

The Application listed the following trapping areas in the vicinity of the proposed Project:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
15 km of active trapline across the Shegunia River, Salmon River and Pinenut Creek to Suska	mink, beaver, lynx, fox, rabbit and wolverine

Gitxsan proposed the following mitigation measures:

- Special consideration should be given to mature stands of trees which remain in the Gitxsan *Lax'Yip*, providing habitat to small fur-bearing animals that have their young in the trees; and
- Avoid registered traplines.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to result in minor impacts on Gitxsan's asserted Aboriginal right ability to trap in the area of the proposed Project.

Fishing

Gitxsan raised the following key concerns related to fishing:

- Gitxsan identified impacts to fisheries and fishing as a key concern;
- General potential adverse effects on watercourses; impacts to fish, fish habitat (including spawning and off-channel habitats), fisheries, riparian areas; and water quality, including impacts to soils (erosion);
- General impacts on fish/lakes/rivers. Impacts to fish result in impacts to Aboriginal rights, title, culture, and wealth;
- Impacts to juvenile Salmon returning to the Skeena from the proposed facility impacts on Flora Bank;
- Impacts to the local fish-based economy along the Skeena;
- Comments about the importance of the Babine River for Salmon;
- Concern for downstream effects on fish habitat;
- Avoid laying pipe too close to rivers and lakes;
- Important fishing site at the Skeena historic village site;
- Protection of water for fish is top priority;
- Concern about impacts to the timing and access of fishing opportunities;
- Potential change in ceremonial fishing rights;
- Concern about the methods for river crossings;
- Concerns about impacts to fish habitat from vibrations of drilling during HDD;
- Concern that change in temperature from heat generated by the pipeline and pumping stations could affect watercourses and fish survival;
- Timing and methods of construction may affect salmon spawning; and
- Change in access corridors could open territory to poachers.

Fish are a staple food source for Gitxsan and they have managed their fisheries for many generations. Sockeye, coho, steelhead, spring, pink, chum, Dolly Varden, white fish, squawfish, eulachon, and brook trout are all food sources and are culturally important to Gitxsan. The sockeye salmon run provides Gitxsan members with the majority of high quality dried fish needed to sustain the community over the winter months and is important for trade with other Aboriginal Groups and between community members.

Important harvesting and fish habitat areas include Ironside Creek, Cullen Creek, Skunsnat Creek, Sweetin River, Skeena River, Sedina Creek, Pinenut Creek, Damsumlo Creek, Twin Lakes, Mitten Lake, Little Fish Lake, Sterritt Creek, Shegunia (Salmon) River, Kispiox River, Babine River, and the eastern bank of Swan Lake.

The Kispiox River is high value spawning habitat for salmon as is Ironside Creek, Cullen Creek, Skunsnat Creek and Sweetin River. Major fish spawning areas include the Skeena River, Sedina Creek and Pinenut Creek while other important fishing areas

include Damsumlo Creek, Twin Lakes, Mitten Lake, Little Fish Lake, Sweetin River, the eastern bank of Swan Lake, Sterritt Creek, Shegunia (Salmon) River and the Kispiox River. Salmon are trapped on the Babine River in summer.

Gitxsan expressed concerns that fish stocks are low, and fewer fish are returning each year. Concerns were raised regarding potential changes to creeks and riverbeds that would alter fish habitat and lead to a decrease in fish population, particularly on the Skeena River. The Skeena River and the salmon occurring there are noted as being particularly important and require protection, including from effects on habitat and the migratory stock.

The proposed Project corridor would cross approximately 16 major watercourses with indicated fish presence within Gitxsan asserted traditional territory, including the Skeena River at approximately KP 533.

Ironside Creek, Skunsnat Creek, Shegunia River, Kispiox River, Suskwa River and Skeena River are all intersected by the proposed pipeline route and local habitat alteration would occur as a result of watercourse crossings. Twin Lake and Little Fish Lake are within the local assessment areas, but not directly impacted by the proposed route. The Babine River is not intersected by the pipeline route within Gitxsan *Lax'Yip*. The pipeline route will not intersect or encroach on the shoreline areas of any of the lakes in the area. The new access roads and the ROW proposed by the proposed Project could alter current access conditions near some of these fishing areas.

Gitxsan requested the following mitigation measures:

- Monitors should be employed to keep poachers off the land while still allowing for normal animal movement;
- Monitors should be present during watercourse crossings where salmonid presence has been confirmed including but not limited to Cullon Creek, Ironside Creek, Steep Canyon Creek, Beaverlodge Creek, and Brown Paint Creek;
- Season activities of the salmon must be taken into consideration;
- Prohibit the felling of trees along waterways and marshes;
- Keep construction at least 100 m from marshlands, waterways;
- Should the pipeline be approved, replanting original species is ideal;
- Micro re-routes are required to reduce contact with lakes, creeks and rivers;
- Involvement in the development of the Access Management Plan;
- Gitxsan Watershed Authorities should be involved in monitoring the health of fish populations and habitat;

- All watercourse crossings should be horizontal directional drilling or aerial crossings; and
- Construction schedule needs to account for fish ceremonies.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to fish and fish habitat, current and traditional land use – as discussed in section 17.2.2 of this Assessment Report - the proposed Project is expected to result in minor impacts on Gitxsan's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Gitxsan identified the following concerns related to plant communities and gathering:

- General potential adverse effects on vegetation and plant communities;
- Introduction or spread of invasive or non-native species;
- Berry patches;
- Pine mushrooms;
- Medicinal and spiritual plants;
- Potential loss of wetland habitat, function, and water quality; alteration of loss of riparian habitat;
- Potential use of pesticides or herbicides on the ROW and potential impacts on country foods;
- Reclamation of the pipeline ROW after construction is completed;
- Continued access to harvesting areas;
- Pipeline corridors could act as wind tunnels and move in invasive species, in the form of plant seed and spores;
- Construction and logging activities can damage growing areas and result in the removal of "photosynthetic hosts" for mushrooms;
- Use of CMTs for cultural purposes; and
- Loss of yellow cedar.

Gitxsan members harvest a variety of plants for medicinal and nutritional purposes. Important plants include root vegetables, green vegetables, berries, fruits, and hemlock and other cambiums. Pine mushrooms are vital to many community members because of their economic value. Gitxsan traditionally gather different berries at different times of the year. Important berries include soapberries, saskatoons, huckleberries, highbush cranberries, and wax berries.

Gitxsan expressed concern about disruption during proposed Project construction as well as cumulative effects on many plant species, including berry patches, cedar and pine mushrooms. Gitxsan are concerned about potential increased access to areas considered highly proprietary pine mushroom patches and the potential long term impacts from loss of pine mushroom habitat. Gitxsan would like the corridor to be replanted as soon as possible after construction.

The Application included the following gathering places in the vicinity of the proposed Project:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
KP 472.9 – 474 KP 479 KP 477 KP 487 – 488.1 KP 519.8 – 522 Huckleberries are located along Harold Price Creek, Skilokis Creek, and Skilokis Mountain	Berry patches in vicinity of project
Along Suskwa River and Natlan Creek	Huckleberry harvesting areas intersected by route
Along the Suskwa River, Harold Price Creek, Natlan Creek, Skilokis Creek, and Skilokis Mountain	Key plant gathering habitat

Ten berry patches were identified by Gitxsan that would be impacted by the project corridor. Eight are not directly impacted by the proposed route, but are within the LAA. Two huckleberry harvesting areas along Natlan Creek and Suskwa River would be intersected by the pipeline route.

Gitxsan raised the following mitigation measures:

- No pesticide or herbicide be used on the ROW;
- Replanting of corridors would not happen quickly enough to mitigate damage done to the natural habitats;
- Avoid mushroom patches;
- Protect berry patches and watch for culturally modified trees around berry patches;
- Ensure that cedar, wild rice, also known as chocolate lily, is protected;
- Plants for medicinal use;

- Medicinal plants must not be touched by humans, disturbed or walked over prior to harvesting; and
- Involvement in the development of the Access Management Plan.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to result in minor impacts on Gitxsan's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Gitxsan have used and continue to use the land for cultural and sacred purposes. Gathering areas, habitation areas (including cabins, campsites, smokehouses, and ancient villages), and sacred areas (cremation, burial, ceremonial, and healing) are located in the Gitxsan *Lax'Yip*.

Gitxsan raised concerns regarding potential adverse effects to areas of cultural significance, including:

- Potential for impacts to archaeological sites and concern that sites will be removed or destroyed with a permit under the *Heritage Conservation Act*;
- Impacts to trails (e.g., trail to Kitseegas);
- Concern about potential impacts to cultural sites/ trails and cabins;
- Avoidance of heritage resource sites, specifically burial sites;
- Impacts to Aboriginal rights and title;
- Ancient trails exist on each *Lax'Yip* and there is a need to identify all ancient trails;
- Concern that trails will be more than disrupted - they may be destroyed; and
- Y-junction trail intersecting the proposed Project.

Trails and Travelways

Through the Gitxsan TLU, 41 trails within in the local assessment area were identified as being used to access communities, fishing sites, traplines, berry harvesting locations and other culturally important locations. Gitxsan identified a Y Junction trail that would be intersected by the project and an active trail up Sedina Mountain. Several watercourses in Gitxsan's asserted traditional territories are historically and currently used as travelways when frozen in the winter months. Traditional trails include the Oolichan, also known as the Grease Trail, Kuldo, Atna Pass, Kispiox and Sedina

Mountain Pass trails. It is unclear to EAO if these named or referenced trails correspond to the trail crossings identified below.

The Application listed the following trails and travelways in the vicinity of the proposed Project:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trails	
KP 474.2 KP 478.8 KP 484 KP 486.5 KP 491.9 KP 492.8 KP 502.9 KP 503.7 KP 514.8 KP 516.6 KP 518.2 KP 519.3 KP 524.4 KP 529.9 KP 531.6 KP 531.8 KP 533.4 KP 533.8 KP 534.1 KP 534.3 KP 534.6 KP 53, KP 538.2 KP 545.2 KP 548.5 KP 552.5 KP 566.4 KP 570.4 KP 573.9 KP 575.6 KP 576.2 KP 576.6 KP 577.9 KP 578.8 KP 582.5 KP 585 KP 585.1 KP 589.8 KP 595.6	Trail Crossings
trail intersecting KP 502.9 and 503.7	Trail Junction
KP 473 – 489 KP 484 – 486 KP 492.8 – 494.2	Trails parallel to or directly on the Project ROW

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
KP 499 – 503.7, 503.7 – 508.6 KP 517 and 518 KP 515 and 520.5 KP 538 and 545 KP 556.8 and 558 KP 577.9 and 578.8 KP 579.5 - 580	

The proposed Project would intersect or be close to 41 traditional trails. New access roads and the ROW created by the proposed Project would alter current access conditions. Community members indicated that there are likely many cultural archaeological features surrounding trail networks within the Gitxsan territory which remain either undocumented or currently unknown. It is important to community members that these trails and the cultural and archaeological features that accompany them are protected.

Gitxsan requested the following mitigation measures:

- Trails must be protected, specifically the trail leading up Sedina Mountain;
- A buffer of 100 m be established around all trails;
- The Proponent to fund preservation of ancient Gitxsan trails; and
- Involvement of Gitxsan in the development of the Access Management Plan.

Habitation and cultural sites:

The Application identifies that habitation areas are used for hunting and trapping, often providing central access to numerous traplines. They are also used as places to dress game and set up smokehouses to prepare fish.

Habitation areas have been identified near Kwinagesse Lake, on the west bank of the Kispiox River, along Sweetin River, Swan Lake, Stevens Lake, Kuldo Creek, Little Fish Lake, Dam Muuukw Lake, Suskwa River, Skeena River, below Twin Lakes, on Driftwood Creek, at Deep Canoe Creek, along Iltzul Creek, as well as on the south side of Xsilaadamuus. More habitation areas are located along Pinenut Creek and on the north bank of Utsun Creek.

The location of cabins and smokehouses on the Suskwa River are less than 500m south of KP 474 and 479, directly on the ROW at KP 483.5, 486.6, and less than 1 km south of KP 493. There is a campsite at Dam Muuukw Lake, 1.4 km north of KP 520, as well as a campsite 2.6 km north KP 515.5.

Areas identified by Gitxsan as sacred are present near Stevens Lake on Telegraph Trail, on the west bank of Dam Similo'o, and on the east bank of the Skeena River (near KP 530). Culturally modified trees occur along the Sedina Trail, as well as north of Klup Lake and south of Date Creek. Four carved masks on CMTs and multiple grave pits are located north of Stevens Lake on Telegraph Trail. There are sites described as being of sacred significance for healing and ceremony on the west bank of Dam Similo'o, less than 300 m from the ROW between KP 531 and KP 531.4. A cremation site on the east bank of the Skeena River is less than 500 m west of KP 530.

The Application listed the following habitation and cultural sites in the vicinity of the proposed Project:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Habitation Sites	
500 m west of KP 529.5 to KP529.7 200 m east of KP 524 500 m south of KP 474 500 m south of KP 479 at KP 483.5 at KP 486.6 1 km south of KP 493	Habitation Sites (cabins and smokehouses)
300 m from KP 531 500 m west of KP 530 KP 529.8	Sacred areas
north bank of Utsun Creek from KP 532.1 to KP 533	Ancient village site

EAO's review of ethnohistoric information points to several home sites located within approximately 2 km of the proposed Project in the following areas:

- Suskwa River in the vicinity of the Harold Price Creek confluence;
- Mid Skeena River west of Mt. Thomlinson and Sidina Mountain and east of Tenas Hill near Kispiox Village, and
- Kispiox River between the confluence of the Sweetin River and Sgansnat Creek.

In addition, the proposed Project would pass within 3 km of the Kispiox village, located at the confluence of the Skeena and Kispiox Rivers.

The Application identifies 7 habitation sites within 1 km of the proposed ROW, with two sites on the proposed ROW at the Suskwa. Three sacred areas are identified within 500 m of the ROW, with one site intersected by the ROW, CMTs on the Sedina Mountain Trail.

Gitxsan requested the following mitigation measures:

- Avoid all cabin and camp locations;
- Sweat lodges must be avoided;
- Involvement in the development of the Access Management Plan;
- Avoidance of old cremation site on east bank of the Skeena River;
- Avoidance of sacred site located on the west bank of Dam Similo'o;
- Sacred site for healing and ceremony on west bank of Dam Similo'o is not to be entered under any circumstance;
- Development is often damaging to culturally significant trees and, therefore, activities on Gitxsan territories need to be monitored in order to ensure that CMTs are protected; and
- If trees need to be cut down during construction and operation, the tree species should be identified and Gitxsan notified.

In consideration of the information available to EAO, the Proponent's proposed mitigations, proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project may result in minor to moderate impacts on Gitxsan's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Gitxsan Nation

During the EA process, Gitxsan raised a number of additional concerns with the proposed Project. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.10. Other concerns raised by Gitxsan and responses from EAO, are outlined below.

Key Issue/Concern	EAO Response
Monitoring of activities and of ROW for years after construction; Gitxsan involvement in monitoring	EAO has proposed a condition to require the development and implementation of an EMP prior to construction. The Proponent must engage with relevant regulatory authorities and Aboriginal Groups in the development of this and other management plans and must also carry out a Post-Construction Monitoring Program in accordance with section 37 of the Application.

18.6 Gitanyow

Context

- The Gitanyow Hereditary Chiefs' Office advised EAO that it represents the Gitanyow *huwilp* (except Luux Hon) as the *huwilp* are described as the social, political, and governing units of the Gitanyow.
- Gitanyow is comprised of three reserves. Gitanyow has approximately 800 band members with approximately half living on reserve.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- In March 2012, Gitanyow and the Province of British Columbia signed the *Gitanyow Huwilp Recognition and Reconciliation Agreement (RRA)*. The purpose of the RRA is to build upon the relationship between the Gitanyow and the Province with the intention of guiding land and resource management on the Gitanyow Lax'yip. The RRA addresses the asserted or determined aboriginal rights, including title, as recognized and affirmed under section 35 of the *Constitution Act, 1982* (Aboriginal Interests). Specifically, section 2.2 of the RRA states that the intent of the RRA is to:
 - o "Provide a foundation for a respectful Government-to-Government relationship within which the Parties can collaborate in the implementation and monitoring of this RRA;
 - o Create increased certainty in regard to land and resource management and economic benefits for both Parties;
 - o Establish a clear, reliable and efficient framework for Shared Decision-Making, Land and Resource Decisions; and
 - o Achieve meaningful engagement, a common understanding of each Party's respective interests, including *wilp* sustainability, and the Parties' shared interests, and promote well-informed decision-making."

Part 2 of the RRA comprises the Gitanyow Lax'yip Land Use Plan, which section 8.2 of the RRA states will enable the Gitanyow and the Province to work together on:

- o "Implementing the results of Government to Government land use discussions in a spirit of collaboration; and
- o Addressing strategic and operational land use issues as they arise in the future."

- During the course of considering the proposed Project, Gitanyow Hereditary Chiefs' Office requested EAO not undertake preliminary strength of claim assessments, indicating that in their view, doing so is inconsistent with clauses in the RRA. Although the RRA is a government to government agreement between BC and Gitanyow, the RRA does not capture how consultation on EA decisions impacting Gitanyow Lax'yip should proceed. There has since been discussions of a Letter of Understanding between EAO and Gitanyow, and an indication from EAO that it could consider amendments made to the RRA to specifically address EAs.
- EAO required the Proponent to consider management directions set out in the Gitanyow Lax'yip Land Use Plan (Plan) and how that Plan may inform, for example, route selection and mitigation approaches and efforts relating to the proposed Project.
- See Table 1 below for EAO's analysis of the potential impacts from the proposed Project on the March 2012 Gitanyow Lax'yip Land Use Plan.
- The proposed Project crosses approximately 50 km of Gitanyow's asserted traditional territory. The proposed Project route enters the eastern portion of Gitanyow territory around Flatfish Lake and Hilltop Lake and continues west to the Nass River, following the Nass River southwest past its confluence with the Cranberry River and then heading south, exiting Gitanyow territory. EAO acknowledges that the proposed Project may impact areas of strong *prima facie* claims of Gitanyow Aboriginal rights and title, particularly given that the project traverses areas proximate to village sites and other core areas of occupation, at 1846, on the Kispiox, lower Cranberry and lower Nass Rivers.
- There is one compressor station proposed within Gitanyow territory at Borden Lake. There is one work camp proposed within Gitanyow's asserted territory, as well as two ancillary sites.
- Gitanyow *huwilp* are listed in Schedule B of the Section 11 Order as *wilp* Gamlakyeltxw, *wilp* Malii, *wilp* Gwaas Hla'am and *wilp* Watakhayetsxw represented by the Gitanyow Hereditary Chiefs' Office; *wilp* Luux Hon was listed on Schedule B and consulted separately, and was subsequently moved to Schedule C after the Proponent took the Alice Arm route option that would have traversed Luux Hon territory out of consideration.
- Given the nature and location of the proposed Project corridor route and the potential impacts to Gitanyow's Aboriginal Interests, EAO is of the view that the duty to consult lies in the middle to deep part of the *Haida* spectrum.

Summary of Consultation

Gitanyow was invited to review and provide comments on the draft Section 11 Order, draft AIR, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Gitanyow was also provided with opportunities to attend Working Group meetings, workshops and to meet with EAO staff directly.

EAO provided the Gitanyow Hereditary Chiefs' Office with \$5,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$10,000 in capacity funding during the Application Review phase of the EA. EAO provided Luux Hon with \$1,000 in capacity funding during the Pre-Application phase of the EA for the proposed Project, and \$2,000 in capacity funding during the Application Review phase of the EA. The proponent provided initial capacity funding for Gitanyow to engage in discussions regarding the proposed Project in May 2013 and provided Luux Hon with funding through Sim Gyeekx Group Maintenance Ltd, in June 2013.

