

Westcoast Connector Gas Transmission Project

ASSESSMENT REPORT

With Respect to
the Application by Westcoast Connector 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 3, 2014



Preface

The Environmental Assessment Office (EAO) manages the assessment of proposed major projects in British Columbia, 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 Westcoast Connector 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:

Environmental Assessment Office
PO Box 9426 Stn Prov Govt
Victoria BC V8W 9V1
Phone: 250 356-7441
Fax: 250 356-7477
Email: eaoinfo@gov.bc.ca

Contents

Preface.....	ii
List of Tables.....	xiii
List of Figures.....	xv
Appendices	xvi
Acronyms Used in the Report	xvii
PART A – INTRODUCTION AND BACKGROUND.....	1
1 Purpose of the Report.....	1
2 Project Overview.....	2
2.1 Proponent Description.....	2
2.2 Project Description and Scope	2
2.2.1 Project Description and Location	2
2.2.2 Project Components	5
2.2.3 Project Activities	14
2.3 Project Setting	23
2.4 Alternative Means of Undertaking the Proposed Project	25
2.5 Project Benefits	27
2.6 Applicable Permits.....	31
3 Assessment Process	35
3.1 Strategic Context.....	35
3.2 Major Milestones of the BC Environmental Assessment	36
3.3 Federal Assessment.....	37
3.4 Role of the Advisory Working Group	37
3.5 Aboriginal Groups Consultation.....	38
3.5.1 Ensuring the Crown's Duties to Consult and Accommodate Aboriginal Groups	42
3.6 Nisga'a Nation Consultation	42
3.7 Public Consultation.....	43
PART B – ASSESSMENT OF POTENTIAL ADVERSE EFFECTS.....	48
4 Environmental Assessment Methodology	48
4.1 General.....	48
4.1.1 Background.....	48
4.1.2 Study Boundaries	49
4.1.3 Assessment of Valued Components.....	50
4.1.4 Cumulative Effects Assessment	52
4.1.5 Environmental Assessment Certificate Documentation	53
4.1.6 Compliance and Enforcement.....	54

5	Assessment of Environmental Effects	56
5.1	Acoustics	56
5.1.1	Background.....	56
5.1.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	56
5.1.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	59
5.1.4	Characterization of Residual Project Effects.....	60
5.1.5	Cumulative Effects Assessment	62
5.1.6	Conclusions	62
5.2	Air Quality	63
5.2.1	Background.....	63
5.2.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	63
5.2.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	65
5.2.4	Characterization of Residual Project Effects.....	66
5.2.5	Cumulative Effects Assessment	68
5.2.6	Conclusions	69
5.3	Greenhouse Gas Emissions.....	70
5.3.1	Background.....	70
5.3.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	72
5.3.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	74
5.3.4	Characterization of Residual Project Effects.....	76
5.3.5	Cumulative Effects Assessment	77
5.3.6	Conclusions	77
5.4	Soil	78
5.4.1	Background.....	78
5.4.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	78
5.4.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	80
5.4.4	Characterization of Residual Project Effects.....	81
5.4.5	Cumulative Effects Assessment	83
5.4.6	Conclusions	83
5.5	Terrain Integrity	84

5.5.1	Background.....	84
5.5.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	84
5.5.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	85
5.5.4	Characterization of Residual Project Effects.....	87
5.5.5	Cumulative Effects Assessment	87
5.5.6	Conclusions	87
5.6	Freshwater Fish and Fish Habitat.....	88
5.6.1	Background.....	88
5.6.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	91
5.6.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	99
5.6.4	Characterization of Residual Project Effects.....	105
5.6.5	Cumulative Effects Assessment	108
5.6.6	Conclusions	109
5.7	Water.....	110
5.7.1	Background.....	110
5.7.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	111
5.7.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	115
5.7.4	Characterization of Residual Project Effects.....	119
5.7.5	Cumulative Effects Assessment	122
5.7.6	Conclusions	123
5.8	Wetland Function	124
5.8.1	Background.....	124
5.8.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	124
5.8.3	Project Issues and Effects and Proposed Mitigation Identified during Application Review.....	127
5.8.4	Characterization of Residual Project Effects.....	130
5.8.5	Cumulative Effects Assessment	132
5.8.6	Conclusions	134
5.9	Wildlife and Wildlife Habitat.....	135
5.9.1	Background.....	135

5.9.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	136
5.9.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	149
5.9.4	Characterization of Residual Project Effects.....	158
5.9.5	Cumulative Effects Assessment	166
5.9.6	Conclusions	171
5.10	Terrestrial Vegetation	172
5.10.1	Background.....	172
5.10.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	172
5.10.3	Project Issues and Effects and Proposed Mitigation Identified during Application Review.....	176
5.10.4	Characterization of Residual Project Effects.....	180
5.10.5	Cumulative Effects Assessment	182
5.10.6	Conclusions	183
5.11	Marine Environment	184
5.11.1	Background.....	184
5.11.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	188
5.11.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	204
5.11.4	Characterization of Residual Project Effects.....	211
5.11.5	Cumulative Effects Assessment	216
5.11.6	Conclusions	219
6	Assessment of Economic Effects.....	220
6.1	Economy	220
6.1.1	Background.....	220
6.1.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	220
6.1.3	Project Issues and Effects and Proposed Mitigation Identified during Application Review.....	223
6.1.4	Characterization of Residual Project Effects.....	227
6.1.5	Cumulative Effects Assessment	228
6.1.6	Conclusions	231
7	Assessment of Social Effects.....	233
7.1	Communities, Infrastructure and Services.....	233

7.1.1	Background.....	233
7.1.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	234
7.1.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	241
7.1.4	Characterization of Residual Project Effects.....	249
7.1.5	Cumulative Effects Assessment	251
7.1.6	Conclusions	254
7.2	Transportation and Access.....	255
7.2.1	Background.....	255
7.2.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	255
7.2.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	260
7.2.4	Characterization of Residual Project Effects.....	262
7.2.5	Cumulative Effects Assessment	264
7.2.6	Conclusions	265
7.3	Land and Resource Use.....	266
7.3.1	Background.....	266
7.3.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	267
7.3.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	283
7.3.4	Characterization of Residual Project Effects.....	292
7.3.5	Cumulative Effects Assessment	295
7.3.6	Conclusions	297
8	Assessment of Heritage Effects.....	299
8.1	Heritage Resources.....	299
8.1.1	Background.....	299
8.1.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	300
8.1.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	302
8.1.4	Characterization of Residual Project Effects.....	304
8.1.5	Cumulative Effects Assessment	305
8.1.6	Conclusions	306
9	Assessment of Health Effects.....	307
9.1	Human Health	307

9.1.1	Background.....	307
9.1.2	Project Issues and Effects and Proposed Mitigation Identified in the Application	307
9.1.3	Project Issues and Effects and Proposed Mitigation Identified During Application Review	310
9.1.4	Characterization of Residual Project Effects and Conclusions	315
9.1.5	Cumulative Effects Assessment	317
9.1.6	Conclusions	318
10	Accidents, Malfunctions and Effects of the Environment on the Proposed Project	319
10.1	Background	319
10.2	Accidents or Malfunctions.....	319
10.2.1	Spills of Hazardous Substances	320
10.2.2	Pipeline Leak or Failure	321
10.2.3	Fires or Explosions	322
10.2.4	Fly Rock from Blasting.....	322
10.2.5	Marine Vessel Accidents.....	323
10.2.6	Motor Vehicle Accidents	324
10.2.7	Sediment Releases into Watercourses.....	324
10.2.8	Issues and Concerns Raised During Application Review	325
10.3	Effects of the Environment on the Proposed Project.....	328
10.3.1	Extreme Weather Events	328
10.3.2	Predicted Future Climate Scenarios	329
10.3.3	Seismic Events and Associated Effects.....	329
10.3.4	Subsea Geohazards	330
10.3.5	Volcanic Events	330
10.3.6	Forest Fires.....	331
10.3.7	Slope Stability and Mass Wasting Events.....	331
10.3.8	Forest Pests and Pathogens.....	331
10.3.9	Marine Clays.....	332
10.3.10	Sediment Transport and Scour (including effects of wave action).....	332
10.3.11	Chemical and Mechanical Weathering (including encrusting marine species)	333
10.3.12	Issues and Concerns Raised during Application Review	333
10.4	Summary and Conclusions.....	334
11	Environmental Management Plan.....	335
11.1	Parts of the Environmental Management Plan	335

11.2	Proposed Environmental Management Plan – Terrestrial	336
11.3	Proposed Environmental Management Plan – Marine	340
11.4	Issues Raised During Application Review	341
11.5	Compliance Reporting	344
PART C – ABORIGINAL GROUPS CONSULTATION		345
12	EAO Consultation Process: Overview	345
12.1	Tsilhqot'in Nation v. British Columbia	348
13	Aboriginal Groups Consulted	350
13.1	Treaty 8	352
13.2	Carrier Groups	354
13.3	Tsimshian	354
13.3.1	<i>Nine Allied Tsimshian Tribes</i>	356
13.3.2	<i>Interior Tsimshian</i>	357
13.3.3	<i>Gitxaala Nation</i>	357
13.4	Gitxsan	357
13.5	Gitanyow	359
14	EAO-Led Consultation Activities with Aboriginal Groups	361
14.1	Capacity Funding	361
14.2	Working Group Activities	361
14.3	Government-to-Government Consultation	365
14.4	Regional Workshops with Aboriginal Groups	365
15	Proponent-Led Consultation Activities with Aboriginal Groups	367
16	Common Concerns Raised by Aboriginal Groups	368
16.1	Environmental assessment timelines, number of projects, and capacity of Aboriginal Groups to participate in the assessment process	368
16.2	Adequacy of the effects assessment including Valued Component selection and baseline study methodology	370
16.3	Conversion of a natural gas pipeline to an oil pipeline	370
16.4	Location of construction camps and ancillary facilities	371
16.5	Cumulative effects	372
16.6	Pipeline Benefit Discussions and Other LNG-Related Initiatives	373
16.6.1	Economic Benefits	373
16.6.2	LNG Environmental Stewardship Initiative	374
16.6.3	Employment opportunities, training, and benefits	375
16.6.4	Project-Related Benefits for Aboriginal Groups	376
16.7	Effective Environmental Management	376
16.8	Other matters of concern to Aboriginal Groups	377

17	Summary of Potential Impacts on Aboriginal Interests	384
17.1	General Impacts of the Proposed Project.....	384
17.1.1	Installation of pipelines and compressor stations.....	384
17.1.2	Access	385
17.1.3	Construction camps	386
17.2	Potential Impacts on Specific Aboriginal Interests.....	386
17.2.1	Hunting	388
17.2.2	Fishing	394
17.2.3	Trapping.....	400
17.2.4	Gathering	403
17.2.5	Archaeology and Cultural Heritage Interests	407
17.2.6	Potential effects to Aboriginal Interests associated with the marine environment	409
17.2.7	Aboriginal Title	414
18	Specific Issues Raised by Aboriginal Groups and EAO's Conclusions.....	416
18.1	Treaty 8	416
18.1.1	Blueberry River First Nations	418
18.1.2	Dene Tha' First Nation	435
18.1.3	Doig River First Nation.....	437
18.1.4	Fort Nelson First Nation	449
18.1.5	Halfway River First Nation	450
18.1.6	McLeod Lake Indian Band	460
18.1.7	Prophet River First Nation.....	468
18.1.8	Saulteau First Nations.....	472
18.1.9	West Moberly First Nations.....	483
18.1.10	Treaty 8 Tribal Association.....	491
18.2	Carrier First Nations	491
18.2.1	Carrier Sekani Tribal Council	492
18.2.2	Lake Babine Nation	493
18.2.3	Nak'azdli Band.....	504
18.2.4	Takla Lake First Nation	515
18.2.5	Tl'azt'en Nation	530
18.2.6	Tsay Keh Dene Nation.....	532
18.2.7	Yekooche First Nation.....	539
18.3	Tsimshian	542
18.3.1	Gitxaala Nation	543
18.3.2	Kitselas First Nation	566

18.3.3	Kitsumkalum First Nation	571
18.3.4	Lax Kw'alaams Band	581
18.3.5	Metlakatla First Nation	594
18.4	Gitxsan Nation.....	614
18.5	Gitanyow	634
19	Weighing Impacts on Aboriginal Interests with Other Interests.....	661
19.1	Project Importance to the Provincial Economy	661
19.2	Resources or Values That May No Longer Be Available for Future Generations.....	662
19.3	Benefits of the Project to Affected Aboriginal Communities.....	662
PART D – NISGA'A NATION CONSULTATION		664
20	Introduction and Purpose.....	664
21	Consultation with Nisga'a.....	666
22	NFA 8(e) Environmental Effects Assessment.....	667
22.1	Effects on Nisga'a Land Interests, Land-Related Interests, and Access to Other Lands.....	667
22.1.1	Background.....	667
22.1.2	Potential Effects and Proposed Mitigation	669
22.1.3	Conclusions	674
22.2	Effects on Nisga'a Nation Interests in Freshwater Fish and Plants	675
22.2.1	Background.....	675
22.2.2	Potential Effects and Proposed Mitigation	677
22.2.3	Conclusions	681
22.3	Effects on Nisga'a Nation Interests in Marine Fish and Plants	681
22.3.1	Background.....	681
22.3.2	Potential Effects and Proposed Mitigation	682
22.3.3	Conclusions	684
22.4	Effects on the Right of Nisga'a Citizens to Harvest Wildlife.....	684
22.4.1	Background.....	684
22.4.2	Potential Effects and Proposed Mitigation	685
22.4.3	Conclusions	689
22.5	Effects on Nisga'a Interests Regarding the Right of Nisga'a Citizens to Harvest Migratory Birds.....	689
22.5.1	Background.....	689
22.5.2	Potential Effects and Proposed Mitigation	690
22.5.3	Conclusions	691

22.6	Effects on Nisga’a Interests Regarding the Harvest of Non-Timber Forest Resources	691
22.6.1	Background.....	691
22.6.2	Potential Effects and Proposed Mitigation	692
22.6.3	Conclusions	694
23	Nisga’a 8(f) Economic, Social and Cultural Well-Being Assessment	694
23.1	Economic Well-Being	695
23.1.1	Background.....	695
23.1.2	Potential Effects and Proposed Mitigation	698
23.1.3	Conclusions	702
23.2	Social Well-Being	702
23.2.1	Background.....	702
23.2.2	Potential Effects and Proposed Mitigation	705
23.2.3	Conclusions	710
23.3	Cultural Well-Being.....	711
23.3.1	Background.....	711
23.3.2	Potential Effects and Proposed Mitigation	711
23.3.3	Conclusions	712
PART E – CONCLUSIONS		713
APPENDICES		715

List of Tables

<i>Table 2-1: Proposed compressor station locations</i>	<i>7</i>
<i>Table 2-2: Proposed work camps for initial pipeline construction.....</i>	<i>10</i>
<i>Table 2-3: Summary of economic benefits from Project construction.....</i>	<i>28</i>
<i>Table 2-4: Summary of annual project benefits from Project operations.....</i>	<i>29</i>
<i>Table 2-5: Summary of direct expenditures during Project Construction.....</i>	<i>30</i>
<i>Table 2-6: Authorizations that may be required for Project planning, construction and operations</i>	<i>32</i>
<i>Table 3-1: Aboriginal Groups included on Schedule B and C potentially affected by the proposed Project.....</i>	<i>40</i>
<i>Table 5-1: Modelled day-night sound level results from construction activities</i>	<i>57</i>
<i>Table 5-2: Modelled sound level results from compressor station operation.....</i>	<i>59</i>
<i>Table 5-3: GHG emissions under three Project Development Scenarios.....</i>	<i>73</i>
<i>Table 5-4: Summary of watercourses.....</i>	<i>92</i>
<i>Table 5-5: Estimated riparian and instream disturbance areas in the aquatic environment RSA</i>	<i>96</i>
<i>Table 5-6: Number of watercourse crossings by watershed and risk ranking</i>	<i>97</i>
<i>Table 5-7: Cumulative Instream and Riparian Disturbance for the Cypress to Nasoga Route.....</i>	<i>108</i>
<i>Table 5-8: Wetland class distribution and area in the Project footprint, Application Corridor and wetland LSA, including all routes.....</i>	<i>125</i>
<i>Table 5-9: Cumulative wetland disturbance</i>	<i>133</i>
<i>Table 5-10: Key indicators for Wildlife and Wildlife Habitat Valued Component.....</i>	<i>135</i>
<i>Table 5-11: Population estimate, density and anticipated threat level for GBPU, and existing and project case linear density within the SRSA by GBPU</i>	<i>138</i>
<i>Table 5-12: Caribou population estimates and status</i>	<i>140</i>
<i>Table 5-13: Functional disturbance within caribou ranges</i>	<i>141</i>
<i>Table 5-14: Predicted change in motorized access density from existing conditions to cumulative conditions in the grizzly bear sub regional study area.....</i>	<i>167</i>
<i>Table 5-15: Total functional disturbance in caribou herd ranges.....</i>	<i>169</i>
<i>Table 5-16: Summary of nearshore habitat alteration areas and dredge volumes</i>	<i>189</i>
<i>Table 5-17: Estimated seabed modification areas for each proposed marine route....</i>	<i>194</i>
<i>Table 6-1: Selected 2011 data on labour force activity.....</i>	<i>221</i>
<i>Table 6-2: Proposed construction section and main construction camps.....</i>	<i>224</i>
<i>Table 7-1: Commercial accommodation in LSA municipalities near proposed Project camp locations and construction schedule.....</i>	<i>242</i>
<i>Table 7-2: Estimated number of injuries during construction.....</i>	<i>246</i>

<i>Table 7-3: Potential waste water and solid waste disposal locations by construction camp</i>	<i>247</i>
<i>Table 7-4: Project-related effects of pipeline transport on British Columbia highways</i>	<i>261</i>
<i>Table 7-5: Summary of the Project footprint in THLB and non-THLB, by administrative unit</i>	<i>287</i>
<i>Table 7-6: Proportion of Project timber volume harvest from timber harvesting land base</i>	<i>289</i>
<i>Table 16-1: Status of Economic Benefits Agreements between the Proponent and each Aboriginal Group consulted as of September 5, 2014.</i>	<i>373</i>
<i>Table 18-2: EAO's analysis of the potential impacts from the proposed Project on the March 2012 Gitanyow Lax'yip Land Use Plan.....</i>	<i>650</i>

List of Figures

Figure 2-1: Location of the Westcoast Connector Gas Transmission Project	4
Figure 2-2: Typical Pipeline Construction Footprint.....	6
Figure 2-3: Typical Compressor Unit Building	6
Figure 2-4: Typical Meter Station Site	8
Figure 2-5: Typical Pipeline Construction Sequence.....	16
Figure 2-6: Typical HDD Watercourse Crossing	17
Figure 2-7: Typical Isolated (Dam and Pump) Watercourse Crossing	18
Figure 2-8: S-lay Installation using a Barge or Ship	19
Figure 4-1: Environmental Assessment Methodological Steps	48
Figure 4-2: Steps to Determine Residual Effects and Cumulative Effects.....	53
Figure 5-1: IPCC CO ₂ Emissions and Concentration Projections.....	72
Figure 5-2: Proposed Marine Pipeline Route Alternatives.....	186
Figure 5-3: Marine Routing to Avoid Glass Sponge Reefs in Chatham Sound	192
Figure 5-4: Seabed Modification Areas along the Kitsault Route near Alice Arm.....	195
Figure 5-5: Marine Route Survey and Locations of Dungeness Crab in Chatham Sound	197
Figure 5-6: Bathymetric Map of Alice Rock Sill with Proposed Cut and Fill.....	201
Figure 20-1: Proposed Project, Nass Area, Nass Wildlife Area, and Nisga'a Lands ...	665

Appendices

APPENDIX 1	LIST OF WORKING GROUP MEMBERS
APPENDIX 2	WORKING GROUP COMMENT TRACKING TABLE
APPENDIX 3	PUBLIC COMMENT TRACKING TABLE

Acronyms Used in the Report

AAC:	Annual Allowable Cut
AAQOs:	Ambient Air Quality Objectives
ABCPF:	Association of BC Professional Foresters
AIA:	Archaeological Impact Assessment
AIR:	Application Information Requirements
ALR:	Agricultural Land Reserve
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
CEPA:	<i>Canadian Environment Protection Act</i>
CCME:	Canadian Council of Ministers of the Environment
CEAA:	Canadian Environmental Assessment Agency
C&E:	Compliance and Enforcement
CMP:	Compliance Management Plan
CMT:	Culturally Modified Trees
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
EC:	Environment Canada
EI:	Environmental Inspector
EMP:	Environmental Management Plan
EPA:	Environmental Protection Agency
EPMG:	Environmental Protection and Management Guide
EPMR:	Environmental Protection and Management Regulation

ePIC:	electronic Project Information Centre
ESI:	Environmental stewardship initiative
FLNR:	Ministry of Forests, Lands, and Natural Resource Operations
FRPA:	<i>Forest and Range Practices Act</i>
FSP:	Forest Stewardship Plan
FSR:	Forst Service Road
FTE:	Full Time Equivalent
GBPU:	Grizzly Bear Population Unit
GHG:	Greenhouse Gas
GGRTA:	<i>Greenhouse Gas Reduction Targets Act</i>
HCA:	<i>Heritage Conservation Act</i>
HDD:	Horizontal Directional Drilling
HHRA:	Human Health-Related Assessment
IPCC:	Intergovernmental Panel on Climate Change
ISO:	International Organization for Standardization
IUP:	Investigative Use Permit
KP	Kilometer Post
KPK:	Kilometre Post, Kitsault route
KPN:	Kilometre Pose, Nasoga route
LHA:	Local Health Authority
LNG:	Liquefied Natural Gas
LSA:	Local Study Area
LRMP:	Land and Resource Management Plan
MAMP:	Monitoring and Adaptive Management Plan
MARR:	Ministry of Aboriginal Relations and Reconciliation
MLMCF:	McLeod Lake Mackenzie Community Forest
ML/ARD:	Metal Leaching/Acid Rock Drainage
MNL:	Mitigated Noise Level
MEM:	Ministry of Energy and Mines
MNGD:	Ministry of Natural Gas Development
MOE:	Ministry of Environment
MOH:	Ministry of Health
MOTI:	Ministry of Transportation and Infrastructure
MOU:	Memoranda of Understanding
NCD:	non-classified drainages
NEB:	National Energy Board
NFA:	Nisga'a Final Agreement
NHA:	Northern Health Authority
NLG:	Nisga'a Lisims Government
NTFP:	Non-Timber Forest Product

NVC:	non-visible channels
NWA:	Nass Wildlife Area
OGC:	Oil and Gas Commission
OGAA:	<i>Oil and Gas Activities Act</i>
OGMA:	Old Growth Management Area
OGWR:	Oil and Gas Waste Regulation
PCDD/Fs:	Polychlorinated Dibenzodioxins and Furans
PNW LNG:	Pacific NorthWest LNG
ppm:	parts per million
PRGT:	Prince Rupert Gas Transmission
PRLNG:	Prince Rupert LNG
PRPA:	Prince Rupert Port Authority
PRRD:	Peace River Regional District
PSL:	Permissible Sound Level
PY:	Person Years
RDBN:	Regional District of Bulkley-Nechako
RDFFG:	Regional District of Fraser-Fort George
RDKS:	Regional District of Kitimat-Stikine
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
SQCRD:	Skeena-Queen Charlotte Regional District
SRMP:	Sustainable Resource Management Plan
SSIV:	sub-sea isolation valve
TAC:	Technical Advisory Committee
TC:	Transport Canada
TDR:	Technical Data Report
TEK:	Traditional Ecological Knowledge
TEM:	Terrestrial Ecosystem Mapping
TFL:	Tree Farm License
THLB:	Timber Harvesting Land Base
TLUS:	Traditional Land Use Study
TOC:	Table of Conditions
TSA:	Timber Supply Area
TSS:	Total Suspended Solids
TUS:	Traditional Use Study
UWR:	Ungulate Winter Range

VC:	Valued Component
VOCs:	Volatile Organic Compounds
VQOs:	Visual Quality Objectives
WCGT:	Westcoast Connector Gas Transmission
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 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 First Nations 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 by during the EA process from Working Group members, Aboriginal Groups, Nisga'a Lisims Government (NLG) and members of the public have all be 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 Westcoast Connector Gas Transmission Project (proposed Project) would be designed, owned and operated by Westcoast Connector Gas Transmission Ltd. (Proponent), a British Columbia (BC) company formed for the purpose of pursuing the proposed Project on behalf of Spectra Energy Transmission (Spectra Energy) and BG International Limited.

In Canada and the United States, Spectra Energy operates a network of about 35,000 km of natural gas, natural gas liquids and crude oil pipelines. Spectra Energy's natural gas pipeline system has operated in BC's natural gas industry for 57 years, with upwards of 2,900 km of natural gas pipelines that transport approximately 2.4 billion cubic feet of natural gas per day.

2.2 Project Description and Scope

2.2.1 Project Description and Location

The proposed Project would involve the construction and operation of two approximately 854-862 kilometre (km) sweet natural gas transmission pipelines from the Cypress Area in northeast BC (approximately 100 km northwest of Fort St. John) to a new liquefied natural gas (LNG) terminal being proposed at Ridley Island, near Prince Rupert.

The location of the proposed Project is outlined in the Proponent's Application for an Environmental Assessment Certificate (submitted March 21, 2014) and is depicted in Figure 2-1 below.

The Proponent's initial plans are to develop a single pipeline, with potential to develop a second pipeline if and as commercial circumstances allow. The second pipeline would be constructed after the initial pipeline, would require further permitting, and would fall within the same Pipeline Corridor that was assessed in the Application and is identified in the Certified Project Description (CPD).

The proposed pipeline route would originate in the Cypress Area and proceed westward to a location west of Cranberry Junction; this section is referred to as the Cypress to Cranberry route. West of Cranberry Junction, the Application proposes two route

options, though only one would be constructed; these are referred to as the Kitsault and Nasoga routes and both include an offshore, marine portion. A common marine route is shared by the Kitsault and Nasoga routes from approximately south of where the Nasoga Gulf joins Portland Inlet to Ridley Island. The Cypress to Cranberry route is 622 km, the Kitsault route is 240 km (58 km onshore and 182 km offshore), and the Nasoga route is 232 km (129 km onshore and 103 km offshore). The total length of the proposed pipeline route would depend on the final route option selected and would be approximately 854 km (Nasoga) to 862 km (Kitsault) in length.

In terrestrial portions of the route, the diameter of the proposed pipelines would be up to 48 inches (1,219 mm), while in marine sections the diameter would be up to 42 inches (1,067 mm) (except for the portion of marine pipelines across Iceberg Bay which would be up to 48 inches in diameter).