Gitanyow Hereditary Chiefs Office submitted a letter to EAO on September 17, 2013 with comments on the draft Section 11 Order, the VCs Selection Document and EAO's consultation approach. Gitanyow Hereditary Chiefs Office also provided comments on the draft AIR. Gitanyow Hereditary Chiefs Office submitted letters to the Minister of Environment (July 15, 2013 and August 18, 2014) with extensive comments regarding EAO's interpretation of the *Gitanyow Huwilp Recognition and Reconciliation Agreement* and EAO's duty to consult Gitanyow. Gitanyow Hereditary Chiefs wrote to EAO October 8, 2014 stating that Gitanyow would not be providing comments on this Assessment Report and would be providing a separate submission to Ministers.

EAO met with the Gitanyow Hereditary Chiefs' Office on June 25, 2014 to discuss the proposed Project, EA Application Review schedule and Gitanyow's concerns.

EAO met with Luux Hon on June 4, 2014 to discuss proposed natural gas pipelines in Luux Hon territory and again on June 20, 2014 along with OGC to discuss the proposed natural gas pipelines and the respective roles of EAO and OGC in reviewing applications.

Gitanyow conducted a Cultural Impact Study (CIS) (the *Gitanyow Lax'yip Cultural Impact Study for the Proposed Prince Rupert Gas Transmission Project*) and Socio-Cultural Needs Assessment. The Proponent received TLU information on November 18, 2013, which was been incorporated into the Application, where appropriate.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Gitanyow in person and via teleconference multiple times. The Proponent also conducted helicopter fly overs with members of the Gitanyow Hereditary Chiefs' Office and their consultants, as well as Luux Hon to assess the route and various aspects of the proposed Project.

EAO met with the Gitanyow Hereditary Chiefs' Office on June 25, 2014 to discuss the proposed Project, EA Application Review schedule and Gitanyow's concerns.

EAO met with Luux Hon on June 4, 2014 to discuss proposed natural gas pipelines in Luux Hon territory and again on June 20, 2014 along with OGC to discuss the proposed natural gas pipelines and the respective roles of EAO and OGC in reviewing applications.

In a letter to the Minister of Environment in August 2014, Gitanyow advised that it was serving notice to EAO that no approvals leading to the alienation or exploitation of resources within the Gitanyow Lax'yip would be allowed without the express consent and authorization of Gitanyow under threat of court action.

In a letter to the Proponent on September 14, 2014, after learning that the Proponent was awarding a contract in Gitanyow territory to the Nisga'a for 35 km of ROW clearing, Gitanyow stated it was withdrawing from negotiations with the Proponent and serving the Proponent notice and demand to cease and desist any work and immediately vacate the Gitanyow Lax'yip under threat of court action. EAO is not aware of a resolution to this matter.

Potential Impacts of the Proposed Project on Gitanyow's Asserted Aboriginal Interests

Requests for Route Changes

Key concerns raised in meetings with the proponent were the potential adverse effects of the proposed Project and its associated activities on the Gitanyow Lax'yip Land Use Plan and its objectives. The Gitanyow Hereditary Chiefs' Office indicated that they did not support the Proponent's initial proposed or alternative routes due to the potential effect on the Gitanyow Lax'yip Land Use Plan.

Key concerns with the proposed route included:

- Potential effects at the proposed Cranberry River crossing specifically on moose winter range, fish and fish habitat, and goshawk nesting sites and habitat;

- Potential effects on the Nass River from the Alice Arm alternative route; and
- Potential effect of the route on grizzly bears, mountain goat, and other wildlife.

In July 2013, the Proponent and Gitanyow Hereditary Chiefs Office formed a Route Selection Working Group to collaboratively engage and resolve routing concerns. Through subsequent meetings, the Proponent made seven amendments to the proposed route, which were accepted by Gitanyow Hereditary Chiefs' Office. A draft Interim Route Selection Agreement was tabled by Gitanyow Hereditary Chiefs' Office and at the time the Application was submitted, was undergoing review by Gitanyow Hereditary Chiefs' Office and the Proponent. At the time of writing this report, a Pipeline Route Protocol Agreement was undergoing review by the Gitanyow Hereditary Chiefs' Office. The proposed Alice Arm alternative was put on hold, and not included in the Proponent's Application.

Gitanyow Final CIS Report is based on the Gitanyow Preferred Route (GPR). The Proponent largely adopted the GPR as described in the CIS Report, except for KP 14-23, KP 25-34 and KP 48-54 on the GPR where minor deviations were made for side hill, constructability and access.

Key issues identified by Gitanyow are ensuring the Proponent respects the Gitanyow Lax'yip Land Use Plan (GLLUP) and its objectives, including addressing concerns outlined in the routing section such as potential effects of the proposed Project at the Cranberry River crossing on moose winter range, fish and fish habitat, and goshawk nesting sites and habitat; effects on grizzly bears, mountain goat, moose winter range; and minimizing effects to ecosystem networks, ecosystem buffers, and old-growth Management Areas.

Aboriginal Title

EAO has addressed potential impacts to Gitanyow asserted Aboriginal title by ensuring that Gitanyow are meaningfully consulted and accommodated around the potential effects of this proposed Project, which has included a significant route adjustment in response to routing concerns raised by Gitanyow as described above. The Province and the Proponent have approached Gitanyow to discuss initiatives that would provide financial, environmental and training benefits as outlined above in section 16.7. To this end, economic benefits of the project are being discussed amongst other accommodations, including those arising on potential Aboriginal title lands, and Gitanyow has a role in considering the proposed use for those lands.

Given the potential impacts to Aboriginal Title described in 17.2.7 and considering the proposed routing north away from the Cranberry River watershed, in EAO's opinion, the

proposed Project is expected to have minor impacts on Gitanyow's asserted Aboriginal title to the proposed Project area. Further, the Province and the Proponent are involved in separate discussions with Gitanyow relating to potential benefits, including economic benefits, for LNG-related projects.

Hunting

Gitanyow raised key concerns regarding wildlife, wildlife habitat and the ability to hunt within its traditional territory including:

- The importance of the on-going availability of traditional terrestrial and freshwater foods;
- Potential changes to populations of grouse, which are an important food source for hunters, as well as other birds;
- Negative effects on wildlife from compressor stations, particularly due to noise or air emissions;
- The potential for helicopters used in fieldwork to adversely affect goats during kidding and moose in valley bottoms during winter;
- Changes to bear populations and behaviour, including displacement and alienation, loss of food habitat, and increased hunting pressure;
- Effects to grizzly bears, which have low reproductive rates, and are particularly sensitive to the effects of roads, including increased mortality from collisions with vehicles and from increased access for poachers, as well as displacement from natural habitat areas near roads;
- Changes to the landscape, such as clear cutting or roads, exposing wildlife to predators and increase access to habitat for recreational hunters;
- Cumulative effects on wildlife including Cranberry grizzly bear and moose
- Effects to winter habitat for moose;
- Effects on moose populations, which are already in decline, from the opening of old roads, which are beginning to recover after previous deforestation, putting additional stress on the population through collisions with traffic, increased access for hunters and predators, and habitat fragmentation; and
- Declining moose populations will result in a change to the ability to hunt moose. The Gitanyow Final CIS Report noted that the Nass moose population has declined 68% in the last decade.

EAO does not have information on specific sites used by Gitanyow near the proposed Project area for hunting, the frequency of any such hunting, what times of year different species are hunted, or the proportion of Gitanyow members involved in hunting.

Other known Gitanyow hunting sites include Meziadin Lake and extend north to Surveyors Creek and the Bell-Irving River (approximately 60 km north of the proposed Project). The salmon-rich Hanna and Tintina watersheds (near Meziadin Lake) are important for hunting grizzly bear, which is a species of particular cultural significance for *wilp* Malii.

According to the Application, hunted and or trapped species include moose, caribou, mountain goat, black bear, grizzly bear, coyote, wolf, rabbit, beaver, porcupine, squirrel, marten, wolverine, fisher, weasel, and groundhog. Moose, mountain goat, caribou, grizzly bear and furbearer were included as Key Indicators in the Wildlife Valued Component in the EA.

Key wildlife habitat is located along the proposed route, which was detailed in the Gitanyow Final CIS Report. Key habitat is found particularly at kilometre post (KP) 592.8 to 593.8 (near Hilltop and Octopus lakes, KP 6 to KP 7 on the GPR), 72 m north of KP 594.8 to KP 597 (KP 8 to KP 10.3 on the GPR), 194 m north of KP 600, 884 m north of KP 605.8 and 1.6 km north of KP 619.1 (KP 13, 19, and 29 on the GPR) and in old-growth forests and valley bottoms. Goat-kidding habitat and moose winter habitat in valley bottoms were also identified.

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this Assessment Report - the proposed Project is expected to result in minor to moderate impacts on Gitanyow's ability to hunt within its traditional territory in the area of the proposed Project.

Trapping

Gitanyow raised key concerns regarding wildlife, wildlife habitat and the ability to trap within its traditional territory including:

- The importance of continued availability of traditional terrestrial and fresh water foods;
- The potential for compressor stations to have an effect on wildlife was also identified;
- Habitats for furbearers and other animals traditionally relied upon have already been degraded; and
- The potential for the proposed Project to displace and alienate old-growth forest dependent furbearers, such as marten, fisher, wolverine, and weasel.

According to the Application trapped species include coyote, wolf, rabbit, beaver, porcupine, squirrel, marten, wolverine, ferret, fisher, ermine, weasel, and groundhog.

Key habitat areas were identified along the route including old-growth forest, a high concentration of wildlife in an area influenced by Hilltop and Octopus lakes, between KP 592.8 and 593.8 (KP 6 and KP 7 on the GPR), and several beaver dams, including one that would be intersected by the GPR. Marten, fisher, wolverine, and weasel habitat was identified between 72 m north of KP 594.8 and KP 597 (KP 8 and KP 10.3 on the GPR).

In consideration of the information available to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have minor impacts on Gitanyow's ability to trap within its traditional territory in the area of the proposed Project.

Fishing

Gitanyow raised key concerns regarding fish, fish habitat and the Aboriginal right to fish including:

- Potential for changes to freshwater traditional foods;
- Potential for the proposed Project to affect juvenile salmon and shellfish;
- The potential for project compressor stations to affect traditional aquatic resources;
- Identified that routing options may have adverse implications for the Gitanyow Lax'yip Land Use Plan, including the proposed Cranberry River watercourse crossing, which has the potential to affect fish and fish habitat;
- Potential for the alteration of fish habitat, increased sedimentation and erosion during construction of stream crossings, spills of construction materials, and pipeline ruptures during operations; and
- Potential for poorly located roads or culverts to alter hydro-geomorphic processes, stream ecosystems, and fish. The study also reported that fish habitat has already been degraded by previous and existing industrial development in the area.

According to existing information available from another proposed pipeline application, sockeye is the fish of choice for the Gitanyow, and Gitanyow entered into a Comprehensive Fisheries Agreement with the federal government in 1999. The purpose of the agreement is to involve the Gitanyow in the management and protection of fish

and fish habitat, and sets out the timing, locations, and number of fish per species that the Gitanyow can harvest each year.

The Kitwanga River was a main source of fish for Gitanyow members. As a result, the main historic settlement of the Gitanyow is within the Kitwanga Watershed along the “Grease Trail” between the Skeena and Nass rivers. This location is particularly rich with sockeye salmon originating from Kitwancool Lake. Protecting the salmon spawning habitat is important to Gitanyow *huwilp*, especially along the Cranberry and Kiteen rivers, and in Brown Bear Creek.

Salmon are primarily caught in late summer and Gitanyow Lake and the rivers around the village are popular fishing grounds.

Information from another proposed pipeline project application identified the following fishing sites that are also in close proximity to this proposed Project, at approximately:

- 1.8km west of KP 629 (Cranberry River);
- 1km west of KP 631 (Kiteen River); and
- 7 m northwest of KP 611.

According to the Proponent’s Application, marine and aquatic resources harvested by the people of Gitanyow include chinook salmon, coho salmon, sockeye salmon, pink salmon, steelhead, rainbow trout, cutthroat, bull trout, Dolly Varden as well as shellfish. The Cranberry River was identified as one key habitat area along the Gitanyow Preferred Route.

Freshwater aquatic resources and marine resources were included as VCs in the assessment. Major watercourse crossings within Gitanyow territory are Aluk Creek (KP 599), Derrick Creek (KP 612) and Cranberry River (KP 632).

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures, proposed conditions by any EA Certificate issued, and EAO’s analysis of residual and cumulative effects on fish, fish habitat, current and traditional land use – as discussed in section 17.2.3 of this Assessment Report - the proposed Project is expected to have minor impacts on Gitanyow’s ability to fish within its traditional territory in the area of the proposed Project.

Gathering

Gitanyow First Nation raised key concerns regarding plants and the Aboriginal right to gather including:

- Potential for changes to the availability of traditional terrestrial and fresh water foods and changes to marine vegetation, which are both culturally and ecologically important;
- Potential risk to red cedar stands;
- The proposed Project has the potential to reduce pine and other mushroom habitat. Gitanyow has a particular interest in pine mushrooms, because the commercial sale of pine mushrooms is an economic staple for many Gitanyow families; and
- High quality huckleberry patches are rare in the Traditional Territory of Gitanyow, but there is a long history of cultural use of huckleberries and huckleberry habitat management through prescribed burns. The Gitanyow Final CIS Report explained: “Because of the changing forest dynamic along the proposed route, special attention needs to be paid to ensure healthy huckleberry patches in each respective *wilp* Lax’yip”.

Plant resources harvested by the people of Gitanyow include huckleberry, pine mushrooms, and other mushrooms in addition to other berries, medicinal plants, and other plants used for cultural purposes. The Gitanyow Final CIS Report identified one high quality huckleberry area 854 m north of KP 642 (KP 53 on the GPR). The Gitanyow Final CIS Report also noted that other huckleberry areas are located at KP 599, 16 m north of KP 601 and 630 m north of KP 607 (KP 12, 14, and 20 on the GPR). Red cedar stands were identified as key plant gathering areas.

Vegetation and Wetland Resources was included as a VC in the assessment.

In consideration of the information available to EAO, the Proponent’s proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO’s analysis of residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this Assessment Report - the proposed Project is expected to have minor impacts on Gitanyow’s ability to gather within its traditional territory in the area of the proposed Project.

Culturally important sites, trails and travelways

Gitanyow raised key concerns regarding culturally important sites including:

- Potential for alteration of CMTs - A Gitanyow CIS participant noted that CMTs “are an integral part of the historical record on the land of Gitanyow occupation and ownership;” and
- Potential for disturbance to village sites and fishing camps within the 3 km corridor assessed by the CIS. The study explains that although most are avoided

by the Gitanyow Preferred Route, access and infrastructure requirements during construction could disturb or reduce the ability to use these sites.

Gitanyow have used and continue to use the land for sacred purposes. Burials and CMTs are two examples of sacred activities. The Gitanyow Final CIS Report identified a group of ten or more CMTs near KP 6 of the Gitanyow Preferred Route. No potential project effects on Gitanyow trails or travelways or gathering areas were identified; no potential effects on gathering areas were identified.

Information from another proposed pipeline application indicated that Gitanyow's traditional territory contains numerous culturally important sites, including historic and modern trails and travelways, camps, villages, and areas with high concentrations of culturally-modified trees. According to that application, Kitwancool Trail was a major travel and trade route that connected Grease Harbour on the Nass River with inland areas, and is located approximately 1.8 km west of KP 629 on the proposed route. As described in the Application, there is also a known sacred site 1.8 km west of KP 629 on the proposed route, consisting of a series of petroglyphs near the Cranberry River.

In consideration of the information available to EAO, the Proponent's proposed mitigations, proposed conditions of any EA Certificate issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this Assessment Report - the proposed Project is expected to result in minor impacts to Gitanyow's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Matters of Concern to Gitanyow

During the EA process, Gitanyow raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.10.

Table 18-1: EAO's analysis of the potential impacts from the proposed Project on the March 2012 Gitanyow Lax'yip Land Use Plan

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
Water Resources			
Protect and maintain surface and groundwater to: • Provide a safe and sufficient drinking water supply that supports healthy communities; • Maintain water quality, quantity, peak and low flows within the range of natural variability in rivers, streams, lakes, and wetlands to protect the hydrological integrity of their watersheds (water quality includes temperature, turbidity, and chemistry)	• Limit potential for soil surface erosion • Manage human activities to maintain hydrologic stability of watersheds • Maintain ecological functioning of streams, rivers, wetland complexes, and lakes, including those that do not support fish populations • Maintain the functional integrity of floodplains and alluvial fans • Restore the water quality and hydrologic integrity of damaged watersheds throughout the plan area • Maintain the watershed of Ten Link Creek as a community watershed to provide domestic water supply to Gitanyow village (Cranberry Planning Unit)	• See section 5.6 of the Assessment Report for a detailed analysis of potential effects on water (including surface water and groundwater). • The proposed Project does not overlap with the watershed of Ten Line creek • The maximum direct disturbance⁺ to Equivalent Clearcut Areas, based the Project footprint, is: • Borden – 9.2ha (0.4%) • Aluk – 35.8 ha (0.4%) • Derrik – 56.1 ha (0.5%) • Extra – 98.6 (2.1%) • Upper Kispiox – 14.6 (0.3%) (⁺ actual new disturbance may be less where the corridor is following previously disturbed areas)	Consistent with GLLUP
Biodiversity Resources (GLLUP Layers: Ecosystem Network, Ecosystem Network Buffer; Old Growth Management Area)			
• Ensure ecosystem function across the range of ecosystem types, reflective of the historic natural disturbance regime at the landscape and stand level over time	• Maintain a landscape pattern of patchiness that, over the long term, reflects the natural disturbance pattern • Maintain or recruit	• See section 5.7 of the Assessment Report for a detailed analysis of potential effects on vegetation and wetlands. • See section 5.8 of the Assessment Report for a detailed analysis of	Consistent with GLLUP – the proposed Project is not expected to have significant effects to vegetation, wetlands or wildlife that occurs in

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
• Maintain habitat connectivity throughout the landscape • Connect old-growth management areas • Provide a continuum of relatively undisturbed habitats that possess interior forest conditions for indigenous species that depend on mature and old-growth forests • Facilitate movement and dispersal of organisms across the landscape by providing core areas and dispersal corridors that will help a variety of organisms re-colonize their historic range • Protect and maintain effectiveness of riparian habitats; all riparian habitats have disproportionately high biodiversity values relative to their proportional occupancy of the landscape • Preserve Gitanyow traditional use sites and maintain opportunities for traditional use of the land	structured attributes of old forests to support stand-level biodiversity • Preserve red-listed (endangered or threatened) plant communities, as classified by the BC Conservation Data Centre • Conserve blue-listed (at risk) plant communities as classified by the BC Conservation Data Centre • Maintain a diversity of coniferous and deciduous species that represent the natural species composition at the landscape and stand levels • Maintain a range of forest seral stages by BEC variant, within each landscape unit, that reflects the natural disturbance regime • Maintain structured connectivity in the Ecosystem Network identified in Schedule A, Maps 1-10	potential effects on wildlife habitat. • The Project footprint crosses 13 ha of Ecosystem Network and 14 ha of Ecosystem Network Buffer area. • The Application Corridor crosses 124 ha of Ecosystem Network and 207 ha of Ecosystem Network Buffer. • The proposed Project footprint crosses 0.6 ha of legal OGMA and 8.6 ha of non-legal OGMA. • The Application Corridor intersects 25.6 ha of legal OGMA and 87 ha of non-legal OGMA. • Gitanyow requested that the Proponent implement HDD crossings at each ecosystem network. • The Proponent identified that implementing HDD at all water crossings within the ecosystem network was not feasible. The Proponent proposed a narrow ROW approach to significantly lower impacts to the ecosystem network when compared to the originally planned normal width ROW, and resulted in a lower overall area impact when compared to the HDD proposal due to fewer roads having to be built to facilitate the HDD option.	Gitanyow territory.
Pine Mushroom Resources (GLLUP Layers: Old Growth Management Area)			
Maintain pine mushroom resources	Maintain productive pine	• See section 5.7 of the Assessment	Consistent with the

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
and provide opportunities for a sustainable harvest	mushroom sites across the plan area	Report for a detailed analysis of potential effects on vegetation, including pine mushroom. The Application estimates that the proposed Project traverses 352 ha of pine mushroom habitat.	GLLUP – with mitigation proposed, the proposed Project is not expected to have significant adverse effects on vegetation, including pine mushrooms.
Moose Resources (GLLUP Layers: <i>Moose Winter Range</i>)			
- Manage moose winter range to help ensure a healthy moose population - Minimize pressure on the moose population from legal and illegal harvest through human access management	- Maintain, enhance or restore moose winter range habitats identified on Schedule A Maps 1-10 - Through access management, minimize mortality and disturbance to moose within and adjacent to the moose winter ranges identified on Schedule A, Maps 1-10	- See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including moose). - The proposed Project footprint intersects 80 ha of moose winter range - The Application Corridor intersects 819 ha of moose winter range.	Consistent with GLUUP
Mountain Goat Resources (GLLUP Layers: <i>Mountain Goat Winter Range; Mountain Goat 500m Buffer; Canyon Dwelling Mountain Goat</i>)			
- Manage mountain goat winter range to help ensure a healthy mountain goat population - Avoid disturbance and displacement of mountain goats during vulnerable periods - Minimize pressure on the mountain goat population from legal and illegal harvest through human access management	- Minimize adverse disturbance to goats within the mountain goat winter range identified on Schedule A, Maps 1-10 - Minimize the number or roads within 500 m of mountain goat winter range and 1000m of canyon-dwelling goat winter range - Minimize adverse	- See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including mountain goat). - The proposed Project does not cross any Mountain Goat Winter Range, Mountain Goat 500 m Buffer, or Canyon Dwelling Mountain Goat areas.	Consistent with GLLUP

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
	disturbance to mountain goat winter range from helicopter logging activities		
Grizzly Bear (GLLUP Layers: Grizzly Bear Wildlife Habitat; Grizzly Bear Identified Watershed)			
Provide adequate grizzly bear habitat to help ensure a healthy population of grizzly bears	• Preserve the highest value grizzly bear habitat, identified in Schedule A, Maps 1-10 as either: a) Grizzly Bear Habitat Complex - o Class 1: Very High; prov'lly significant value - o Class 2: High Value (Cranberry, Kispiox and Kalum Planning Units) - or b) Grizzly Bear Specified Areas (Nass South Planning Unit) • Maintain the quality and effectiveness of grizzly bear foraging habitat • Minimize human-bear conflicts • Minimize long-term displacement of grizzly bears from industrial access development	• See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat, including grizzly bears. • The proposed Project footprint crosses 34 ha of Grizzly Bear Identified Watersheds • The Application Corridor crosses 323 ha of Grizzly Bear Identified Watersheds and 18 ha of Grizzly Bear Wildlife Habitat Area.	Consistent with GLLUP – with mitigation, effects to grizzly bear are not expected to be significant.
Fur-bearers			
Maintain high-value habitat for identified fur-bearer species to help	Minimize impact to known high-value fisher and	• See section 5.8 of the Assessment Report for a detailed analysis of	Consistent with GLLUP

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
ensure a healthy population of furbearers	wolverine habitat	potential effects on wildlife and wildlife habitat (including furbearers). The proposed Project would affect 9.2% of moderate and high-value fisher natal denning habitat within in the LAA in the Cranberry SRMP, 8.3 % in the LAA in the Nass South SRMP area and 14.3% in the LAA in the Kalum LRMP.	
Goshawk (GLLUP Layers: Goshawk Habitat/Nests)			
Maintain a viable population of northern goshawk within the plan area	- Maintain nesting and post-fledgling habitat at known goshawk nest areas to support continued use and reproduction in those areas - Maintain foraging habitat around known goshawk nest and post-fledgling areas	- See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including goshawk). - The proposed Project footprint crosses 12 ha of high value and 28 ha of moderate value habitat in the Cranberry. - The Application Corridor crosses 129 ha of high value and 224 ha of moderate value habitat in the Cranberry.	Consistent with GLLUP
General Wildlife Resources (GLLUP Layers: Special Habitat for General Wildlife)			
Protect special habitats for general wildlife	- Maintain effectiveness of riparian habitats adjacent to wetlands in polygons identified on Schedule A, Maps 1-10 as Special Habitats for General Wildlife - Maintain effectiveness of alder brush and aspen patch habitats in polygons	- See section 5.7 of the Assessment Report for a detailed analysis of potential effects on vegetation and wetlands. - See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wildlife habitat. - The proposed Project footprint crosses 2 ha of high value patch habitat and no riparian reserves.	Consistent with GLLUP

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
	identified on Schedule A, Maps 1-10 as Special Habitats for General Wildlife (Cranberry and Kalum Planning Units)	The Application Corridor crosses approximately 63 ha of high value patch habitat and no riparian reserves.	
Fisheries Resources (GLLUP Layers: Ecosystem Network, Ecosystem Network Buffer)			
Protect fish populations by preserving, maintaining and restoring fish habitat	- Maintain habitat for indigenous fish populations - Restore habitat for indigenous fish populations	See section 5.5 of the Assessment Report for a detailed analysis of potential effects on fish and fish habitat.	Consistent with GLLUP
Cultural Heritage Resources			
Recognize and respect Gitanyow traditional areas, values, and activities so that they may exercise their aboriginal rights on the landscape	- Preserve cultural sites - Preserve cultural heritage resources - Address Gitanyow interests in access to cultural sites - Identify and record locations of CMTs; minimize impact to these where appropriate - Maintain a sustainable source of cedar for Gitanyow traditional, cultural and subsistence use - Reserve land surrounding Gitanyow Lake for Gitanyow management of cultural heritage resources	- See section 8.1 of the Assessment Report for a detailed analysis of potential effects heritage resources. - See section 5.7 of the Assessment Report for a detailed analysis of potential effects vegetation. - The proposed Project does not intersect any Lake Reserves or Cedar Stand Reserves.	Consistent with GLLUP
Timber Resources			

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
• Promote full utilization of productive sites while providing stable or increased harvest levels • Develop a sustainable and economically viable forest industry that contributes to the local community over the short and long terms, while respecting Gitanyow interests	• Dedicate and maintain a productive timber harvesting land base, that promotes an economically sustainable forest industry • Avoid timber harvesting within proposed treaty settlement lands shown on Schedule A, Maps 1-10 (from Gitanyow Treaty Settlement Lands Offer – 2002) • Manage the forest harvest to represent the timber quality and terrain profile • Maintain the long-term health and site productivity of the timber harvesting land base • Limit conversion of the available productive forest land base for non-timber purposes • Develop long-term plans that recognize and respect Gitanyow interests in the forest resource	• See section 5.7 of the Assessment Report for a detailed analysis of potential effects on vegetation. • See section 7.3 of the Assessment Report for a detailed analysis of potential effects on land and resource use.	Consistent with GLLUP
Water Management Resources (<i>GLLUP Layers: Water Management Units</i>)			
Manage surface water and groundwater to maintain water quality and peak and low flows within the range of natural variability, and protect the	Ensure proper hydrological functioning of streams, lakes, and wetlands within water management units identified in Schedule A,	• See section 5.6 of the Assessment Report for a detailed analysis of potential effects on water quality and quantity (including groundwater and surface water).	Consistent with GLLUP

Plan Goals	Objectives	Potential Effects of Proposed Project*	Conclusion
hydrologic integrity of the watersheds	Maps 1-10	• See section 5.7 of the Assessment Report for a detailed analysis of potential effects on wetlands. • The proposed Project does not route through any Watershed Management Units.	
Upper Kispiox Special Management Zone			
• Primary goal is to maintain key resource values such as wildlife habitat, water quality, fish habitat, and cultural heritage resources • Secondary goal is to allow identified economic opportunities to prevail	• Ensure proper hydrological functioning of all streams, lakes and wetlands within the Upper Kispiox Special Management Zone, as identified on Schedule A, Map 8 • Minimize long-term displacement of grizzly bears from industrial access development	• The proposed Project does not route through the Upper Kispiox Special Management Zone	Consistent with GLLUP
Area To Be Protected (GLLUP Layers: Hanna Tintina)			
• Protect key resource values such as fisheries, wildlife, recreation and cultural heritage resources while allowing for continued traditional use activity and identified economic opportunities to prevail	• Maintain conservation, recreation, and cultural heritage values and features and features within the area to be protected identified as the Hanna-Tintina Area to be protected in Schedule A, map 1	• The proposed Project does not route through Hanna Tintina Area	Consistent with GLLUP

19 Weighing Impacts on Aboriginal Interests with Other Interests

The Crown has a responsibility to weigh the potential impacts and accommodations on Aboriginal Interests with other societal interests, including the social, environmental and economic benefits of the proposed Project. This evaluation is an important component informing the Ministers' decision regarding the decision on whether to approve the proposed Project. In weighing the proposed Project benefits with the impacts on Aboriginal Interests, EAO holds the view that the following factors regarding the proposed Project are relevant to consider:

- Importance of the proposed Project to the local, regional, and Provincial economy,
- Nature of the proposed Project;
- Resources or values that may no longer be available for future generations; and
- Benefits of the proposed Project to affected Aboriginal communities.

EAO has summarized the estimated Project benefits during construction and operations in Section 2.5 of Part A of the Assessment Report and in Section 16.7 of Part C.

19.1 Project Importance to the Provincial Economy

The B.C. government set its vision for an LNG industry in B.C. in September 2011 with the release of *Canada Starts Here: The BC Jobs Plan*. The government saw an opportunity for unprecedented economic growth and jobs for British Columbians and set a goal of three LNG facilities in operation by 2020.

According to the Ministry of Natural Gas Development, LNG-related projects have the potential to bring tens of billions of dollars in investment to British Columbia between 2014 and 2022. As many as 100,000 jobs to construct and operate these plants could be created, injecting more than \$1 trillion into our province. This will lead to long term jobs and contracting opportunities for Aboriginal Groups and communities.

Essential to the new LNG industry are corridors for proposed natural gas pipeline routes that provide natural gas to LNG facilities. The proposed Project is critical to the success of Prince Rupert LNG. Prince Rupert LNG is a very significant project on its own. Looking at overall revenue projections for the industry, it is reasonable to assume that even the first two trains of Prince Rupert LNG would produce significant provincial tax revenue over a 30-50 year time horizon. The economic potential of the proposed projects is significant and could lead to large gains in provincial GDP and job growth.

19.2 Resources or Values That May No Longer Be Available for Future Generations

Traditional subsistence activities, such as hunting, fishing, gathering and trapping may be altered as a result of construction and operations activities of the proposed Project, which could manifest itself through changes to local harvesting locations, behavioural alteration or sensory disturbance of environmental resources, or through increased public access to traditional harvesting areas and increased pressure on environmental resources.

Although EAO believes there could be potential impacts to resources or values of importance to Aboriginal Groups, the majority of this disturbance and impact would be expected to be short to medium term, during and following construction, and would be reversible shortly after construction. EAO is of the view that the Proponent has made efforts to demonstrably avoid greenfield, high value areas for Aboriginal Groups, by following previously disturbed areas and by making several routing alterations in response to feedback from Aboriginal Groups.

19.3 Benefits of the Project to Affected Aboriginal Communities

For Aboriginal Groups, the proposed Project would have the potential to provide important economic opportunities, including capacity-building initiatives to support employment, contracting and business development through identifying economic opportunities tailored and specific to each Aboriginal Group under agreements with the Proponent that would remain confidential.

The Proponent has provided and would continue to provide economic benefits and to support capacity-building opportunities specific to Aboriginal Groups prior to and during the construction phase of the proposed Project. These opportunities include:

- Building Aboriginal business capacity through the use of directed procurement activities prior to and during the EA of the proposed Project as well as during construction. To date these activities have included supporting the environmental and socio-economic baseline studies and engineering fieldwork. During construction the Proponent will continue to maximize Aboriginal opportunities through designated services to qualified Aboriginal businesses and individuals. The Proponent will continue to communicate its employment and subcontracting opportunities that are available to Aboriginal Groups and Nisga'a Nation. The Proponent is developing a list of interested local contractors and services available. This database will also be provided to those contractors and

companies working on the proposed Project to fulfill local and Aboriginal hiring commitments. The Proponent requests information about activities related to Aboriginal participation as part of the prime contractor procurement package. This information forms part of the overall evaluation in the selection of the prime contractor;

- Providing capacity funding to support meaningful participation in consultation activities with the Proponent and in the regulatory process;
- Providing capacity funding to optimize employment and contracting opportunities;
- Supporting education legacy programs focused on long-term capacity building for Aboriginal and non-Aboriginal communities. Priorities of the programs are to enhance local education and respond to grassroots community needs. Breakfast clubs and youth resiliency programs are part of the legacy that the Proponent is exploring in collaboration with communities;
- Partnering with local non-profit organizations to enhance the quality of life in local communities. Activities include supporting emergency response organizations, environmental initiatives and Aboriginal language programs; and
- The Proponent has sought to commence negotiating Project Agreements (PAs) with Aboriginal Groups that are affected by the proposed Project. The PA's provide for short term and long term financial benefits including consideration of education and training, contracting and employment and socio-economic partnerships.

PART D – NISGA’A NATION CONSULTATION

20 Introduction and Purpose

The purpose of Part D is to comply with Chapter 10, paragraph 8(e) and 8 (f) of the Nisga’a Final Agreement (NFA). Chapter 10 of the NFA applies to the EA of the proposed Project as it would pass through Nisga’a Lands, the Nass Wildlife Area (NWA) and the Nass Area, as those terms are defined in the NFA. Figure 20-1 shows the proposed Project in relation to Nisga’a Lands, the NWA and the Nass Area.

Chapter 10, paragraph 8(e) of the NFA requires that all EA processes, as defined in the NFA will, in addition to the requirements of applicable EA legislation, “assess whether the project can reasonably be expected to have adverse environmental effects on residents of Nisga’a Lands, Nisga’a Lands, or Nisga’a interests set out in this Agreement and, where appropriate, make recommendations to prevent or mitigate those effects.”

Chapter 10, paragraph 8(f) of the NFA requires that all EA processes, as defined in the NFA, will, in addition to the requirements of applicable EA legislation “assess the effects of the project on the existing and future economic, social, and cultural well-being of Nisga’a citizens who may be affected by the project.”

Part D provides an assessment of the potential effects of the proposed Project, mitigation measures and EAO’s conclusions, with respect to paragraph 8(e) and 8(f) of Chapter 10 of the NFA, based on review of the Proponent’s Application and supplemental information provided by the Proponent and input from Nisga’a Lisims Government (NLG) during the EA. A more detailed assessment of a range of VCs used to inform the assessments can be found in Part B of this Report. The May 6, 2013 EAO Order under Section 11 of the *Environmental Assessment Act*, including the Application Information Requirements (AIR) in Schedule A (Scope, procedures, and methods for the EA) of the Order outlined the information required to be provided by the Proponent in order to address and fulfill the provisions of the NFA.

The basis of this assessment is the Proponent’s Application, and the supplemental materials and comments gathered during Application Review. The requirements for the Proponent’s Application were established in the AIR issued by EAO. The AIR regarding the 8(e) and 8(f) assessments were established by consensus between EAO and NLG.

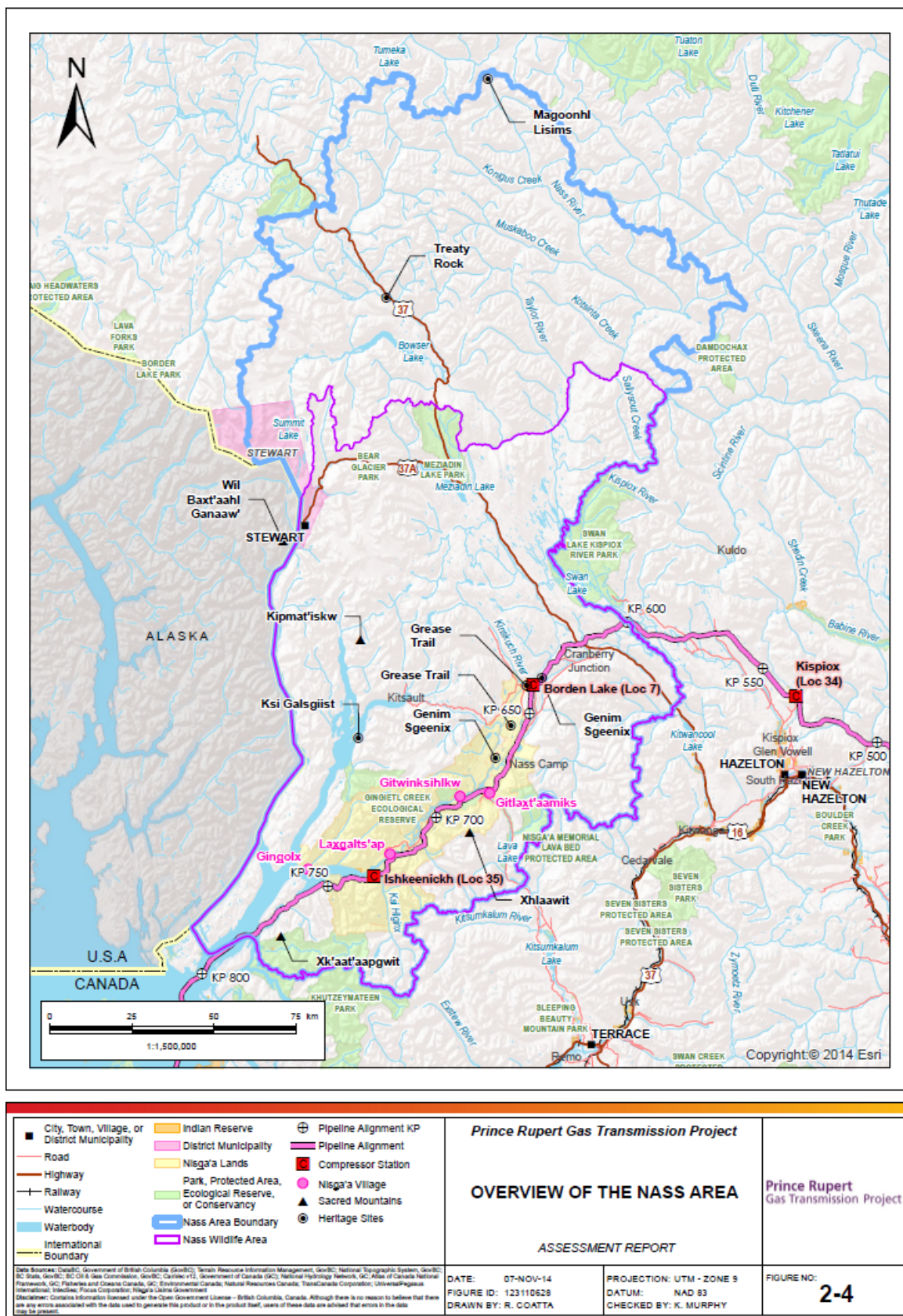


Figure 20-1: Proposed Project, Nass Area, Nass Wildlife Area, and Nisga'a Lands

Section 22 of this Report assesses whether the proposed Project can reasonably be expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests and, where appropriate, makes recommendations to prevent or to mitigate those effects, pursuant to Chapter 10, paragraph 8(e) of the NFA.