The proposed Project would include up to two parallel pipelines, up to five new compressor stations (see Table 2-1) and associated above-ground facilities, including mainline valves at specific locations within the designated right-of-way (ROW), up to three meter stations, cathodic protection measures to protect the pipeline, and launchers and receivers to enable pipeline inspection with inline tools. To construct the proposed Project, ancillary sites such as access roads, temporary bridges, pipe stockpile sites, borrow sites, storage areas for equipment and pipe, disposal sites and construction camps to house workers, would also be required.

The proposed Project would have an initial pipeline and compression capacity of approximately 2.2 billion cubic feet per day (bcf/d), and the potential to expand to approximately 8.4 bcf/d with two pipelines and full compression.

If an EA Certificate is issued, and other regulatory approvals are received, it is anticipated that construction of the first pipeline would start in 2016 and be completed in 2019. Construction of the second pipeline, if and as constructed, would occur approximately between 2020 and 2023, with additional compressor station construction being completed by 2026. Based on current construction planning, the initial pipeline construction would occur in eighteen terrestrial segments (or “spreads”) and two marine segments as determined by factors such as terrain, access, seasonal conditions, water depth and construction activity. Detailed construction planning for the second proposed pipeline has not yet been initiated, but is expected to be similar. Construction activity would occur during winter or summer in each of the segments.

2.2.2 Project Components

Pipeline Right-of-Way

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

The construction ROW on level, flat terrain would be approximately 55 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 100 m, although these wider locations would be localized. The specific construction ROW widths would be established at permitting.

The approach to construction would involve the development of an initial pipeline followed by the potential construction of a second pipeline if and as economic conditions permit. If developed, the second pipeline would be constructed generally within the same 55 m ROW with some exceptions, but would not extend beyond the 400 m Application Corridor. Within terrestrial sections, the pipelines would be fully buried to a depth of approximately 0.6 m to 0.8 m with the exception of some aerial stream crossings and at compressor stations, meter stations and other facilities. The buried depth would be greater under roads, under farmland in the Agricultural Land Reserve (ALR) and under watercourses and all trenchless crossings. In marine sections, the pipelines would be laid on the seafloor, except at shore approaches and select shallow water locations. If constructed, the second marine pipeline would accommodate a planned separation from the first marine pipeline of approximately 30 m. Separation between the pipelines would be variable to accommodate terrain conditions and operational requirements.

During operation, the Proponent would manage re-vegetation of the terrestrial ROW. Over top of the pipeline(s), grasses and other smaller vegetation would be allowed to grow. The final permanent ROW would be approximately 55 m for two pipelines (and approximately 32 m for one pipeline), with approximately 5 m on either side of each pipeline maintained clear of large woody vegetation. 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.

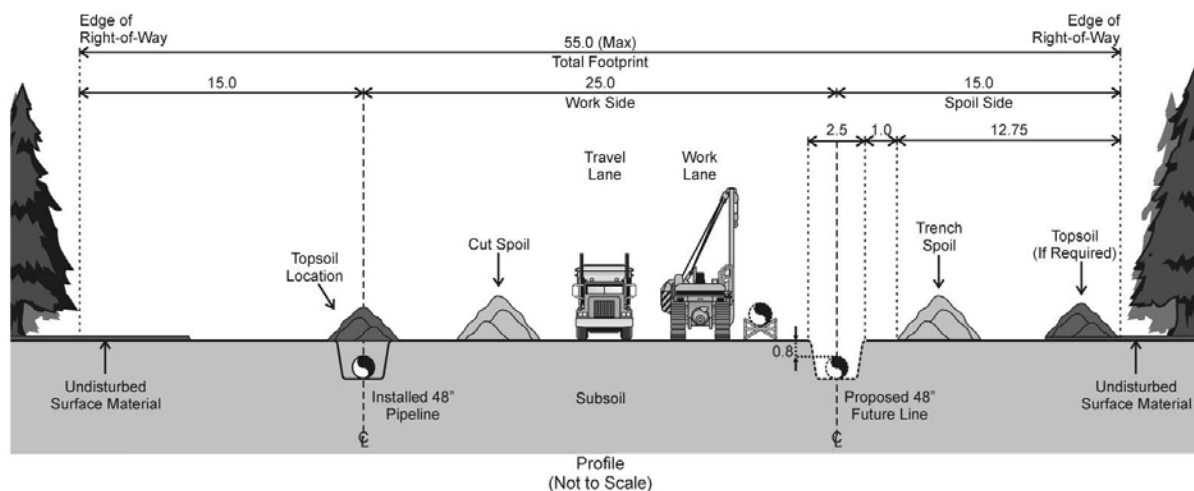


Figure 2-2: Typical Pipeline Construction Footprint

Compressor Stations

Compressor stations increase the pressure of, or compress, the natural gas, allowing it to move through the pipeline. They would be placed at relatively even intervals along terrestrial/onshore portions of the pipeline to maintain optimal operating 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 five locations, each of which would require up to 35 ha of land (except for the K5A Nasoga Compressor Station, which would require up to 65 ha for the full build-out scenario with

2 pipelines). Compressor stations would include multiple natural gas-fired compressor units (gas turbines) each sized at a nominal 35 megawatt (MW) and permanent, all-season access roads. Where access roads do not exist, new ones would be built. Coastal land-based compressor stations would require marine access. Compressor stations would also include an auxiliary/control room, cathodic protection systems, employee accommodation, venting systems, power generation equipment and a fuel gas module. Compressor station sites would be fenced. The location, components, present land use and ancillary site requirements for each proposed station are identified in Table 2-1. Locations are also shown in Figure 2-1.

Table 2-1: Proposed compressor station locations

Compressor Station (Kilometer Post [KP] location)	Maximum Number of Compression Units	Location and Land Requirements
Compressor Station K1 (KP 0)	6	North of Cameron River in a previously cleared logging cutblock / Up to 35 ha.
Compressor Station K2 (KP 219)	6	Along the east side of the Parsnip Reach Valley and approximately 5 km east of the Mugaha Marsh Protected Area / Up to 35 ha
Compressor Station K3 (KP 314)	4	Approximately 2.8 km east of Gillis Creek in an old cutblock area / Up to 35 ha
Compressor Station K4 (KP 487)	6 (Nasoga) 7 (Kitsault)	Approximately 4 km west of the Nilkitkwa River in an old cutblock area / Up to 35 ha
Compressor Station K5A (Nasoga Route) (KPN 751)	9	Located near the southeast end of Nasoga Gulf and includes two areas for development (Valley Side Slope Area or Rock Knob Area) / Up to 65 ha
Compressor Station K5B (Kitsault Route) (KPK 680)	8	Near the north end of Alice Arm / Up to 35 ha

Meter Stations

Meter stations would measure the volume of all natural gas entering or exiting the natural gas system. The proposed Project is designed to include meter stations at up to three locations: the first meter station would be co-located at compressor station K1, the second would be within the Pipeline Corridor upstream from existing Spectra Energy compressor station CS-2 (at approximately KP 128.5), and the third would be on Ridley Island. Meter stations would be cleared, graded, graveled and fenced.

Construction of meter stations is expected to be concurrent with the relevant pipeline section. 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 near 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, and are generally located every 35 km.

In-line inspection facilities would be installed at compressor stations and meter station locations. The facilities generally consist of valves, piping and, depending on the location, launchers or receivers.

Cathodic protection would be used to protect the pipeline and facilities from electrochemical corrosion. A Supervisory Control and Data Acquisition (SCADA) system would be installed to link pipeline and compressor facilities to Spectra Energy's existing and updated Gas Control centres in Fort St. John, BC and Calgary, Alberta. The SCADA system would remotely monitor and control pipeline flows, pressures, temperatures and equipment status on a continuous basis and 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, meter stations and other pipeline facilities. Electrical power would be supplied by third-party power providers where available. 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.

Approximately 29 radio towers would be used to support the SCADA and communication system. The exact location of the towers has not been determined, but is expected to be generally within the Project footprint.

Construction Camps

The Proponent proposes to operate up to 17 main construction camps to support the construction of the Project. Pioneer (small) camps ranging in size from 3 ha to 7 ha and accommodating 200 to 250 workers, would support early construction-related activities such as access road and bridge construction, right-of-way clearing and other preparations required prior to pipeline construction. These camps would typically be installed the year prior to mainline construction and would be located in close proximity to the main camps. Once the main camps are operational, the small camps would either be demobilized or remain in operation through to reclamation and clean-up activities. Temporary construction camps would be demobilized upon completion of the particular construction spread that the camp supports. Information on camps was updated by the Proponent in a supplemental submission based on a request by EAO during Application Review (see *Supplemental Response to FLNR-109-EAO*).

Main camps would be approximately 35 ha in size, accommodating up to 550 workers. The main camps would generally become operational one month prior to pipeline construction for a given spread and would be demobilized upon completion of pipe installation for that particular section. The number of personnel at each camp would generally peak for 4-12 months, depending on the location. In addition to these camps, each compressor station along the proposed route would require a temporary work camp that is expected to accommodate up to 200 workers. Two floating camps are proposed, associated with the Nasoga Route.

Should the construction of the second proposed pipeline proceed, the Proponent would make best available use of the camps that were built for the construction of the initial pipeline in the construction of the second pipeline.

Table 2-2 provides information on the approximate work camp locations and the time frame for their use. EAO acknowledges that the camp locations and schedule are preliminary and subject to change. Additional information on proposed construction camps can be found in Sections 6 and 7 (Economic and Social Effects) of this Report.

Table 2-2: Proposed work camps for initial pipeline construction

Camp Location	Spread KPs	Operational Period	Estimated Personnel	Type
KP 39	KP 0 to KP 73	Aug 2016 – Oct 2017	55-510	Terrestrial
KP 94	KP 73 to KP 135	Aug 2016 – Oct 2018	55-430	Terrestrial
KP 139	KP 135 to KP 175	June 2017 – Oct 2019	55-430	Terrestrial
KP 141	KP 175 to KP 195	June 2017 – Oct 2019	55-430	Terrestrial
KP 219	KP 195 to KP 215	June 2017 – Oct 2019	55-430	Terrestrial
KP 219	KP 215 to KP 229	Nov 2017 – Oct 2019	55-250	Terrestrial
KP 252	KP 229 to KP 290	Aug 2016 – Oct 2018	55-550	Terrestrial
KP 275.5	KP 290 to KP 350	Dec 2016 – Oct 2018	55-430	Terrestrial
KP 379	KP 350 to KP 408	June 2017 – Oct 2019	55-430	Terrestrial
KP 423	KP 408 to KP 468	Aug 2016 – Oct 2018	55-430	Terrestrial
KP 484	KP 468 to KP 507	Nov 2016 – Oct 2018	55-430	Terrestrial
KP 532	KP 507 to KP 563	June 2017 – Oct 2019	55-430	Terrestrial
KP 578	KP 563 to KP 626	Aug 2016 – Oct 2018	55-430	Terrestrial
KP 654	KP 626 to KP 674	Nov 2016 – Oct 2018	55-175	Terrestrial
KP 688	KP 674 to KP 709	Aug 2016 – Oct 2018	55-175	Terrestrial
KP 740	KP 709 to KP 731	Nov 2016 – Oct 2018	55-175	Floating
KP 750.9	KP 731 to KP 744	Aug 2016 – Oct 2019	55-430	Floating

Start-up of the camps would involve site preparation and mobilization of supplies and material. Identification of water sources, power supply and waste disposal requirements for camps would be finalized during construction planning.

The largest element of camp operations would involve the provision of food and housekeeping services for camp residents. Contractors would be engaged to provide these services, as well as security, medical services and recreational opportunities.

Other activities at the camps include:

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

Potable water would be supplied by on-site wells or bulk community water supplies where available. Solid waste disposal would be managed through incineration (where permissible only) and otherwise by transporting the waste in covered trucks to landfills that can accept the projected waste volumes of the proposed Project. Liquid waste from the construction camps would be processed through a purpose-built sewage treatment

system such as a temporary septic field, lagoon or storage tanks. Otherwise, sewage may be transported to a licensed facility for disposal.

The Proponent would obtain the required permits, licences and approvals prior to proceeding and that the management of water, waste and sewage systems would be in accordance with applicable regulatory requirements.

Access

The Application notes that existing infrastructure, such as existing forest service roads (FSR), would be used to the extent practical during construction. In remote sections of the pipeline route where road access does not exist, access would be constructed along the proposed pipeline ROW. Some deactivated roads may be reactivated and existing resource roads would be used wherever possible to reduce disturbance. The roads to compressor stations and meter stations would be permanent, while roads developed for construction would be reclaimed. Access roads built for the construction of the initial pipeline would be used for the construction of the second pipeline, if constructed.

In addition to access roads, tote roads (shoo-flies) would need to be constructed to allow for work around impassable areas or features in the land that relate to a steep slope, such as deeply incised valleys or gullies or drainages, and some mountainous terrain or large hills that cannot be safely travelled on the ROW.

Existing bridges would be used, where feasible, by construction vehicles and equipment. In the absence of existing bridges, other techniques, such as single or multiple clear-span bridges or open bottom culverts would be used to cross any fish-bearing watercourses with defined banks that may be encountered along the travel lane. The crossing method would be assessed and reflect the conditions at the time of construction. Appropriate permits and authorizations would be required for all crossings.

Increased marine traffic is expected during construction and would be managed through a Marine Safety Navigation Plan. Marine offloading facilities and barge landings would be developed for the transportation of material and equipment to support the construction of the Kitsault or Nasoga marine routes, including compressor stations.

Existing airports, roads and railways would also be used for the transportation of equipment, materials and workers from supply locations to the ROW throughout the proposed Project.

All construction access would be managed in accordance with the construction Access Management Plan and the Marine Access/Traffic Management Plan. Existing disturbed areas or areas already designated for such activities would be used whenever practical and reclamation of disturbed areas would begin as soon as practical following construction.

Permanent Disposal Sites

Permanent disposal sites would be required for excess grade spoil material, primarily consisting of rock. It is anticipated that approximately 37 disposal sites would be required, each ranging in size from 0.2 ha to 9 ha, for a total area of up to 80 ha. Disposal sites would be located in areas of stable terrain and would make use of previously disturbed areas, such as abandoned roads and landings, to the extent practical. The most easterly location would be at approximately KP 174.8 while the most westerly location would be near tidewater at approximately KPN 749. Disposal sites would be restored similarly to temporary work spaces and the construction ROW.

Also requiring disposal would be those materials resulting from marine construction activities such as excavated shore approaches and marine seafloor preparation which are not reused as excavation backfill or seafloor preparation fill material, including disposal at sea.

Temporary Storage Areas

In addition to the pipeline ROW, facility sites and associated temporary workspace, land would be needed for other temporary sites, including:

- Staging and stockpile sites;
- Rail sidings;
- Contractor storage yards;
- Laydown areas;
- Construction office sites;
- Work areas to set up and operate equipment for trenchless watercourse crossing construction; and
- Borrow sites.

Wherever practical, these temporary facilities would be located within previously disturbed areas to reduce overall Project-related disturbance. General site selection criteria for temporary ancillary sites are similar to those for work camp sites.

Stockpile sites would be required for the temporary storage of pipe during construction of the proposed Project. The number of stockpile sites and their specific locations would be finalized during detailed engineering, but the sites would be strategically located as close as possible to the pipeline ROW. The sites would be located approximately 34 km apart and would be roughly 25 ha each.

Contractor storage yards would be located at or near construction work camps, where practical. They may include a contractor warehouse, equipment storage, maintenance and mechanics shops, fuel storage for all vehicles and some equipment, fabrication facilities and storage of contractor materials. It is anticipated that an average of 8 ha of land would be required for each contractor storage yard.

Laydown areas would be used for the storage of equipment, pipe and other Project material near the construction footprint. Each laydown area would require approximately 3 ha of land and would be serviced from the stockpile sites.

Rail sidings are sections of low-speed railway track, distinct from the main line, that serve to load and unload equipment and materials. Construction of the proposed Project would involve transporting pipe by rail to sidings near the route and then loading it onto trucks bound for stockpile sites. It is anticipated that a total of eight railway sidings would service construction spreads at the following locations:

- Fort St. John;
- Chetwynd;
- Mackenzie;
- Fort St. James;
- Smithers area;
- Carnaby;
- Terrace; and
- Prince Rupert.

Borrow sites would be needed to produce gravel, sand, road crush and rock for various purposes during construction. Borrow site locations would be dependent on the amount and type of material available. Several proposed as well as existing borrow sites have been identified within 5 km of the pipeline ROW. These sites could be completely new developments or pre-existing and owned and operated by others.

Marine Base

A marine base for the offshore storage of contractor equipment would be required in the Prince Rupert area. The site would require dock access for loading and unloading. It is anticipated that this marine storage base would need approximately 5 ha of land.

Hydrostatic Test Fill Lines

Hydrostatic test fill lines would be required to move water from water sources to the pipeline and facilities for the hydrostatic pressure testing and commissioning process. Water trucks may also potentially be used. The fill lines would be placed on the construction ROW or approved temporary workspace with a pump and equipment pad. Specific locations for the hydrostatic test fill lines have not yet been determined.

Fresh water would be used to pressure test the terrestrial segments of the proposed pipeline(s) and ocean water would be used for the marine segments. The test water would be discharged back to the appropriate environment in accordance with applicable requirements. EAO acknowledges that applicable approvals would be in place and that hydrostatic testing activities in both the terrestrial and marine environments would be conducted in accordance with applicable regulatory requirements. Hydrostatic test segments, test water source locations and quality specifications would be outlined in a Project-specific Hydrostatic Test Plan.

2.2.3 Project Activities

Construction – Terrestrial

The proposed Project involves the construction of a pipeline and associated facilities, followed by the construction of the second pipeline and additional associated facilities if economic conditions allow. Construction of the initial pipeline is expected to start in 2016 and be completed by 2019. Interim restoration and monitoring would occur through 2020. Construction of the second pipeline would occur approximately between 2020 and 2023, with full restoration and post-construction monitoring in 2024. It is anticipated that additional compressor station construction would be completed by 2026. The overall construction schedule can therefore be summarized as lasting approximately 10 years and occurring within the 2016 to 2026 timeframe.

Construction work on the initial pipeline would be divided into a number of terrestrial and marine spreads, with multiple contractors carrying out construction activities in parallel at multiple locations along the construction ROW. The Proponent is currently considering 18 terrestrial spreads ranging in length from 11 km to 73 km. In the

offshore, the marine construction would be one or more spreads required for seabed modifications, pipelay and vessel support, shore approaches at either Kitsault or Nasoga, as well as the shore approach at Ridley Island, and post-lay activities to bury the pipe or install span corrections.

Construction activity for each pipeline spread would last several months and be carried out during the summer and/or winter seasons. Pipeline construction activities would be progressive and overlap could occur between consecutive phases of the pipeline construction.

Construction of compressor stations and meter stations is expected to be concurrent with pipeline construction and would take several months depending on, among other variables, scope, land use and construction techniques for each facility.

The general sequence of pipeline construction activities is illustrated in Figure 2-5, and includes the following steps and durations:

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

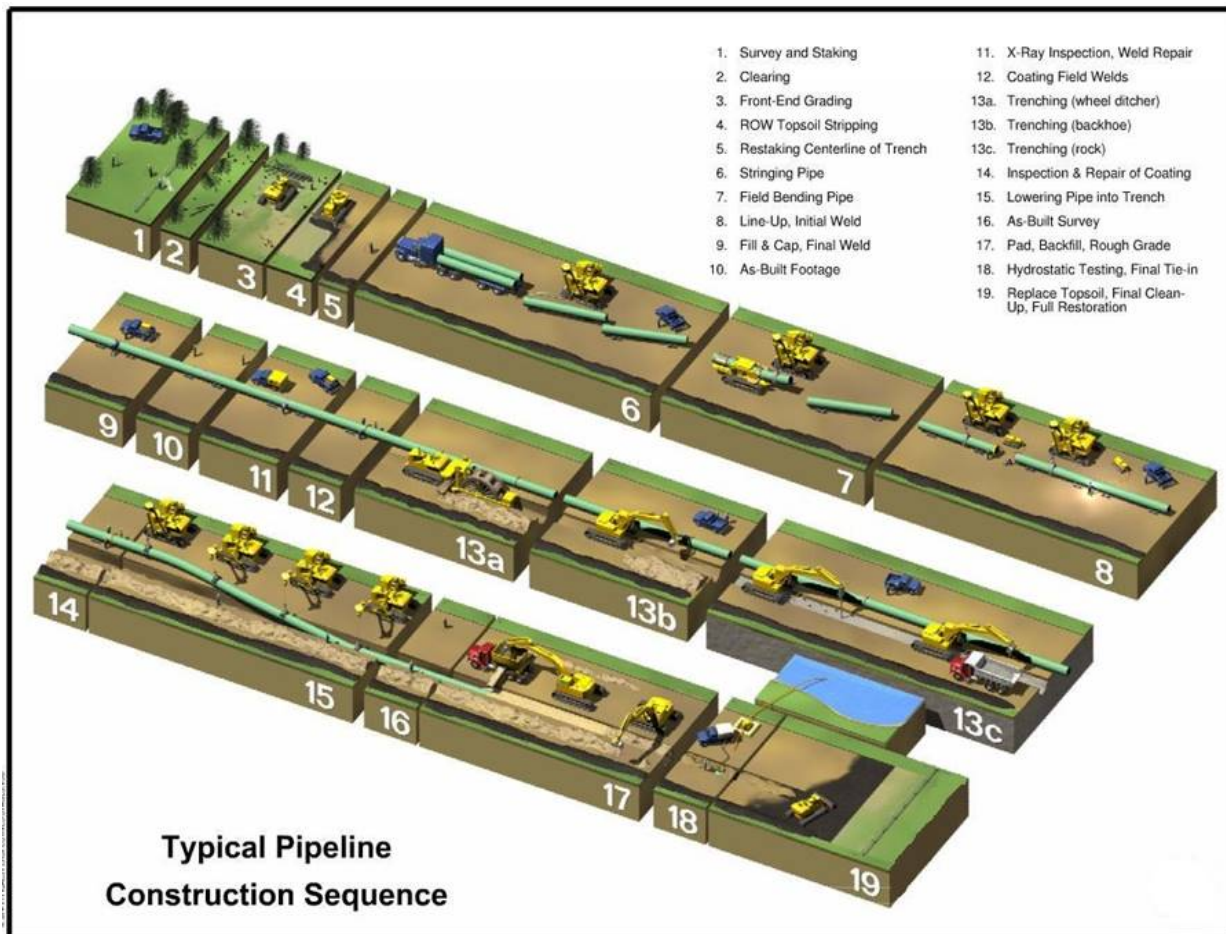


Figure 2-5: Typical Pipeline Construction Sequence

Construction – Watercourses

The proposed Project would cross approximately 1370 to 1382 watercourses, depending on the final route option selected (Nasoga or Kitsault), and over 50% of these watercourses are either known or assumed to be fish-bearing. Watercourse crossings involve either digging a trench to bury the pipeline below the bed of the watercourse (“trenched”), or a trenchless method. Options for trenchless crossings include, underground trenchless crossings (e.g., horizontal directional drill [HDD], microtunnelling) and aerial crossings. Figures 2-6 and 2-7 below show a typical underground trenchless (e.g. HDD) and a trenched (e.g. isolated dam and pump) watercourse crossing, respectively.

A bottom pull crossing is planned for Parsnip Reach in the Williston Reservoir and Iceberg Bay off the mouth of the Nass River, both of which are too large to allow for an isolation or trenchless crossing technique. The bottom pull crossings would involve laying the pipeline on the bottom and undertaking partial trenching and backfill of the

shore approaches or identified areas along the crossing. Further information on watercourse crossing methods is provided in the Application (Application Appendix 2-K).

Streams and rivers with narrow channels and lower flow rates may be suitable for trenched crossings. In certain conditions, trenched techniques can also be applied to larger river crossings. An isolated crossing method establishes a 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 isolating a work area are to:

- Isolate the crossing location between dams and convey the water across or around the work site by pumping (dam and pump method); and
- Isolate the crossing between dams and install one or more culverts (flumes) (flume method).

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

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 to the bottom, or the conditions do not allow for an isolation to be installed.

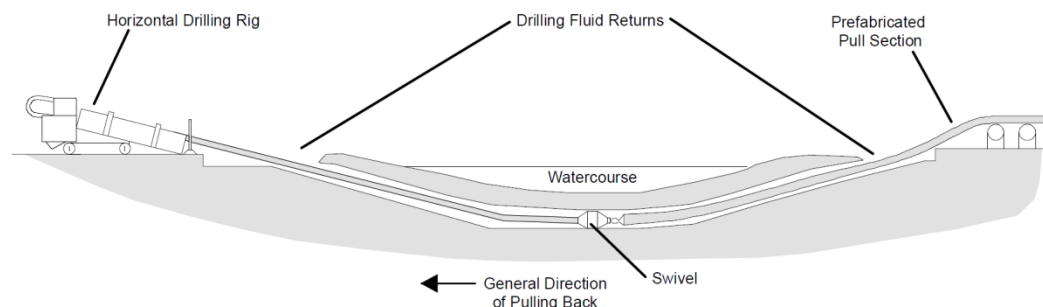


Figure 2-6: Typical HDD Watercourse Crossing

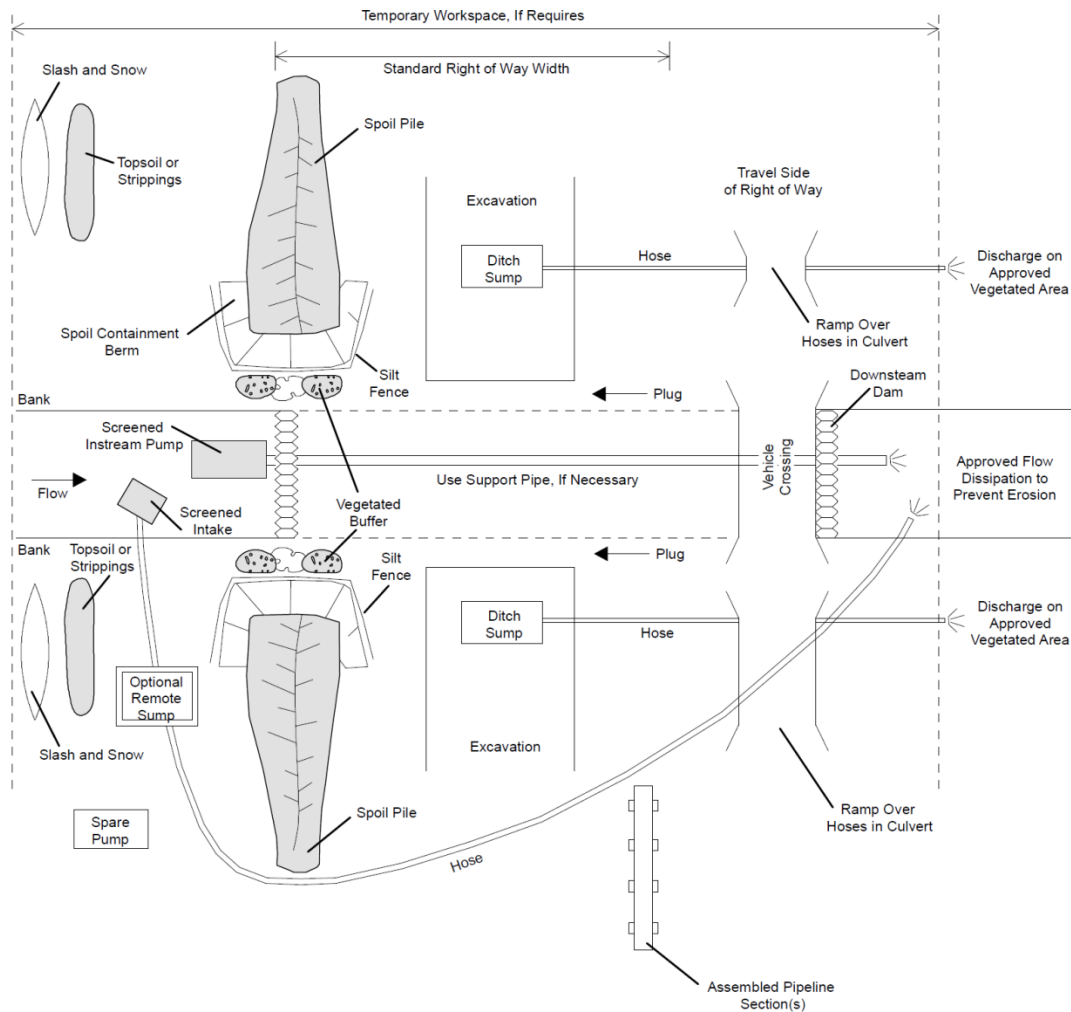


Figure 2-7: Typical Isolated (Dam and Pump) Watercourse Crossing

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. Other underground trenchless methods include auger boring and microtunnelling. Aerial crossings are considered where other methods may not be feasible due to terrain configuration, water volume and/or sensitivity.

Depending on the methodology chosen and the nature of the watercourse crossing, the duration of an individual crossing can range from one to several days for a small to medium-sized crossing to a month or several months for a trenchless crossing. Instream activities would be minimized, and scheduled to take place in respect of applicable least risk timing windows, unless otherwise approved by the appropriate

regulatory authorities for specific watercourse crossings. Clean-up at watercourses would be undertaken immediately following backfill and erosion control operations. However, where winter clean-up is hampered by frozen soil conditions, rough clean-up would be completed prior to spring break-up and final clean-up after break-up.

Generally, large water bodies in areas with particularly sensitive (i.e., water quality, fisheries and habitat) ecosystems, and where geotechnical and hydrological conditions are favourable, may be suitable for trenchless crossings.

Construction – Marine

The marine pipelines would be installed by specialist marine contractor(s). There are a limited number of contractors in the world with the appropriate equipment and specialized experience required to lay large diameter pipelines in the marine environment. Installation of pipeline in the marine environment would be completed using the S-lay method from a barge or ship. Figure 2-8 illustrates an S-lay installation method. The pipeline(s) would generally rest on top of the seabed floor or settle into soft, seabed sediments. Extra work space would be required in areas where the seabed requires preparation to accommodate the pipe, access for the pipe lay ship and for excavation of the shoreline approaches. Work space would be required due to side slope, longitudinal slope, lay barge access, anchor patterns or other site specific conditions. The second pipeline would be laid separately and accommodate a planned separation anticipated to be approximately 30 m. Separation between the pipeline(s) would be variable to accommodate terrain conditions and operational requirements.

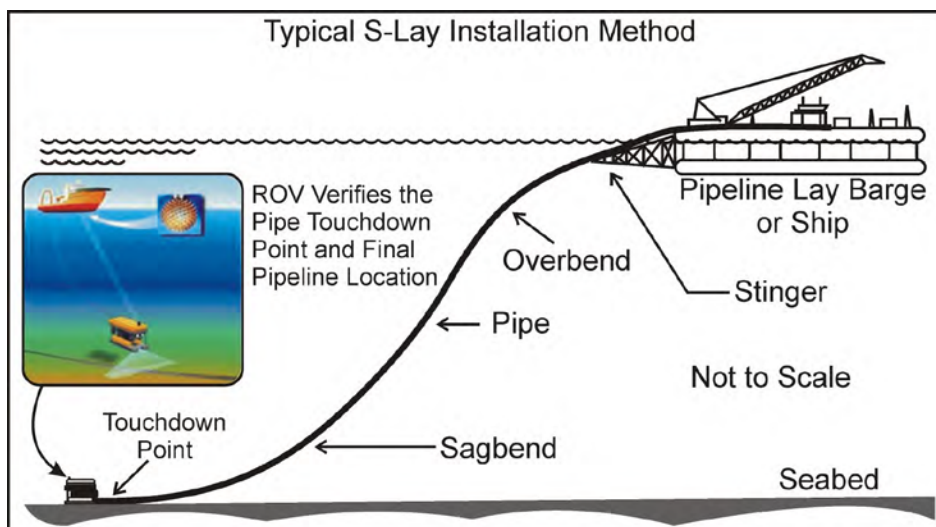


Figure 2-8: S-lay Installation using a Barge or Ship

The main marine construction activities are as follows:

- Marine surveys – a remotely operated vehicle (ROV) vessel would perform 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 (dredging), rock breaking and bedding (placement of fill);
- Pipelay – joints of pipe would be 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 buried, either 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 hydrostatically pressure tested using seawater as a medium.

At shoreline approaches, a trench excavation would be used to transition the proposed pipeline from the marine to the terrestrial environment. Dredged material would be sidecast immediately adjacent to the trench, followed by pulling the pipeline string from the pipelay vessel offshore to onshore. Dredged material would then be used to backfill the trench.

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;
- 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 and truck transport would be the primary mode of transportation for pipe segments and valve assemblies. It is anticipated that pipe would be pre-coated with further on-site concrete coating where required, then stored at stockpiling sites. Truck transport would then be required to deliver pipe segments from the stockpile sites to work areas.

For nearshore and marine construction activities, concrete-coated pipe would be stacked in pipe yards and then loaded onto material transport vessels for delivery to the pipelay vessel. Engineered materials such as rock, gravel and concrete mats would also be stored locally until loaded onto the appropriate vessel for placement.

Daily transport of personnel between the camps, muster areas, and work sites would occur by multi-passenger vehicles.

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 approximately 50 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. Key operational activities would include ROW and block valve maintenance, operational surveillance (aerial and ground-based), cathodic protection and line patrol. Prior to commissioning the pipeline, the Proponent would develop various plans to address access management, vegetation management (including management of invasive species), and emergency response management.

The permanent ROW and facilities sites would be maintained to prevent the introduction or spread of noxious weeds and to avoid negative impacts to sensitive or protected wildlife habitat. Approximately 5 m on either side of each pipeline would be maintained clear of large woody vegetation to allow for line-of-sight inspection of the ROW.

A SCADA system would be used to continuously monitor the pipeline and control the emergency shut-down valves from the control centres in Fort St. John, BC and Calgary, Alberta. Regular preventative maintenance would be conducted on the pipeline, compressor stations, meter stations and associated facilities. The proposed Project

would also include in-line inspection facilities in order to periodically inspect the operating pipeline(s) and verify integrity. The pipelines would have cathodic protection with internal and external coating to prevent or reduce external corrosion; however, where pipeline integrity issues are identified, the pipeline would be exposed, visually inspected and repaired as required.

For marine sections of the pipeline, operational monitoring and inspections would be conducted as required by the BC Oil and Gas Commission (OGC), using a variety of methods including ROV video surveys and geophysical surveys.

For terrestrial portions of the pipeline, regular aerial patrols would be undertaken to monitor conditions, especially areas of high erosion potential, along 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 visually inspect for evidence of pipeline damage, construction or third party activities on or near the ROW, loss of vegetative cover on the pipeline route, unauthorised vehicular traffic, exposed pipe, and erosion and bank stability at river crossings. Additionally, the marine sections of the pipeline would be surveyed by ROW. Markers and signs would be inspected and maintained to ensure the pipeline location remains visible.

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

As specified in the Reviewable Projects Regulation, the decommissioning phase is not included in the EA of natural gas transmission pipelines. Decommissioning would be required to adhere to the 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;
- Where feasible, selling or reusing terrestrial piping, equipment and buildings for other purposes; otherwise removing them;
- Reclaiming any land disturbed by physical activities; and
- Selling marine pipeline or cleaning, flooding and abandoning it in place.

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 (PRRD), Regional District of Fraser-Fort George (RDFFG), Regional District of Bulkley-Nechako (RDBN), the Regional District of Kitimat-Stikine (RDKS) and the Skeena-Queen Charlotte Regional District (SQCRD).

Approximately 80% of the proposed route would cross Provincial Crown land. Other types of land in proximity to the proposed Project include Federal Crown land, fee simple private land, Indian reserves and Nisga'a lands. The proposed route would cross a short section of federal land administered by the Prince Rupert Port Authority (PRPA). The proposed route would not cross any Indian Reserves, as defined under the *Indian Act*; however, the proposed Project would cross the traditional territories of 23

Aboriginal Groups, 2 Tribal Councils and the Nass Area and Nisga'a Lands, as defined in the Nisga'a Final Agreement.

The proposed Project would cross eight Land and Resource Management Plan (LRMP) areas (Fort St. John, Dawson Creek, Mackenzie, Fort St. James, Bulkley, Kispiox, Kalum and North Coast), which provide management direction for various resource values within their boundaries. The proposed project also crosses six Sustainable Resource Management Plan (SRMP) areas (Moberly Peace Tract, West Babine, Kispiox, Cranberry, Kalum South and Nass South), as well as areas managed by the Coast Land Use Decision Implementation and the Central and North Coast Order Boundary. Local governments have developed Official Community Plans overlapping the proposed Project area; a number of Aboriginal Groups have also developed land use plans that overlap the proposed Project.

The proposed Project's Nasoga route would traverse Nisga'a Lands and, would require tenure from Nisga'a Lisims Government (NLG). The Nisga'a Land Use Plan provides guidance on land use consistent with the autonomous governance of NLG.

There are a number of provincial parks located in proximity to the proposed pipeline route. The proposed Project would cross through Nisga'a Memorial Lava Bed Provincial Park, which is a Class A provincial park. In addition to a Section 20 Park Use Permit from the Ministry of Environment (MOE) – BC Parks, a Park Boundary Adjustment would be required to cross this Park, and would need to be approved by the *Wilp* Si'ayuukhl Nisga'a (Nisga'a legislature) and the Provincial legislature. The proposed pipeline route would traverse it from approximately KP 666.8 to KP 668.3. Another Provincial Park, the Nation Lakes Provincial Park, is located approximately 0.5 km southeast of KP 391.4.

The proposed Project would not cross any national parks, regional parks, municipal parks or marine parks. There are 3 protected areas, 6 ecological reserves and 26 conservancy areas located in proximity to the proposed Project; however, the proposed pipeline route would not cross any of these.

Sensitive land designated in the Mugaha Marsh Sensitive Area Plan, is crossed by the proposed Project from KP 220.7 to KP 224.0. The land is designated sensitive due to its local significance for wildlife habitat values and wildlife viewing (the marsh is an important stopover for migrating birds).

The proposed pipeline route would cross 17 legal and 5 non-legal Old Growth Management Areas (OGMA). OGMA's serve to protect the biodiversity of old growth forests as designated under the *Forest and Range Practices Act*.

Section 7 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 and locations for the facility sites, as well as methods of construction and mitigation.

During pipeline route planning, the Proponent made use of existing disturbance where practical, including existing and proposed pipeline, railway, and power line ROWs, and previously disturbed areas. The Proponent's process of selecting an appropriate pipeline route and facility site involved collaborating with experts from various disciplines, including land use planning, environmental, engineering and construction, and considering input from potentially affected Aboriginal Groups, NLG, provincial and federal regulators, municipalities, landowners and the public. The Application identified a number of factors considered by the Proponent when evaluating terrestrial pipeline routing options, such as:

- Identifying previously cleared areas that are the result of forest harvesting or other linear developments, e.g., power lines, roads and highways;
- Avoiding disturbance to parks and protected areas, wildlife areas, archaeological or heritage sites and other environmentally-sensitive areas, where practical;
- Minimizing:
 - The number of watercourse crossings and the potential complexity of pipeline installation;
 - Crossing watercourses at straight and stable reaches;
 - The length of disturbance in wetlands;
 - Exposure of the pipeline and associated facilities to geotechnical hazards such as unstable terrain; and
 - Disturbance to sensitive habitats;
- Ensuring compatibility with existing land use (including traditional land use);
- Ensuring worker and public safety;
- Ensuring the technical feasibility of construction;

- Selecting a route that is cost-effective to build; and
- Gathering and responding to input from landowners, Aboriginal Groups and other interested parties.

Additional factors considered by the Proponent for the marine section of the proposed pipeline route(s) include:

- Selecting a marine route along a smooth sea bottom where possible, with low side slopes and an absence of geohazards;
- Avoiding aquaculture tenures;
- Avoiding busy port and high marine traffic areas;
- Avoiding or mitigating for other marine environmental resources; and
- Considering concerns raised by commercial fishing parties.

The Proponent considered various specific alternatives for the pipeline route, as outlined in section 1.4.3 of the Application.

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 numerous 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 the major route refinements is provided below (refer to section 1.4.4 of the Application for further details):

- Peace-Moberly – to reduce potential wildlife habitat fragmentation and to avoid potential impacts to wildlife;
- South Peace Caribou Herd – to avoid core habitat areas of the South Peace caribou herd;
- Callazon Creek – to reduce potential impacts to bull trout in Callazon Creek and to meet Forest, Lands and Natural Resource Operations (FLNR) management objectives for the area;
- Mugaha Creek – to avoid a potential geohazards near Mugaha Creek;
- Mugaha Marsh – to investigate means to protect wetland wildlife habitat such as a trenchless crossing method under Mugaha Marsh or winter construction;
- Wolverine Caribou Herd – to avoid or minimize the impact on identified sensitive areas for the Wolverine herd of Woodland Caribou;
- Kwanika Mine – to reduce potential interactions between the proposed pipeline and future mine-site development activities;

- Babine/Skeena River Area – to avoid potential riparian habitat disturbances and meet the visual quality objectives for the area contained in resource management plans for the Babine/Skeena area;
- Kispiox River area – to avoid private and recreational lands along the river;
- Kispiox River – to improve the Coral Creek crossing location and to follow a former logging road disturbed area, avoiding the area west of Skunsnat Creek;
- Borden Mainline Forest Service Road and Cranberry River Crossing – moved the route further north to follow part of the Borden Mainline FSR, to investigate the feasibility of a trenchless crossing of the Cranberry River and to minimize clearing in the Gitanyow ecosystem core area;
- New Aiyanish Watershed – to investigate routing opportunities and the feasibility of trenchless methods to avoid potential effects to the Community watershed for WiiLaxKap (New Aiyanish);
- Nisga’a Memorial Lava Bed Park (KP 665.9 to 668.8) – to provide a trenchless crossing under the Park;
- Chatham Sound – to avoid potential interference with glass sponge colonies identified during sidescan and sub-bottom profiling as well as ROV surveys;
- West of Prince Rupert – to avoid the Metlakatla shellfish tenure application proposed in the area; and
- Ridley Island – to avoid the proposed BG LNG berthing sites and to avoid an environmentally-sensitive bay.

2.5 Project Benefits

This section summarizes the proposed Project 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 pipeline construction would be \$7.5 billion (2013), with 94% expected to be spent between 2016 and 2019 for the initial build-out of a single pipeline to 2.2 bcf/d in transmission capacity, and 6% for additional compressor stations that would bring capacity to 4.2 bcf/d. The Application notes that if and as developed, the second pipeline would have economic benefits similar to the initial pipeline; although quantitative estimates are not provided.

Table 2-3 summarizes economic benefits that would be generated from Project construction in BC and other Canadian provinces, mainly Alberta. The \$7.5 billion in capital expenditures related to initial Project capacity would be expected to include \$5.0 billion of direct capital expenditures in Canada, representing 67% of total capital costs,

of which \$3.3 billion would be spent in BC. Construction would generate some 18,600 person-years (PY) of direct employment, and support 47,000 PYs across Canada, of which 53% would be within BC.

Table 2-3: Summary of economic benefits from Project construction

Summary of Benefits from Project Construction	British Columbia	Other Canada	Total
Project construction costs	\$ million		
Spent in BC/ Canada	\$3,264	\$1,705	\$4,969
Imported goods and services ^(a)			<u>\$2,486</u>
Total construction costs			\$7,455
Gross Domestic Product (GDP)^(b)	\$ million		
Direct, indirect and induced	\$1,952	\$2,221	\$4,173
Employment^(b)	Person Years of Employment		
Direct	13,377	5,215	18,592
Indirect and induced	<u>11,773</u>	<u>16,807</u>	<u>28,580</u>
Total	25,150	22,022	47,172
Government revenues (direct, indirect and induced)^(b)	\$ million		
BC government	\$176	over the construction period	
Federal government	<u>\$546</u>		
Total	\$722		

(a) The imported goods and services are primarily for pipe parts and fittings, compressors and off-shore pipe installation. (Appendix B-5 and B-6 of Appendix 2P of the Application)

(b) Based on results from Statistics Canada Input-Output Model.

Economic Benefits from Project Operations

During the 50 years or more of operations, the primary benefit of the Project would be to support the natural gas exploration and production sector in northeast BC (upstream activities), and the proposed Prince Rupert LNG (BG Group) export facility to be located on Ridley Island near the communities of Prince Rupert and Port Edward (downstream activities).

Table 2-4 summarizes the benefits that would be generated in BC and other Canadian provinces from Project operations, exclusive of benefits from the upstream and downstream activities noted above. Of the 119 direct full-time equivalent (FTE) positions, approximately 45 would be on-site jobs to support operations.

Table 2-4: Summary of annual project benefits from Project operations

Summary of Benefits from Project Operations	BC	Other Canada	Total
Annual operating expenditures ^(a)	\$ million per year of operation		
Expenditures in BC/Canada	\$16	\$15	\$31
Imported goods and services			<u>\$8</u>
Total annual operating expenditures			\$39
Employment			
Full-Time Equivalent (FTE) Positions on site	approx. 44 FTE in RSA overall (5 FTE per compressor station)		
Employment direct, indirect and induced FTEs	BC	Other Canada	Total
Direct Jobs	119	36	155
Indirect and Induced Jobs	<u>81</u>	<u>72</u>	<u>154</u>
Total	200	108	308
Annual government revenues:	\$ million per year of operation		
Annual municipal/ regional taxes ^(b)	\$25.0		
Annual payments to Nisga'a Lisims Government ^(b)	\$5.45		
BC government (direct, indirect and induced)	\$1.4	excluding carbon taxes	
Federal government (direct, indirect and induced)	\$3.2		

(a) Annual operating expenditures (2013 dollars) exclude the cost of natural gas that would be used by the compressor stations as well as any associated carbon taxes.

(b) Based on results from Statistics Canada Input-Output Model.

The BC government revenues exclude carbon taxes which are estimated by the Proponent to be at \$14 million per year for the initial capacity and up to approximately \$101 million per year at full build-out of both pipelines and with full compression.

Annual municipal/regional revenues are estimated by the Proponent to be at \$25 million as follows:

- Regional District (RD) of Bulkley-Nechako (\$11.0 million);
- Peace River RD (\$6.5 million);
- RD of Kitimat-Stikine (\$3.3 million);
- RD of Fraser-Fort George (\$2.6 million);
- District of Hudson's Hope (\$1.4 million); and
- District of Mackenzie (\$0.1 million).

Social Benefits from Proposed Project

The Project is expected to create employment opportunities for Regional Study Area (RSA) residents and procurement opportunities for RSA businesses.

The value of contractor supply services during construction of the initial pipeline including materials and equipment (e.g. line pipe, compressor units and valves) is estimated at \$1 billion, and the expected value of service contracts (e.g. pipe transportation) at \$2.5 billion. Service contracts are expected to offer a broad range of opportunities to local and provincial suppliers as detailed in the Application.

Direct labour income from Project construction is estimated at \$1.1 billion, of which \$750 million would be earned in BC and \$350 million would be earned in other provinces, mainly in Alberta. At any given time during the three- to four-year construction period, the construction workforce is expected to comprise up to 4,000 personnel spread across 14 main construction camp locations along the pipeline route.

Table 2-5 provides additional detail on direct expenditures during Project construction by project phase and by key cost component, as estimated by the Proponent.

Table 2-5: Summary of direct expenditures during Project Construction

Direct Expenditures During Project Construction	\$ million (2013\$)
By Project Phase	
Project development, design, regulatory needs, consultation, Environmental Assessments	\$205
Land-based pipeline (on-shore pipeline materials and construction)	\$5,110
Marine-based pipeline (off-shore pipeline materials and construction)	\$807
Compressor stations	\$1,223
Meter stations, testing and other	\$110
Total	\$7,455
By Key Cost Component	
Contractor supply services including materials and equipment (e.g. line pipe, compressor units and valves)	\$1,000
Service contracts (e.g. pipeline transportation)	\$2,500
Direct labour income (BC, Alberta and other Canada)	\$1,100
Other	<u>\$2,855</u>
Total	\$7,455

In addition to employment generated through direct and indirect spending on goods and services, the Project is expected to generate social benefits to local communities and Aboriginal communities, such as training and education and employment opportunities for unemployed or underemployed individuals, and increased availability of funds for government programs. The proposed Project would also be expected to provide capacity-building initiatives to support employment, contracting and business development.

Other Benefits from Proposed Project

Other benefits of the proposed Project as described in the Application include:

- Heritage Benefits: Information gathered on the presence of previously recorded historical and archaeological sites, and the potential for additional finds would advance the knowledge and understanding of heritage resources along the proposed route.
- Health Benefits: Information gathered as part of the human health-related assessment (HHRA) for the proposed Project has advanced the knowledge and developed a better understanding of select human health-related features.

2.6 Applicable Permits

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

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

Table 2-6 provides a list of municipal, provincial and federal licences, permits and/or approvals required for the planning, construction and operation of the proposed Project.

Table 2-6: Authorizations that may be required for Project planning, construction and operations

Responsible Authority	Legislation	Permit/Section	Planning	Construction	Operations
Federal					
Environment Canada	<i>Canadian Environmental Protection Act, 1999</i>	Section 122(1): Authorizes the disposal of material at sea		X	X
	<i>Species at Risk Act (SARA)</i>	Section 73: Authorizes activity affecting a listed wildlife species, any part of its critical habitat or the residences of its individuals		X	X
Fisheries and Oceans Canada (DFO)	<i>Fisheries Act</i>	Section 35(2) Issue Authorizations for serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery		X	X
	<i>Fishery (General) Regulations</i>	Scientific Fish Collection Permit.	X	X	X
Industry Canada	<i>Radio Communication Act</i>	Section 5: Radio Licence.	X	X	X
Natural Resources Canada	<i>Explosives Act</i>	Ammonium Nitrate and Fuel Oil Order: Permit		X	
		Section 7(1): Temporary Magazine Licence		X	
		Section 63: Explosives Transportation Permit		X	
Transport Canada	<i>Navigable Waters Protection Act/ Navigation Protection Act</i>	Issues approvals for structures on, over, under, through or across navigable waters	X	X	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
	<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	X
		Section 9: Approval for Changes In and About a Stream		X	X
	<i>Forest Act</i>	Section 47.4: Master Licence to Cut	X	X	X

Responsible Authority	Legislation	Permit/Section	Planning	Construction	Operations
		Section 117: Road Use Permits for Industrial Use	X	X	X
	Heritage Conservation Act	Section 12: Site alteration permit	X	X	
Agricultural Land Commission	Agricultural Land Commission Act	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	X
MOE – BC Parks	Park Act	Section 20: Park use permit authorizing activity on or in a park	X	X	X
		Park Boundary Adjustment	X		
MOE	Environmental Management Act	Section 6(5)(a): Waste Disposal		X	X
		Section 6(5)(b): Waste Incinerator		X	X
		Section 7(2): Hazardous Waste Confinement		X	X
		Section 14: Permit authorizing the introduction of waste into the environment		X	X
		Section 10(1)(c)(ii) Transportation of Hazardous Waste		X	X
	Integrated Pest Management Act	Integrated Pest Management Regulation (for herbicide applications)		X	X
FLNR	Wildlife Act	Section 19(1): General Permit	X	X	X
	Wildlife Act Permit Regulation	Permit to capture fish or wildlife	X	X	X
	Forest Act	Burning permits		X	X
	Heritage Conservation Act	Section 14: Heritage Inspection and Investigation Permit	X		
Ministry of Transportation and Infrastructure	Commercial Transport Act	Section 8: Oversize-Overweight Vehicle Permit		X	X
	Commercial Transport Regulations	Division 6: Non-Resident Commercial Vehicle Permit		X	X
	Transportation Act	Section 62 (use of occupancy permit to cross or use highway right-of-way, work notification, lane closure, sign permit, development approval)	X	X	X
		Section 48: Controlled Access Highway Permit		X	X
Regional					
Northern Health	Public Health Act	Section 19: Application for health approval (Permits under Public Health Act regulations for food, water, accommodations and sewerage for industrial camps and employee accommodations)	X	X	X
Prince Rupert Port Authority	Port Authorities Operations Regulations	Dive Permit		X	X
		Transportation of Dangerous Goods		X	X
		Hot work permit		X	X

Responsible Authority	Legislation	Permit/Section	Planning	Construction	Operations
	<i>Canada Marine Act and Regulations</i>	Port Authority approval to conduct marine geophysical program	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	X
		Road Permit	X	X	X
		Road Use Permit		X	X
		Special Use Permit	X	X	X
	<i>Nisga'a Land Act</i>	Investigative Permit	X		
		Licences of Occupation	X	X	X
		Permits of Occupation	X	X	X
		Statutory Rights of Way		X	X
		Leases		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;
- A Memorandum of Understanding between EAO and the OGC intending to:
 - Prevent duplication between EA and OGC application information requirements;
 - 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);
 - Coordinate engagement with Aboriginal Groups and NLG, to the mutual benefit of Aboriginal Groups, NLG and government; and
 - 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, 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.