Section 23 of this Report identifies and evaluates the impacts of the proposed Project on the social, cultural and economic well-being of Nisga'a citizens pursuant to Chapter 10, paragraph 8(f) of the NFA.

Part D is not intended to duplicate or reproduce the analysis of the Application prepared pursuant to the provincial EA processes or other parts of this Report. Part D provides additional, supplemental analysis that is focused on issues, impacts, and interests that pertain directly and specifically to Nisga'a citizens, Nisga'a Lands and Nisga'a Treaty interests

As described in other parts of this Report, the analysis and conclusion of potential effects of the proposed Project includes consideration of the Proponent's mitigation commitments including those in the Application, which, as defined in the TOC, would become legally binding conditions should an EA Certificate be issued.

The Application proposed multiple route options within the Nass Area, including the Nass Bay Shoreline, Nass Bay Nearshore Alternative and Nasoga Tunnel. On July 31, 2014, the Proponent submitted an Addendum to the Application with several route adjustments including removal of these alternate route options which are no longer being considered, leaving the Nass Bay Nearshore Marine route through Iceberg Bay to Nasoga Gulf. The assessment in Part D only considers the proposed Project's final routing, as shown in Figure 20-1.

21 Consultation with Nisga'a

During the EA of the proposed Project, EAO consulted with the Nisga'a Nation through a number of activities including, but not limited to:

- Development of the Section 11 Order, and the language specifying the Proponent's requirements in relation to Nisga'a Nation;
- Development of AIRs regarding the 8(e) and 8(f) assessments;
- Participation in Working Group meetings and comment periods during pre-Application and Application Review;
- Government-to-government meetings;
- Participation in the screening of Application;
- Hosting public open houses in Nisga'a Villages during Application Review;
- Participation in the review and comment on EAO's draft referral material (i.e. draft Assessment Report, including 8(e) and 8(f) assessments, draft conditions, and draft Certified Project Description); and
- Opportunity to make submissions directly to ministers regarding the Assessment Report.

On July 31, 2014, the Province and NLG entered into a Dispute Resolution Settlement Agreement to resolve issues over the implementation of environmental assessment and consultation obligations under the Nisga'a Treaty including those related to the Kitsault molybdenum mine. This included Guiding Principles and an Appendix C, outlining the process for collaboration in EAs. That Appendix outlined how EAO and NLG would collaborate and strive to reach consensus at key decision points through the course of future EAs, including regarding relevant aspects of EAO's direction to the Proponent, the screening of the Application related to 8(e) and 8(f) requirements, and the Assessment Report analysis and conclusions related to the 8(e) and 8(f) assessments. The Appendix further outlines that EAO and NLG will collaborate and attempt to conclude a compliance and enforcement framework, as well as specifying additional detail on what would be included in the 8(f) effects assessment.

22 NFA 8(e) Environmental Effects Assessment

22.1 Effects on Nisga'a Land Interests, Land-Related Interests, and Access to Other Lands

22.1.1 Background

The NFA exhaustively sets out Nisga'a Section 35 rights, including establishing the boundaries and the Nisga'a Nation's ownership of Nisga'a Lands and Nisga'a Fee Simple Lands, water allocations, the right of Nisga'a citizens to harvest fish and wildlife, and the legislative jurisdiction of NLG.

Nisga'a land interests

Chapter 3 of the NFA establishes the boundaries of Nisga'a Lands (approximately 1,992 km²) and the Nisga'a Nation's ownership of Nisga'a Lands and Nisga'a Fee Simple Lands (Category A and B Lands) which are situated outside of Nisga'a Lands.

The Nisga'a Nation owns Nisga'a Lands in fee simple. The Nisga'a Nation owns the mineral resources on or under Nisga'a Lands as well as all forest resources on Nisga'a Lands (NFA, Chapter 5, paragraph 3). BC owns the submerged lands within Nisga'a Lands.

Other land-related interests in the NFA

The NFA sets out Nisga'a rights in the Nisga'a Memorial Lava Bed Park (the "Park") and the Gingietl Creek Ecological Reserve (the "Ecological Reserve"). The NFA also provides for the granting of the Nisga'a commercial recreation tenure.

Nisga'a citizens have the right to traditional uses of lands and resources within the Park and Ecological Reserve (NFA Chapter 1, paragraph 100). The Nisga'a Nation has the right to participate in planning, management and development of the Park and Ecological Reserve as set out in the NFA.

Chapter 3 requires the Province to issue a commercial recreation tenure to the Nisga'a Nation at the Nisga'a Nation's request (paragraph 90). Chapter 3 also provides for a Nisga'a water reservation of 300,000 cubic decameters (dam) per year from the Nass River, and other streams wholly or partially within Nisga'a Lands for domestic, industrial, and agricultural purposes (paragraph 122). There are provisions relating to applications for Nisga'a water licences for volumes of flow which would be applied against the Nisga'a water reservations.

Provisions of Chapter 3 require the Province to designate sites of cultural and historical significance to the Nisga'a Nation outside of Nisga'a Lands as provincial heritage sites (as set out in Appendix F-1 of the NFA). Chapter 17 addresses the protection of heritage sites on Nisga'a Lands and the treatment of Nisga'a artifacts discovered within the Nass Area.

Chapter 9, Wildlife and Migratory Birds, sets out Nisga'a citizens' rights to harvest wildlife throughout the NWA, NLG's legislative jurisdiction to make laws in respect of the Nisga'a Nation's rights and obligations in respect of wildlife and migratory birds, and establishes a "Wildlife Committee" to facilitate wildlife management within the NWA. There are provisions regarding traplines wholly or partially within Nisga'a Lands, and provisions regarding the continuation of traplines wholly outside Nisga'a Lands. Chapter 9 also contains provisions regarding guide outfitting wholly or partially within Nisga'a Lands and the issuance to the Nisga'a Nation of certain angling guide licences for watercourses outside of Nisga'a Lands.

Chapter 7, Roads and Rights of Way, describes the ownership, responsibilities, and obligations for roads and rights of way (including utility rights of way) within Nisga'a Lands, including the Nisga'a Highway and secondary provincial roads such as the Nass FSR, and the Alice Arm Road, and Nisga'a Roads (as defined in the NFA). Nisga'a laws apply to secondary provincial road rights of way areas, public utility rights of way areas, and works under licence to British Columbia or a public utility from the Nisga'a Nation or a Nisga'a Village, subject to certain qualifications (paragraph 6).

The Nisga'a Land Use Plan

The Nisga'a Land Use Plan, dated December 2002, was developed to provide guidance to elected Nisga'a officials and staff when decisions need to be made involving the evaluation of competing resource priorities or the consideration of the effect of a particular activity. The Nisga'a Land Use Plan addresses Public Use Zones, Areas Requiring Special Consideration, Resource Stewardship Zones, and Special Management Areas designated by the NFA. Resource Stewardship Zones include Forest Resources (Timber Products Zone, Botanical Forest Product Zone, and Cultural Products Zone), Agricultural Resources (Agricultural Lands), and Wildlife Habitat in the Nass Wildlife Management Area. Special Management Areas include the Nass bottomlands, Tseax visual polygon, Grease Trail, pine mushroom polygon and archaeological polygons.

Nisga'a access to other lands

Chapter 6, Access, defines the rights, obligations, and limitations regarding public and Crown access to Nisga'a Lands, as well as Nisga'a citizens' access to Crown lands. Agents, employees and contractors of the Nisga'a Nation, Nisga'a Villages, Nisga'a Corporations and members of the Nisga'a Police Service may enter, cross, and stay temporarily on lands off Nisga'a Lands to carry out their responsibilities, respond to emergencies, and carry out the terms of the NFA (para. 20). Furthermore, Nisga'a citizens have reasonable access to Crown lands to allow for the exercise of Nisga'a rights and for the normal use and enjoyment of Nisga'a interests set out in the NFA, subject to certain qualifications (paragraph 23).

22.1.2 Potential Effects and Proposed Mitigation

The proposed Project would traverse the Nass Area, the NWA and Nisga'a Lands. The Application reported on potential Project effects on Nisga'a interests and measures to prevent or mitigate adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands or Nisga'a interests under the NFA.

The proposed pipeline route through Nisga'a Lands would be 82.82 km. The proposed Project pipeline route through the (overlapping) Nass Area and NWA would be 179.48 km. Within Nisga'a Lands, the proposed Project pipeline route on land would traverse the Nass River watershed, including the south side of the Nass River estuary and the Nass Bay area. The route would traverse the Nass Bottomlands but avoid the Tseax Visual Area. Numerous roads would be crossed within Nisga'a Lands, and Highway 37 in the NWA.

The Nisga'a Memorial Lava Bed Park would be crossed by 12.1 km of the route. Construction of the pipeline route across the Park would first require a Park Boundary Adjustment that involves legislative action by the Province and the Wilp Si'ayuukhl Nisga'a (the Nisga'a legislature). The Park Boundary Adjustment process begins with an application to BC Parks and MOE. The application is prepared in consultation with the Nisga'a and subsequently reviewed for approval by the Province. On October 29, 2014, Wilp Si'ayuukhl Nisga'a (the Nisga'a legislature), by resolution, consented to the amendment to the boundary of the Nisga'a Memorial Lava Bed Park in relation to the construction of the proposed Project. On October 30, 2014, the Province announced Bill 8-2014 – the *Protected Areas of British Columbia Amendment Act (No. 2), 2014*, which if passed and brought into force by regulation, would confirm the removal of 63.5 hectares of land from the Park.

The Proponent indicated that the proposed pipeline route would intersect Laxgalts'ap Village boundaries for 3.69 km, and pass within 0.57 km of Gitwinksihlkw, 0.54 km of Gitlaxt'aamiks, and 0.31 km of Gingolx.

The Proponent discusses interactions between Nisga'a Lands, other land-related interests, and access to other lands in sections 35.4-35.7 of the Application.

Land Interests

Based on the routes proposed in the Application, s 82.8 km of the proposed Project would pass through Nisga'a Lands, and could interact with mineral resources and forest resources of Nisga'a Nation (see NFA Chapter 5, paragraph 3). It could also interact with Nisga'a Fee Simple Lands outside of Nisga'a Lands. The current proposed route would pass through 1 km of Nisga'a Fee Simple Category B Lands, specifically lot #3, although there is no overlap with Category A Lands.

Other potential effects of the Project on Nisga'a Lands and Nisga'a Fee Simple (Category B) Lands could include reduced availability of Nisga'a Lands available for harvesting or other purposes of benefit to Nisga'a citizens, for the life of the proposed Project. The ROW could also increase access to lands currently difficult to access, which could have positive and negative consequences.

The Application states that the proposed Project footprint could result in a maximum clearing of 13.6 km² of Nisga'a Lands (0.68%), and up to 0.14 km² of Category B Lands (9.2%), conservatively assuming a 100 m cleared ROW (whereas the actual cleared ROW would be typically 50-60 m). The Proponent estimates a reduction of 1.1% of the forest resources zone within Nisga'a Lands and 0.20% of the botanical area within Nisga'a Lands during construction and operation would occur. These figures would decrease slightly, as some routes overlapping Nisga'a Lands are no longer being pursued.

In response to adverse potential effects on Nisga'a Land interests, including reduced availability of Nisga'a Lands and Fee Simple Lands and potential disturbance to access and use of Nisga'a Lands, the Proponent has, in consultation with the NLG, developed mitigation strategies which include:

- Using previously disturbed areas where feasible for access, stockpiles and temporary construction camp sites;
- Avoiding areas of known forest and mineral resources on Nisga'a Lands;
- Developing Nisga'a Access Management and Traffic Management Plans;
- Identifying sites that warrant mitigation related to hunting, trapping, fishing, plant

gathering, habitation, trails and travelways, gathering places and areas identified by the Nisga'a as being of sacred value;

- Coordinating Project construction activities with forestry operators;
- Identifying timber salvage opportunities with respect to timing of pipeline maintenance and vegetation management activities on Nisga'a Lands; and
- Standard mitigation measures and project-specific Environmental Management Plan (EMP) are identified in section 36.1 of the Application.

EAO proposes a condition which would require the Proponent to avoid incursions into Old Growth Areas wherever practicable, and where not practical to provide replacements or recruitment proposals.

Other Land-Related Interests

Nisga'a Nation treaty rights in respect of the use of lands and resources within Nisga'a Memorial Lava Bed Park could be impacted by the proposed route as 12.1 km would be constructed through the Park, including impacts arising from changes in the Park's geological, vegetation and heritage resources. The Ecological Reserve is north of the proposed route and would likely be unaffected.

Reduced use of the Park by Nisga'a citizens could occur. Project activities or works that could interact with treaty rights to the use of lands and resources within the Park include site preparation, pipe placement, construction of watercourse crossings, cleanup and post-construction reclamation, employment and expenditures. Potential effects from vegetation and maintenance programs during operation could also occur. There could be increased unregulated use of the Park and long-term effects to its visual, geological, vegetation, wildlife and heritage resources, related to the creation of the pipeline ROW.

The proposed Project could also disrupt commercial freshwater, land-based and marine tourism activities. While it would not be expected to cross sites or facilities currently utilized under the Nisga'a commercial recreation tenure, Lisims Backcountry Adventures Inc., which operates tours in the Park and provides jobs for Nisga'a people, could be affected. Several Nisga'a sport fishing guides also operate on the Nass River, and other tourism ventures, including white-water kayaking, have been proposed on the river. Nisga'a villages are developing tourism strategies, a 2-year process initiated in 2012.

Trapping activities could be disrupted intermittently, due to vegetation management, pipeline maintenance activities and emissions, discharges and noise. Changes to existing wildlife habitat along the ROW could alter abundance and distribution of trapped species, which could be further affected if species avoided the right-of-way due to proposed Project-related disturbances. Nisga'a citizens' exercise of their right to

utilize traplines in the NWA could also be adversely affected by site preparation, pipeline placement, compressor station construction, cleanup and post-construction reclamation, employment and expenditures, and the presence of physical facilities.

Trappers expressed concerns with previous proposed Projects, including Kitsault Mine, regarding increased access, fur theft, and increasing access to trapline areas. The proposed Project footprint could affect five traplines outside Nisga'a Lands held by Nisga'a citizens and 18 that are wholly or partially on Nisga'a Lands. The Iskeenickh compressor station, which could be built to allow expansion of the pipeline, could affect one trapline tenure. Nisga'a Nation does not currently have a guide outfitter licence in the NWA, but future interactions could occur.

Ginulak Creek, Dragon Lake, and Cranberry River are the three watercourses within the Nass Area covered by the Nisga'a Guided Angling Licence which intersect the proposed pipeline route. Potential effects to angling guide activity could include prevention of guiding from occurring during construction and maintenance in some areas, and diminishment of quality of the angling experience. Fish displacement and deterioration of fish habitat during construction could occur, and the ROW could facilitate increased and human presence and unregulated use of resources, potentially adversely impacting fish populations in some streams.

The five sites identified in the NFA of cultural and historical significance to Nisga'a Nation that could be designated as provincial heritage sites would not be crossed by the proposed route. The route would avoid heritage sites within Nisga'a Lands identified on Map B of the Nisga'a Land Use Plan.

Nass Camp is a 115.6 acre Nisga'a-owned property intended to eventually support commercial recreation tenures. The Proponent, upon request by NLG and Village representatives, confirmed it could move the proposed pipeline route slightly east, away from Nass Camp, within the existing corridor.

Maintaining stream flow and water quality within the Nass Area is important to the protection of freshwater and marine ecosystem values as well as terrestrial vegetation and wildlife values, of high importance to the Nisga'a Nation. Changes to stream flow and water quality can have potential adverse effects on ecosystem health which, in turn, could have implications on human health from consumption of fish and wildlife harvested by Nisga'a citizens. These are discussed more in Part B of this Report.

The Application identified Nisga'a trails and travelways, habitation sites, gathering places and areas identified by the Nisga'a as being of sacred value throughout the

NWA. The proposed Project could have impacts on Nisga'a treaty rights related to access to trails and travelways, plant gathering sites, trapping sites, habitation sites, or gathering places outside of Nisga'a Lands (as set out in Chapter 6, paragraph 23), and the route would cross public roads and the Highway numerous times. Indirect effects are considered in Part B of this Report.

In response to potential adverse effects of the proposed Project on other land-related interests, the Proponent has put forward additional mitigation strategies which include:

- Avoiding overlap with commercial recreation activities, and implementing the Nisga'a Access Management Plan;
- Consulting Nisga'a trapline and angling guide tenure holders;
- Losses would be paid as per the Trapper Compensation Schedule to registered trappers for demonstrated economic losses related to construction of the Project;
- Reducing visual effects associated with the pipeline;
- Notifying NLG, Nisga'a citizens, and angling guides of project activities to avoid overlap or interruption with Nisga'a activities;
- Continuing to consult with NLG regarding Nisga'a Memorial Lava Bed Park to confirm construction and operation preserves the heritage, cultural, geological and recreational values of the Park;
- Ensuring the right-of-way parallels the Nisga'a Highway wherever possible;
- Standard mitigation measures and environmental and operational management plans (described in section 36); and
- Avoidance measures to effects on critical habitat for salmon species including adherence to timing windows, redesign, and relocation.

Nisga'a Access to Other Lands

The Application indicated that the proposed Project, during construction, could require temporary traffic interruptions or detours on existing roads. This could limit Nisga'a access to non-Nisga'a Lands to carry out their duties and Nisga'a citizens' access to Crown lands to exercise Nisga'a rights and for the normal use and enjoyment of Nisga'a interests. Related disruptive works would be short-term and infrequent, and not expected during operation.

In response to potential adverse effects of the proposed Project on Nisga'a access to other lands, the Proponent has put forward additional mitigation which include: consulting NLG on timing of construction activities; potential access restrictions and noise disturbance in recreational areas to limit disruptions and the ability of Nisga'a citizens to access the Nass Area; and a Traffic Management Plan to limit disturbances,

reduce and safely manage traffic interruptions.

22.1.3 Conclusions

Part B contains various sections that are relevant to the assessment of Nisga'a Land interests, land-related interests, and access to other lands, particularly section 7.2 (Transportation) and section 7.3 (Land and Resource Use). These sections identified a number of residual effects, and concluded that none of these effects were significant.

The proposed Project would result in some reduction in the availability of Nisga'a Lands and Nisga'a Fee Simple Lands for alternative uses. Typically a pipeline right-of-way is a non-exclusive tenure, which may be compatible with some other activities, while a compressor station would require an exclusive land tenure. Land tenures would be issued by Nisga'a Nation.

The proposed Project would permanently alter and remove approximately 62.7 ha of the Nisga'a Memorial Lava Bed Park, and may result in some changes to the visual, geological, vegetation, and heritage resources, but these changes would be managed by BC and Nisga'a Nation.

There may be some temporary disruption of guide outfitting, trapping, tourism, recreational and subsistence activities during the proposed Project's construction period.

Conditions established under OGC permitting or the Nisga'a Nation Right of Way Agreement with the Proponent would also be expected to be important in mitigating potential adverse effects. Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on Nisga'a Land interests, land-related interests, and access to other lands.

22.2 Effects on Nisga'a Nation Interests in Freshwater Fish and Plants

22.2.1 Background

Chapter 8 of the NFA sets out Nisga'a citizens' right to fish as well as Nisga'a fish entitlements held by the Nisga'a Nation. Nisga'a citizens have the right to harvest fish and aquatic plants in accordance with the NFA, subject to measures necessary for conservation and legislation enacted for public health or public safety.