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

3.2 Major Milestones of the BC Environmental Assessment

- The EA process started on November 9, 2012, 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_385_35120.html
- On May 6, 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_385_35572.html
- On July 9, 2013, February 21, 2014, March 14, 2014 and May 29, 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_385_36007.html
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_37262.html
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_37409.html
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_37631.html
- On September 12, 2013 the name of the Proponent was changed from 0948090 B.C. Ltd. to Westcoast Connector Gas Transmission Ltd. EAO formally acknowledged the name change in writing on September 27, 2013.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_36123.html
- On September 27, 2013 EAO approved and issued the final Application Information Requirements (AIR) to the Proponent.
http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_36125.html
- On March 21, 2014, the Proponent submitted an Application for an Environmental Assessment Certificate for the proposed Project. From March 21, 2014 to April 22, 2014, EAO evaluated the Application against the AIR, and decided that the Application met the requirements of the AIR. EAO indicated that

the Application review period would commence when the Proponent provided the required copies of the Application.

http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_37482.html

- On May 6, 2014 the Proponent submitted the required copies of the Application for distribution to Working Group members, and the Application Review period began.

http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_document_385_37752.html

- On November 3, 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 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, to the selection of Valued Components, AIR, Application and EAO's Assessment Report;
- Government policy direction and/or gaps that may affect the conduct of the EA;
- Potential conflicts with the legislation and/or regulations of their organizations;
- EA information requirements as compared to permitting design and information requirements. It is important to focus on the level of detail appropriate to the EA; 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. EAO reviewed the Proponent's responses to all comments received from Working Group members in the Working Group Comment Tracking Tables during Pre-Application and Application Review; the Working Group Comment Tracking Table for Application Review is in Appendix 2.¹ EAO required the Proponent to update the Working Group Comment Tracking Table and supporting Technical Memos as appropriate. EAO considered all comments and issues raised during the EA, in development of its Assessment Report.

3.5 Aboriginal Groups Consultation

On May 6, 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 a First Nations 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 Assessment Report and Aboriginal Consultation Report;

¹ The Working Group Comment Tracking Table on the draft AIR is available here: http://a100.gov.bc.ca/appdata/epic/html/deploy/epic_document_385_37069.html.

- 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 Application Information Requirements, 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 the draft Assessment Report.

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 Application Information Requirements, 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 the draft Assessment 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 2012. As a result of these discussions, or new information relating to an Aboriginal Group, several modifications to the Section 11 Order were made during the EA:

- Dene Tha First Nation was added to Schedule C (July 9, 2013);
- The Schedule B Gitxsan (Territories) were amended to include Xsugwin Liginxw as a territory in place of Xsugwin and Liginxw (July 9, 2013);
- Doig River First Nation was moved from Schedule C to Schedule B (February 21, 2014);
- At the request of the Gitanyow Hereditary Chiefs Office, replaced “Gitanyow (Hereditary Chiefs Office)” on Schedule B a list of each *wilp* (February 21, 2014); and,
- Following consultation with Gitxsan Hereditary Chiefs, the names of the Gitxsan territories on Schedules B and C were replaced with a list of *huwilp* being consulted.

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 included on Schedule B and C potentially affected by the proposed Project

Aboriginal Groups		
Section 11 Order, Schedule B Aboriginal Groups	Treaty 8 First Nations	<ul style="list-style-type: none"> • Prophet River First Nation • Blueberry River First Nations • Doig River First Nation • Halfway River First Nation • Saulteau First Nations • West Moberly First Nations • McLeod Lake Indian Band
	Aboriginal Groups	<ul style="list-style-type: none"> • Tsay Keh Dene First Nation • Nak'azdli Band • Takla Lake First Nation • Lake Babine Nation • Gitksan (<i>Huwilp</i>): <ul style="list-style-type: none"> ○ Geel; ○ Nii Kyap;

Aboriginal Groups		
		<ul style="list-style-type: none"> ○ Gitludahl; ○ Tsa Buk; ○ Gwii Yeehl; ○ Wii Gyet; ○ xGwoimtxw; ○ Wii Mugulxw; ○ Haiwaas; ○ Miluulak; and ○ Delgamuukw • Gitanyow: <ul style="list-style-type: none"> ○ <i>Wilp</i> Gamlakyeltxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs Office); ○ <i>Wilp</i> Malii (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs Office); ○ <i>Wilp</i> Gwaas Hla'am (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs Office); ○ <i>Wilp</i> Watakhayetsxw (as represented for the purposes of consultation by the Gitanyow Hereditary Chiefs Office); and ○ <i>Wilp</i> Luux Hon. • Kitselas First Nation • Kitsumkalum First Nation • Lax Kw'alaams Band • Metlakatla First Nation • Gitxaala Nation
Section 11 Order, Schedule C Aboriginal Groups	Treaty 8 First Nations	<ul style="list-style-type: none"> • Fort Nelson First Nation • Dene Tha' First Nation • Treaty 8 Tribal Association
	Aboriginal Groups	<ul style="list-style-type: none"> • Carrier Sekani Tribal Council • Tl'azt'en Nation • Yekooche First Nation • Gitxsan (<i>Huwilp</i>): <ul style="list-style-type: none"> ○ Gitgwinuxw; ○ Luus; ○ Wii Hlengwax; ○ Yagosip; ○ Antgililbix; ○ Wii Gaak; ○ Wii Minosik; ○ Luutkudziwus;

Aboriginal Groups		
		<ul style="list-style-type: none"> ○ Kliiyem Lax Haa; ○ Gyologyet; ○ Djogaslee; ○ Lelt; ○ Mauus; ○ Yal; ○ Tenim Gyet; ○ Wii Eelast; ○ Giist; ○ Baskyatsinhlikit; and ○ Gwininitxw.

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 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 Environmental Assessment 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 Group, and participated in both Working Group meeting and government-to-government meetings.

On July 31, 2014, the Province and NLG entered into a Settlement Agreement, which included Guiding Principles and an Appendix C, outlining the process for collaboration in EAs. The Appendix outlined how EAO and NLG would collaborate and strive to reach consensus at key decision points through the course of future EAs.

Throughout the environmental assessment of the proposed Project EAO consulted with NLG and 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 assessments required in relation to Chapter 10 of the Nisga'a Final Agreement;
- Participation in working group meetings and comment periods during pre-Application and Application Review;
- Participation in the screening of Application;
- Hosting public open houses in Nisga'a villages during Application Review; and,
- Participation in the review and comment on EAO's draft referral material (i.e. draft Assessment report, including 8(e) and 8(f) assessments, Table of Conditions (TOC), Certified Project Description (CPD)).

3.7 Public Consultation

Context

For the purposes of conducting an EA, public consultation requirements are set out in the Section 11 Order dated May 6, 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. The Public Consultation Plan and all Public Consultation Reports are available on the proposed Project's EAO website².

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 these activities.

² The Public Consultation Plan and all Public Consultation Reports are available on EAO's website: http://a100.gov.bc.ca/appdata/epic/html/deploy/epic_project_home_385.html

Summary of Proponent Activities

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

- Conducted research which included in-person interviews, focus groups and a telephone survey of 700 British Columbians;
- Provided information packages to affected landowners along the proposed route and conducted face-to-face visits with landowners to answer questions and to discuss the proposed Project;
- Held information meetings with local government municipalities, regional districts;
- Developed external communications materials, including radio advertisements, various online advertisements, a toll free line at 1-855-757-4755, and direct mailed over 112,000 BC households requesting public input via postage-paid comment cards;
- Launched a project website at www.energyforbc.ca including a fact sheet, location map, news updates, videos, and a feedback form for public comments;
- Opened a business office in Terrace in October 2012;
- Held two meetings with commercial fishery stakeholders in Prince Rupert to discuss the proposed Project and specifically marine issues and concerns;
- Conducted nine open house information sessions in Fort St. James, Smithers, New Hazelton, Terrace, Burns Lake, Mackenzie, Chetwynd, Hudson's Hope and Port Edward;
- Held community meetings in Hazelton and Mackenzie;
- Held Business and Employment Information Sessions along the proposed Project route in November 2013;
- Distributed tenure notification and information to tenure holders including trappers, guide outfitters, and foresters within the proposed route and participated in ongoing meetings and discussions;
- Presented as a keynote speaker and/or participated in panel discussions at 49 local, regional and provincial conferences between 2012 and 2014;
- Participated in 81 community events through sponsorship and/or on-site presence;
- Participated in ongoing meetings and discussions with economic development officers, Aboriginal communities, businesses and individuals regarding business and employment opportunities, skills and training and to hear about the business capacity of communities along the Proposed Project route.

Through three years 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 45-day public comment period during the Application Review stage on the Proponent's Application.
- The public comment period on the AIR was held from May 3 to June 2, 2013.
 - Open houses were held in Prince Rupert (approximate # attendees 47), Terrace (44), Prince George (38) and Fort St. John (42) in May 2013.
 - There were 26 public comments submitted. These comments and the Proponent's response are on EAO's website.³
 - 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 14 to July 2, 2014 (extended from June 27, 2014 due to technical difficulties with EAO's website).
 - Open houses were held in Prince Rupert (approximate # attendees 32), Terrace (40), Hazelton (50), Fort St. James (22), Mackenzie (17), Hudson's Hope (43), Fort St. John (20), Smithers (25), Gitwinskihlkw (40) and Gingolx (40) in June 2014.
 - There were 120 public comments submitted. These comments and the Proponent's responses are on EAO's website.⁴
 - 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:
 - The number of projects proposed;
 - Interest in employment and contracting opportunities;
 - Potential effects to local lifestyles (e.g. in the Kispiox valley) and hunting, fishing and cultural preservation;
 - Potential cumulative effects as a result of several proposed pipeline projects, and a desire to see the Province coordinate pipeline development across projects;
 - Potential cumulative effects to wildlife, land and water due to upstream natural gas development and hydraulic fracturing;
 - Potential cumulative effects to salmon habitat in the Skeena Estuary;

³ http://a100.gov.bc.ca/appsddata/epic/html/deploy/epic_document_385_37069.html

⁴ http://a100.gov.bc.ca/appsddata/epic/html/deploy/epic_project_doc_list_385_r_pro.html

- Potential cumulative effects to climate change and BC's GHG emissions targets;
- Concern about the potential effects to caribou and moose; and
- Pipeline safety.

Results of Public Engagement

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

- Requests to avoid specific areas or to reduce/eliminate a potential effect (in particular, to wildlife herds, sensitive habitats, prospecting opportunities and landowner sightlines) led to several route revisions (see section 2.2.3 for more information on route refinements);
- Concerns over the multiple projects proposed in the Mugaha Creek area resulted in a detailed review of the proposed Project route in this area, confirming that two pipelines could be safely accommodated within the proposed Application Corridor;
- Requests for the relocation of Compressor Station K2 near Mackenzie (in particular, to avoid impacts on recreational use and berry harvesting) led to the completion of noise impact assessment for the area. The assessments concluded that there would be little to no impact to the citizens of Mackenzie with the proposed location of the compressor station (3 km away from the Gantahaz Subdivision). A more detailed noise assessment study of this area was conducted late in Application Review and the Proponent committed to make the results available to Working Group members and the community;
- Concerns related to the potential conversion of pipeline infrastructure from natural gas to oil resulted in the Proponent drafting a public letter to the EAO stating their commitment not to seek to convert the proposed Project at any time;
- Concerns raised by Aboriginal and local communities related to potential effects to water levels, fish and fish habitat (including salmon in the Skeena estuary) due to watercourse crossings resulted in site-specific amendments to the proposed route (prior to Application submission);
- Concerns regarding the effects of the proposed Project on crab resulted in the planned development of a plan regarding the movement, mitigation and monitoring of Dungeness crab, which would include the establishment of an agreement in collaboration with the Area B Crab Association and an assessment of the movement by Dungeness crab in southern Chatham Sound adjacent to the pipeline corridor. The tagging and tag recovery program is anticipated to begin in 2015;

- Concerns regarding birds and bird habitat led to site-specific amendments to the proposed route (prior to Application submission), including a route adjustment near Mugaha Marsh away from the bird banding station and a proposed HDD crossing under the marsh to protect wetland wildlife habitat;
- Concerns related to the potential effects on marine mammals (in particular, noise during construction) led to the development of mitigation measures to address construction scheduling and marine traffic planning in relation to specific marine construction activities;
- Concerns related to the water level in Williston Lake for the pipeline crossing, as well as existing and future vessel traffic on the reservoir to support pulp mill operations, resulted in a commitment by the Proponent to continue to work with BC Hydro and consult with other Williston Lake users to ensure all potential data sources have been assessed and accounted for in the final engineered design;
- Concerns related to community water quality and supply along proposed pipeline route, including residential water supply in the Nass area, resulted in a commitment by the Proponent to develop a groundwater quality monitoring program and to sample groundwater wells within 200 m of the proposed pipeline. Water quality monitoring would also be undertaken at select watercourses during instream construction activities;
- Concerns related to potential effects on marine navigation and traffic during construction has helped to inform a preliminary Marine Traffic Management Plan;
- Concerns regarding ROW management, including vegetation, reclamation, and access by humans and animals helped to inform the Access Management Plan; and
- Concerns regarding pipeline safety resulted in a commitment from the Proponent to work with communities, first responders and landowners along the proposed Project in the development of the Emergency Response Plan (ERP).

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.⁵ 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.

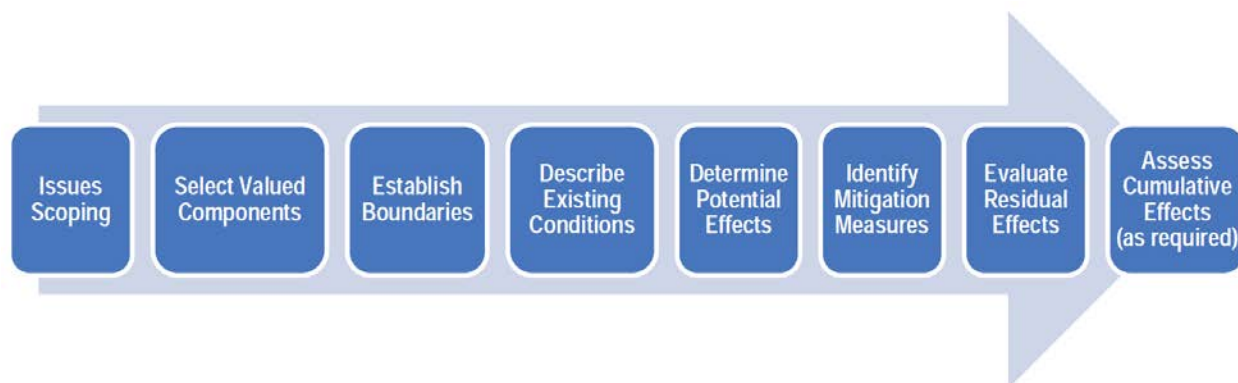


Figure 4-1: Environmental Assessment Methodological Steps

⁵ The Guideline is available at http://www.eao.gov.bc.ca/pdf/EAO_Valued_Components_Guideline_2013_09_09.pdf.

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 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 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 Study Area (LSA) – 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 Study Area (RSA) – 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 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 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 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 the 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 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. In all cases, the assessment findings represent the most likely scenario; although the level of confidence might be higher in some cases than others.

Significance is usually determined for both the residual effects of a 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.

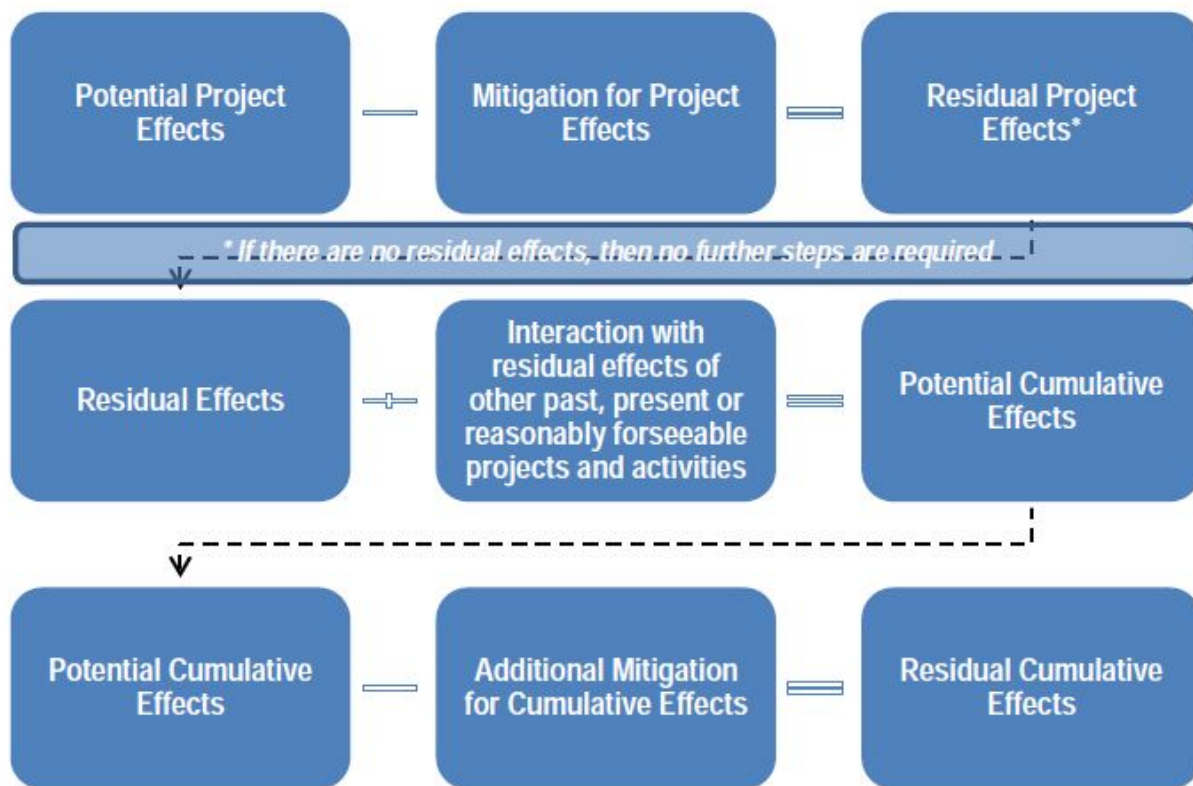


Figure 4-2: Steps to Determine Residual Effects and Cumulative Effects

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.

4.1.5 Environmental Assessment Certificate Documentation

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

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 materially 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 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. 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

The 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.

The 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, EAO C&E staff prepare a CMP in collaboration with partner agencies (e.g. OGC, FLNR, and MOE). The CMP outlines the general approach to compliance oversight for a 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, EAO plans its administrative (i.e., desk-based) and field-based inspections for the year in keeping with risk-based criteria developed by EAO and the targets specified in MOE’s Service Plan. Unplanned inspections are also conducted in response to new information received by 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 conduct 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 potential or alleged

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

The Application presents the findings of the assessment carried out by the Proponent on the potential noise effects from construction and operations on human receptors. Noise effects on wildlife are assessed under the wildlife and wildlife habitat, section 5.9 and those on fish and fish habitat, under section 5.6.

The LSA is defined as a 1.5 km band centred 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 RSA 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 the OGC and Health Canada, each of which uses a different assessment methodology. The OGC's *British Columbia Noise Control Best Practices Guideline* is receptor based, guiding the control of noise at the operational phase of projects. It prescribes a maximum cumulative permissible sound level at dwelling units (receptors located within 1,500 m from the Project footprint. 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 guidelines for the Mitigated Noise Level (MNL) for L_{dn} and change in %HA.

Acoustic modeling was conducted in accordance with International Organization for Standardization (ISO) methodology and calculation standards. It 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 Project sources of noise identified in the Application include construction activities associated with helicopter traffic, blasting, grading, pipe delivery, installation

and backfilling. Because most of the proposed Project would be located in remote and unpopulated areas, the Application states that few human receptors would be affected by construction noise along the ROW. Three specific locations near Mackenzie, Kitsault and Alice Arm were identified as areas with potential human receptors that could be impacted by construction noise.

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 rapidly with distance away from the source.

Construction activities at any one site are expected to last less than two months, with the exception of construction work at the compressor stations, and the marine based dredging activity and sea-floor operation. Health Canada's MNL criteria for activities lasting less than one year is 47 dBA (A-weighted decibel) L_{dn} . For activities lasting less than two months, and additional 10 dBA is added for a MNL criteria of 57 dBA L_{dn} . For construction activities lasting longer than a year, the criteria of a maximum 6.5% change in %HA is used.

In the land-based construction phase, the L_{dn} is below the MNL at receptors 800 m or further from the ROW. In the marine-based pipeline construction phase during sea floor preparation, the day-night sound level is below the MNL at receptors 1,500 m or further from the ROW. During HDD activity at watercourses in the construction phase, the day-night sound level is below MNL at receptors 500 m or further from the ROW.

Table 5-1: Modelled day-night sound level results from construction activities

Construction Phase	Activity	Receptor	Day-Night L_{dn} (dBA)	Health Canada MNL
Land-based pipeline construction	Clearing	800 m	55.0	57
	Grading		55.0	57
	Stringing		53.0	57
	Engineering		50.0	57
	Pipe gang		50.0	57
	Reclaim		53.0	57
	Ditch crew		56.0	57
	Coat lowering backfill		56.0	57
	Tie-in and repair		53.0	57
	Clean-up		53.0	57
Marine-based pipeline construction	Shore approach operation near Kitsault shoreline	Kitsault	49.7	57
	Shore approach operation	Port Edward	38.5	47

Construction Phase	Activity	Receptor	Day-Night L _{dn} (dBA)	Health Canada MNL
	near Ridley Island			
	Sea-Floor Preparation	1500 m	46.9	47
Horizontal Directional Drilling		500 m	56.4	57
Compressor station (K2)	Phase 1 (Civil work)	Gantahaz	42.3	47
Compressor station (K5B)	Phase 1 (Civil work)	Kitsault	36.5	47

Phase 2 construction work at the compressor stations (e.g. mechanical, instrumentation, and electrical work) is expected to last more than a year. There is no expected change in %HA at the two compressor stations (Mackenzie and Kitsault) with receptors located within the RSA.

Operations

Operational activity noise would be primarily generated by the proposed compressor stations near Cypress, Mackenzie, Gilles Creek, Nilkitkwa River and Kitsault or Nasoga Gulf, and by periodic helicopter monitoring along the ROW.

The identification of noise receptors within the LSA and the RSA of the five proposed compressor stations determined that:

- A portion of the community of Kitsault (three receptors) is located 800 m from compressor station K5B (on the Kitsault route option), within the LSA;
- No permanent or seasonal dwellings are present within the LSAs of the five compressor stations proposed for the Nasoga route variant;
- The community of Gantahaz is located 3 km from the compressor station K2, within the RSA; and
- The community of Alice Arm is located 4 km from compressor station K5B (on the Kitsault route option), within the RSA.

Compliance with the OGC Guideline's Permissible Sound Level (PSL) limits was assessed at the communities listed above (Gantahaz, Kitsault and Alice Arm) and along the 1,500 m boundary for all the compressor stations. Table 5-2 considers the combined (cumulative) noise effects of the proposed Project with the noise contribution of the existing facilities within the RSA, taking into account ambient sound level. Compliance with the OGC recommended PSLs are expected for all compressor stations.

Table 5-2: Modelled sound level results from compressor station operation

Receptor	Ambient Sound Level (dBA)		Cumulative Sound Level (dBA)		OGC PSL (dBA)	
	Day	Night	Day	Night	Day	Night
K1 1.5 km criteria boundary	45	35	46	40	50	40
K2 Gantahaz	48	38	48	39	53	43
K2 1.5 km criteria boundary	45	35	46	40	50	40
K3 1.5 km criteria boundary	45	35	46	40	50	40
K4 1.5 km criteria boundary	45	35	46	40	50	40
K5A 1.5 km criteria boundary	45	35	46	40	50	40
K5B Kitsault	48	38	48	39	53	43
K5B Alice Arm	45	35	45	36	50	40
K5B 1.5 km criteria boundary	45	35	46	40	50	40

The residual effects predicted from the modeling take into account equipment noise control design as part of the engineering process. Supplemental mitigation measures would be considered if necessary at the time of final selection of the equipment as follows:

- Construction activities would be scheduled during daytime hours, to the extent practical;
- Noise control installed on construction equipment (e.g. mufflers) would be maintained in good working condition;
- Construction traffic to and from the site would be restricted to approved routes or alternate routes would be considered to reduce travel near residences;
- 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 gas turbine and compressors would be enclosed in buildings;
- Power generator and associated gas driver for the compressor would be fitted with exhaust silencers; and
- Pipe lagging or other shielding would be applied to above ground piping at the compressor stations if the sound pressure levels exceed the permissible value.

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

During their review of the Application, the Working Group and public raised several key issues on noise effects. These issues and the responses of the Proponent and/or EAO are summarized below.

Halfway River First Nation sought clarification on which industries and projects the Application considered in the cumulative noise assessment.

The Proponent responded that generally projects not regulated by the OGC or the National Energy Board (NEB) were not included in the cumulative noise assessment, as they are difficult to quantify due to lack of public information and that no quantitative noise limits are applicable to such activities.

The Application's assessment of cumulative noise effect considered four existing compressor stations within the RSA of the compressor station K1 (Canadian Natural Resources Limited Kobes, Progress Gundy, Suncor Kobes, and Talisman Kobes) and an existing mining operation within the RSA of compressor station K5B. The existing Avanti Kitsault Mine is located 2.6 km from compressor station K5B. The estimated noise contributions from the Kitsault Mine's EA were added to the acoustic model results for compressor station K5B.

Several members of the public expressed concerns about the proposed pipeline being in close proximity to their homes, between KP657 to KP659, and suggested alternative routes to avoid disruption, including noise.

The Proponent informed EAO that they are currently working with Nisga'a to identify and review routing options through the Nass Valley and that comments and concerns from nearby residents have been included in this discussion. Potential staging options currently being considered, as part of the route alternative being considered, would substantially reduce concerns from residents and the Proponent would continue to consult and advise landowners prior to any field work being undertaken in the area.

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 sound levels.

EAO's characterization of the expected residual effects of the proposed Project on the acoustic environment 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 sensitivity	The acoustic environment is of a low sensitivity, as the receiving environment is undisturbed and generally not sensitive to noise.
Magnitude	Moderate	The magnitude of potential adverse effects is predicted to be medium. Noise from pipeline and compressor station construction and compressor station operations is perceptible, but predicted to be within <i>BC Noise Control Best Practices Guideline</i> or Health Canada's MNL guideline.
Extent	Local	The facilities of the proposed Project would comply with the <i>BC OGC Noise Control Best Practices Guideline</i> and potential effects would generally be within the LSA of 1.5 km.
Duration	Short term to long term	<p>Construction and testing activities for the pipeline would temporarily affect the area acoustic environment; however, once these activities end, the acoustic environment would return to its original state with no potential residual effects.</p> <p>Construction of compressor stations and meter stations is expected to take up to two years.</p> <p>There would be a long term increase in ambient noise levels during operation of the proposed compressor stations.</p>
Reversibility	Reversible	The potential adverse effects would be fully reversible upon cessation of construction or operational activity.
Frequency	<p>Construction – Semi-continuous</p> <p>Operations – continuous</p>	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 – 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 stated that there are no reasonably foreseeable projects or activities within the RSA that would overlap with the Project in such a way as to exceed OGC or the Health Canada noise guidelines on a persistent basis. Cumulative effects have therefore been assessed as not 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 VC and included in the assessment due to emissions produced from the proposed Project during construction and operations and potential impacts to human health and other biophysical values. 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 (human health effects are assessed in section 9 of this Assessment Report).