Chapter 1 of the NFA defines fish as:

- a) Fish, including anadromous fish;
- b) Shellfish, crustaceans, and marine animals;
- c) The parts of fish, shellfish, crustaceans, and marine animals; and
- d) The eggs, sperm, spawn, larvae, spat, juvenile stages and adult stages of fish, shellfish, crustaceans and marine animals but not “wildlife fish.”

The Nisga’a are also entitled to harvest wildlife fish pursuant to their right to harvest wildlife as specified in Chapter 9 of the NFA. Chapter 1 defines wildlife fish as:

- a) Lampreys, crustaceans, mollusks, and non-anadromous fish, from or in non-tidal waters;
- b) The part of lampreys, crustaceans, mollusks, and non-anadromous fish, from or in non-tidal waters; and
- c) The eggs, sperm spawn, larvae, spat, juvenile stages and adult stages of lampreys, crustaceans, mollusks and non-anadromous fish, from or in non-tidal waters.

Aquatic plants are defined to include kelp, marine flowering plants, benthic and detached algae, brown algae, red algae, green algae and phytoplankton.

Nisga’a Interests include the right of Nisga’a citizens to harvest fish and aquatic plants (Chapter 8), including specific allocations for:

- Nass salmon (i.e., sockeye, pink, chinook, Coho, and chum salmon originating in the Nass Area);
- Nass steelhead (i.e., winter run and summer run steelhead originating in the Nass Area);

and harvesting rights for:

- Eulachon (also known as eulachon) within the Nass Area; and
- Intertidal bivalves for domestic purposes (in designated areas within the Nass Area as per Appendix I of the NFA).

For non-salmon species of fish and aquatic plants, including marine mammals, Nisga’a citizens have treaty rights to harvest those species for domestic purposes anywhere in the Nass Area. This section focuses on the potential impacts to fish and plants in the freshwater environment.

EAO's Assessment Report includes an assessment of freshwater fish and fish habitat and water in sections 5.5 and 5.6.

22.2.2 Potential Effects and Proposed Mitigation

The Application identified interactions between Nisga'a interests identified in the NFA (Chapter 10, Section 8(e)) and the proposed Project, related to Nisga'a citizens' right to harvest fish and aquatic plants (Chapter 8), including specific allocations. The proposed Project has the potential to affect this right as it relates to Nass salmon, Nass steelhead, and eulachon and non-salmon species (Dolly Varden, bull trout, rainbow trout, and pacific lamprey) within the Nass Area. The Proponent indicated that an assessment of the potential project effects on freshwater aquatic plants harvested by Nisga'a citizens was not possible due to a lack of data. Potential effects of the proposed Project and mitigation measures are discussed below.

The major watersheds crossed by the proposed pipeline route are east and southeast of the Nass River, after NLG feedback, and include: Chambers Creek; Flewin Creek; Welda Creek; Ksgyukwsa; Monkley Creek; Quilgauw Creek; Ksi Hlginx; Ginulak Creek; Ksi Mat'in; Ksemamaith Creek; Ansedagan Creek; Kwinyarh Creek; Ksi Ts'oohl Ts'ap; Vetter Creek; Ksi Sii Aks; Gingit Creek; Ksi Sgasginist; and Cranberry River.

The Proponent's proposed pipeline route, watercourse crossing methods and locations have taken into consideration the sensitivity of fish habitat and fish species present at each crossing, habitat characteristics including stream width and stream flow, geotechnical considerations and the ability to effectively implement mitigation measures to protect fish and fish habitat. With effective mitigation measures (e.g., isolation of flow from instream work areas, erosion and sediment control, construction timing during least risk windows), isolation of trenched crossings and open-cut trenched crossings (i.e., where channel is dry or frozen to the bottom) are not expected to result in adverse effects to freshwater fish and fish habitat at or downstream of the construction footprint.

Based on the updated information collected during Application Review and presented in the Proponent's Conceptual Habitat Offsetting Plan (CHOP), the proposed Project would cross 285 streams in the Nass River watershed, which includes 142 fish-bearing watercourses, 31 non-fish-bearing watercourses, and 112 NVCs/NCDs. The Proponent indicates the proposed pipeline route would alter 100,000 m² of riparian habitat and 5,749 m² of instream habitat (see Tables 5-3 and 5-4 in section 5.5 of this Report).

The Proponent identified 26 watercourse crossings in the Nass River watershed may

require *Fisheries Act* authorization and offsetting, including 16 which are high risk, 2 borderline high, and 8 medium risk (CHOP Table 4-2).

The Application indicated baseline data for freshwater fish and aquatic plants were gathered from: review of historical and published information and provincial and federal databases; fish and fish habitat data (RISC standards) collected during the summer and fall of 2013 for the proposed Project; and large river survey data from fish habitat assessment procedure (FHAP) Level 1 surveys completed for the proposed Project.

NLG indicated to the Proponent on February 28, 2014, that the Northwest Transmission Line Project has a fish habitat compensation project within the Ksi Ts'oolh Ts'ap and Ginulak watersheds which could be crossed by the proposed route.

The Proponent responded that the route through Ginlulak watershed was determined due to a lack of routing options and noted they would discuss watercourse crossings further with NLG during Application review. EAO proposes a condition which would require the Proponent to restore any impacted habitat compensation sites on Nisga'a Lands to equivalent environmental function.

Any fish mortality as a result of the proposed Project is overall expected to be negligible and concentrated in the construction phase. During Application Review, the Proponent indicated the proposed Project is not expected to have a measurable effect on the productive capacity of freshwater fish and fish habitat.

Pacific Salmon

Potential effects on habitat availability for Pacific salmon would be expected during construction. Related work on surrounding riparian areas, upland areas, approach slopes to watercourses and in-stream could reduce quantity and quality of cover from predators and temperature-regulating shade, increase erosion and introduce suspended sediments into the watercourse. Upland and in-stream works could alter habitat features such as over-wintering pools and spawning areas, cause in-filling of critical habitat and mortality of eggs in spawning gravel areas.

As shown in Table 22-1, the proposed Project would cross a number of high productive watersheds for various salmon species.

Table 22-1: Crossings of High Productive Pacific Salmon Watersheds in the Nass Area

	Watersheds	Mainstem Crossings	Fish-Bearing Tributary Crossings	NCD/NVC/Non Fish-Bearing Tributary Crossings	Total

	Watersheds	Mainstem Crossings	Fish-Bearing Tributary Crossings	NCD/NVC/Non Fish-Bearing Tributary Crossings	Total
Sockeye	Cranberry River Gingit Creek Ksi Ts'oolh Ts'ap	2 (1 HDD)	2	6	10
Coho	Cranberry River Ksi Sii Aks	2 (2 HDD)	No crossing	4	6
Chum	Ksi Sii Aks	1 (HDD)	No crossing	No crossing	1
Pink	Ksi Sii Aks Ksi Hlginx Chambers Creek	3 (2 HDD, 1 open cut)	2	13	18
Chinook	Cranberry River Ksi Sii Aks	2 (HDD)	No crossing	4	6

Note: Based on data from the Application. Additional high productive watersheds may be identified during subsequent field studies.

Eulachon

Eulachon habitat availability could be adversely impacted due to instream works, use of industrial equipment, and vegetation clearing in spawning and early rearing habitat. Eulachon spawners and juveniles could become entrained through pump intakes during watercourse isolation, and alterations of water depth and flow could disrupt access to important spawning and rearing areas.

As no pipeline crossing is proposed on the mainstem of the Nass River, proposed Project activities during construction would not be expected to affect eulachon habitat or its productive capacity, or Nisga'a access to eulachon fishing locations.

Steelhead

Potential effects on habitat availability for steelhead could result from instream excavation, trenching, placement of material or structures in water, vegetation clearing, use of heavy equipment, and grading. Temporary vehicle crossings could cause loss and alteration of riparian vegetation and in-stream habitat. Changes to critical habitat could affect steelhead production and Nisga'a citizens' right to harvest steelhead could be impacted. During construction, proposed Project activities could interrupt Nisga'a access to fishing locations in tributaries of the Nass River.

As shown in Table 22-2, the proposed Project would potentially cross a number of high productive watersheds for summer and winter steelhead.

Table 22-2: Crossings of High Productive Steelhead Watershed in the Nass Area

	Watersheds	Mainstem Crossings	Fish-Bearing Tributary Crossings	NCD/NVC/Non Fish-Bearing Tributary Crossings	Total
Summer Steelhead	Cranberry River Ksi Sgasginist Ksi Sii Aks	3 (2 HDD)	2	29	34
Winter Steelhead	Ksi Sgasginist Ksi Sii Aks Ksi Hlginx Ksi Mat'in	4 (3 HDD)	6	28	38

Note: Based on data from the Application. Additional high productive watersheds may be identified during subsequent field studies.

Non-salmon species

Potential project effects on habitat availability for other non-salmon species (i.e., rainbow trout, Dolly Varden, bull trout, and Pacific lamprey) would be expected during construction, which could affect production of these species and the ability of Nisga'a citizens to harvest such stocks. Thus, the proposed Project construction could affect access of Nisga'a citizens to potential fishing locations in tributaries of the Nass River.

Mitigation

Mitigation measures for Pacific salmon, eulachon, steelhead, and non-salmon species include:

- Altering Project design, including relocation, horizontal directional drilling crossing method, selecting watercourse crossing methods based on fisheries sensitivities, limiting disturbance within riparian areas, minimum riparian set-back distances for permanent facilities, and construction least-risk periods for fish species present;
- Utilizing a watercourse crossing technique decision process;
- Fish salvage after the isolation of instream work site with captured fish to be released downstream;
- Mitigation measures and BMPs within the EMP, including:
 - o Acquiring appropriate permits and notifications;
 - o Reducing riparian disturbance and maintaining riparian buffers;
 - o Adopting an Erosion and Sedimentation Control Management Plan, Nisga'a Access Management Plan, Directional Drilling Procedures and Instream Drilling Mud Release Contingency Plan (section 36.2 and 36.3 of Application);

- o Narrowing the right-of-way in sensitive areas where possible;
- o Posting signage in environmentally sensitive areas;
- o Restoring and reclaiming the bed and banks; and
- Fish habitat offsetting, as required, for any serious harm to fish after mitigation.

EAO also proposes EA Certificate conditions to:

- Provide opportunities for Nisga'a Nation to provide environmental monitors during construction;
- Require the Proponent to engage Nisga'a Nation in the development and implementation of plans for fish habitat offsetting on riparian or in-stream habitats prior to submission to Relevant Regulatory Authorities;
- Require the Proponent to engage Nisga'a Nation in the development and implementation of the EMP and component plans;
- Require that if the final pipeline route overlaps with existing aquatic or riparian habitat restoration or compensation sites within Nisga'a Lands, the Proponent must develop a Nisga'a Watercourse Restoration Plan with the objective of achieving no net loss of environmental function; and
- Require implementation of a No-Hunting, No-Trapping, No-Fishing and No-Plant Gathering Policy for employees and contractors during work hours.

22.2.3 Conclusions

Part B of this Assessment Report identified a number of residual effects related to freshwater fish and fish habitat and water. Considering the analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO was satisfied that the proposed Project is not likely to have significantly adverse effects on either fish and fish habitat or water.

Conditions established under permitting or the Nisga'a Nation ROW Agreement with the Proponent would also be expected to be important in mitigating potential adverse effects. Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on the Nisga'a right to harvest freshwater fish and aquatic plants.

22.3 Effects on Nisga'a Nation Interests in Marine Fish and Plants

22.3.1 Background

Section 22.2.1 outlines Nisga'a right to fish as well as fish harvest allocation entitlements as outlined by Chapter 8 of the NFA.

The Application identified interactions between Nisga'a interests identified in the NFA (Chapter 10, Section 8(e)) and the proposed Project, including Nisga'a citizens' right to harvest marine fish and plants (Chapter 8), including specific allocations.

Under Chapter 8, paragraph 64, Nisga'a citizens also have the right to harvest intertidal bivalves for domestic purposes within those portions of the Nass Area set out in Appendix I of the NFA. Intertidal bivalves are defined in Chapter 1 as littleneck clams, butter clams, horse clams, cockles, mussels and manila clams.

The assessment of impacts to Marine Resources is discussed in Section 5.9 of this Report, while impacts to Human Health are discussed in Section 9 and impacts to marine activities are discussed under Land and Resource Use in Section 7.3.

22.3.2 Potential Effects and Proposed Mitigation

As discussed in section 5.9 (Marine Resources), the proposed Project marine route would cross Nass Bay, and then enter Nasoga Gulf and travel along Portland Inlet and Chatham Sound to the proposed terminal at Lelu Island near Prince Rupert Harbour. The marine route is not within Nisga'a Lands, but includes areas of importance to Nisga'a Nation. The key habitat and biological features associated with the key location in the Nass Area are summarized in Table 22-3. The Proponent's Conceptual Habitat Offsetting Plan's (CHOP) Table 4-7 also provides a summary of marine habitat alterations for Nasoga Gulf, Iceberg Bay and Nass Bay shorelines and proposed offsetting measures.

Table 22-3: Interactions with Marine Resources in the Nass Area

Location	Project Activities or Physical Work	Dominant Biological Features	Habitat Features
Nass Bay and Iceberg Bay	Marine entry and exit, marine infilling	Important salmon rearing habitat; important eulachon and salmon migration route; Dungeness crab; and Harbour porpoise, killer whale, harbour seal	Area dominated by bioturbated mud; and Rockweed mats

Nasoga Gulf	Marine entry and exit	Important salmon rearing habitat; patches of biogenic sponge reef; Dall's porpoise, harbour porpoise, humpback whale, harbour seal; and historically important herring spawning area	Bioturbated mud dominates center of gulf; Eelgrass bed along north end of gulf; Eastern wall of gulf has high relief rocky substrates with diverse epifauna; and Rockweed mats
Portland Inlet	Marine pipeline placement	Important salmon migration route; and Dall's porpoise, Pacific white-sided dolphin, harbour porpoise, killer whale, humpback whale, minke whale, harbour seal, Stellar sea lion	Dominated by bioturbated mud

Note: Additional species may be present. The information is based on the Application.

Impacts to marine species

Proposed Project construction activities and works could have adverse effects on habitat for marine species, particularly those leading to physical disturbance, sediment deposition or increased turbidity during site preparation (blasting, infilling, under-pipe support), marine entry and exit, marine pipeline placement, and construction activities resulting in increased TSS levels. Proposed Project construction activities and physical works could also harm marine species would include construction activities that could cause burial and crushing, underwater noise, or increased TSS levels.

The localized, short-term nature of project activities in offshore and shoreline areas would reduce the degree of habitat alteration or harm for marine species. Mobile species, displaced from construction areas due to noise and increased TSS, would reduce risk of physical harm from activities such as blasting.

Some species could benefit from the coarse substrates the proposed Project would introduce through under-pipe support fill, blast rock deposition, and concrete-covered pipe. Trenching activities would result in localized loss of less mobile species including bivalves, but habitat conditions for species recovery would be likely over the medium term. Habitat loss and alterations in shoreline areas, such as eelgrass beds would be addressed through reclamation measures, or the Conceptual Fish Habitat Offset Strategy.

Mitigation measures related to impacts to marine species include:

- Routing alterations to protect sensitive areas:
 - o Nass Bay north route, which passed south of Gingolx, was eliminated to

- avoid key Nisga'a crab harvesting areas;
 - o Routing options through Nasoga Gulf and Chatham Sound avoid sensitive sponge reefs;
 - o Nasoga Gulf route has been aligned to avoid the Nasoga Gulf bivalve harvesting area; and
 - o Where practical, further micro-routing would be made to avoid high-value habitat and sensitive marine resources;
- Reducing area of disturbance to shoreline habitats to the extent feasible;
- EMP would outline erosion and sediment control procedures for nearshore zones;
- Water quality monitoring during trenching to determine TSS, and altering or halting construction activities until TSS drops below guideline levels;
- Prior to excavation, trenching, plowing, or blasting in important areas for Dungeness crab, capturing crabs and releasing them to suitable areas nearby;
- Blasting, if required, would be in accordance with DFO guidelines. A marine mammal observer would monitor a safety zone to ensure mammals are not present and that blasting occurs in daylight and high visibility. Bubble curtains would be used to attenuate sound pressure levels where suitable;
- Scheduling construction activities to reduce likelihood of harm during sensitive life stages of fish species associated with Nisga'a interests;
- Offsetting measures to ensure ongoing productivity of CRA fisheries, as required;
- Eelgrass beds disturbed would be seeded or replanted following construction; and
- Locations where obstruction may overlap with areas of crustacean movement would be identified, and mitigation measures developed.

In addition, EAO proposes EA Certificate conditions including:

- Crab mitigation and monitoring, marine access and traffic management, marine sediment and water quality mitigation and monitoring, and marine mammal mitigation and monitoring;
- Provide opportunities for Nisga'a Nation to provide environmental monitors during construction;
- Require the Proponent to engage Nisga'a Nation in the development and implementation of plans for fish habitat offsetting on riparian or in-stream habitats prior to submission to Relevant Regulatory Authorities; and
- Provide opportunities for Nisga'a Nation to provide environmental monitors during construction;

Change of access to fishing and harvesting

Fishing activity could be disrupted due to presence of construction and support vessels during pipeline installation and related works. This would involve potential spatial overlap between the Iceberg Bay route and benthic fishing activities by Nisga'a such as longline halibut and crab fishing during construction. Access to harvesting and fishing areas within the Nass Area would be limited during the construction period, depending on the physical overlap between the safety zone around construction vessels and the harvesting areas.

Mitigation measures include:

- Identifying navigational routes, fishing and harvesting areas, and timing windows;
- Consulting with NLG on how to further reduce adverse effects on access to fishing and harvesting areas;
- Limiting duration and timing of construction within the marine portion of the Nass Area to reduce disturbance to fishing activities; and
- Marine Access/Traffic Management Plan would include the Nass Area based on consultation as planning with marine construction activities proceeds which would include BMPs and measures to limit adverse effects of marine construction vessels and activities on current marine use.

Damage or loss of benthic fishing gear

Potential damage or loss of benthic fishing gear could occur during operations through interaction of equipment and exposed portions of the submerged pipeline and rock infill or concrete mattresses used to cover the pipeline, including but not limited to long-line halibut sets and crab traps. Mitigation measures intended to avoid interactions between the submerged pipeline and benthic fishing-related equipment include:

- In depths greater than 20 m, lowering the pipeline below the seabed in areas where there is concern of damage due to vessel anchors or equipment; and
- A management plan would be developed to address protocols involving interaction of fishing activities and pipeline-related construction activities and works in the marine component of the Nass Area.

22.3.3 Conclusions

Required nearshore seabed modification areas within the Nass Area (adjacent to Nisga'a Lands) would include: Nass Bay, Iceberg Bay, and Nasoga Gulf landfall. The pipeline along Nass Bay and at the nearshore areas of each landfall (<20 m deep)

would be fully buried below the seabed. A key concern highlighted by Nisga'a in Iceberg Bay includes the crossing in deeper water (70 m), where unburied pipe may have a barrier effect to crab. The Proponent would mitigate potential barrier to crab movement with the installation of gravel or concrete mattresses to bridge the pipe, or pipe burial. EAO proposes a condition of the EA Certificate for mitigation and monitoring to ensure that it does not present a barrier within five years after construction.

Additional details on areas of habitat alteration for Nass Bay, Iceberg Bay and Nasoga Gulf, as well as key mitigation measures, are discussed in section 5.9 in of this Report. In addition, EAO proposes conditions related to marine access and traffic management, marine sediment and a Water Quality Monitoring Plan, and marine mammal mitigation and monitoring.