The air quality assessment emissions from proposed Project-related activities include Critical Air Contaminants (CACs) and hazardous air pollutants (HAPs) appropriate to the proposed Project activities (including diesel combustion, forest clearing, slash burning, compressor stations and maintenance activities). CACs expected to be emitted include nitrogen oxides (NO_x), sulphur oxides (SO_x), volatile organic compounds (VOC), carbon monoxide (CO) and particulate matter (PM₁₀ and PM_{2.5}).

Predicted emissions associated with pipeline construction were assessed within 500 m and 30 km bands centered on the proposed pipeline right-of-way, delimiting the local and regional study areas, respectively. Predicted emissions associated with operations were assessed for the six potential compressor stations, although only five would be constructed. The LSA was represented by a 20 km by 20 km square centred on each proposed compressor station, while the RSA was expanded to 50 km by 50 km. Three communities are located near the proposed compressor stations: a portion of the Kitsault community is located within the LSA of the proposed K5 – Kitsault compressor station and Alice Arm and the community of Gantahaz (near Mackenzie BC) are located within the RSAs of the proposed K5 – Nasoga and K2 compressor stations, respectively.

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

The Application identified that adverse air quality effects would result from activities associated with different Project components. Background ambient air quality was determined using air quality monitoring data available from representative continuous air quality monitoring stations in the region and consistent with MOE guidance. In general, the baseline ambient air quality within the region of the proposed pipeline was considered good, with concentrations of CACs always below the applicable Ambient Air Quality Objectives (AAQOs). Localized anthropogenic effects from industry and traffic were noted.

Air dispersion modelling was conducted for CACs associated with the operation of each proposed compressor station in accordance with MOE's *Guidelines for Air Quality Dispersion Modelling in British Columbia*. The air quality assessment applied the most stringent of the provincial and national AAQOs for the following CACs of interest:

- Nitrogen Oxides (NO_x);
- Sulphur dioxide (SO₂);
- Carbon monoxide (CO); and
- Respirable particulate matter (PM_{2.5}).

BC is currently developing Interim AAQOs for nitrogen dioxide (NO₂) and sulphur dioxide (SO₂), which were not available at the time of this Application. At the request of the MOE, EAO directed the Proponent to consider the US National Ambient Air Quality Standards for 1 hour SO₂ and 1 hour NO₂ objectives (modified for 1-year averages) and the World Health Organization (WHO) guidelines for annual NO₂ objectives. A more detailed analysis of these interim guidelines was included in a supplemental technical memo following submission of the Application.

Proposed construction and operational HAPs emissions were estimated in the Application. As BC does not have AAQOs for HAPs, the assessment used the Alberta AAQOs for the HAPs of interest (i.e., Benzo (a) Pyrene, Benzene, Toluene, Ethylbenzene, and Xylene). Benzene, toluene, ethylbenzene and xylenes are a sub-set of total VOCs and were included as HAPs owing to their toxicity.

Emissions from construction

During construction, concentrations of CACs and HAPs would increase in the LSA from vehicle operation and ROW clearing activities, including open burning of woody debris. Emissions from construction camp operation would be negligible.

Construction activities would occur along several pipeline segments, with each segment worked on for about six months. Air quality effects are expected to last longer for construction activities at proposed compressor station sites.

The Application 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 from operations

During operations, the primary source of air quality impacts would be the compressor stations. To quantitatively assess compressor stations emission effects on ambient air quality the assessment included detailed air dispersion modelling, consistent with MOE guidelines. Other minor sources emissions associated with operation included vehicle traffic, maintenance work and fugitive emissions. Emissions from pipeline operation were considered to have negligible effects on air quality and were not assessed.

The maximum ground-level concentrations for all CACs and HAPs at all proposed compressor stations, predicted through dispersion modelling, were below the applicable ambient air quality objectives. The Proponent noted that the one exception, 24-hour PM_{2.5} at K5 Kitsault compressor station, is not meaningful owing to the conservative background value imposed and that objectives were only marginally exceeded. No concerns were raised by MOE, EAO or other Working Group members with this conclusion during Application Review.

The Application has proposed the following mitigation for potentially elevated concentrations of all CACs, HAPs and particulates during construction and operation:

- Reduce idling, proper vehicle maintenance and non-optimized construction equipment capacity for duty at hand;
- Control construction-related fugitive road dust by spraying water;
- Adhere to Soil Erosion Contingency Plan;
- Reduce open burning of timber, tree/shrub debris and stumps, and instead mulch it for spreading on ROW and maximize timber salvaging;
- Adhere to the *Environmental Management Act*, Open Burning Smoke Control Regulation;
- Prohibit open burning of domestic refuse and hazardous waste, including construction camp waste; and
- Use efficient gas turbines using “dry low NO_x emission” combustors.

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

During their review of the Application, the Working Group and public raised a number of key issues regarding impacts on air quality. These issues and the responses of the Proponent and/or EAO are summarized below.

Three supplemental memoranda were developed in response to requests from Lake Babine First Nation and Halfway River First Nation for more detailed information on the assessment of air quality effects during Application Review, including:

- Compressor stations drawings;
- More detail on other industries within the 5 km buffer of the K1 compressor station; and
- Additional rationale for excluding other facilities within the 5 km of K1 compressor for cumulative effects assessment.

The Proponent responded that within the 5 km buffer of the K1 compressor station there are well facilities that may have small internal compressor engines; however, the emissions from these compressors are considered negligible.

A member of the public expressed a lack in confidence of the validity of the air quality data and methodologies used in the assessment, including:

- Concerns that the air quality monitoring data underestimated baseline ambient levels of air contaminants of concern (PM_{2.5});
- Concerns that the assessment did not include larger respirable particulate matter as an air contaminant of concern; and
- Concerns that the dispersion modelling may have underestimated compressor station emissions since the model assumed 100% load condition, but did not include start-up and shut down.

The Proponent responded that the methods applied to measuring baseline ambient levels were sound, and that PM_{2.5} is considered a proxy for health concerns with respect to all particulate size fractions. The Proponent assumed a 100% load conservatively, as higher emissions during start up and shut down would be balanced by periods of no emissions while equipment is idle.

Other air quality related concerns received from the public involved a component of human health, indicating concerns that construction activities located near residents, especially burning, may cause breathing and allergy issues. Effects to human health are addressed in section 9 of this Report.

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 EAO's level of confidence in the effects determination (including likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low (i.e.; high resilience and low sensitivity to adverse effect)	The airsheds that would be 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	<p>Project construction and operational activities are predicted to result in low to moderate increases of CACs and HAPs for a limited extent.</p> <p>The maximum predicted ground level concentrations for all CACs and HAPs at all proposed compressor stations are below the applicable ambient air quality objectives (with one minor exception, where objectives were only marginally exceeded and were based on conservative estimates.</p> <p>The predicted ground level concentrations for NO₂ and SO₂ at all proposed compressor stations are below identified objectives.</p>
Extent	Local and regional airshed	<p>Residual effects from construction are not expected to extend beyond LSA.</p> <p>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.</p>
Duration	Construction: short to medium-term	Construction-related emissions would persist along with construction. Construction at specific areas would remain active for six approximately

Criteria	Assessment Rating	Rationale
	Operations: long-term	months at a time along the pipeline and longer in duration at the compressor sites. Total construction would occur over 10 years. Operations emissions would occur for the life of the proposed Project (50 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	Effects due to construction would be semi-continuous along the pipeline and at compressor sites. 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 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	There is a high level of confidence in the significance determination based on the available Project design information, background air quality data, and emissions estimation and air modelling methods.	

5.2.5 Cumulative Effects Assessment

The Application considered other projects with substantial emissions, located within a 5 km buffer zone of proposed compressor station, as having the potential for cumulative interaction with the proposed Project. Using this metric, no past, present or reasonably foreseeable projects were identified in the RSA.

The Application did not identify the potential for cumulative interactions with the other proposed linear infrastructure such as the proposed Prince Rupert Gas Transmission Project (PRGT). PRGT's Application for an EA Certificate indicated that the proposed K2 compressor station from this proposed Project is located in the RSA of the Callazon Creek compressor. EAO is of the opinion that there may be situations where compressor stations are located in close proximity to other stations from future projects, which could justify ambient air quality monitoring; however, EAO and OGC acknowledge that this would be addressed during the OGC permitting process.

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 would be released during the construction and operation of the proposed Project. GHGs were selected due to their importance for the global climate and the regulatory requirements in BC.

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.

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 BC Government passed the *Greenhouse Gas Reduction Targets Act* (GGRTA), 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, in some cases, 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.⁶

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.

⁶ 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.

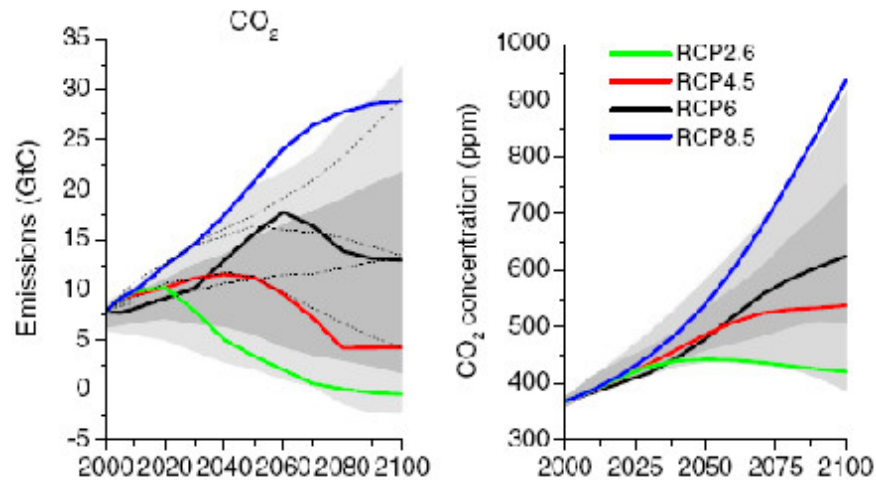


Figure 5-1: IPCC CO₂ Emissions and Concentration Projections

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

The construction and operation GHG impacts of the proposed Project are generally related to the combustion of fossil fuels in construction equipment, and land clearing/biomass burning during construction, and combustion at compressor stations, fugitive emission, venting and aerial patrols and maintenance during operations.

The proposed Project would have an initial pipeline and compression capacity of approximately 2.2 bcf/d, with the potential to expand to approximately 8.4 bcf/d with two pipelines and full compressions (the basis for the GHG emissions assessment). The Application presents the proposed Project's estimated emissions under three different development scenarios: initial pipeline and compression; initial pipeline and full compression; and two pipelines and full compression. Table 5-3 presents the estimated CO₂e emissions under the three project development scenarios.

The total estimated emissions during construction would be 2.13 megatonnes (Mt) of CO₂e for the construction of the first pipelines and associated facilities (Scenario 1). Construction of the second pipeline would emit an additional 0.23 Mt CO₂e (Scenario 3). Approximately 47% of the total emissions would be due to land clearing, 34% the result of biomass burning, 7% from marine vessels, and the remaining 11% from the operation of (terrestrial) construction equipment.

Table 5-3: GHG emissions under three Project Development Scenarios

Scenario	Construction (total Mt CO ₂ e)	Operations* (avg Mt CO ₂ e /year)
Scenario 1 (initial pipeline and compression)	2.33 ⁺	0.7
Scenario 2 (initial pipeline and full compression)	0 (incremental to scenario 1)	2.5
Scenario 3 (two pipelines and full compression)	0.23 (incremental to scenario 2)	4.4

* CO₂e operations emissions presented for the Nasoga route option. Emissions for the Kitsault route option would be marginally lower (0.5 Mt/yr for one pipeline and 0.16 Mt/yr for two pipelines)

⁺ Estimates updates based on information provided during Application Review in *Updated GHG Emission Quantification for Land Clearing Activities* (September 4, 2014)

Land clearing required to create the pipeline ROW would involve the removal of trees and other vegetation. The estimated GHG emissions would be a result of biomass burning and residual decay emissions. Biomass burning of unmerchantable timber and other vegetation would occur during construction. Residual emissions are estimated to occur over the next 20 years as a result of biomass decomposition. Residual emissions were estimated assuming a 70 m wide construction ROW and considered only a very coarse approximation of regional vegetation. The anticipated actual land clearing in most areas is expected to be approximately 50-60 m wide. This assumption was intended to compensate for not including direct estimates of other cleared areas outside the ROW, such as temporary camps and roads. It was also assumed that 60% of timber would be merchantable, while 40% would be non-merchantable; the latter is estimated to be burned (though it may have other uses along the ROW).

The final permanent ROW would be approximately 55 m for two pipelines (and approximately 32 m for one pipeline), with approximately 5 m on either side of each pipeline maintained clear of large woody vegetation. If this narrower corridor would be a better reflection of the actual clearing, then construction CO₂e emissions would be approximate 16-18% lower than presented in Table 5-3.

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.

The estimated annual operations GHG emissions from the two initial capacity scenarios, Scenarios 1 and 2, would be 1.1% and 4.0% of BC 2011 emissions, respectively. At full

operational capacity with two pipelines (Scenario 3), the proposed Project is estimated to release 4.4 Mt/year of CO₂e, which would be a 0.01% increase to global emissions (with respect to 2010 inventory), a 0.6% increase to national emissions, and a 7% increase to provincial emissions (with respect to 2011 inventory). At full build-out 96% of annual emissions would be from combustion at compressor stations, 3.6% from fugitive emissions (96% of which would occur at compressor stations), and 0.3% 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, reducing overall pipeline length, pipeline coating and efficient utilization of compression and station spacing;
- Incorporate isolation valves to reduce vented emissions during maintenance, inspection and emergencies;
- Reduce vented emissions by utilizing a mobile pump-down compressor to re-pressurize the gas and return it to the pipeline;
- Reduce vented emissions by using a mobile incinerator or flare to reduce the GHG impact by converting the CH₄ to CO₂, where practical;
- Implement electric motor starters and dry gas seal systems to reduce fugitive emissions from components;
- Implement a fugitive emissions management program to detect and repair fugitive emissions sources;
- Optimize fuel efficiency by assessing the operating characteristics of the pipeline and the compressors;
- Consider the use of Waste Heat Recovery for the generation of renewable electricity from heat that is not normally utilised.

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, Lax Kw'alaams Band, Nak'azdli Band and the public. These issues and the responses of the Proponent and/or EAO are summarized below.

Lax Kw'alaams Band expressed concerns about a perceived lack of specific mitigation measures, and uncertainty about how mitigation measures would reduce GHG emissions.

The Proponent noted that GHG management planning was based on best available information about the proposed Project design at the time of submitting the Application. Once the proposed route and Project design are finalized, and concrete mitigations known, further details about the percentage of GHG emission reductions would be prepared.

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

FLNR advised that the calculations for land clearing and biomass clearing should be revised in the Application.

EAO, the Proponent, and FLNR met to further discuss this issue, and the Proponent submitted revised calculations in a memo titled *Updated GHG Emission Quantification for Land Clearing Activities* (September 4, 2014). This memo resolved FLNR's request. It resulted in a 27-30% increase in total estimated CO₂e emissions during construction, and is reflected in the numbers previously presented in Table 5-3.

CAS had comments of clarification to ensure compliance with the BC Reporting Regulation, which were adequately addressed by the Proponent.

Several members of the public, including the Pembina Institute, raised comments about the Application's assessment of the proposed Project's GHG emissions. The Pembina Institute noted that the proposed Project's GHG emissions would also be more than twice as much as BC's largest emitter and would place the Project among the ten highest emitters in Canada (both comparisons based on 2012 figures). They also noted that a pipeline would be only one source of GHG emissions resulting from LNG, from wellhead through to final combustion.

The Proponent responded that GHG emissions are a global issue, as they are emitted globally and disperse uniformly in the atmosphere to form part of a global background concentration. Therefore, they assessed the environmental effect at the global level. They also noted that the trade in LNG would facilitate a number of benefits including displacement (avoided use) of more GHG intensive energy

sources in Asia as increased LNG supplies are made available. The Proponent also noted that a full lifecycle analysis was not a requirement of their Application.

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 the effects that GHG emissions are at levels that are impacting the global climate.
Magnitude	High	Total construction emissions of CO ₂ e would be up to 2.26 Mt. The majority of emissions would arise during operations (up to 4.4 Mt/year of CO ₂ e). At full build-out, the proposed Project would increase provincial GHG emissions by 7% from 2011 levels. The proposed Project would also increase national GHG emissions by 0.6%, as well as contributing to a 0.01% increase in global GHG emissions.
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	The emission of GHG emissions would be continuous for the life of the proposed Project.

Criteria	Assessment Rating	Rationale
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 level of confidence 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 Soil

5.4.1 Background

The proposed Project would cross a variety of soil conditions. The soils assessment considered soil types, capability and related factors potentially affecting soil productivity and plant growth. The following key indicators were studied in the Application:

- *Agricultural capability* – assessed based on a land capability classification system developed for agricultural lands in BC; and
- *Land restoration suitability* – assessed based on the physical and chemical properties of soil and is an indicator of the relative quality of the soil materials as a growth medium.

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

The Proponent conducted a soil survey along portions of the proposed pipeline route where the route would cross land within the Agricultural Land Reserve (ALR). A desktop review of non-agricultural (forested) soils and organic (wetland) soils within the 400 m wide Application Corridor was also completed based on existing soils mapping data, air photo interpretation and other published information.

The agricultural capability of the soils surveyed within the ALR ranges from Class 2 to 6, but is generally considered Low because of limitations related to climatic heat deficiency, excess water and/or topography. The restoration rating of material in the upper root zone depends on the texture(s) of the materials involved but ranges from Good to Fair-Poor. Finer grained materials generally have a more favourable restoration rating (i.e. Good) than soils whose upper root zone is either gravelly or exceedingly stony (i.e. Fair-Poor).

The Application states that the natural erosion potential throughout the LSA is highly-variable and depends on factors such as the topography, ground cover, local conditions and any changes in the local conditions or weather.

Of the 65.5 km of the Application Corridor that would cross land within the ALR, about 10.9 km or 17% of this land is being used for agricultural purposes. The remaining ALR land is not being used for agricultural purposes and approximately 80% is treed or recently logged. Outside of the ALR, lands within the Application Corridor are predominantly forested and support a variety of resource activities.

The proposed Project activities associated with clearing, construction and restoration, including blasting, grading, trenching, soil storage, infilling, slope stabilization trenching, operations and maintenance may have the following adverse effects:

- Diminished agricultural capability due to:
 - Mixing of topsoil and subsoil during grubbing, soil salvage, storage, replacement and decompaction activities;
 - Mixing of lower quality subsoils with better quality upper topsoil;
 - Degradation of soil structure through compaction and rutting;
 - Loss of topsoil or upper soil material through wind or water erosion;
 - Ponding of surface water or interference with agricultural practices due to trench subsidence or a remnant crown over the trench;
 - Soil contamination; and
 - Soil disturbances (for example, maintenance digging activities) during the operational phase.
- Reduced suitability for land restoration due to:
 - Surface soil compaction;
 - Loss of surface soil from erosion; and
 - Mixing of topsoil and subsoil during grubbing, soil salvage, storage, replacement and decompaction activities.

The proposed Project may also result in the exposure of acid generating rock and rock subject to metal leaching, which can affect water quality. Metal leaching and acid rock drainage (ML/ARD) are discussed section 5.7 (Water) and section 10.3 (Effects of the Environment on the Proposed Project) in this Report.

The Proponent committed to undertake mitigation to address potential effects on the soil capability, which were developed in accordance with industry-accepted best practice and BC regulatory guidelines, and include the following:

- Replace topsoil evenly over all portions of the construction ROW and postpone replacement during wet conditions or high winds to prevent damage to soil structure or erosion of topsoil;
- Monitor the trench and areas prone to erosion during first spring break-up after construction and for two years following construction until vegetation is established and erosion is controlled;
- Inspect areas of high erosion potential during regular aerial patrols;

- Install appropriate sediment control measures at the discretion of the Environmental Inspector (EI), in consultation with the Chief Inspector;
- Install cross ditches and berms on moderate to steep slopes in order to prevent runoff along the construction footprint and subsequent erosion;
- Restrict root grubbing on steep erosion prone slopes in order to limit soil disturbance and the risk of erosion;
- Monitor areas that are disturbed during operations and maintenance activities and implement remedial measures, where warranted; and
- Limit heavy equipment travel to machinery and vehicles equipped with low ground pressure tires or wide tracks to reduce the potential for compaction and rutting if wet soil conditions are present.

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. These issues are summarized below.

FLNR raised concerns 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 the Project would comply with the applicable sections of the Environmental Protection and Management Regulation (EPMR) of OGAA. FLNR suggested that disturbed soils should be maintained or rehabilitated to their original condition; however, the EPMR outlines specific requirements for soil conservation and restoration that the Proponent would be required to follow.

Halfway River First Nation and FLNR expressed concern that field investigations were not carried out on forested soils and that forested soils should be subject to the same guidance and best management practices as for ALR lands regarding conservation and management.

The Proponent responded that industry best practices would be employed to conserve and manage non-ALR (forested) soils, including salvaging root zone material, segregating it from other stockpiled material and replacing it over the stripped portion of the construction footprint. These practices would be outlined in the Proponent's Environmental Management Plan (EMP). Refer to Appendix 3A of the Application which describes the preliminary Terrestrial EMP and related

plans, as well as section 14 of the Application which provides a summary of the EMP. EAO proposes a condition that would require the Proponent to develop and implement an EMP in accordance with section 14 and Appendix 3A of the Application.

FLNR expressed concerns about the absence of detailed soil-terrain mapping west of KP 562 (both Nasoga and Kitsault routes).

The Proponent responded that, for areas where limited soils mapping is available, available resources were used to the extent practical and soils were grouped by more general characteristics. The Proponent further indicated that industry best practices would be employed to conserve and manage non-ALR (forested) soils.

FLNR expressed concern that there could be residual effects on forested soils within the LSA, 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 effective implementation of mitigation measures such as salvaging and replacement of root zone material, the growing medium of the non-permanent ROW would be favourable to pioneer tree species such as Lodgepole pine, Douglas fir and red alder; however, the permanent ROW would be maintained to minimize the growth of tree species. The final permanent ROW would be approximately 55 m for two pipelines (and approximately 32 m for one pipeline), with approximately 5 m on either side of each pipeline maintained clear of large woody vegetation.

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:

- Loss of productive topsoil and surface soil; and
- Lowering of soil capability due to compaction and admixing.

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	<p>Through ALR lands, the water erosion risk can be considered low, mainly due to the gentle slopes (<15%). Where slopes are steeper, the erosion risk 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.</p> <p>In non-ALR lands, the topography, drainage conditions and soil types are highly-variable. Forested soils with a high coarse fragment content (>70%) 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.</p>
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 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.	

Criteria	Assessment Rating	Rationale
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 Project would not likely result in significant adverse effects on soils.
Confidence		High confidence – The significance determination and likelihood rating for potential 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 cumulate 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.

5.5 Terrain Integrity

5.5.1 Background

Terrain integrity was identified as a VC because of the physical environment along the proposed route, which would cross areas of steep terrain, including the Rocky Mountains, the Skeena Mountains and the Coast Mountains, and major river valleys.

The terrain assessment LSA describes terrain along the 2 km wide proposed route based on desktop studies, ground and aerial reconnaissance, and interpretation of air photos and available mapping data.

The goals and objectives related to the Terrain Integrity VC are generally based on avoiding geo-hazards, maintaining terrain stability, limiting soil loss from erosion, and preventing sediment transport.

The Application identifies existing terrestrial geohazards near the Application Corridor, as well as geohazards that have the potential to be initiated or mobilized by proposed Project activities. Mass wasting events such as slides and debris flows, as well as glaciomarine deposits with possible sensitive clays or other potentially liquefiable deposits have been noted near the Application Corridor. In the marine environment, geohazards include slides, turbidity flows, marine differential settlement and marine differential erosion.

EAO's assessment of effects of the environment on the proposed Project, including slope stability and seismic events, is in section 10.3 (Potential Effects of the Environment on the Proposed Project) of this Report.

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

The Application presents general and detailed information on existing terrain conditions including topography, bathymetry (for marine sections), surficial geology, physiographic regions and related information. The Application also includes maps that were developed according to provincial standards for terrain mapping, a discussion of the potential adverse effects of the Project on terrain, proposed mitigation measures, and a follow-up and monitoring program for prediction validation.

If an EA certificate is issued, the pipeline route would be further refined during detailed engineering design which would be considered in the OGC permitting process. The OGC regulates for most terrain aspects for natural gas pipelines situated entirely in BC.

The geotechnical program would be continued by the Proponent during ongoing engineering design to further define areas of potential terrestrial and marine instability along the proposed route. After completion of the geotechnical program and assessment, a detailed grade plan would be developed with the pipeline construction contractor before construction would start, to safely install the pipeline, re-establish slopes to a stable profile and implement any additional surface stabilization measures.

The Proponent committed in the Application to undertake a number of mitigation measures to address potential effects on the terrain integrity, including but not limited to:

- Route optimization, such as selecting stable stream crossing locations and avoiding geo-hazards;
- Ongoing local stability evaluations throughout the investigation, design and operations phases;
- Maintenance of natural drainage patterns to the fullest extent feasible;
- implementation of sediment and erosion control measures during construction;
- Provision of controlled groundwater drainage in key areas;
- Implementation, restoration and re-vegetation of stream banks and riparian areas;
- Limiting the extent of clearing to ROW footprint;
- Monitoring the trench and areas prone to erosion during first spring break-up after construction;
- Avoiding any grading or filling activities that promote or change existing lateral erosion, avulsion or scour conditions; and
- In selected areas, investigating the potential for trenchless stream crossings where erosion potential may affect downstream water users.

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

During their review of the Application, the Working Group, including Aboriginal Groups, and public raised several key issues on terrain integrity. These issues are summarized below.

FLNR expressed concern that not all geohazards were adequately identified or characterized. In particular, the North and South approaches to the Peace River cross potentially unstable terrain and active slumps. The area on either side of the route is

indicated as an active landslide and terrain mapping, LiDAR, and photo interpretation suggest an actively unstable slope.

The Proponent responded that geotechnical investigations are ongoing and that the route would be refined throughout detailed engineering design. Regarding the North approach, the Proponent suggested that active movement had not occurred recently in the slope segment proposed for routing but that the potential for further movement and/or erosion would be further investigated. Along the South approach slope, the proposed route would proceed along a stable rib between the slide areas. Further investigation of the route is anticipated and the Proponent indicated that ground and surface water controls would likely be required to maintain the existing stability conditions on the route at this location.

FLNR recommended that further investigations be conducted on the South approach slope to determine the actual stability of this section and that other routing options be considered as required. FLNR also suggested that although ground and surface water control may be possible, it may not necessarily be a long-term solution.

FLNR suggested that the KP 622 to KP 680 on the Kitsault route appeared the most favourable from a geohazards avoidance perspective and that the Nass crossing at KP 622 to KP 625 would require detailed geotechnical investigation. Geotechnical investigation of possible lateral spread potential at KP 650 to KP 651.5 would also be required prior to determining the best route option at Kshadin Creek.

The Proponent agreed that the Kitsault route would have fewer geohazards, but that other factors should be considered in route selection, including the difficulty level for construction in marine portions of the route. The Proponent also indicated that further investigations at Kshadin Creek are anticipated depending on the timing of the selection of the preferred route option at the west end of the terrestrial route.

FLNR expressed concern regarding the glaciomarine clays beneath fluvial sediments at KP 680.4 and recommended that these be further investigated. FLNR also notified the Proponent of an apparently incorrectly labeled landslide location in the Preliminary Geotechnical Report (Appendix 2B of the Application). FLNR suggested that the landslide should have been shown at the Kitsault trailer park and not the proposed log dump area.

The Proponent responded that further investigations are anticipated depending on the choice of final route option. The Proponent also indicated that the location of the landslide was based on verbal discussions with engineers having knowledge of the slide occurrence and suggested that there may be a second slide occurrence in this area. FLNR indicated that the only known landslide occurrence in the area was in the Kitsault trailer park and that additional information would be provided to the Proponent to support detailed design.

5.5.4 Characterization of Residual Project Effects

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.

5.5.5 Cumulative Effects Assessment

A cumulative effects assessment was not required, as the proposed Project would not have any residual adverse effects on terrain integrity.

5.5.6 Conclusions

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

5.6 Freshwater Fish and Fish Habitat

5.6.1 Background

This section provides an assessment of potential effects of the proposed Project on freshwater Fish and Fish Habitat. Potential effects on marine fish and fish habitat for the proposed marine pipeline routes are assessed in the Marine Environment VC (section 5.11). Fish and fish habitat valued component's key indicators included various fish species and fish habitat that are important for commercial, recreational or Aboriginal fisheries, as well as fish species of conservation concern (e.g. provincially or federally listed species at risk, species of concern and species identified in the BC Conservation Framework or regional LRMPs), and fish species that are of interest to Nisga'a Nation as per the Nisga'a Final Agreement (NFA).

The Proponent's assessment focussed on two broad indicators: fish species that are associated with a commercial, recreational, or Aboriginal (CRA) fisheries, and fish species at risk. The species included, but were not limited to: all five species of Pacific salmon (i.e., chinook salmon, chum salmon, coho salmon, pink salmon and sockeye salmon); trout/char (i.e., steelhead trout, rainbow trout, coastal cutthroat trout, bull trout, dolly varden, lake trout, brook trout); eulachon; arctic grayling; white sturgeon; mountain whitefish, burbot; northern pike, walleye, yellow perch; and lamprey. The potential effects on fish and fish habitat typically include mortality or injury to fish, loss or alteration of fish habitat, and obstruction of migration during construction and operation of the proposed Project.

The LSA includes the zone of influence (ZOI) that would be likely affected by direct disturbance during construction and operations, including an area extending 100 m upstream of the crossing location and a minimum of 300 m downstream of the proposed crossing location. The boundary of the RSA is the major watershed boundaries crossed by the proposed Project and includes the sub-basins potentially affected by the proposed Project as well.

Fish and fish habitat has important ecosystem interactions with other VCs, including water quality and quantity, wetlands, marine resources, vegetation and wildlife.

Regulatory Background

The following subsection provides a brief summary 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. Authorization requirements for the proposed Project would be determined by regulatory agencies following the review of permitting applications only if an EA Certificate is granted, and frequently 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 in respect of fish and fish habitat include:

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

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. The *Fisheries Act* defines “serious harm to fish” as “the death of fish or permanent alteration to, or destruction of, fish habitat” (DFO 2013). The *Fisheries Act* also has provisions that prohibit the deposition of deleterious substances into waters frequented by fish, ensure the safe passage of fish, require flow of water and passage of fish, as well as require water intakes and diversions to have a fish guard or fish screen.

Based on the new Fisheries Protection Policy (DFO 2013), proponents are responsible for conducting a self-assessment to determine if their proposed project may result in serious harm to fish requiring *Fisheries Act* Authorization. Based on permitting application review and determination by DFO, watercourse crossings or other proposed Project activities that result in unavoidable serious harm to fish may require Authorization under the Section 35(2) of the *Fisheries Act* and offsetting. Serious harm to fish, including permanent alteration or destruction of fish habitat, potentially resulting from construction of some of the proposed pipeline watercourse crossings may require *Fisheries Act* Authorization and offsetting. Offsetting is defined by DFO 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 Environmental Protection and Management Regulation (EPMR), under OGAA, includes requirements related to the protection many aspects of the aquatic environment. Pipeline and access road watercourse crossings are required to be designed and constructed following best management practices (BMPs) and mitigation measures in accordance with the *Environmental Protection and Management Guide* (EPMG). The EPMG includes mitigation measures for watercourse crossings (e.g., crossing methods, least risk timing windows, riparian management areas) to minimize and avoid potential effects fish and fish habitat.

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.

In the event that a qualified professional has not determined an appropriate instream construction timing window, construction of a watercourse crossing may only proceed within the regional least risk timing window. In cases where following the least risk timing window is necessary, an application must be submitted to OGC for approval.

Where stream crossing methods and activities proposed cannot follow the requirements in the EPMR and EPMG, an application must be submitted to OGC for approval with an appropriate rationale and site-specific mitigation measures to minimize impacts to fish and fish habitat.

Water Act – The *Water Act* regulates the allocation and management of surface water and establishes protective measures for groundwater and wells.

Section 8 of the *Water Act* regulates the right to divert and carry out any short-term use of water from a natural waterbody. OGC may need to authorize water withdrawals during hydrostatic testing of the pipeline or other specific uses if water is sourced from surface water supplies.

Section 9 of the *Water Act* regulates and allows for changes in and about a stream in accordance with regulations under the act. The Water Regulation sets out specific conditions under which changes in and about a stream may be carried out. These include scheduling activities within timing windows of least risk for instream activities (also known as “instream work windows” or “reduced risk timing windows”) and prohibitions on entry of substances into a stream that may have a potential adverse effect on the stream and measures to protect fish, wildlife and habitat. Least risk timing windows may be subject to change by OGC or other provincial and federal agencies.

Pipeline watercourse crossings for OGC-regulated projects require either approval from, or notification to, the OGC under Section 9 of the *Water Act* and Part 7 of the Water Regulation. Whether an activity requires notification to or approval from OGC depends on the nature of the work. The approval process requires proponents to submit an application to OGC with all habitat assessments, designs and plans for the proposed works that are needed to assess the potential adverse effects of the proposed works on channel stability, flood levels, fish and wildlife resources and downstream water licenses.

Environmental Management Act (EMA) – EMA regulates industrial and municipal waste discharge, pollution, hazardous waste and contaminated site remediation. The Oil and Gas Waste Regulation (OGWR) allows authorization to discharge specific wastes to the environment from specific oil and gas operations, including water and water/chemical mixes utilized for hydrostatic testing of new or existing pipelines. The OGWR 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) of that regulation are met.

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

Background

The Application identified a total of 62 freshwater fish species with potential to occur in watercourses within the RSA, of which 19 species are sport fish and 43 species are forage or coarse fish. There are 9 fish species at risk within watercourses crossed by the pipeline route.

For assessment purposes, the route has been divided into three segments. The Cypress to Cranberry route traverses the watersheds of the Peace, Fraser, Skeena and Nass rivers, from KP 0 to KP 622.0. The Kitsault route begins west of Cranberry Junction (at KP 622.0), crossing the Nass River and then turns northwest to cross the Kinskuch River, before turning south and running west to the Pacific Ocean at Alice Arm. The Nasoga route initially runs south from Cranberry Junction (at KP 622.0), and continues across Nisga'a Lands and parallels the Lower Nass River valley until reaching the Pacific Ocean at Nasoga Gulf.

As summarized in Table 5-4, the proposed pipeline route would traverse either 1,370 (Kitsault) or 1,384 (Nasoga) watercourses in six major watersheds: the Peace, Fraser, Skeena, Nass, and North Coast Rivers watersheds. For the Nasoga route, the relative numbers of fish and non-fish bearing watercourses is estimated as:

- 718 fish-bearing classified watercourses (or 52% of the total);
- 664 non-fish bearing watercourses (or 48% of the total).

The Application also took a conservative approach to all classified watercourses and assumed that they were fish-bearing, unless otherwise demonstrated through field studies. To date only 42 watercourses on the Kitsault route and 15 watercourses on the Nasoga route are considered non-fish-bearing. Field work and analysis of the non-classified drainages (NCD) or non-visible channels (NVC) have identified up to 15 that are fish-bearing. Based on additional field studies the classification of watercourses would be refined prior to permitting and construction. The numbers presented in Table 5-4 were submitted during Application Review, following the completion of additional field studies, and therefore differ slightly from those in the Application.

The proposed Project would have an estimated 1176 watercourse crossings on the Cypress to Cranberry route, and an additional 206 on the Nasoga route or 194 on the Kitsault route. Of the total 1370 to 1382 watercourse crossings, the majority (approximately 52% for either route) would be in the Peace River watershed. Crossings in the Nass River watershed would account for 20% if the Nasoga route would be developed and 17% if the Kitsault route would be developed. Approximately 18% would be in the Skeena River watershed. Several NCDs were identified as fish-bearing during field studies (11 from Cypress to Cranberry and 13 from Cranberry to Nasoga). The Application also took a conservative approach to classified watercourses and assumed that they were fish-bearing. Based on additional field studies the watercourse classification would likely be refined prior to permitting and construction.

Table 5-4: Summary of watercourses

Major Watershed (and sub-basin)	Number of Crossings	Number of classified watercourses	Number fish- bearing	Number of NVC/NCD
CYPRESS TO CRANBERRY ROUTE				
Peace River	721	334	342	387
Halfway River	64	25	26	39
Peace River	66	38	40	28
Pine River	145	63	63	82
Parsnip Arm	108	55	57	53
Manson River	63	37	37	26
Nation River	275	116	119	159
Fraser River	125	51	51	74
Takla Lake	64	28	28	36

Major Watershed (and sub-basin)	Number of Crossings	Number of classified watercourses	Number fish- bearing	Number of NVC/NCD
Driftwood River	61	23	23	38
Skeena River	255	135	138	120
Babine River	141	74	77	67
Middle Skeena River	68	34	34	34
Kispiox River	46	27	27	19
Nass River	75	40	40	35
Lower Nass River	43	19	19	24
Middle Nass River	32	21	21	11
ROUTE SUBTOTAL	1176	560	342	616
KITSAULT ROUTE				
Nass River	152	88	88	64
Lower Nass River	134	80	80	54
Kinskuch River	18	8	8	10
North Coast Rivers	42	34	34	8
Illiance River	42	34	34	8
ROUTE SUBTOTAL	194	122	122	72
NASOGA ROUTE				
Nass River	204	132	145	72
Lower Nass River	204	132	145	72
North Coast Rivers	2	2	2	0
Nasoga Gulf Creek	2	2	2	0
ROUTE SUBTOTAL	206	134	147	72
OVERALL TOTALS				
CYPRESS TO KITSAULT TOTAL	1370	682	693	688
CYPRESS TO NASOGA TOTAL	1382	694	718	688

Note: For simplicity, the numbers in this table were submitted during Application Review, following the completion of additional field studies, and therefore may differ slightly from those in the Application.

Fish habitat assessments were completed at all proposed watercourse crossings. Sampling for fish presence was conducted only at sites with potential fish habitat, and where limited or no historical fisheries data were available. Fish and fish habitat baseline data was used in the Proponent's route selection process to avoid and mitigate potential effects to fish habitat, where possible, and to determine appropriate watercourse crossing locations, construction methods, least risk timing windows and other mitigation measures.

The proposed watercourse crossing methods and mitigation measures including least risk timing windows for each crossing are listed in the Application's Appendix 2-K (Fish and Fish Habitat TDR).

Background: Species of Conservation Concern

There are nine species of conservation concern (i.e., federal or provincially listed species) that potentially occur in the aquatic environment RSA.

White sturgeon, which is classified as Endangered by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and red-listed by BC, occurs in the Fraser River Watershed. Green sturgeon, which is classified as Special Concern by COSEWIC and red-listed by BC, occurs in the Nass River Watershed. There are seven blue-listed species within the RSA: bull trout, eulachon (also classified as Special Concern by COSEWIC), goldeye, pearl dace, northern red belly dace, spottail shiner, and Arctic grayling. Bull trout are known to occur in a number of streams crossed by the proposed route in the Peace, Fraser, Skeena and Nass Watersheds.

Effects of the Proposed Project

The Application identified a number of potential adverse effects to fish and fish habitat, primarily associated with the construction of pipeline and access road watercourse crossings:

- Alteration or loss of riparian habitat;
- Alteration or loss of instream habitat;
- Increased suspended sediment concentrations;
- Potential for mortality or injury to fish species;
- Temporary blockage of fish movements;
- Potential for increased access and fishing pressure; and
- Interbasin transfer of aquatic organisms.

Watercourse crossings would involve either digging a trench to bury the pipeline below the bed of the watercourse ("trenched"), or a trenchless method. Options for trenchless crossings include underground trenchless (e.g. horizontal directional drilling (HDD), micro-tunnelling) and aerial crossings. Open-cut trench crossing methods would only be used for non-fish-bearing watercourses or where channels are dry or frozen to the bottom. 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. Watercourse crossing methods are described in additional detail in section 2.2 of this Report.

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 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 fish and fish habitat downstream of the construction footprint. The duration of instream construction activities required to excavate a trench and install the pipe at most watercourse crossings would be approximately 1-2 days. The scheduled timing of watercourse crossing construction would be guided by least risk timing windows (see the Application's Appendix 2-K for a complete listing of crossing methods, timing windows, and mitigation by watercourse).

The Proponent identifies 15 proposed underground trenchless watercourse crossings on the Cypress to Cranberry route,⁷ an additional seven underground trenchless watercourse crossings on the Nasoga route, and no additional underground trenchless watercourse crossings on the Kitsault route. Depending on the final route selected (given the options presented in the Application) there would be one to four aerial crossings on the Cypress to Cranberry route⁸ and an additional two aerial crossings west of Cranberry on the Kitsault route. There are several aerial crossings proposed as a secondary option for underground trenchless crossings that may prove not to be feasible following detailed engineering and geotechnical investigation. The Application also identifies two bottom lay crossings (Williston Reservoir and Iceberg Bay).

Effects of Other Infrastructure on Watercourses

Temporary facilities (e.g. construction camps, access roads, equipment and fuel storage sites, rock quarries, pipe stockpile sites) would generally be at least 30 m away from any watercourse, except where crossings are required. In the event that temporary facilities are constructed in riparian habitat, there may be a potential effect of loss or alteration of riparian habitat function. Temporary access across watercourse crossings

⁷ Current proposed underground trenchless crossings are: Cameron River, Halfway River, Lynx Creek, Brenot Creek, Peace River, Moberly River, Callazon Creek, Nation River, Driftwood River, Nilkitkwa River, Babine River, Skeena River, Blackstock Creek, Kispiox River, and Cranberry River.

⁸ Current proposed aerial crossings are: Shed in Creek, Sam Green Creek (on alternate route), Blackstock Creek (on alternate route) and Skeena River (on south alternate route).

on all fish streams are proposed to be constructed using bridges or open bottomed structures to maintain fish passage and avoid instream habitat disturbance.

The proposed permanent facilities would include the pipelines, permanent access roads, pipelines and access road watercourse crossings, compressor and meter stations. Permanent facilities would generally be at least 30 m away from any watercourse, except where watercourse crossings are required. Permanent facilities constructed in riparian habitat would result in a potential effect of loss or alteration of riparian habitat function. Riparian vegetation at watercourse crossings within the proposed pipeline corridor and permanent access road construction footprints would require clearing during construction and long term maintenance during operations. Permanent access road watercourse crossings on all fish streams are proposed to use bridges or open bottomed structures to maintain fish passage and avoid instream habitat disturbance.

Access roads and associated watercourse crossings would be confirmed in the permitting stage once a final pipeline route is selected. The Application included general assessment of potential effects to fish and fish habitat and proposed mitigation measures associated with access roads.

Instream Habitat Alteration

Table 5-5 shows the estimated riparian and instream disturbance areas and percentage within each watershed. The estimated total riparian disturbance area from the proposed Project within the aquatic environment RSA would be approximately 730 to 799 ha (0.08% of total). The estimated total instream disturbance area from all watercourse crossings within the aquatic environment RSA would be approximately 15-32 ha (0.02-0.04% of total). Almost half (356 ha) of the riparian disturbance would occur in the Peace, accounting for about 0.07% of total riparian area in the watershed. With the Nasoga route, the Nass River watershed would account for almost two-thirds (20 ha) of the total instream disturbance.

Table 5-5: Estimated riparian and instream disturbance areas in the aquatic environment RSA

	Peace River	Fraser River	Skeena River	Nass River	North Coast Rivers	Total
KITSAULT ROUTE						
Riparian disturbance ha (% of area in watershed)	356 (0.07%)	74 (0.09%)	167 (0.08%)	115 (0.06%)	18 (0.77%)	730 (0.07%)
Instream disturbance ha (% of area in watershed)	7 (0.02%)	1 (0.03%)	4 (0.03%)	3 (0.02%)	<1 (<0.01%)	15 (0.02%)
NASOGA ROUTE						

	Peace River	Fraser River	Skeena River	Nass River	North Coast Rivers	Total
Riparian disturbance ha (% of area in watershed)	356 (0.07%)	74 (0.09%)	167 (0.08%)	198 (0.10%)	4 (0.17%)	799 (0.08%)
Instream disturbance ha (% of area in watershed)	7 (0.02%)	1 (0.03%)	4 (0.03%)	20 (0.08%)	<1 (<0.01%)	32 (0.04%)

Watercourse Crossing Risk Assessment

The Proponent conducted an assessment to determine the level of risk of potential adverse residual effects to fish and fish habitat at proposed watercourse crossings using DFO's Risk Management Framework (2006). Of the 693 to 718 fish-bearing watercourse crossings, the supplemental Conceptual Freshwater Fish Habitat Offsetting identified 7 (1%) as high risk, 88 to 111 (19-23%) as medium risk, and 366 to 376 (77-80%) as low risk. Two watercourse crossings were not assessed due to a technical boundary which resulted in no access to collect field data during baseline surveys. The list of these rankings may be modified following selection of final route, crossing methodologies, and access plans, or following additional engagement with DFO, Aboriginal Groups, and the Working Group. The few watercourse crossings that have not yet been assessed in the field have not been included in this preliminary risk assessment (e.g., crossings on Nisga'a Lands).

Alternative pipeline crossing methods (e.g., should attempts at underground trenchless methods fail) and road crossings also have not been included at this conceptual stage as final pipeline route and access plans have not yet been determined; however, alternative pipeline crossing and road crossing methods would also be self-assessed using the above methodology following selection of the final route. The results of the self-assessment would guide the Proponent in the submission of applications for DFO review or Authorization.

Table 5-6: Number of watercourse crossings by watershed and risk ranking

Watershed	Low Risk	Medium Risk	High Risk	Extreme Risk
CYPRESS TO CRANBERRY ROUTE				
Peace River	190	51	1	0
Fraser River	31	15	2	0
Skeena River	104	19	2	0
Nass River	21	0	1	0
KITSAULT ROUTE				
Nass River	11	3	1	0
North Coast Rivers	19	0	0	0
NASOGA ROUTE				
Nass River	18	26	1	0

Watershed	Low Risk	Medium Risk	High Risk	Extreme Risk
North Coast Rivers	2	0	0	0
TOTAL CYPRESS TO KITSALT	376	88	7	0
TOTAL CYPRESS TO NASOGA	366	111	7	0

Fisheries Act authorizations for serious harm to fish or fish habitat with specific mitigation conditions and offsetting may be required for some high and medium risk watercourse crossings. However, specific watercourses potentially requiring authorization and offsetting would be determined by DFO based on the final proposed route and engineering design details in the permitting phase, and not at the environmental assessment phase.

Mitigation Measures

The proposed Project location and design has been the primary mitigation measure to seek to avoid or minimize impacts to fish and fish habitat; this has included relocating the proposed route to avoid several key areas identified based on technical analysis and consultation with Aboriginal Groups. 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:

- Develop detailed site-specific watercourse crossing plans that includes mitigation measures to avoid harm to fish and aquatic habitat, water quality monitoring, and riparian and instream habitat restoration plans;
- Adhere to construction during windows of least risk for trenched crossings unless:
 - The crossing is dry or frozen to the bottom at the time of construction;
 - Trenchless techniques are employed; and
 - Approval from the appropriate regulatory agencies is obtained.
- Complete minor instream works in one working day or in as short a time as practical;
- At all watercourses and waterbodies that support fish, fish salvages would be conducted prior to dewatering of the work site;
- Install erosion and sediment control at all watercourses;
- Re-contour bed and banks to pre-disturbance profiles and grades with no realignment of the channel and carry out channel restoration measures. Site-specific measures would be developed where bank protection is required, as per the EMP's Restoration Plan Framework;
- Construct, install and remove all watercourse vehicle crossings across waterbodies, shorelines, and riverbanks in a manner that protects the banks from erosion, and maintains flow;
- Schedule instream work for low flow periods when practical;

- Monitor to assess the immediate effects of crossing construction and monitor sediment release throughout the crossing construction period; and
- Construct watercourse crossings in accordance with the DFO Self-Assessment Process and Measures to Avoid Causing Harm to Fish and Fish Habitat.

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 fish and fish habitat. A non-exhaustive list of key issues and comments, specific to fish and fish habitat and raised by these groups include:

- Lack of sufficiently detailed baseline data;
- Pipeline watercourse crossing information;
- Lack of information regarding requirements for *Fisheries Act* authorizations and offsets;
- Potential fish mortality and implications for Aboriginal fish harvesting;
- Concern regarding the assessment methodology, significance criteria, and cumulative effects analysis;
- Increased access and fish harvesting and overfishing; and
- Potential effects to species at risk.

Lack of sufficiently detailed baseline data

Concerns were raised by Aboriginal Groups and regulatory agencies regarding potential deficiencies in the baseline data on fish and fish habitat and lack of assessment on potential effects to specific salmon species and stocks (e.g. Babine Lake sockeye salmon). Comments from both regulatory agencies and Aboriginal Groups expressed concern with regards to the level of detail associated with collected baseline data. More specifically, the concern was expressed that, given the scale and duration of baseline data collection, it is possible that the location of and potential impacts to many sensitive aquatic communities and fish species in the LSA and RSA was not captured.

Blueberry River First Nations noted that it is facing impacts from up to 68 water crossings in the upper and lower Peace basins. Nak'azdli Band, Lake Babine Nation, Lax Kw'alaams Band expressed concerns over baseline data with respect to the initial EA as well as to support subsequent monitoring. Nak'azdli Band noted that there is a lack of long term and spatially representative water temperature data.

The Proponent has committed to undertaking additional field studies and to the development of site specific mitigation measures, as required to avoid negative effects to fish and fish habitat. The Proponent has committed to collecting water temperature data on a subset of crossing sites prior to construction and would continue to implement standard operation and construction practices for water temperature data collection. This information would be required as part of permitting with regulatory authorities.

Pipeline watercourse crossing information

The Application indicated that fish and fish habitat field investigations were conducted in 2012 and 2013 on approximately 85% of the potential watercourses crossed by the proposed Project. Field studies for many of watercourse crossings in the Nass River watershed on Nisga'a Lands for the proposed Nasoga Route were not completed during the 2012 and 2013 season and were not included in the Application. At the time of accepting the Application, EAO, following consultation with Nisga'a Lisims Government, established a requirement for additional fieldwork to be conducted on the missed watercourses, and for the results to be submitted during Application Review. Concerns were raised that the Application does not provide a total number of proposed watercourse crossings, there were many inquiries about the crossing method proposed for each watercourse. MOE requested additional information regarding substrate characteristics and settlement rate at the locations of watercourse crossings. FLNR also requested additional information with regards to watercourse crossings where channel realignment is being considered, as well as how this effect was evaluated.

Additional information was provided by the proponent in their supplemental report "Nisga'a Lands Freshwater Fish and Fish Habitat Technical Data Report" (Aug 2014). Mitigation measures and crossing method selection may differ for watercourses containing important versus essential habitat. The Proponent has committed to the development of a site-specific plan for watercourses undergoing channel realignment as a precautionary measure. Crossing methods and mitigation measures would be selected on a site-specific basis.

The proponent noted that there are no proposed watercourse crossings where channel realignments are currently being considered. This mitigation measure is provided as a precaution. In the unlikely event that a channel needs to be realigned, a request for review would be provided to DFO and if DFO determines that an authorization under the *Fisheries Act* is required, all necessary mitigation and offsetting requirements would be implemented.

The Proponent further noted that, in the event subsequent geotechnical investigation changes the level of confidence in specific methods at specific watercourses, alternative crossing methods have been proposed and are contained in Table 4.5-7 of the Application. If any of the proposed mitigation and crossing methods that were considered in the assessment are subject to change prior to or during construction, the changes would be discussed with appropriate regulatory authorities, including the NLG within the Nass watershed.

Lack of information regarding requirements for Fisheries Act authorizations and offsets

During Application Review, Working Group members raised concerns regarding the lack of understanding regarding which watercourse crossings may require Authorization for serious harm to fish and offsetting (previously referred to as habitat compensation) based on amendments to the *Fisheries Act*. There was also general concern over the EA approach adopted by the Proponent regarding habitat offsets. This concern related to the proponent having drawn conclusions on the significance of effects before habitat offset needs and options/solutions had been confirmed and successfully addressed. Lake Babine Nation, as an example, requested more details regarding proposed offsetting measures to compensate for mortality due to construction activities and also expressed concern that least risk windows for construction proposed within Lake Babine Nation asserted territory were not accurate for all species present. The proponent and Working Group have committed to a stream by stream review with the Lake Babine Nation of all crossings in mid-November 2014.

In order to better understand the potential residual effects on fish and fish habitat, in consideration of mitigation measures identified in the Application, EAO requested the Proponent to provide a Conceptual Freshwater Habitat Offsetting Plan. The offsetting plan included the Proponent's preliminary assessment of proposed pipeline watercourse crossings which may require *Fisheries Act* Authorization and offsetting for serious harm to fish; and provided information on potential offsetting measures. Upon acceptance of the Application for review, EAO requested initial supplemental reports related to fish and fish habitat that included a report on additional fieldwork for watercourse crossings where field studies had not been completed (particularly in the Nass Area and on Nisga'a Lands) prior to submitting the Application, and development of a conceptual fish habitat offsetting plan.