Part B of this Report identified a number of residual effects related to marine resources, and other aspects of the marine environment (e.g., commercial fishing). Considering the analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significantly adverse effects related to the marine environment.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on the Nisga'a right to harvest marine fish and aquatic plants.

22.4 Effects on the Right of Nisga'a Citizens to Harvest Wildlife

22.4.1 Background

Chapter 9 of the NFA sets out Nisga'a citizens' rights to harvest wildlife in the NWA. Nisga'a wildlife entitlements are held by the Nisga'a Nation. Nisga'a citizens have the right to harvest wildlife in accordance with the NFA, subject to measures necessary for conservation and legislation enacted for public health or safety. Nisga'a citizens have the right to trade or barter wildlife and wildlife parts and migratory birds. Subject to certain provisions, Nisga'a wildlife entitlements are for domestic purposes.

The rights set out in Chapter 9 require wildlife to be harvested in a manner that is consistent with the communal nature of the Nisga'a harvest for domestic purposes and traditional seasons of Nisga'a harvest. Harvesting must also not interfere with other

authorized uses of Crown land. The Crown may authorize uses or dispose of Crown land that may affect Nisga'a harvesting rights, provided that the Crown ensures that those uses or dispositions do not deny Nisga'a citizens a reasonable opportunity to harvest Nisga'a wildlife entitlements or reduce Nisga'a wildlife allocations.

Schedule A of Chapter 9 establishes the procedure for determining Nisga'a wildlife allocations for initial designated species of moose, grizzly bears, and mountain goats. Chapter 9 also sets out a process for the designation and de-designation of wildlife species. A Nisga'a wildlife allocation that is set out as a percentage of the total allowable harvest has the same priority as the recreational and commercial harvest of the total allowable harvest of that species.

Chapter 9 sets out provisions concerning the management of wildlife in the NWA, Nisga'a law making authority in respect of Nisga'a harvesting of wildlife pursuant to the NFA, and establishes a "Wildlife Committee". There are also provisions dealing with traplines and guiding; and the issuance to the Nisga'a Nation of certain angling guide licences for watercourses outside of Nisga'a Lands. The issuance of hunting licences by the NLG in the NWA varies each year.

Spatial and temporal boundaries for Section 8(e), Chapter 10 of the NFA assessment are consistent with the temporal and spatial boundaries for VCs for wildlife.

EAO's Assessment Report includes an assessment of wildlife resources in section 5.8.

22.4.2 Potential Effects and Proposed Mitigation

The Application identified interactions between Nisga'a interests identified in the NFA (Chapter 10, Section 8(e)) and the proposed Project, including Nisga'a citizens' right to harvest wildlife throughout the NWA including, but not limited to, allocations for moose, grizzly bear and mountain goat. Effects on change in ability to harvest designated species could potentially occur through changes in habitat, mortality risk, and movement, or disruption of access to harvest areas.

Change in habitat could occur from vegetation clearing during construction and from vegetation management on portions of the proposed pipeline corridor during operation. Sensory disturbances, including from compressor stations, could reduce habitat suitability in areas of the proposed Project footprint throughout the operational period. These effects could alter distribution and abundance of harvested wildlife species within the NWA. Increases from human-caused mortality, including increased hunting pressure

facilitated by the 185 km ROW's linear disruption through the NWA, and from predator-prey dynamics due to creation of movement corridors for wolves, may also occur.

Potential adverse effects and related mitigation measures for grizzly bear, moose and mountain goat are discussed in more detail in section 5.8 of this Report. The Application identifies mitigation measures considered in the assessment of wildlife and wildlife habitat (Table 34-76), and measures developed in consultation with NLG.

EAO also proposes the following conditions: requiring development and implementation of a Human-Wildlife Conflict Management Plan; requiring a No-Hunting, No-Trapping, No-Fishing and No-Plant Gathering Policy for employees and contractors during work hours; and requiring wildlife mitigation and monitoring measures as part of the EMP. Additional proposed conditions are discussed below.

Grizzly Bear

Grizzly bear is a species of conservation concern provincially (blue-listed) and federally (COSEWIC Special Concern), largely due to range and population reductions influenced by development and habitat fragmentation, and to human related conflicts and mortality. As the proposed Project's alignment with grizzly habitat occurs primarily at low elevation throughout the NWA, the Application primarily considered the valley bottom ecotype of the grizzly bear population of the NWA.

The proposed Project footprint would change effective grizzly bear habitat by -834.9 ha, or -0.3% of available effective habitat in the NWA. However, the Proponent indicated the habitat changes would remain significantly under the -20% change threshold.

Increased access to remote areas due to the similar project corridors has been linked to increased grizzly bear mortality due to increased illegal harvest. The Proponent expects this potential adverse effect could be reduced to acceptable levels by the Nisga'a Access Management Plan, developed in consultation with NLG. The -0.44% to -0.58% change in grizzly bear habitat suitability would not be expected to adversely affect local populations. Vegetation management along the proposed pipeline corridor could also benefit spring and summer feeding bears by increasing availability of grasses, sedges, forbs, and berry-producing shrubs.

The proposed Project would reduce availability of core security habitat for grizzly bears in the Cranberry and Khutzeymateen/Stewart GBAs by -1% and -1.2% respectively. The Application indicated these reductions would remain well below significance thresholds. The proposed Project would likely increase density of linear features by 3% in the Cranberry GBA and 4.9% in the Khutzeymateen/Stewart GBA.

Construction activities at marine exit and entry points could alter sedge flats used by grizzly bear as spring foraging areas, and connectivity between upland foraging habitat and salmon-bearing watercourses could be affected.

New presence of roads and pipelines could alter seasonal grizzly movement patterns, and grizzlies would likely avoid construction activities occurring in important movement corridors. The Ksi Sii Aks, for example, intersected by the proposed pipeline, is an important travel corridor for grizzly to access salmon feeding areas on the Nass River. Haines Flats, another important foraging area spring through fall, might be avoided by grizzly during active construction. Conversely, grizzly bears could be attracted to the proposed pipeline corridor, which could serve as a travel route.

Specific mitigation measures to reduce potential adverse effects from the proposed Project on grizzly bear include:

- Consulting FLNR if an active grizzly bear den is discovered during pre-construction or construction activities to determine if mitigation is required;
- Maintaining a minimum 50 m setback from bear dens during winter construction;
- Implementing recommended mitigation measures for construction activities within grizzly bear zones; and
- Consulting with NLG to identify sensitive ecosystems and harvesting areas requiring additional site-specific or situational mitigation.

EAO proposes conditions related to a Grizzly Bear Mitigation and Monitoring Plan, as well as financial contribution to FLNR to support the management of existing and cumulative effects to grizzly bear populations. NLG has indicated that, in addition to EAO's proposed conditions they would like to see integration of ROW maintenance with grizzly bear habitat management. EAO notes that such measures would be included in the Grizzly Bear Mitigation and Monitoring Plan.

Moose

Moose are highly valued as a game species and for cultural purposes. Recent declines have been observed in the Nass moose population in the NWA. Moose winter range in proximity to the proposed Project footprint, including adjacent to Ksi W'iipdalks and its confluence with the Nass River, was rated as moderately high suitability moose winter habitat. Regional mapping broadly identified these areas as important moose habitat.

The proposed Project footprint in the NWA could reduce regional moose habitat by approximately -1,273 ha or -1.1%. Suitable moose habitat availability would be reduced

during site preparation and clearing. Winter feeding habitat availability would be expected to decrease by -4.7%, or -352 ha. Effective moose winter shelter habitat would be expected to decrease -6.7%, or -1,111 ha. Foraging values in winter, however, could increase due to regeneration of low-growing shrub species in temporary work areas and in the permanent pipeline corridor.

Improved access and line-of-sight along the proposed pipeline corridor could increase hunting pressure on moose and increased population pressure from predators (wolves). Increases in the density of linear features within potential moose habitat, predicted to increase between 3-4.9%, could potentially increase mortality rates. The Application notes the linear feature density is below cautionary thresholds for the Kutzeymateen and Cranberry GBAs.

Changes in movement and disruption to Nisga'a access to harvesting activities would be likely if construction activities interacted with movement corridors or harvesting areas. These could be reduced through access management and other mitigation. Upon regeneration of forbs and deciduous shrubs and trees, moose could select habitats based on forage availability along the proposed Project corridor and behaviour could change from avoidance of the corridor to attraction.

Surveys in the NWA have shown a decline from approximately 1,600 moose in 2001 to 500 moose in 2011. Hunting has been reduced since 2007 and closed since 2012, with a limited number of permits released by NLG for harvest.

EAO notes that many of the issues relating to the regional decline in moose population are complicated and likely stem from a number of issues, including predation and legal, illegal and unregulated hunting. As such, the long term recovery of Nass moose populations is appropriately addressed through planning partnerships involving government, Aboriginal Groups, the Nisga'a Nation and a range of industry partners.

EAO proposes conditions related to the mitigation and monitoring of the proposed Project's effects on Nass moose. NLG has indicated that, in addition to EAO's proposed conditions they request integration of ROW maintenance with moose habitat management. EAO notes that such measures would be included in the Nass Moose Monitoring Plan, and EAO proposes a condition requiring vegetation management with a view to integrating fish and wildlife habitat considerations with Operations requirements.

Mountain Goat

For the most part, the pipeline corridor is situated at elevations below those commonly inhabited by mountain goat. The Application identified that two mountain goat UWR polygons would be intersected by the pipeline corridor, and the proposed Project footprint would directly affect 1.7 ha of UWR in the NWA. Since the filing of the Application, the Proponent is no longer considering the route alternative that would directly impact designated mountain goat UWR habitat.

22.4.3 Conclusions

Section 5.8 of this Report identified a number of residual effects related to wildlife. Considering the analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significantly adverse effects related to wildlife (with the exception of caribou, which are not present in the NWA). Mitigation implemented as part of permitting and the Nisga'a Nation ROW Agreement with the Proponent would also be expected to be important in mitigating potential adverse effects.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on the Nisga'a right to harvest wildlife.

22.5 Effects on Nisga'a Interests Regarding the Right of Nisga'a Citizens to Harvest Migratory Birds

22.5.1 Background

Chapter 9 of the NFA sets out Nisga'a citizens' rights to harvest migratory birds within the Nass Area. This right extends throughout the year. Nisga'a entitlements are held by the Nisga'a Nation. Nisga'a citizens have the right to harvest wildlife in accordance with the NFA, subject to measures necessary for conservation and legislation enacted for public health or safety. Nisga'a citizens have the right to trade or barter migratory birds. Subject to certain provisions, Nisga'a entitlements are for domestic purposes.

20.1.1 Potential Effects and Proposed Mitigation

The proposed Project footprint would overlap with Nisga'a hunting areas throughout the NWA. The Application identified interactions between Nisga'a interests identified in the NFA (Chapter 10, Section 8(e)) and the proposed Project, including Nisga'a citizens' right to harvest migratory birds for domestic purposes throughout the Nass Area (Chapter 9).

Pipeline and facility construction and operation would directly and indirectly affect wildlife and wildlife habitat through alteration of vegetation, terrain and drainage, and sensory disturbance which cause changes in migratory bird habitat, movement and mortality risk. Potential adverse effects and mitigation measures are discussed in more detail in section 5.8 of this Report.

Migratory bird habitat would be reduced during construction for the proposed pipeline corridor, metering facility and compressor stations. Vegetation clearing would continue throughout operations along parts of the proposed corridor while the remainder of the corridor and other work areas would be left to regenerate. Within the proposed Project footprint, 10.3% of Indicated Breeding Pairs would be expected to be directly affected.

Alteration of wetland habitat would also result from vegetation clearing and site preparation. Where avoidance of wetlands was determined not feasible, the EMP outlines measures to mitigate potential effects. The Application indicates project effects on waterfowl habitat would not be expected to influence long-term sustainability of local or regional waterfowl populations.

Change in shoreline habitat for waterfowl would result from marine pipeline installation, affecting marine birds including diving ducks, dabbling ducks, loons and cormorants, murre, murrelets, and auks. Temporary and localized alteration of physical, chemical or acoustic conditions of marine habitats could potentially decrease foraging opportunities and displace individual birds. The percentage of shoreline or offshore marine habitats directly affected by the proposed footprint would be relatively small.

Change in upland game bird habitat for sooty and ruffed grouse of 10% within the LAA in the Nass Area would be expected. This would remain below the defined threshold of 20% habitat loss for significant residual effects.

Mortality risk to migratory and upland game birds would be primarily associated with younger life stages (i.e. eggs or nestlings). Proposed Project personnel would be prohibited from hunting on the work site, using recreational vehicles on the pipeline footprint and access routes, and bringing pets and firearms (except safety personnel) in

project vehicles along the footprint and facilities. These and other measures would be outlined in the Nisga'a Access Management Plan. Other mitigation measures, including clearing outside of breeding timing windows, would be expected to ensure mortality risk to migratory birds does not influence long-term sustainability of harvesting activities on local populations.

EAO proposes the following conditions: mitigation and monitoring of the proposed Project's effects on marbled murrelets; implementing a No-Hunting, No-Trapping, No-Fishing and No-Plant Gathering Policy for employees and contractors during work hours; and implementing a policy restricting employees from possessing or storing firearms, bows and crossbows in camps or work vehicles unless at request of the Certificate holder.

22.5.2 Conclusions

Section 5.8 of this Assessment Report identified residual effects related to birds. Considering the analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significant adverse effects on birds. Mitigation implemented as part of permitting and the Nisga'a Nation ROW Agreement with the Proponent would also be expected to be important in mitigating potential adverse effects.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on the Nisga'a right to harvest migratory birds.

22.6 Effects on Nisga'a Interests Regarding the Harvest of Non-Timber Forest Resources

22.6.1 Background

Chapter 5 of the NFA deals with forest resources. All forest resources (timber and non-timber) on Nisga'a Lands are owned by the Nisga'a Nation, who is required to make laws in respect of timber resources (see the *Nisga'a Forest Act*). There are provisions which deal with harvesting activities and the management of forestry activities on Nisga'a Lands, including forest health and fire suppression. The 8(f) assessment of economic interests discusses impacts to timber resources.

The NLG Department of Forest Resources manages and regulates harvest of botanical forest products within Nisga'a Lands, including pine mushrooms and 10 other mushroom species and fiddleheads. All Nisga'a Nation and non-Nisga'a Nation harvesters and buyers must apply for a permit for an area-based harvest of pine mushroom. Cultural plants identified by Nisga'a Nation as having economic and cultural importance to the Nisga'a Nation include large cedar trees, pine mushroom, medicinal plants, and edible berry-producing plants.

22.6.2 Potential Effects and Proposed Mitigation

Potential pine mushroom habitat areas could occur within site series crossed by the proposed Project in the Vegetation RAA within the NWA. The proposed Project was rerouted to avoid the pine mushroom polygon identified in the Nisga'a Land Use Plan and other important mushroom harvesting areas.

The Application focused on six species potentially used as non-timber forest resources by Nisga'a citizens: devil's club, western red cedar, soopolallie, Labrador tea, black huckleberry, and pine mushroom. Effects from the proposed Project on vegetation and wetlands are further assessed in section 5.7.

A summary of the potential adverse environmental effects of the proposed Project to cultural plants is described below. A more detailed assessment of impacts to vegetation is provided in section 5.7 of this Report. The harvest of non-timber forest products is discussed in section 7.3.3 (Land and Resource Use).

Table 22-4: Project Interactions with Six Focal Species' Suitable Habitat in the Nass Area

	Base Case	Application Case	Change	Change
Pine mushroom	3,192.2 ha	3,034.8 ha	-157.4 ha	-4.9%
Black huckleberry	472.9 ha	447.1 ha	-25.8 ha	-5.5%
Soopolallie	16.8 ha	16.6 ha	-0.1 ha	-0.8%
Devil's club	1,981.8 ha	1,751.4 ha	-230.4 ha	-11.6%
Labrador tea	652.1 ha	626.5 ha	-25.7 ha	-3.9%
Western red cedar	9,120.4 ha	8,592.7 ha	-527.8 ha	-5.8%

As shown in Table 22-4, the proposed Project footprint would be expected to disturb and alter suitable habitat for the six focal species selected from -0.8% to -11.6%, with effects varying by species. During construction, invasive species could be introduced or their existing distribution could change via accidental transport of seeds or vegetable material into the project area. Indirect changes to habitat suitability may also occur due to microclimatic changes and introduction of spread of invasive plant species.

Combined, indirect and direct changes in habitat due to construction and proposed Project presence could change availability of non-timber forest resources.

As pine mushrooms grow in mature or old forests, effects on mushroom habitat along the maintained proposed pipeline footprint would likely continue for 80 years beyond the operational life of the pipeline.

In general, there is expected to be an increase in berry shrub abundance within 10 years of clearing activities along the pipeline route in areas outside the maintained corridor of 10 m. The maintained corridor of 10 m would not be suitable for black huckleberry and soopolallie throughout the proposed pipeline's lifespan. Labrador tea habitat would not be expected to be adversely affected by overstory tree removal and maintenance of low-growing shrub stage on the maintained corridor.

The total length of the proposed pipeline footprint would extend 185 km through the Nass Area. While no new access roads are proposed, access to resources for Nisga'a could be impeded by construction areas. Increased harvest pressure on resources including pine mushrooms could occur due to an influx of construction workers and the increase in access to harvesting areas through the creation of a pipeline corridor.

Related mitigation efforts include:

- Route options to avoid important mushroom areas;
- Vegetation removal restricted to the pipeline footprint and temporary workplace;
- Natural recovery methods for reclamation of temporary work space;
- Implementation of an EMP, Invasive Plant Species Management Plan, and Plant Species and Ecological Communities of Concern Discovery Contingency Plan;
- Restricting general application of herbicide near culturally important species and rare plant communities;
- Notifying and allowing for plant harvesting along the pipeline footprint before construction, and notification of access restrictions during construction to allow citizens to plan to use alternative harvesting locations;
- Deactivating and reclaiming temporary construction access roads;
- Encouraging rapid regeneration of natural vegetation by planting native tree seedlings and shrubs in selected temporary work spaces, construction camps and decommissioned project access roads; and
- Limiting additional clearing for construction access using existing access or corridors and existing disturbances.

EAO proposes conditions that would require: site habitat assessment surveys for all BC Conservation Data Centre red- and blue-listed plants and ecological communities, and any additional proposed mitigation measures, prior to construction; and implementation of a No-Hunting, No-Trapping, No-Fishing and No-Plant Gathering Policy for employees and contractors during work hours. NLG has indicated that surveys and identification of cedar-dominated communities would also be necessary for mitigation efforts to be successful. EAO notes that these surveys were conducted for the Application and additional surveys would be completed prior to permitting. EAO also proposes a condition that would require vegetation management during the life of the project to be conducted with a view to integrating fish and wildlife habitat with Operations requirements.

22.6.3 Conclusions

Sections 5.7 and 7.3.3 of this Report identified residual effects related to terrestrial vegetation and land and resource use. Considering the analysis and having regard to the conditions identified in the TOC (which would become legally binding as a condition of an EA Certificate), EAO is satisfied that the proposed Project is not likely to have significantly adverse effects related to terrestrial vegetation or land and resource use. Mitigation implemented as part of OGC and NLG permitting would also be expected to be important in mitigating potential adverse effects.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project would not have any adverse environmental effects on the Nisga'a right to harvest non-timber forest resources.