The Proponent referred back to the regulatory requirements of the *Fisheries Act* and the need to comply in terms of Authorizations and offsetting. The Proponent's submitted a Conceptual Freshwater Habitat Offsetting Plan (July

2014). Any submission of a permit application (e.g., request for review, application for authorization) would require final routing and watercourse crossing detailed designs. The Proponent's preliminary self-assessment was done in accordance with DFO's *Self-Assessment Process and Measures to Avoid Causing Harm to Fish and Fish Habitat* to determine whether a crossing may require *Fisheries Act* authorization with subsequent offsetting.

Results of the Proponent's self-assessment indicate that, with appropriate mitigation measures (e.g., construction during applicable least risk timing windows, implementation of sediment and erosion control, selecting trenchless crossing methodologies, and/or isolating flowing watercourses and conducting open cuts under dry/or frozen to the bottom conditions), the majority of moderate-risk watercourse crossings would likely not result in serious harm to fish that form or support a CRA fishery. A total of eight high-risk pipeline watercourse crossings were identified which may require authorization and offsetting for serious harm to fish, although site specific assessment may determine additional moderate-risk crossings that require habitat offsetting due to long term loss of riparian habitat function.

The list of watercourse crossings that may require an authorization is subject to change following selection of final route, crossing methodologies, and access plans, or following additional engagement with DFO, OGC, FLNR, Aboriginal Groups, NLG, and other Working Group members. Ultimately, DFO would determine authorization requirements for the proposed Project and any associated conditions of authorization, including offsetting, required to ensure the ongoing productivity of CRA fisheries. The Proponent has committed to ongoing consultation with Aboriginal Groups, Nisga'a Lisims Government (NLG), and regulatory agencies for review in developing any final offsetting plans required by DFO.

Potential fish mortality and implications for Aboriginal Groups fish harvesting

Concern was raised by several Aboriginal Groups regarding potential effects to fish traditionally harvested by Aboriginal Groups including fish which may not be categorized as commercial fish or sport fish (e.g., suckers harvested for eggs by Lake Babine Nation). Nak'azdli Band raised concerns over potential fish mortality during construction and operations and potential effects on genetic diversity.

The Proponent noted that the loss of individuals as a result of the proposed Project is expected to be negligible and concentrated in the construction phase.

The remaining individuals (majority of the population) are a suitable source for genetic diversity for those individuals lost or injured during construction. The Proponent would seek to avoid impacts and would implement offset measures approved by DFO where necessary. The Proponent indicated that it had collected Traditional Ecological Knowledge (TEK) and that CRA fish, including non-sport fish species such as suckers, would be protected in accordance with regulatory requirements in consultation with Aboriginal Groups.

Concern regarding the assessment methodology, significance criteria, and cumulative effects analysis

FLNR and several Aboriginal Groups raised concerns with regards to the scope and approach to residual effects characterization, significance determination and cumulative effects assessment. For example, Lake Babine Nation noted that conclusions are based on a population scale over a period of time and expressed concern that this does not consider harvest level implications for Aboriginal Groups. MOE suggested that the Application would benefit from a discussion regarding the rationale or pathway for identified potential effects of the proposed Project on the Fish and Fish Habitat VC. FLNR noted that the scale used for the cumulative effects assessment may be too large to provide any meaning. The assessment should be provided at the sub-basin level such as described in the environmental setting section of the document. Within the application, the results of the Cumulative Effects (CE) assessment are presented at the entire RSA level or Watershed level.

The Proponent indicated their opinion that a comprehensive assessment of potential adverse effects had been completed. The effects analysis was undertaken through consideration DFO Pathways of Effects (DFO 2010) in the assessment of potential effects resulting from interaction of pipeline construction activities with aspects of fish habitat that are vital to sustaining healthy fish populations. Quality of riparian and instream habitat, maintenance of fish passage, potential for fish mortality and injury, suspended sediment levels in water and interbasin transfer of aquatic organisms were all considered to be important endpoints for assessment of the Fish and Fish Habitat VC. In response to concerns by Lake Babine Nation, the Proponent and Working Group have committed to a stream by stream review with the Lake Babine Nation of all crossings in mid-November, 2014.

Cumulative effects were considered at the spatial scale defined by the RSA. In determining an appropriate scale for the RSA and the cumulative effects assessment, two primary factors were considered:

- If the spatial extent is too large, effects of the Project appear relatively small

- If the spatial scale is too small, it may exclude potentially significant effects.

To balance these factors, the RSA was defined to include the area encompassed by all sub-basins crossed by the proposed route and the cumulative effects assessment was applied to the RSA as a whole.

Increased access and fish harvesting and overfishing

Lake Babine Nation, NLG, and Nak'azdli Band raised concerns over increased access to fishing opportunities. Specific reference was made to the need to protect bull trout populations, as well as other species. A request was made for population monitoring plans and plans to minimize/eliminate access.

The Proponent referred to consultation with DFO on the need for authorization and offsetting, as well as a commitment to continue to consult with applicable stakeholders, Aboriginal Groups and NLG during the planning phase to determine appropriate offsetting measures. Measures to control access on the ROW during operations are described in the Access Management Plan Framework in section 6.1 of the EMP. The Proponent made a commitment to consult with Aboriginal Groups concerning appropriate measures and locations where access control may be considered necessary.

The Proponent also proposes several mitigation strategies to restrict motorized access along the pipeline corridor and to control and manage access during construction and operations. Decisions about limiting access to Crown lands rest with provincial regulatory agencies.

Potential effects to Species at Risk

Concerns were expressed by several Aboriginal Groups and FLNR during the Application review over the potential effects of the Project on bull trout. Further information was requested, including a description of species distribution, relative abundance, critical habitats, and locations of sensitive populations by sub-basin.

In response to raised concerns on species at risk, the Proponent clarified that additional information regarding bull trout is provided in Fish and Fish Habitat TDR. The Proponent noted that it would seek to avoid impacts and would implement offset measures approved by DFO where necessary.

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 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.

Summarized below is the EAO's assessment of the expected residual effects of the proposed Project on 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-Medium	Habitat: The total habitat impacted by proposed Project is relatively low. However, within some watercourses there is the possibility that the Project would impact moderately sensitive habitat and would have "serious harm" to fish, requiring habitat offsetting. Mortality: The proposed Project has the potential for some mortality to fish species.
Extent	Habitat and Mortality: Local	Potential residual effects to fish habitat and fish mortality risk would be within the LSA (primarily 100 m upstream and 300 m downstream, but further downstream on larger watercourses). For some migratory species such as bull trout, effects could potentially be within the larger watershed or sub-basin.
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-

Criteria	Assessment Rating	Rationale
	Mortality: Short-term	<p>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.</p> <p>The duration of impacts to riparian habitat would depend on the re-establishment of riparian vegetation following construction, which would take approximately 3-5 years. Effects 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.</p> <p>Mortality: Potential for fish mortality or injury would be limited to the duration of instream construction activities at each watercourse crossing.</p>
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. Access effects may be continuous during the life of operations.
Likelihood		<p>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.</p> <p>Mortality: The likelihood of fish mortality would generally be low, but would somewhat depend on watercourse crossing method, fish presence and access to local concentrations of fish such as overwintering areas of steelhead or bull trout.</p>
Significance		Taking into consideration the magnitude of the potential

Criteria	Assessment Rating	Rationale
		effect, as well as their short duration and reversibility, EAO concludes that the potential 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 potential 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.

5.6.5 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 riparian and instream habitat disturbance and fish mortality or injury, including blockage of fish movement within each watershed three watershed-scale metrics, riparian disturbance, instream disturbance and stream crossing density).

Table 5-7 below provides estimates of the instream and riparian disturbance arising from the construction of the proposed Project, which includes an assumption that all proposed trenchless crossings are implemented. For simplicity, only the results of the Nasoga route are presented in this Table; the results for the Kitsault route are found in Table 4.5-11 and 4.5-13 in the Application

Table 5-7: Cumulative Instream and Riparian Disturbance for the Cypress to Nasoga Route

	Peace River	Fraser River	Skeena River	Nass River	North Coast Rivers	Total
INSTREAM HABITAT DISTURBANCE						
Proposed Project's Instream Disturbance ha (%)	7 (0.02%)	1 (0.03%)	4 (0.03%)	20 (0.08%)	<1 (<0.01%)	32 (0.04%)
Reasonably Foreseeable Development Instream Disturbance ha (%)	4,085 (11.0%)	1 (0.03%)	7 (0.05%)	13 (0.05%)	0 (0.0%)	4,106 (5.0%)
Total Cumulative Instream Disturbance ha (%)	4,157 (11.2%)	6 (0.16%)	17 (0.12%)	49 (0.19%)	<1 (<0.01%)	4,229 (5.2%)
RIPARIAN HABITAT DISTURBANCE						
Proposed Project's Riparian Disturbance ha (%)	356 (0.07%)	74 (0.09%)	167 (0.08%)	198 (0.10%)	4 (0.17%)	799 (0.08%)
Reasonably Foreseeable Development Riparian Disturbance ha (%)	16,250 (3.1%)	1,943 (2.4%)	609 (0.28%)	746 (0.37%)	0 (0.0%)	19,548 (1.9%)
Total Cumulative Riparian Disturbance ha (%)	63,461 (11.9%)	8,238 (10.0%)	7,591 (3.5%)	12,113 (6.0%)	33 (1.4%)	91,436 (8.8%)

Note: Cumulative disturbance is the sum of existing disturbance, disturbance from the proposed Project and disturbance from other reasonably foreseeable projects and activities in the RSA

The total increase in cumulative instream disturbance in the RSA is 4,229 ha, or 5.2%, ranging from a low of <0.1 ha (<0.01%) in the North Coast to 4,157 ha (11.2%) in the Peace. The total increase in cumulative riparian disturbance in the RSA is 91,436 ha, or 8.8%, ranging from a low of 33 ha (1.4%) in the North Coast to 63,461 ha (11.9%) in the Peace.

Due to the very short duration of many of these impacts to fish habitat and mortality, and proximity and timing of other projects and activities, these effects are not reasonably expected to cumulate with past, present, or reasonably foreseeable projects and activities. Other foreseeable projects and activities would be required to adhere to DFO requirements regarding serious harm to fish.

No additional mitigation beyond the Project-specific measures is presented in the Application or were identified or deemed necessary to mitigate potential cumulative effects.

The potential residual cumulative effects to fish and fish habitat were assessed as having a low magnitude and are considered not significant.

5.6.6 Conclusions

Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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.

5.7 Water

5.7.1 Background

The VCs considered in this section are surface hydrology, water quality and quantity (in the freshwater environment). Discussion on metal leaching and acid rock drainage (ML/ARD) potential is also presented. Key indicators that were assessed in the Application for the VC surface water hydrology include surface flows and drainage patterns, and for the VC water quality and quantity include surface water and groundwater. Marine water quality and sediments are discussed in the marine resources section of this report.

For surface water the assessment focused on surface water within watercourse crossings (i.e. within a zone of influence (ZOI) that included at least 150 m upstream of the crossing location and 300 m downstream), natural surface water flow and drainage along the construction footprint, while the groundwater assessment focused on aquifers and wells within 1 km of the proposed route. The LSA for ML/ARD was 10 km on either side of the proposed Project footprint, focussing on mineral occurrences within 1 km, operating or former mine sites within 10 km, and porphyry deposits within 3 km.

The proposed pipeline route has approximately 1,300 watercourse crossings within the following five watersheds (Peace River, Fraser River, Skeena River, Nass River, and North Coast) and would cross four hydrologic zones:

- Rocky Mountains;
- Central Interior;
- Central Mountains; and
- Coastal Mountains.

Baseline surface and ground water quality data collected by the Proponent at watercourse crossings within each hydrologic zone was compared with the Canadian Council of Ministers of the Environment (CCME) *Water Quality Guidelines* and British Columbia's *Approved Water Quality Guidelines*. Baseline flows and water quantity data were collected from Water Survey of Canada stations and field surveys.

Additional information on relevant aspects of the regulatory environment is provided in section 5.6.1 (Fish and Fish Habitat) of this report and in section 4.3 of the Application.

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

Maintenance of water quality and quantity is important for fish and aquatic habitat, domestic water supplies and community watershed values. This subsection outlines the key aspects of the Application's assessment on surface hydrology, water quality and quantity, and metal leaching and acid rock drainage.

Surface Hydrology

Potential changes to surface water quantity could arise due to changes in local surface hydrology arising due to changes in the lateral erosion conditions of streams due to inappropriate construction or restoration methods. Pipeline grading has the potential to inadvertently cause drainage of wetlands or lakes, while some construction activities have the potential to alter surface water runoff characteristics. The potential effects of pipeline construction and operation on surface hydrology are generally well known and have predictable effects, which can be managed with standard mitigation.

The area of watershed clearing and disturbance can be used as a quantitative measure of possible disturbance of surface flow and natural drainage patterns and overall watershed health. Within the RSA the proposed Project would increase the area of areal disturbance by 0.07%, resulting in a total disturbed area of 11.5%. At present the Peace and Fraser River watersheds have the greatest existing disturbance (14.6% and 11.3%, respectively). However, with appropriate mitigation measures, including corrective actions where necessary, any impacts of the proposed Project would be primarily short-term.

Some key mitigation measures include:

- Maintaining natural drainage patterns
- Restore bank slopes to stable conditions, preferably with similar erosion characteristics to the rest of the channel and banks, and avoid creating hard zones
- Prevent surface water flow along the trench line (e.g. using stub berms)
- Re-contour the construction ROW, to the extent practical, and restore the pre-construction grades and drainage channels
- Ensure that water use (e.g. volume and flow rates) from natural waterbodies would comply with requirements specified by agency permits.

Water Quality and Quantity

Potential changes to surface water associated with proposed construction activities include an increase in suspended sediment caused by:

- Road and pipeline construction;
- Instream construction activities; and
- Erosion of approach slopes and stream banks.

Other potential sources of suspended sediment are the inadvertent release of drilling mud during trenchless pipeline watercourse crossings and the disturbance of water intake areas during withdrawal of hydrostatic test water.

Vegetation clearing and grading associated with the construction of the proposed pipeline ROW and new access roads could potentially result in localized changes to surface hydrology, natural drainage patterns and runoff characteristics within the construction footprint. On a watershed scale, the potential areas of disturbance to surface hydrology from the proposed Project would be relatively small in comparison to the overall watershed area and natural variations in surface hydrology.

Potential effects on groundwater could include changes to recharge or discharge conditions affecting available quantities in aquifers, contamination of aquifers due to spills and changes to aquifer conditions in the immediate vicinity of blasting such as compaction. Withdrawal of water from wells for the purpose of supplying temporary construction camps with water could also potentially affect available water in aquifers depending on production.

A number of the potential impacts to water quality and quantity discussed above could arise due to accidents or malfunctions of the proposed Project (e.g. contaminant spill). Potential effects caused by accidents or malfunctions are discussed in section 10.2 of this report.

For watercourse crossings, turbidity and total suspended solids (TSS) guidelines have been established for instream activities. It is anticipated that average TSS levels during instream construction at these sites would be below the CCME Guidelines and BC Ambient Water Quality Guidelines for short-term (24 hour) exposure of 25 mg/L above baseline levels. Short-term potential exceedances may occur at some isolated crossings, depending on the size of the watercourse, rate of flow and the amount and rate of sediment released during construction of the watercourse.

Prior to operations of the proposed pipeline, hydrostatic testing would occur along the terrestrial and marine portions of the pipeline. The hydrostatic test plan is still in the preliminary stages and therefore details on water use have not been finalized and are subject to change. Preliminary estimates by watercourse are presented in the Application, not accounting for the potential re-use of water. The OGC has set water

withdrawal volumes to no more than 10% of the stream flow or withdrawals that cause an adverse effect on water levels in lakes and ponds. The hydrostatic test water from the terrestrial portion of the pipeline would not contain contaminants and would be monitored during to ensure that erosion, flooding or icing do occur.

The Nasoga route would cross the Gitzyon Community Watershed for 2.5 km from KP 663.0 to KP 665.5. The Gitzyon Community Watershed supplies the Nisga'a Village of Gitlaxt'aamiks and is the only community watershed located in the Communities Infrastructure and Services LSA. Trenchless watercourse crossing mitigation measures are proposed to be implemented when crossing the Gitzyon Community Watershed. In addition, contours from LiDAR indicate that most surface water flows south and west of approximately KPN 664.2 would not flow into the surface water intake area. Considering the proposed crossing method under the productive portion of the community watershed, the proposed Project is not anticipated to adversely affect the hydrology conditions in the Gitzyon Community Watershed.

Two additional community watersheds are located in the RSA, including the Kas Miintl Am Hawak Community Watershed, which supplies the Nisga'a Village of Gitwinksihlkw and is located 4.3 km northwest of KP 673.9 of the Nasoga route, and the Axe Community Watershed, which supplies the Nisga'a Village of Laxgalts'ap and is located 3.8 km northwest of KP 707.7 of the Nasoga route. Both of these community watersheds occur outside of the proposed Project area and would not be affected by pipeline construction.

A total of 234 wells and 27 cold water springs were located within the RSA and four wells and zero springs in the LSA. Baseline groundwater chemistry found various naturally-occurring exceedances throughout the RSA.

Mitigation measures have been proven effective based on well-developed regulatory requirements, industry standards, guidelines and BMPs for pipeline construction and operations. Some of the key mitigation measures proposed in the Application include:

- Develop a detailed site-specific watercourse crossing plans that include water quality mitigation and monitoring measures.
- During trenching activities, pump water onto stable and well vegetated areas, tarpaulins, geotextiles or sheeting or into a settling pond at a rate and in a manner that does not cause erosion or any unfiltered or sediment laden water to enter a watercourse or wetland, and discharge trench water through an appropriate sediment filtering medium (e.g., geotextile bag, straw bale/silt fence dewatering structure), where warranted.

- Direct grading away from watercourses, wetlands and waterbodies, to the extent practical, to reduce the risk of sedimentation.
- In the event of a spill, implement the Spill Contingency Plan (as part of the EMP)
- Monitor pH of surface water in conjunction with the Water Quality Monitoring Plan (section 6.11 of the preliminary terrestrial EMP (Appendix 3A of the Application)) to avoid acidification of surface water.
- Follow the drilling mud frac-out monitoring and other measures provided in the Drilling Mud Release Contingency Plan (as part of the EMP) during underground trenchless watercourse crossings.
- Conduct all hydrostatic testing activities in accordance with the Oil and Gas Activities Act, Oil and Gas Waste Regulations under the Environmental Management Act and the Water Act.
- Where shallow groundwater is intercepted upslope from other users, divert water across the ROW to where it can be recharged into the layers previously carrying the groundwater flows.
- Conduct water quality monitoring during construction of watercourse crossings (pipeline and vehicle), as well as beaver dam removals, to measure and document TSS and turbidity.

Metal Leaching/Acid Rock Drainage

The proposed Project has some potential to cause metal leaching and acid rock drainage (ML/ARD) due to exposure of rock with high sulphide mineral content during construction activities (e.g., blasting of bedrock), which could result in metal leaching and acidification of surface water. Several areas with potential for ML/ARD requiring implementation of standard mitigation measures have been identified within the LSA.

Potential locations for ML/ARD along the proposed route were initially determined through a desktop evaluation. The analysis identified nine locations potentially permissive to ML/ARD, and prioritized them for more detailed field inspection. Following field analysis, five segments were identified as having moderate to high potential for ML/ARD:

- High – KP 532 to KP 536; (Kitsault) KP 666 to KP 680; (Nasoga) KP 670 to KP 690
- Moderate – KP 364 to KP 373

Additional field review and sampling of potential ML/ARD sites would be carried out both prior to and during construction to assist in defining areas subject to ML/ARD. Blasted or exposed rock would be inspected during construction with particular emphasis on areas where the potential for potential acid generating (PAG) rock has been identified.

Mitigation measures for different areas would be determined prior to construction and would be finalized during construction if PAG material is identified based on the characteristics of the material exposed.

A Metal Leaching and Acid Rock Drainage Management Plan (ML/ARD Plan) would be developed as part of the EMP, and a preliminary plan was included as part of the Application. Key mitigation measures identified in the Application include:

- Blending of limestone with PAG rock and placing into the trench or excavation as backfill;
- Applying shotcrete or a synthetic spray cover on elevated PAG rock faces and diversion of water from exposed PAG rock;
- Avoiding the use of PAG rock for construction; and
- Monitoring the runoff from exposed PAG rock.

5.7.3 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 quantity, and ML/ARD. Some of the broad themes of comments included: adequacy of the baseline water quality and quantity data; potential for TSS/turbidity and the zone of influence; maintenance of surface drainage patterns; impacts to groundwater resources; and, clarification about ML/ARD risk. These themes are discussed below.

EAO requested that the Proponent provide supplemental information during Application Review with respect to water quality data that was not recorded for a sub-set of sites, primarily on Nisga'a Lands, at the time of submitting the Application. The Proponent provided the supplemental "Nisga'a Lands Freshwater Fish and Fish Habitat Technical Data Report" (Aug 2014), which included water quality, fish and fish habitat field assessment results. No concerns were raised with this supplemental information.

Adequacy of the Baseline Water Quality and Quantity Data

A number of Aboriginal Groups, including Nak'azdli Band, raised questions about the lack of multi-season, multi-year sampling at all watercourses.

The Proponent outlined that the desktop analysis, coupled with the single field samples provide a suitable understanding of the baseline characteristics throughout the proposed pipeline route for the purpose of the environmental

assessment, and in consideration of the potential impacts of the proposed Project and proposed mitigation measures. Additional baseline data would continue to be gathered to inform detailed engineering and permitting.

FLNR noted that regional estimates identified in the Application do not use all available hydrology information and focused primarily on Water Survey of Canada stations near the pipeline route. FLNR suggested estimates in the Application be compared to regional estimates using other sources of hydrology information including MOE's "BC Stream Flow Inventory". Comparison of the estimates would add validity to the estimates provided, particularly for hydrological areas where the number of stations used to generate estimates was low.

The Proponent responded that for all watercourse crossings with drainage areas greater than 10 km², the 1:100 year maximum instantaneous discharge estimates for each site were based on the regional flood discharge relationships, and included consideration of the BC stream flow inventory.

EAO proposes a condition that would require the Proponent to develop and implement a Freshwater Water Quality Monitoring Plan in consultation with OGC to address freshwater quality monitoring during the construction phase. EAO has also proposed a condition whereby the Proponent would be required to develop and implement an EMP in consultation with relevant regulatory authorities, Nisga'a Nation and Aboriginal Groups for the approval of EAO.

Potential for TSS/Turbidity and the Zone of Influence

FLNR and Aboriginal Groups, including Nak'azdli Band, raised questions regarding sedimentation, particularly during construction and in the years following: whether it is possible that TSS could be underestimated during construction monitoring; the further the distance downstream sediment would settle on the streambed; and would bank erosion be monitored and how would it be mitigated.

The Proponent responded that prior to construction a TSS versus turbidity correlation would be established. During construction, manual and automated turbidity sampling would occur. Turbidity data would typically be collected 24 hours a day at 10 to 30 minute intervals. When required, additional TSS laboratory samples would also be collected to further verify the TSS/turbidity relationship. As a result of these sampling techniques, the data collected are expected to be an accurate representation of conditions at the site.

In addition to a control site upstream, sampling sites would be located several hundred metres (to several km) downstream to determine the how far downstream sediment may have an effect on fish habitat. These downstream sites in conjunction with sampling sites located at and near the construction area would provide an accurate ZOI. If large amounts of deposited sediment are anticipated, additional investigation would be conducted and applicable mitigation implemented.

Erosion and sediment control measures would be monitored and maintained to ensure their effectiveness. The Proponent would conduct post-construction monitoring, including ground reconnaissance of streambed, approach slopes, banks and riparian areas up to 5 years after reclamation and clean-up. If issues of sedimentation are identified, measures would be implemented and further monitoring conducted until the issue is rectified.

Maintenance of Surface Drainage Patterns

FLNR commented that culvert spacing should also be addressed to ensure natural drainage is maintained and requested information on how culvert spacing would facilitate natural drainage patterns.

The Proponent responded that existing roads would be used wherever possible to access Project areas, including the ROW, camps and laydown areas. Where new roads would be developed or deactivated forestry roads reactivated and new culverts installed, the aim would be to maintain flow in the existing drainages across the roads and to install sufficient culverts or bridges to avoid concentration or alteration of natural drainage patterns.

Impacts to Groundwater Resources

FLNR asked whether the proposed Project could potentially impact groundwater quality and quantity by a direct impact of the pipeline itself on groundwater quality, including but not limited to slow leaks, of the effect of pipeline steel on groundwater chemistry, and potential corrosion if the corrosion inhibitor is ineffective. There were additional questions from Working Group members about the possible effects of the pipeline on groundwater flow patterns.

The Proponent responded that an important aspect of modern high pressure gas pipeline design and construction is to engineer the pipeline and corrosion system so that corrosion does not occur. There are no liquids in the proposed pipeline and therefore leakage of liquids is considered an unlikely risk. The pipeline would

be coated and provided with cathodic protection to prevent external corrosion. There would be no liquid corrosion inhibitor involved. As a result, the pipeline itself would not interact chemically with the groundwater and would have no effect on groundwater quality. In the unlikely event of a leak, natural gas is lighter than air and tends to rise through the soil and groundwater to the surface and vent. The solubility of natural gas in groundwater is low and there would be no appreciable effect on the groundwater.

The mitigation measures put in place would result in the pipeline being neither a barrier nor a conduit for groundwater. High groundwater flow along the pipeline is undesirable since it may cause erosion of the soil along the trench or change groundwater flow patterns. Trench blocks would be used to control this potential flow. Typically, the pipeline would not be a barrier either since groundwater can move across the pipeline trench backfill or under the trench.

OGC noted that the hydrogeological assessment approach is technically sound and thorough, and requested that unregistered water wells within the LSA be addressed by the mitigation measures and clarification about the proposed groundwater monitoring program.

The Proponent responded that the radius of 500 m proposed for monitoring wells where blasting or other construction activities are occurring is very conservative and is based on extensive past experience with concerns put forward by residents rather than purely technical considerations. Additional wells, registered or unregistered, near the pipeline route would be considered for monitoring depending on local conditions. Shallow wells downslope of the pipeline potentially fed by groundwater movements through aquifers or infiltration zones would be considered for monitoring on a local basis. Wells that tap deep aquifers are very unlikely to be affected by the pipeline construction and so would be less likely to be selected; however, where local well owners in proximity to the pipeline express concern additional wells would be considered for monitoring. Routine drinking water sampling and analysis along with pump testing would also be incorporated into the well monitoring program.

Halfway River First Nation expressed concern that locally important springs or geothermal areas that could be impacted by the proposed Project were not identified in the Application.

The Proponent responded that locally-significant springs or geothermal areas have been avoided based on information from ground surveys along the route,

and that known hot springs within 200 m of the proposed footprint have been avoided.

Clarification about ML/ARD Risk

FLNR asked whether, when developing new quarries or using material from the ROW if there would be ML/ARD testing, particularly in proximity to watercourse crossings.