23 Nisga'a 8(f) Economic, Social and Cultural Well-Being Assessment

Chapter 10, paragraph 8(f) of the NFA requires that EA processes, as defined in the NFA, “assess the effects of the project on the existing and future economic, social, and cultural well-being of Nisga'a citizens who may be affected by the project.” The Proponent's requirements for the economic, social and cultural well-being assessment were specified in the AIR, in consultation with the NLG and in consideration of the *Economic, Social, and Cultural Impact Assessment Guidelines* (“ESCIA Guidelines”) utilized during the assessments for the Kitsault Mine and KSM Projects. Potential economic, social, and cultural effects identified in the AIR include:

- Economic interests:
 - o Nisga'a citizens' employment and income;
 - o Nisga'a citizens' business activities;
 - o Natural resource activities and related earnings or values;
 - o Future Nisga'a citizens' economic opportunities and economic development;
 - o Nisga'a government expenditures, based on estimates provided by NLG for monitoring Project-related education and training or other economic development strategies, and mitigation of social and cultural impacts on such effects;
- Social interests:
 - o Migration and population effects in the Nisga'a Nation communities;
 - o Infrastructure and services in the Nisga'a Nation communities;
 - o Occupational and non-occupational health risks;
 - o Occupational and non-occupational accident risks;
 - o Crime;
 - o Family and community well-being;
- Cultural interests:
 - o Effects of environmental impacts (including those resulting from accidents and malfunctions) on the cultural activities and practices of Nisga'a citizens;
 - o Effects of changing work patterns and income on Nisga'a cultural activities and practices; and
 - o Effects on Nisga'a language.

The 8(f) assessment is linked to VCs for Air Quality, Acoustic Environment, Water Quality, Employment, Infrastructure and Services, Transportation, Heritage and Archaeological Background, and Human Health, as well as to Accidents or Malfunctions and the 8(e) assessment.

23.1 Economic Well-Being

23.1.1 Background

Nisga'a employment and income

The Proponent provided background information on Nisga'a citizens' employment and income, including employment and unemployment, labour availability by trade or skill, educational attainment, earnings and income.

Unemployment rates in Nisga'a Villages range from 18.3% to 54%, substantially higher than the overall provincial rate of 6% and the provincial Aboriginal rate of 15% (based on 2006 data, modified from the 2013 Kerr Sulphurets Mitchell (KSM) EA Application). The Nisga'a Sustainable Employment Plan (2011) reports that 25% of 329 respondents cited lack of job opportunities as the main reason for unemployment, as well as a lack of education, skills, and training.

Of those surveyed by the Skeena Native Development Study (SNDS) in 2007, 57% worked full-time, 17% were employed part time, and 26% were employed full-time were engaged in seasonal employment, including pine mushroom harvesting, forestry, and fishing. The total active labour force as of 2006 was 973.

Key employment sectors in most Nisga'a Villages include public administration and resource-based industries (agriculture, forestry, fishing, hunting, mining, oil and gas, utilities), health care and social assistance, educational services, and accommodation. Unemployment in the Nass Area decreased by 18.3% from 1994-2006.

Nisga'a business activity, earnings, and investment activity

Nisga'a Nation is involved in diverse business activities such as forestry, construction, food services, tourism, archeological and environmental monitoring, transportation, and fishing. The Nisga'a Commercial Group (NCG) is responsible for the management of Nisga'a corporations which includes Nisga'a Fisheries Ltd., Lisims Forest Resources LLP, Lisims Backcountry Adventures Inc., and enTel Communications Inc. Nisga'a Nation also owns Greenville Enterprises Inc., which works in construction and forestry, and Nass Area Enterprises (NAE), which seeks to advanced Nisga'a Nation interests in the Nass Area. NAE manages Nass Camp which is 10 km east of Gitlaxt'aamiks and was purchased in 2010, and is employed in construction on the NTL Project.

Nisga'a citizens manage small-to medium-sized businesses throughout the Nass Area, primarily one- or two-person operations. A business survey found that around 20% of

Nisga'a businesses work in mining, construction and forestry. A 2012 survey cited by the Proponent indicated the majority of Nisga'a businesses operate in tourism, accommodation, and food services sectors. Four (5%) of the 79 surveyed were in the mining, quarrying, and oil and gas sector, six (7.6%) in construction, and five (6.3%) in forestry. The most recent Nisga'a Business Survey counted 32 businesses in Nisga'a Villages and Nisga'a urban locations.

Nisga'a natural resource activity and related earnings or values

Nisga'a Lands and all natural resources associated with the lands are owned and managed under the jurisdiction of Nisga'a Nation. The Nisga'a Land Use Plan provides guidance for the benefit of Nisga'a citizens and includes Public Use Zones, Areas Requiring Special Consideration, Resource Stewardship Zones, and Special Management Areas. Resource Stewardship Zones include Forest Resources (Timber Products Zone, Botanical Forest Product Zone, and Cultural Products Zone), Agricultural Resources (Agricultural Lands), and the Nass Wildlife Management Area. Special Management Areas include the Nass Bottomlands, Tseax Visual Polygon, Grease Trail (Genim Sgeenix), Pine Mushroom Polygon and Archaeological Polygon.

Nisga'a citizens depend on the natural resources within the Nass Area to practice and pursue treaty rights, including those related to cultural and commercial activities. Nisga'a citizens use the landscape for hunting, trapping, gathering, fishing, country foods, medicines, materials, and other resources. There are also Nisga'a commercial harvesting activities including fishing and forestry operations.

Other key areas to Nisga'a natural resource activity and related earnings or values include Nisga'a Memorial Lava Bed Park, other parks and protected areas, fish and wildlife, forestry, and mining. As of 2006, 11.5% of the population on Nisga'a Lands were employed in commercial fishing. Chapter 5 of the NFA establishes timber harvesting rates on Nisga'a Lands and a process for Nisga'a Nation to acquire forest tenures having an allowable annual cut of up to 130,000 m³. In 2006, the mining sector was a minor employer, employing 0.7% of the population on Nisga'a Lands. This may change in the near future given the approval of KSM and Kitsault Mines in the region.

Nisga'a Government revenues and expenditures

The Application indicates the NLG's 2013 annual revenue was approximately \$99.7 million, with \$23.8 million in excess revenue and an accumulated end-of-year surplus at approximately \$225.1 million. NLG expenditures in 2013 totaled \$24.6 million, with an additional \$51.2 million in transfers to Nisga'a Village Governments. Most NLG finances are channeled towards operations and administration of NLG including transfers to the Nisga'a Village Governments, Nisga'a Valley Health Authority, and the Nisga'a School

Board. Key areas of expenditures in 2011 were administration, programs and services, land and resources, and fish, wildlife and migratory birds.

Operating surpluses from commercial entities such as Nisga'a Fisheries, Lisims Forest Resources, enTel Communications also contribute to the NLG revenue stream.

The Proponent has provided capacity funding for project-related consultation expenditures and has negotiated a Benefits Agreement.

Future Economic Opportunities and Economic Development

NLG provides training and employment services to Nisga'a citizens through the Nisga'a Employment Skills and Training Department (NEST), which was created in response to labour market needs and challenges faced in obtaining employment as identified in the Nisga'a Sustainable Employment Plan.

The Nisga'a Business Survey and focus groups conducted for the Kitsault Mine found that Nisga'a businesses are expected grow over the next 10 years due to new projects in the area, intention to expand and community growth. Challenges identified include competition with larger economic centres, demand volatility, loss of infrastructure, highway conditions or access, equipment depreciation, insurance, and personnel health and safety. Research undertaken for Kitsault Mine showed a strong desire to expand businesses in Nisga'a Villages and their ability to take on larger contracts.

The NLG has expressed interest in developing LNG infrastructure as a sustainable contribution to its economy and community, as outlined in their presentation New Available LNG Sites on Canada's West Coast.

NLG, four Nisga'a Villages and three Urban Locals in Prince Rupert, Terrace and Vancouver developed a 10-year strategic economic initiative through to 2022 for the 'Prosperity for Nisga'a Nation Project', to encourage social change through economic development.

23.1.2 Potential Effects and Proposed Mitigation

Nisga'a economic interests identified in the NFA that are expected to interact with the proposed Project include Nisga'a citizens' employment and income, Nisga'a citizens' business activities, natural resource activities and related earnings or values, Nisga'a government expenditures and future Nisga'a citizen's economic opportunities and economic development. A summary of these effects is described below, and a more detailed assessment of adverse effects related to economy and land and resource use

is provided in section 6 and 7.3 of this Assessment Report. Project benefits are discussed in section 2.5.

Nisga'a employment and income

The Proponent indicated that details on potential employment and training opportunities for Nisga'a citizens are not currently available and are subject to discussion with NLG.

Proposed project construction could generate over 24 months, 110 person-years of direct, indirect, and induced employment for Nisga'a citizens. It would be expected to provide 35 person-years of direct employment for Nisga'a citizens for a total direct labour income of \$4.2 million. The Proponent estimates that \$96.4 million in goods and services would be purchased from BC suppliers for construction on Nisga'a Lands, of which \$19 million could be purchased from local suppliers and generate 65 person-years of indirect employment and \$3.9 million in labour income for Nisga'a. Nisga'a project-related consumer spending could create 10 person-years of induced employment.

The proposed Project would require approximately a total of 23 people per year in direct employment for the Project lifespan, and about 45 person-years of total indirect and induced labour. Due to the operation phase's low employment demand, it would be unlikely to adversely affect labour availability or cause local labour shortages.

Adverse economic effects could occur if proposed Project employment or contracting requirements exceeded local capacity for labour, goods and services. Disruption to access of natural resource harvesting areas could adversely impact revenues and costs of some Nisga'a businesses. Demands placed on the Nisga'a workforce due to the proposed Project could also adversely affect the ability of Nisga'a businesses to meet requirements of other projects in the area.

Overall effects on employment and income would be expected to be positive, particularly with creation of employment opportunities during construction. Potential related adverse effects could include labour shortages and wage inflation due to change in labour wage and availability by skill level, and changes in labour force participation and unemployment rates. Higher wages could encourage Nisga'a to leave lower-paying jobs to work on the proposed Project and others in the region, with resulting labour shortages and wage inflation potentially increasing costs to Nisga'a businesses.

Construction of the proposed Project on Nisga'a Lands would be expected to cost \$470 million, with \$139 million in purchases from BC sources. An estimated 9% of employment would be sourced locally for Nisga'a Lands, based on availability of skilled

labour, although this could increase if Nisga'a citizens took up training opportunities offered by the Proponent, which would also reduce skilled labour shortages.

Mitigation measures include:

- During construction, creating contract and procurement opportunities, in the short- and long-term and to support capacity-building;
- Addressing employment participation barriers for Nisga'a citizens and to increase opportunities to participate on the project workforce;
- Provide qualified Nisga'a citizens and businesses opportunity to participate in project construction, and avoid quotas or targets that may lead to wage competition with other employers;
- Maintaining sustainable project costs by offering fair wages in line with market conditions; and
- Undertaking opportunities to increase Nisga'a participation in the project, which may include a Labour Force Assessment, Labour Recruitment and Retention Strategy, and/or a Workforce Training Strategy.

Nisga'a business activity, earnings, and investment activity

The 24-month construction period would increase employment and local contract procurement, but could also temporarily disrupt Nisga'a business activities in forestry, fishing, and harvesting of other natural resources. The degree to which this occurs would depend on the amount of physical overlap between the ROW safety zone and Nisga'a business activities.

Direct, indirect and induced benefits for Nisga'a businesses could include increased or new demands for goods and services, although this would be contingent on Nisga'a businesses' successful contracting and procurement. Concerns were raised by NLG about business capacity, limited access to investment capital, training, the Proponent's procurement and hiring practices and competition from larger businesses.

Mitigation and enhancement measures include:

- Limiting construction activities' interferences with forestry, fishing, commercial mushroom harvesting, tourism, and other business activities;
- Nisga'a Access Management Plan including access for Nisga'a businesses to resource harvesting areas, notification of pre-construction periods to allow plant harvesting in the project footprint, notification of access restrictions, and access to resource areas temporarily restricted by project right-of-way safety zones;
- Designating services to be conducted by Qualified Aboriginal Businesses;

- Conducting information sessions on contracting and employment opportunities; and
- Working with prime contractors to increase Aboriginal and local companies and people's participation, informing Aboriginal groups who the successful prime contractor is and explaining the reasons for the selection.

Nisga'a natural resource activity and related earnings or values

The proposed Project has the potential to affect Nisga'a treaty rights in relation to disruption of cultural and commercial natural resource activities, due to environmental impacts or to changes in employment patterns. Project construction would potentially affect land use areas designated for timber harvesting, agricultural use, special management, and park use. The safety exclusion zone during construction around active areas could temporarily disrupt access to natural resource harvesting areas.

Project construction could also affect natural resource activities in Resource Stewardship Zones and Special Management Areas. While the Proponent changed pipeline routing to avoid the pine mushroom polygon, other pine mushroom habitat areas could be affected.

During operation, the permanent Project footprint and access roads could increase access to natural resource harvesting areas, which could alter the abundance and availability of resources. However, disruptions would be expected to be short-term, with new access roads not being developed and strategies in the Nisga'a Access Management Plan. Tourism-related natural resource activities including guided angling, cultural tours and other commercial recreation could also be affected, although effects are expected to be minimal.

Table 23-1: Nisga'a Land Use Zones Potentially Affected by the Proposed Project

Land Use Zones	Total Area (km ²)	Area Affected by Project Footprint (km ²)	% of Zone Affected by Project Footprint
Resource Stewardship Zones			
Forest Resources - Botanical Forest Products Zone	127.1	0.2	0.16
Forest Resources - Timber Products Zone	1,380.7	15.5	1.12
Agricultural Resources	249.3	4.7	1.89
Wildlife Area	492.9	6.6	1.34
Special Management Area			
Pine Mushroom	64.9	0	0
Nass Bottomlands	110.1	3.5	3.17

Grease Trail (Genim Sgeenix)	5.9	0	0
Archaeological	0.5	0	0
Tseax Visual	29.4	0	0

As shown in Table 23-1, 1.12% of the timber harvesting land base in the Forest Resource Zone and 3.17% of the Nass Bottomlands would be overlapped. During construction, 1.89% of agricultural resources would be affected, although most would be returned to agricultural use following construction. While the pine mushroom polygon was avoided by the route, up to 4.1% of pine mushroom high-value habitat in the Nass Area could be affected by the footprint.

Commercial fishing activities along the marine route could be disrupted during construction, damage or loss of benthic fishing equipment could occur during operation between long-line halibut and crab traps and exposed portions of the submerged pipeline or rock infill (see section 7.3).

Nisga'a Nation expressed concern about the potential for the pipeline to interact with the Nass River's natural geomorphology through the Nass Bottomlands, and emphasized the need for proactive planning to mitigate potential adverse effects. EAO proposes a condition requiring the Proponent to conduct detailed geotechnical and risk assessment to identify areas of scour potential, and to identify mitigation measures to ensure that environmental impacts associated with potential pipeline scour are reasonably minimized. Additional geotechnical risk assessment may be required by OGC during permitting.

Construction would be expected to affect 18 of 38 traplines in the NWA, as the pipeline would affect 0.41% of Nisga'a Lands for the Project's life (see section 7.3). Tourism activities, including guided angling, cultural tours and other commercial recreation could experience disturbances from construction and restricted access to tourism areas, although these would be managed by the Nisga'a Access Management Plan. Tourism associated with Nisga'a Memorial Lava Bed Park could also be adversely affected.

Increased access through road improvements, management and monitoring strategies for natural resources would be potential positive effects of the Project.

Identified mitigation measures include:

- Forestry: coordinating project construction activities with forestry operators in the area, and preparing a Timber Utilization Plan for use of merchantable timber;
- Botanical and agricultural use: developing the Nisga'a Access Management Plan,

- including strategies to limit disturbances to botanical and agricultural activities;
- Pine mushroom harvesting: potential route options were chosen to avoid the pine mushroom polygon;
- Harvesting of fish and wildlife: adhering to species-specific timing constraints during construction, consulting with affected registered trapline tenure holders, implementing the Nisga'a Access Management Plan, reducing land disturbance where possible, and compensating registered trappers for economic losses; and
- To ensure that risks associated with scour in the Nass Bottomlands are identified and that related potential environmental impacts are reasonably minimized.

Nisga'a Government revenues and expenditures

Costs could be incurred by NLG to monitor project-related employment, training, and contracting. The Proponent indicated they would assist NLG to monitor project-related education, training, employment, and procurement opportunities, and to develop and implement an economic development strategy or initiatives related to project employment, procurement, and capacity building or training. The Proponent did not discuss property taxes or rents where the proposed Project would cross Nisga'a Lands. On October 30, 2014, the Province announced Bill 7-2014 – the *Nisga'a Final Agreement Amendment Act*, which, if passed, will establish the Nisga'a Nation as the primary property taxation authority over Nisga'a Lands. The legislation gives effect to the Real Property Tax Co-ordination Agreement between the Province and the Nisga'a Nation which was signed by the parties in July 2014, and enables the NLG to levy and collect property tax from persons other than Nisga'a citizens, including companies that operate industrial installations, such as LNG pipelines and midstream infrastructure.

The Proponent has provided capacity funding for project-related consultation expenditures and has negotiated a Benefits Agreement.

Future Nisga'a Nation economic opportunities and economic development

The Proponent expects the proposed Project to have a positive effect on employment in northern BC, with potential economic effects including construction and operating expenditures, employment generation and business opportunities, local, provincial and federal revenues, and local economic development. NLG has interest in development of LNG infrastructure as a sustainable contribution to its economy and community.

23.1.3 Conclusions

Under Chapter 10, paragraph 8(i), EAO's EA may take into account any agreements between the Proponent and the Nisga'a Nation or a Nisga'a Village concerning the effects of the proposed Project. On October 29, 2014, Nisga'a Nation announced that it had entered into a Benefits Agreement with the Proponent in respect of the proposed Project. The Benefits Agreement provides for significant direct financial benefits to the Nisga'a Nation and further capacity funding. The agreement also contains commitments from the Proponent to provide exclusive contracting opportunities for the ROW clearing, camp services, security and medical services on Nisga'a Lands. Under the agreement the Proponent would have ongoing consultation obligations with NLG during the planning, construction, operation and decommissioning phases of the proposed Project.

EAO proposes a number of socio-economic conditions that would be relevant to potential impacts to the economic, social and cultural well-being of Nisga'a citizens, including a condition that would require the Proponent to develop a SEEMP that would include monitoring and reporting on the effectiveness of mitigation and, if necessary, adaptive management. NLG would be engaged in the development of the SEEMP.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project is not reasonably expected to adversely affect the economic well-being of Nisga'a Citizens and is likely to have beneficial effects.

23.2 Social Well-Being

23.2.1 Background

Migration and population effects

The Proponent provided statistics from Aboriginal Affairs and Northern Development Canada (2013) on Nisga'a Nation registered populations for Gitlaxt'aamiks, Gitwinksihlkw, Laxgalts'ap and Gingolx, including those living off Nisga'a Lands. The total Nisga'a population is 5,955. The demographic structure of communities in the Nass Area may change in response to proposed major projects in the region, which could see an influx of people into Nisga'a Villages during construction phases of projects and departure of non-Nisga'a workers once construction would be complete. An exception is mining projects, which would require long-term workers after construction.

Impacts on infrastructure and services

The Application reviewed the existing housing stock and current capacity of infrastructure and services, including water, sewage, transportation, housing and accommodation, health and emergency services, other services and amenities.

Housing shortages were identified in all Nisga'a Villages. Statistics Canada reported that in 2011 there were 690 private dwellings in the Villages, with 590 occupied. About 40% of were constructed prior to 1986, and 23% were identified as needing major repair. Total capacity of temporary accommodation in Gitlaxt'aamiks and Gitwinksihlkw is approximately 272 units (2012 data).

The Gitlaxt'aamiks Volunteer Fire department and RCMP Lisims/Nass Valley police detachment provide emergency services in Nisga'a communities. Nisga'a Nation employs a modified vehicle for emergency transport to Terrace, and Gitwinksihlkw operates a Class A ambulance. An ambulance in Terrace and the Prince Rupert air ambulance can travel to Nisga'a Lands in case of emergency. Nisga'a Nation members organize and conduct their own efficient rescue operations.

Healthcare services (physician services, public health, and dental/mental health) in Nisga'a villages is delivered through and managed by the Nisga'a Valley Health Authority. The nearest full-service hospital is Mills Memorial Hospital in Terrace. Concerns have been expressed about increased demand on health care services due to the large number of proposed and planned development projects in northern BC.

Each Nisga'a Village government provides social services in their respective communities while the Nisga'a Child and Family Services coordinates services to ensure the protection and well-being of Nisga'a children and youth. Each Village also operates a recreation centre that houses community-based recreation programs funded by Nisga'a Child and Family Services.

The Nisga'a Memorial Lava Bed Provincial Park provides the setting and facilities for a variety of recreational activities. Nisga'a Nation identified two recreational sites under the *Nisga'a Forest Act*: Dragon Lake Campground and Dragon Lake Picnic Site, located 6 km north of Nass Camp along the Nass Forest Service Road.

Community utilities within Nisga'a Lands such as water, sewer, garbage collection, and landfill services are operated by NLG and the Nisga'a Village governments. The community landfill, funded by the Regional District of Kitimat-Stikine, is located near Gitlaxt'aamiks and services the Nisga'a communities and surrounding area. The water systems in Gingolx and Gitwinksihlkw were upgraded in 2011 and 2012 but

Gitlaxt'aamiks, although not currently used to full capacity, would need to be upgraded to accommodate any population increase. The majority of the community sewer systems are in good working order with only one system needing a recent upgrade (2011). High-speed internet services are provided to all Nisga'a Villages by enTel.

Regarding road and highway infrastructure, Highway 113 is a Class C provincial highway which heads northwest from the Nass Valley to Terrace. The Cranberry Connector connects Gitlaxt'aamiks to Cranberry Junction (Highway 37). NLG maintains some forest roads, although most are managed by the Province, as are primary and secondary highways. The only gas station in the Nass Area is located in Gitlaxt'aamiks.

The Nisga'a Nation School District No. 92 administers education services to the Nisga'a Villages and employed 32 teachers as of 2011/2012, with 403 enrolled students in 2013/2014. New proposals are being considered by the District that focuses on re-organization of the school system in the Nass Valley and development of a trades program. The *Wilp* Wilxo'oskwhl Nisga'a Institute also provides post-secondary education opportunities in different academic and vocational sectors.

Occupational and non-occupational health and accident risks

The proposed Project's potential human health effects assessment and social effects assessment are discussed in sections 9 and 7 of this Assessment Report.

Projects such as Kitsault Mine and NTL have raised concerns from Nisga'a citizens and NLG about noise and visual effects from construction, electric and magnetic fields, and possible contamination of air, water, and foods. There were also concerns that a leak or spill would cause irreparable damage to the environment and waterways, and result in long-lasting negative effects on harvesting activities and cultural practices.

Family and community well-being

The Application characterized existing social conditions in Nisga'a communities using the Canadian Community Well-Being index (CWB), which considers data on income, labour participation, housing, and educational attainment, and available regional socio-economic indicators, including crime rates, life expectancy, physical and mental health rates, and reliance on family services. Based on these indicators, well-being in Nisga'a communities is significantly lower than the relevant provincial average.

23.2.2 Potential Effects and Proposed Mitigation

Nisga'a social interests identified in the NFA expected to interact with the proposed Project include migration and population effects in Nisga'a Nation communities, community infrastructure and services in Nisga'a Nation communities, family and community well-being, occupational and non-occupational health risks, and occupational and non-occupational accident risks.

Migration and population effects

Some Nisga'a citizens have expressed concern about emissions, discharges and wastes from the proposed Project, and potential related out-migration. However, these are unlikely enough to produce a measurable effect on the Nisga'a population.

The population in the Nass Area would increase temporarily due to regional employment and expenditure during construction. Proposed Project-related employment opportunities could also draw Nisga'a citizens into the Nass Area, increasing Nisga'a Village populations temporarily or permanently. However, Nisga'a citizens living in Terrace, Prince Rupert, and Vancouver have indicated they would be unlikely to return to the community for a short-term employment opportunity. Some temporary proposed Project workers could choose to remain in the Nass Area permanently following construction activities, although it is not anticipated that workers would be exposed to Nisga'a Villages enough to be enticed to relocate to the Nass Area permanently.

As camps could accommodate up to 1,100 personnel, it is unlikely worker in-migration would exceed that level at any one time. This would be a notable increase in the population of the Nass Area, and change to demographics as 85% of workers are anticipated to be male.

Mitigation measures include:

- Housing workers in camps outside of Nisga'a Villages, and in Terrace during camp setup;
- Managing movement of workers into Nisga'a Villages by discouraging use of vehicles for personal use and providing other means of transport;
- Providing amenities for workers in camps, such as Wi-Fi; and
- Managing emissions, discharges, and wastes according to Health Canada guidelines and BC AAQO, and implementing best management practices and applicable management plans.

Impacts on infrastructure and services

Potential effects on infrastructure and services in Nisga'a Villages as a result of the proposed Project would include an increase in use of roads, water, sewage, and waste disposal, housing, and health and emergency infrastructure and services.

While existing challenges related to overcrowding and inadequate accommodations could be exacerbated if the proposed Project triggered an influx of Nisga'a citizens to return to the Nass Area, this is not expected to occur in numbers that would create additional housing pressure.

The large workforce required for construction could stress already limited patient transport resources, even after mitigation. The Gitlaxt'aamiks health clinic could assist with camp emergencies while waiting for emergency services, although emergencies would mostly be dealt with in camps or in Terrace's Mills Memorial Hospital.

There could be increased pressure on social services due to a population increase during proposed Project construction, although this effect is expected to be minimal in Nisga'a Villages. Work camps could adversely affect the mental health of workers, and some could require mental health practitioners, drug and alcohol treatment, or counselling services. Potentially adverse social effects resulting from demographic changes accompanying development were identified as a concern of representatives from Gitwinksihlkw, Gitlaxt'aamiks and Lisims-Nass Valley RCMP.

The Proponent plans to enter into third-party agreements to supply drinking water, potentially with Gitlaxt'aamiks if it has capacity. Camp sewage would be disposed of at Nisga'a Village sewage systems if capacity is adequate.

Traffic volumes would likely increase by 3.7% to 9.4% depending on the route. Anticipated benefits would likely include road infrastructure upgrades to accommodate project equipment and service contracts to address water and sewage requirements.

The proposed Project would not be expected to strain capacity of education facilities in Nisga'a Villages or increase student enrolment. No effects on social services would be anticipated during Project operation.

In response to adverse potential social effects of the proposed Project related to Nisga'a infrastructure and services, mitigation strategies include:

- Purchasing potable water from a bulk vendor and making the contract for the Nass Area available to Nass Area businesses;

- Transporting sewage out of the area or arranging to use local infrastructure;
- Providing adequate housing in construction camps for all workers during construction, and housing workers in Terrace during camp set-up;
- regarding emergency and social services:
 - o Providing at least two first aid medics in construction camps and supplying camps with emergency conveyance vehicles;
 - o Recording worker medical incidents requiring Nisga'a Village emergency infrastructure or services during construction and sharing incident numbers with the NVHA; and
 - o Working with subcontractors to maintain emergency personnel and equipment onsite and at camps.

Occupational and non-occupational health risks

Occupational health risks could increase due to the increased number of workers in the region during the construction phase, although these would be mitigated through standard health and safety practices, management plans, and WorkSafeBC practices.

Non-occupational health risks relate to air quality, drinking water quality, noise, and quality of foods; these potential effects are discussed in sections 5.2, 5.6, 5.1 and 9.1 of this Report respectively.

Sediment disturbance during construction at water crossings could release metals and organic compounds, although these would not be expected to exceed levels occurring during natural events, as discussed in section 5.6 of this Report.

Noise levels would be elevated during the 24-month construction phase, although for less than 12 months in any given area. Predicted worst-case construction noise would exceed Health Canada's guideline within 1 km of pipeline construction activities, reaching Gitlaxt'aamiks and Gitwinksihlkw without mitigation.

Non-occupational accident risks during construction could include increased road and marine traffic (from barge safety zones), increasing risk of vehicular and marine traffic collisions. Daily traffic volumes could increase by up to 89 vehicles daily on the Nass Road (from 529), 41 on the Cranberry Connector and 34 on the southern branch of the Nisga'a Highway (which have 493 combined daily currently).

Mitigation to reduce potential adverse non-occupational health risk effects of air, water and harvestable food quality, and noise, accident risk and incidents of crime during construction activities include:

- Dust control on existing access roads;
- Applicable permits obtained before wood burning, notification of NLG and following applicable regulations;
- Following Trans Canada's Waste and Hazardous Materials Management Manual if contaminated soils are encountered;
- Restricting general application of herbicide near identified important species and rare plant communities, using alternate measures in those areas and prohibiting herbicides within 30 m of an open body of water;
- Water quality monitoring for sediment events during instream construction;
- Prohibiting fuel, oil, or hazardous material storage within 100 m of a watercourse or water body except where secondary containment is provided in the Spill Contingency Plan;
- Managing noise complaints from Nisga'a citizens during construction; and
- Using protocols described in Section 3.1.1 of the BC Noise Control and Best Practices Guideline, including conducting construction and operation activities in the daytime and restricting construction traffic to approved access routes.

Family and community well-being

Potential adverse effects on family well-being during construction phase employment and expenditure activity could include increased drug and alcohol abuse, marital discord, domestic violence and gambling related to in-migration in the Nass Area and Nisga'a citizens leaving home for extended shifts. Potential well-being benefits to families and communities could include a rise in CWB scores: including increased income, labour participation, and educational attainment. Housing could be adversely affected by the proposed Project through in-migration of Nisga'a workers.

Proposed mitigation to reduce potential adverse effects on family and community well-being during construction includes:

- Housing non-local workers in camps outside Nisga'a Villages, and in Terrace during camp set-up;
- Managing movement of workers into Nisga'a Villages by discouraging use of vehicles for personal use and providing other means of transport;
- Implementing TransCanada's Drug and Alcohol Policy;
- Collaborating with NLG to provide counselling services, including money-management training, to interested Nisga'a Project employees;
- Implementing culturally sensitive workplace policies; and
- Developing strict requirements for workers to emphasize respectful behavior.

23.2.3 Conclusions

Under Chapter 10, paragraph 8(i), EAO's EA may take into account any agreements between the Proponent and the Nisga'a Nation or a Nisga'a Village concerning the effects of the proposed Project. On October 29, 2014, NLG announced that it had entered into a Benefits Agreement with the Proponent in respect of the proposed Project. The Benefits Agreement provides for significant direct financial benefits to the Nisga'a Nation and further capacity funding. The agreement also contains commitments from the Proponent to provide exclusive contracting opportunities for the ROW clearing, camp services, security and medical services on Nisga'a Lands. Under the agreement the Proponent would have ongoing consultation obligations with NLG during the planning, construction, operation and decommissioning phases of the proposed Project.

EAO proposes a number of socio-economic conditions that would be relevant to potential impacts to the economic, social and cultural well-being of Nisga'a citizens, including a condition that would require the Proponent to develop a SEEMP that would include monitoring and reporting on the effectiveness of mitigation and, if necessary, adaptive management. NLG would be engaged in the development of the SEEMP.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project is not reasonably expected to adversely affect the social well-being of Nisga'a Citizens.

23.3 Cultural Well-Being

23.3.1 Background

Chapter 2 of the NFA states that "Nisga'a citizens have the right to practice the Nisga'a culture and to use the Nisga'a language, in a manner consistent with this Agreement".

Use of the Nisga'a language has been slowly declining due to reduced education programs, an aging population of speakers and increased work in English-based labour. 77% of Nisga'a citizens have some level of understanding, 19% are fluent and many others are actively learning. The Ayuukhl Nisga'a Department of the NLG is responsible for protecting, preserving and promoting Nisga'a language, culture and history.

23.3.2 Potential Effects and Proposed Mitigation

Nisga'a cultural interests identified in the NFA that are expected to interact with the

proposed Project include impacts on the cultural activities and practices of Nisga'a citizens, effects of changing work patterns and income on Nisga'a cultural activities and practices, and effects on Nisga'a language.

Effects on cultural activities and practices including changing work patterns and incomes

Depending on the level of Nisga'a employment with the proposed Project, there could be simultaneous positive and negative impacts on Nisga'a cultural activities and practices. Construction and the footprint during operation could affect harvesting of fish, wildlife, and medicines in plants, including routing the pipeline through the Nisga'a Memorial Lava Bed Park and through pine mushroom high-value habitat areas.

Construction could temporarily disturb cultural land use activities and restrict access, particularly if it interferes with harvesting periods (see Table 23-1). The footprint could increase access to important cultural areas for non-Nisga'a people while increasing harvest pressures on key resources, while facilitating some cultural activities for Nisga'a citizens.

Families may need to balance availability of community and family support, cultural obligations and activities with employment if the proposed Project goes ahead, and workers may need to balance family and cultural responsibilities. Examples of impacts include Nisga'a citizens' availability to attend family, community and cultural events and the diets at work camps. Nisga'a citizens employed by the proposed Project may also experience an increase in income which may have positive and negative effects and which Nisga'a Elders expressed concern about regarding developments in the Nass Area. However, Nisga'a citizens employed by the proposed Project earning more than previously may be enabled to purchase equipment and supplies to enhance capacity to participate in cultural activities.

Mitigation measures to reduce adverse proposed Project-related effects on Nisga'a cultural activities and practices include:

- Undertaking routing adjustments to avoid or limit socially and culturally important areas, such as pine mushroom polygon, burial grounds and gravesites;
- Developing a Heritage or Paleontological Resource Discovery Contingency Plan, Traditional Land Use Sites Discovery Contingency Plan, and Nisga'a Access Management Plan;
- Posting signs during construction to identify sensitive environmental features;
- Completing an archaeological impact study before ground disturbing activities;
- Engaging Nisga'a Wildlife and Fisheries Department to disseminate information

- to trappers, hunters, fishermen, and guides; and
- Working with successful subcontractors to develop human resources policies that recognize and accommodate cultural practices.

Effects on Nisga'a language

Nisga'a members have expressed concern regarding potential impacts to youth-driven efforts to revive the Nisga'a language from regional developments. For the proposed Project, influx of English-speaking workers could impact the language.

The Application identified disruption of the Nisga'a language throughout the Nass Area as a potential adverse cultural effect related to the Nisga'a language. The Proponent indicated that while potential effects on Nisga'a language would not be anticipated, it would consult with NLG about how to support and enhance Nisga'a language as part of ongoing language revival efforts.

23.3.3 Conclusions

Under Chapter 10, paragraph 8(i), EAO's EA may take into account any agreements between the Proponent and the Nisga'a Nation or a Nisga'a Village concerning the effects of the proposed Project. On October 29, 2014, NLG announced that it had entered into a Benefits Agreement with the Proponent in respect of the proposed Project. The Benefits Agreement provides for significant direct financial benefits to the Nisga'a Nation and further capacity funding. The agreement also contains commitments from the Proponent to provide exclusive contracting opportunities for the ROW clearing, camp services, security and medical services on Nisga'a Lands. Under the agreement the Proponent would have ongoing consultation obligations with NLG during the planning, construction, operation and decommissioning phases of the proposed Project.

EAO proposes a number of socio-economic conditions that would be relevant to potential impacts to the economic, social and cultural well-being of Nisga'a citizens, including a condition that would require the Proponent to develop a SEEMP that would include monitoring and reporting on the effectiveness of mitigation and, if necessary, adaptive management. NLG would be engaged in the development of the SEEMP.

Following consultation with NLG, and in consideration of the above assessment, the Proponent's proposed mitigation measures, and the conditions which would become legally binding if an EA Certificate is issued, EAO concludes that the proposed Project is not reasonably expected to adversely affect the cultural well-being of Nisga'a Citizens.

PART E – CONCLUSIONS

Based on:

- Information contained in the Application;
- The Proponent's and EAO's efforts at consultation with Aboriginal Groups, government agencies, including local governments, and the public, and its commitment to ongoing consultation;
- Comments on the proposed Project made by Aboriginal Groups, Nisga'a Nation and government agencies, including local governments, as members of EAO's Working Group, and the Proponent's and EAO's responses to these comments;
- Comments on the proposed Project received during the public comment period, and the Proponent's responses to these comments;
- Issues raised by Aboriginal Groups regarding potential impacts of the proposed Project and the Proponent's responses and best efforts to address these issues;
- Issues raised by Nisga'a Nation, regarding potential impacts of the proposed Project and the Proponent's responses and best efforts to address these issues;
- The design of the proposed Project as specified in Schedule A of the EA Certificate to be implemented by the Proponent during the construction and operations of the proposed Project; and,
- Mitigation measures identified as conditions in Schedule B of the EA Certificate to be undertaken by the Proponent during the construction and operations of the proposed Project.

EAO is satisfied that:

- The EA process has adequately identified and assessed the potential adverse environmental, economic, social, heritage and health effects of the proposed Project, having regard to the conditions, the mitigation measures, and the compensation provisions set out in the Schedule to the EA certificate;
- Consultation with Aboriginal Groups, government agencies, and the public, and the distribution of information about the proposed Project have been adequately carried out by the Proponent and that efforts to consult with Aboriginal Groups will continue on an ongoing basis;
- Engagement with the Nisga'a Nation and the provision of information or studies, as appropriate, about the proposed Project and its potential environmental effects and the measures that can be taken to prevent or mitigate those effects have been adequately carried out by the Proponent, and that efforts to engage

the Nisga'a Nation will continue on an ongoing basis;

- Issues identified by Aboriginal Groups, government agencies and the public, which were within the scope of the EA, were adequately and reasonably addressed by the Proponent during the review of the Application;
- Issues identified by Nisga'a Nation which were within the scope of the EA, were adequately and reasonably addressed by the Proponent during the review of the Application;
- Practical means have been identified to prevent or reduce any potential negative environmental, social, economic, heritage or health impacts of the proposed Project such that no direct or indirect significant adverse effect is predicted or expected, with the exceptions of adverse effects to GHG emissions and caribou, which would be significant;
- The potential for adverse effects on the Aboriginal rights and Treaty 8 rights of Aboriginal Groups has been avoided, minimized or otherwise accommodated to an acceptable level;
- The provincial Crown has met its obligations under Chapter 10 of the NFA, including adequately assessing whether the proposed Project can be reasonably expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests set out in the NFA and as appropriate, making recommendations to prevent or mitigate those effects, as well as adequately assessing the effects of the proposed Project on the existing and future economic, social and cultural well-being of Nisga'a citizens who may be affected by the proposed Project; and
- The provincial Crown has fulfilled its obligations for consultation and accommodation to Aboriginal Groups relating to the issuance of an EA Certificate for the proposed Project.

The provincial Minister of Environment and the Minister of Natural Gas Development will consider this Assessment Report and other accompanying materials in making their decision on the issuance of an EA Certificate to the Proponent under the Act.

APPENDICES

APPENDIX 1	LIST OF WORKING GROUP MEMBERS
APPENDIX 2	WORKING GROUP COMMENT TRACKING TABLE
APPENDIX 3	PUBLIC COMMENT TRACKING TABLE