The Proponent responded that wherever possible, conditions that might generate ML/ARD would be avoided and quarries that could potentially contain significant quantities of PAG material would generally be avoided. Plans for rock excavation across the Project, including quarries, would be prepared and implemented. The proximity to watercourse crossings is one of the considerations that would determine whether additional ML/ARD investigation would be warranted. This would be addressed in the ML/ARD Plan, which EAO proposes as a condition to the EA Certificate. Additionally, acid rock assessment and mitigation information would be provided to the OGC to support the decision-making process on relevant operation permits with respect to PAG rock along the proposed route.

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 would have the following residual adverse effects to water:

- Change in water quality due to increased TSS;
- Change in water quantity due to the disruption or alteration of drainage patterns and stream flows; and
- Disruption of groundwater flow where springs are encountered.

The use of well understood mitigation measures for managing ML/ARD potential, as would be outlined in the required ML/ARD 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, as well as EAO's determination of significance based on the residual effects characterization.

Criteria	Assessment Rating	Rationale
Context	<p>TSS and Quantity: Undisturbed; variable sensitivity</p> <p>Groundwater: high resiliency; low sensitivity</p>	<p>Sensitivity of a watercourse to sedimentation or changes in flows depends on somewhat on the end receptors (e.g. the uses of the water by people and animals). The resilience of a watercourse to localized alteration of natural drainage patterns depends on several factors, including: the size of the basin, the natural flow regime, stability of bank materials, existing hydrologic regime and land use conditions within the watershed. Larger watersheds with relatively small alterations are the most resilient.</p> <p>The sensitivity and resiliency of groundwater that may be encountered would vary based on the recharge rate of the aquifer and the extent of disruption of shallow groundwater flow where springs are encountered. In context of regional groundwater and aquifers there is a high level of resiliency and low sensitivity.</p>
Magnitude	<p>TSS, Quantity and Groundwater: Low</p>	<p>TSS: Given proven mitigation measures, the TSS would be with regulatory guidelines within the ZOI. They are expected to be within the range of natural variability, and would not affect health of aquatic organisms.</p> <p>Quantity: Any change is expected to be well within the range of natural variability and would not measurably affect the long-term ecological integrity of fluvial systems. Any water withdrawals are limited under the <i>Water Act</i>.</p> <p>Groundwater: The relative magnitude of potential residual effects from disruption of shallow groundwater flow is expected to be generally low. At a regional or aquifer level the impacts would be negligible.</p>
Extent	<p>TSS, Quantity and Groundwater: Localized</p>	<p>TSS: Impacts would be within the ZOI (i.e. an area extending a minimum of 300 m downstream of proposed crossing locations).</p> <p>Quantity: Potential changes in water quantity may extend beyond the ZOI for some watercourse, but would not be measureable within a system.</p>

Criteria	Assessment Rating	Rationale
		Groundwater: Effects on groundwater flow and springs encountered may extend beyond the construction footprint, but would primarily be within 1 km of the proposed route.
Duration	TSS and Groundwater: short term Quantity: short term to medium-term	TSS: TSS levels would generally decrease in less than two days after construction at flowing watercourses, but the potential residual effect would not be reversed until dry or frozen-to-bottom open-cut crossings first become inundated with water following construction. Suspended sediments from test water release would settle out within 24 hours. The potential for erosion is expected in the short to medium term until the re-vegetation of slopes and banks occurs. Quantity: Impacts from water withdrawals would be very short-term. In some instances it may take more than one year to reclaim natural drainage patterns and stream flow. Groundwater: The duration of effects to shallow groundwater flow would depend on the recharge rate of the disrupted spring or aquifer, but any effects are expected to be mitigated during, or shortly following, construction.
Reversibility	TSS, Quantity and Groundwater: Reversible	TSS, Quantity and Groundwater: Once the cause is addressed, the residual effects would be reversible.
Frequency	TSS, Quantity and Groundwater: Once	TSS, Quantity and Groundwater: At any one location the effect would primarily be caused by a single event during construction.
Likelihood	TSS: 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. Quantity: The likelihood of residual effects to water quantity would be relatively low. Groundwater: Although springs may be encountered, there is a low likelihood	

Criteria	Assessment Rating	Rationale
		that groundwater flow would be disrupted during construction based on the assessment and required mitigation measures.
Significance		Taking into consideration the magnitude of the residual effect, as well as the short duration and reversibility, EAO concludes that the potential residual effects of the proposed Project on water are not likely to be significant.
Confidence		The significance determination and likelihood rating for potential 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 the potential residual effects would be minimized and would not be significant.

5.7.5 Cumulative Effects Assessment

The Application included a quantitative assessment of the potential cumulative effects on surface hydrology and water quality and quantity. Runoff from forestry cutblocks, agricultural runoff and other non-point sources of contamination could contribute to cumulative effects on water quality and is reflected in current baseline water quality conditions.

An indicator of the potential for adverse effects on surface hydrology and water quality and quantity is the areal surface disturbance; the proposed Project would contribute to an increase of 0.07% in the RSA's areal disturbance, while other reasonably foreseeable developments would contribute an additional 2.4%, resulting in a total cumulative disturbance of 13.9% (average across watersheds). Approximately 75% of this increase in areal disturbance is estimated to come from forestry cutblocks, which are subject to the hydrology regulatory requirements of the *Forest and Range Practices Act*.

Project effects are associated with the construction phase. In relation to surface water, these construction-related effects are not expected to overlap spatially or temporally with other projects. As a result, EAO considers that the proposed Project would not contribute to residual cumulative effects.

The proposed Project's residual effect on groundwater would occur during the construction phase and be limited to localized, short-term impacts to specific springs and groundwater flows. Therefore these effects are not expected to materially overlap spatially or temporally with other projects or activities. As a result, EAO considers that

the proposed Project would not contribute to residual cumulative effects.

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), the EAO is satisfied that the proposed Project is not likely to have significant adverse effects on water.

5.8 Wetland Function

5.8.1 Background

Wetlands support unique assemblages of plants and ecological communities, provide important habitat for wildlife, moderate water flow and maintain water quality. The potential for the proposed Project to adversely affect wetland function was assessed in terms of three key indicators that represent the major ecological functions provided by wetlands:

- Hydrological function (including flood control and groundwater recharge);
- Habitat function (including habitat for wildlife and plants); and,
- Biogeochemical function (including carbon sequestration and water quality improvement).

The Wetland LSA aligns with the Terrestrial Vegetation RSA (a 2 km wide corridor centred on the proposed ROW), as changes in vegetation are expected to be the primary indicator of effects on wetland function. The Wetland RSA aligns with the Freshwater Fish and Fish Habitat RSA to include sub-basins crossed by the proposed Project ROW and the wetlands, wetland complexes and riparian wetlands located within those sub-basins, as hydrology is the overall driver for wetland and aquatic ecosystems.

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

The area of wetlands in the Wetland RSA, based on aerial imagery interpretation, is estimated at 149,445 ha, approximately 2% of the total area of the RSA.

Table 5-8 summarizes the area of the five Canadian Wetland Classification System (CWCS) wetland classes and the percent each class comprises of the total wetland area, as well as for beaver ponds and estuarine marshes. The area of wetlands in the Wetland LSA is estimated at 14,377 ha. Wetlands comprise approximately 7% of the total area in the Wetland LSA. Wetlands comprise different percentages of the total land area in each of the six watersheds found within the LSA.

Fens are the most common wetland class in the Project footprint (73%), Application Corridor (72%) and Wetlands LSA (69%). Within the Project footprint, Application Corridor and Wetland LSA, the percentage of the total area in each wetland class is consistent.

Table 5-8: Wetland class distribution and area in the Project footprint, Application Corridor and wetland LSA, including all routes

Wetland Class	Project Footprint		Application Corridor		Wetland LSA	
	Area (ha)	% of Total Wetland Area	Area (ha)	% of Total Wetland Area	Area (ha)	% of Total Wetland Area
Bog	20 ha	5 %	172 ha	7 %	1,140 ha	9%
Fen	264 ha	73 %	1,850 ha	72 %	9,004 ha	69 %
Marsh	7 ha	2 %	58 ha	2 %	304 ha	2 %
Shallow Water	4 ha	1 %	38 ha	1 %	562 ha	4 %
Swamp	67 ha	19 %	454 ha	18 %	2,031 ha	15 %
Estuarine Marsh	0 ha	0 %	2 ha	<1 %	109 ha	<1 %
Total	362 ha	100 %	2,574 ha	100 %	13,150 ha	100 %

The proposed route has been aligned to avoid wetlands wherever feasible. However, construction on the proposed route could, depending on final alignment, temporarily alter up to 303 ha of wetlands and 9 ha of beaver ponds. The siting of permanent facilities such as compressor stations may result in the permanent loss of wetland area. At the two western proposed compressor station sites (only one of which would be constructed), wetlands occur in the general area. During detailed design and facility site optimization, the wetland areas would be avoided as far as practical, and the local surface and groundwater flows would be managed to preserve wetland function.

Nineteen wetland communities at risk were identified in the field in both wetland and vegetation surveys. Nine plant species at risk were found in or near wetlands during rare plant surveys. Fifty-eight locations within wetlands were identified as being associated with one or more fish-bearing potential watercourse crossings. Three wildlife species at risk were identified in wetlands during wildlife surveys.

Approximately 1.16 km of protected area (the Mugaha Marsh Sensitive Area) would be crossed by the Cypress to Cranberry Route. The Mugaha Marsh Sensitive Area is situated on Crown Land in the Provincial Forest east of Williston Reservoir, approximately 6 km northwest of Mackenzie. This area was designated in 2001 given its local significance for wildlife habitat values and wildlife viewing opportunities.

During pre-Application, members of the public raised concerns about the proximity of the route to the bird banding station at Mugaha marsh. The proposed solution was a rerouting of the corridor further north and away from the bird banding station along with an underground trenchless crossing, which has been incorporated into the route presented in the Application. Subsurface investigations are being carried out to determine the possibility of the trenchless crossing, the contingency crossing method is conventional trench installation during winter when the ground is frozen and potential

impacts to terrain would be lessened.

The potential effects of the proposed Project on wetlands would include the potential impacts of the following:

- Pipeline installation, pipeline maintenance, and ancillary site development causing changes to hydrological flow. The hydraulic conductivity of wetlands substrate can be affected by stripping, compaction and mixing of the soil structure;
- Pipeline installation, pipeline maintenance, and ancillary site development causing alteration of habitat function. Examples include changes in floristic species composition, interruption of wildlife movements and fragmentation of natural habitats;
- Activity in or near wetlands during pipeline or ancillary site construction causing an increased sediment supply and turbidity of surface waters, thereby affecting biogeochemical function of the wetland; and
- Pipeline decommissioning and abandonment causing alteration or loss of wetland function as a result of contamination.

Activities associated with pipeline construction and operations, such as surveying, clearing, trenching and backfilling could potentially alter wetland hydrological, habitat and biogeochemical function due to loss of or changes to wetland vegetation, soil mixing and compaction from equipment use, impoundment of water, and/or increased dust and erosion from increased use of access roads in the vicinity of construction activities.

Proposed Mitigation and Monitoring

The Proponent's overall mitigation strategy focuses on the allowance of natural recovery of wetland vegetation and recovery of pre-disturbance contours to restore function, including habitat such as open water features that can provide breeding habitat for birds. After initial pipeline construction, interim reclamation would be implemented to reduce adverse effects associated with the extended construction phase of the Project.

Other key mitigation and monitoring measures for wetlands identified in the Application include:

- Schedule wetland pipeline crossing construction, to the extent practical, to be completed within one working day;

- Limit clearing in the vicinity of watercourse or wetland crossings to the removal of trees and shrubs along the trench line and work side area needed for the vehicle crossing in order to protect riparian areas. Retain low-lying understory vegetation, where feasible; and
- Align new access roads or extensions of existing roads, where needed, to avoid, to the extent practical, watercourse and wetland crossings, steep slopes and sidehill terrain.
- Reducing the use of areas within the Riparian Management Area of a wetland.
- Implementation of various construction techniques to reduce ground and vegetation disturbance (e.g. hand removal of vegetation and maintenance techniques such as pruning, mowing, girdling, or topping).
- Installation of temporary erosion and sediment control structures.
- Appropriate soil handling procedures, such as separation of organic and mineral soils during excavation and backfilling
- Minimizing soil compaction through measures such as use of wide track equipment and matting to protect substrate.
- Re-contouring terrain to recover drainage patterns.
- Post-construction compliance and effectiveness monitoring, and application of adaptive management as required based on monitoring results.

If the function of the overall wetland has been compromised due to project activities (e.g. at compressor station sites), the loss of wetland function will be mitigated if warranted, through compensatory technical or economic mitigation in consultation with appropriate regulatory agencies.

5.8.3 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 agency and Aboriginal Group representatives. A non-exhaustive list of key issues and comments, specific to wetland KIs, raised by these groups related to the following:

- Permanent loss of wetlands and required compensation;
- Additional certainty around site-specific impacts, mitigation, monitoring and compensation; and
- Impacts to the Mugaha Marsh Sensitive Area.

Permanent Loss of Wetlands

Reviewers raised the concern about permanent loss of wetland function and commented that pre-construction data must be collected to allow for post construction monitoring to verify predictions of recovery. Concern was expressed about the effects of permanent facilities including that the precise locations of temporary and permanent facilities are not known. Further information on compensation for wetland function was requested. Environment Canada (EC) further noted that the federal policy on wetland conservation would likely apply to portions of the pipeline, and that a wetland function analysis and compensation plan should be provided, which includes consideration of input from federal agencies as well as Aboriginal Groups (e.g. input to compensation plan in relation to traditional use).

The Proponent responded that pre-construction surveys were conducted to determine existing conditions (e.g., wetland function) within the Application Corridor (section 4.7.2.2 of the Application). Wetland functions were documented and would be compared to wetland functions observed on an annual basis during the wetland post-construction monitoring program. The results of this comparison would be used to measure the effectiveness of mitigation and restoration measures, and to provide support to the determination of loss or no net loss of wetland function. Based on the findings during the post-construction monitoring, additional recommendations for remedial measures would be provided, if warranted, to promote the successful return of wetland function within the lifetime of the wetland post-construction monitoring. The duration of the wetland post-construction monitoring is anticipated to be for five years following construction. If at the end of five years of monitoring the wetland has still not reached full functionality, the Proponent would consult with the appropriate regulatory agencies regarding the appropriate next steps which may involve either additional remedial measures or compensation.

EAO proposes a condition that would require the Proponent to develop a Wetlands Management Plan to meet a “no net loss” objective for wetland function and area. The plan would include survey results for all wetlands in the Project corridor including site-specific information on wetland location, type, area and function and mitigation and compensation measures to address any loss of wetland function and area.

Additional Certainty around Site-Specific Impacts, Mitigation, Monitoring and Compensation

Several Aboriginal Groups expressed concern about level of baseline data collected and expressed a desire to see further data collection and more intensive surveys.

FLNR also noted concerns with the fact that wetland functions were not well linked with wetland ecological communities and associated vegetation, and that mitigation was not identified by wetland type.

The Proponent responded that the level of field sampling provides a high level of certainty and high confidence in the characterization of wetland distribution and abundance within the Application Corridor. The results of post-construction monitoring program would be used to measure the effectiveness of mitigation and restoration measures, as well as to provide support to the determination of loss or no net loss of wetland function at a site-specific level for wetlands that have been inventoried along the proposed pipeline route.

EAO proposes a Condition that would require the Proponent to develop a Wetland Management Plan, as described above.

Impacts to the Mugaha Marsh Sensitive Area

During Application Review, EC recommended that Project activities in Mugaha marsh and the surrounding area be avoided to avert potential adverse environmental impacts arising from the proposed Project. EC stated that conventional trenching methods would contribute additional fragmentation to the landscape, and recommended the avoidance of conventional trenching construction methods across the entire Mugaha Marsh Sensitive Area, not just the wetland features found within it. Furthermore, EC advised measures should be identified to ensure compensation for any permanent loss and degradation of habitat if conventional trench installation is used.

The Proponent has stated that its preference is to implement an underground trenchless crossing method, such as HDD, subject to further feasibility assessment in an effort to minimize the impact to the Community Forest in this area, where bird watching/banding is of great importance. A contingency crossing method, should HDD be determined to not be feasible, would be trenched installation when the ground is frozen. The Proponent would minimize disturbance to the extent practicable and work with the community to determine the best overall approach towards the completion of a crossing.

EAO proposes a Condition that would require the Proponent to adhere to the objectives of the Sensitive Area Plan for Mugaha Marsh (2001), and a condition that would require the Proponent to develop a Wetland Management Plan, as described above.

5.8.4 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 wetlands:

- Loss or alteration of wetland function.

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

Criteria	Assessment Rating	Rationale
Context	Neutral	<p>Wetland hydrological function is expected to be moderately resilient to disturbance when appropriate mitigation measures are implemented (e.g. re-establishment of pre-disturbance contours, minimizing soil compaction and appropriate soil handling).</p> <p>Peatlands that rely solely on precipitation for water inputs, such as bogs (9% of wetlands in the LSA), are expected to be less resilient to hydrological alteration, especially if alteration of the hydrologic regime results in transition to an upland ecosystem.</p>
Magnitude	Low to medium	<p>Effects of hydrologic alteration would be detectable until natural surface and subsurface flow patterns were restored. Biogeochemical alteration would be detectable until natural flow patterns and vegetation are restored. Effects on habitat function would be detectable until vegetation is restored.</p> <p>The effects on wetland function are considered low to medium in magnitude because the establishment of the second pipeline may occur before complete recovery of wetland function (including additional hydrologic disturbance) as a result of the first pipeline. The recovery period between the construction of the initial pipeline and the second pipeline may result in delayed re-establishment of vegetation or increased opportunity for establishment of invasive species, effecting habitat function. Loss of treed habitat is considered medium in magnitude. In some cases, compensation could</p>

Criteria	Assessment Rating	Rationale
		be used to achieve “no net loss” of wetland function.
Extent	LSA	Potential effects are expected to extend to areas adjacent to the proposed route, or adjacent to access roads and temporary facilities, but within the LSA. However, compensation for “no net loss” could take place within the RSA.
Duration	Short to long-term	<p>Recovery of natural flow regime is expected in the medium to long-term following construction of the first, and then second pipeline, if built.</p> <p>Wetland habitat such as graminoid and shrub vegetation is expected to recover quickly, however repeated disturbance from the initial and second pipeline construction cause the duration to be medium term. Effects to treed wetland habitat would take longer to recover and would not be allowed to re-establish until after abandonment and decommissioning, making the effects long term.</p> <p>Sedimentation effects are expected in the short-term with mitigation to re-establish vegetation. Nutrient cycling and carbon sequestration is expected in the long term.</p> <p>There may be areas with permanent loss of wetland function where compressor or meter stations are located in wetland areas. However, these areas would be subject to offsets or compensation.</p>
Reversibility	Reversible	<p>The reversibility of residual effects to wetlands varies by Project activity. All potential residual effects to wetland function are considered reversible, although in some cases project effects are not reversible until after decommissioning.</p> <p>For areas with permanent loss of wetland the impacts at the site would be irreversible, but these areas would be subject to compensation and there the impact to wetland function is considered reversible.</p>

Criteria	Assessment Rating	Rationale
Frequency	Once to periodic	Disturbance would occur during the construction phase, followed by periodic disturbance from maintenance activities.
Likelihood	There is a high likelihood that residual effects to wetland function would occur from the proposed Project.	
Significance	Based on the low to medium magnitude impacts to wetland function and the short-term to long term effects, as well as the mitigation and monitoring measures identified by the proponent, and the proposed conditions requiring pre-construction surveys, development and implementation of a wetland management plan which incorporates a “no net loss” objective for wetland structure and function, and post-construction effectiveness monitoring, the capacity of the wetland to maintain functional integrity is not threatened. EAO concludes that the proposed Project would not likely have significant residual effects on wetlands.	
Confidence	The level of confidence is determined by the understanding of cause-effect relationships and the availability of data pertinent to the project area. Based on the potential effects, proposed mitigation and monitoring, and proposed conditions, the significance determination and likelihood rating for potential residual effects on wetland function are determined with moderate confidence.	

5.8.5 Cumulative Effects Assessment

Since surface disturbances can affect wetland function, existing activities and the proposed Project would act cumulatively to increase disturbance of wetland function in the LSA and RSA.

Cumulative effects assessment and significance determination has been completed with consideration of objectives identified in the eight LRMPs and six SRMPs encountered along the proposed route. Examples of LRMP / SRMP objectives and requirements are as follows:

- Establishment of riparian management zones around wetlands and allowing natural succession in wetlands (Mackenzie, Fort St James and Kispiox LRMPs).
- Development adjacent to sensitive waterbodies and wetlands should be managed to minimize negative effects on water quality in addition to recognizing the Mugaha Marsh as a sensitive area in the Parsnip General

Management Zone, with its own management objectives (Mackenzie LRMP).

- Maintenance of hydro-riparian areas near wetlands (Cranberry and Nass South SRMPs).
- Retention of riparian areas around wetlands and protecting Red-listed plant communities (North Coast LRMP, supplemented by the Central and North Coast Consolidated Order).

For the Nisga'a Nation Land Use Plan, objectives to protect wildlife habitat, maintain natural biodiversity and protect sensitive habitat apply to wetlands.

Aboriginal Land Use Plans establish targets for wetlands including 200 m buffers around trumpeter swan nesting sites, as well as targets for setbacks around wetlands (Moberly Peace Tract SRMP; Land Use Plan for All Gitanyow Traditional Territories).

Other Existing and Reasonably Foreseeable Future Developments

Existing activities with residual effects acting in combination with the proposed Project include agriculture, forestry, utility activities, natural resource development, oil and gas and other development. Reasonably foreseeable future developments and activities include all proposed Project-related activities involving clearing, stripping / topsoil salvage, grading, back-filling, cleanup and reclamation.

Surface disturbance has occurred to 3.4% of the wetland area in the RSA. The proposed Project and other proposed projects and activities would cumulatively result in 4.1% of wetlands in RSA being disturbed. The proposed Project would contribute to 5% of that total cumulative disturbance in the LSA (Table 5-9).

Table 5-9: Cumulative wetland disturbance

Wetland Cumulative Disturbance Assessment	Area of Wetland in the RSA	
	Kitsault	Nasoga
Area of Wetlands	149,455 ha	
Area of Wetland Disturbance Attributed to Existing Activities (Existing)	5,071 ha	
Area of Wetland Disturbance Attributed to the Proposed Project	310 ha	296 ha
Area of Wetland Disturbance Attributed to Foreseeable Future Activities	820 ha	819 ha
Total Cumulative Wetland Disturbance (Existing + Proposed Project + Foreseeable Future)	6,204 ha	6,189 ha
% Cumulative Wetland Disturbance	4%	4%
% Contribution of Proposed Project to Cumulative Wetland Disturbance	5%	5%

It is expected that other operators in the RSA would be subject to similar regulatory guidelines and would implement mitigation that is similar to that proposed for the proposed Project. Forestry companies would adhere to similar guidance, best practices and the objectives of the LMRPs.

In addition, the Proponent has committed to the inclusion of a wetland function component as part of their post-construction monitoring program. The general monitoring program study design is to revisit wetlands disturbed by the proposed Project in order to document the progress of functionality returning to representative wetland ecosystems and evaluate the likelihood that disturbance is contributing to cumulative effects. The results of this comparison would be used to measure the effectiveness of mitigation, develop additional remedial measures if warranted, and provide support to the determination of loss or “no net loss” of wetland function.

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

In determining the significance of cumulative adverse effects to wetlands, EAO has considered the residual effects from the proposed Project, the cumulative disturbance to the RSA from the Project and reasonably foreseeable projects as well as the reversibility of potential adverse effects to wetlands in the medium to long term. EAO considered that the residual cumulative adverse effects to wetlands from permanent facilities may be irreversible, but that the magnitude of these effects is medium and can be mitigated, if warranted through compensation, developed in consultation with appropriate regulatory agencies.

EAO concludes that the residual cumulative adverse effects to wetlands within the RSA from the proposed project and reasonably foreseeable future projects are not likely to be significant.

5.8.6 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 wetland function.

5.9 Wildlife and Wildlife Habitat

5.9.1 Background

The potential for the proposed Project to adversely affect wildlife and wildlife habitat was scoped to assess adverse effects related to change in habitat, movement and mortality risk, and include both direct and indirect pathways arising from construction and operations. The following Key Indicators, identified in *Table 5-10* were selected to include:

- Wildlife communities by habitat type (e.g., riparian and water birds);
- Species groups (e.g., bats);
- Species at risk (e.g., caribou); and
- Species of management importance, or of social or cultural importance (e.g., moose).

Table 5-10: Key indicators for Wildlife and Wildlife Habitat Valued Component

Mammals:	Birds:
Grizzly Bear	Mature/Old Forest Birds
Caribou	Early Seral Forest Birds
Moose	Grassland/Shrubland Birds
Mountain Goat	Riparian and Water Birds
Furbearers	Yellow Rail
Bats	Rusty Blackbird
Amphibians:	Common Nighthawk
Pond-dwelling Amphibians	Olive-sided Flycatcher
Western Toad	Canada Warbler
Northwestern Salamander	Marbled Murrelet
Coastal Tailed Frog	Northern Goshawk (coastal and interior subspecies)
	Western Screech-owl (<i>kennicottii</i> ssp)

The spatial boundaries for the Wildlife and Wildlife Habitat VC include:

- LSA: A 2 km band centered on the proposed pipeline route (i.e., extending 1 km on both sides of the proposed route)
- RSA: A 30 km band centered on the proposed pipeline route (i.e., extending 15 km on both sides of the proposed route)
- Grizzly Bear RSA: Delineated by the boundaries of the Grizzly Bear Population Units (GBPUs) and natural features (e.g., watersheds, rivers) to include the entire Moberly, Hart, Omineca, Babine, Cranberry, Stewart, and Khutzeymateen GBPUs and portions of the Rocky, Parsnip and Finlay-Ospika GBPUs

- Grizzly Bear Sub Regional Study Area (SRSA): Delineated by Landscape Units within the Grizzly Bear RSA, chosen to approximate the size of an adult female grizzly bear home range. The Grizzly Bear SRSA is the spatial scale at which home range effects can be evaluated, which is relevant to subpopulations or breeding units of grizzly bears.
- Caribou RSA: The caribou ranges that would be crossed by the Application Corridor, which includes the Graham, Moberly, Kennedy Siding, Scott, and Wolverine ranges.
- Nass Wildlife Area (NWA): Defined as the Nass Wildlife Area delineated under the NFA.

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

A desktop and literature review, consultation program and field surveys were completed for the proposed Project. Field surveys included: general aerial reconnaissance and wildlife feature review; winter track survey; aerial waterbird surveys (breeding and fall staging); breeding bird survey; coastal tailed frog survey; pond dwelling amphibian survey; and acoustic monitoring. Field work was also completed to ground-truth preliminary wildlife habitat ratings for wildlife habitat models. Potentially affected Aboriginal communities participated in the wildlife field surveys to incorporate Aboriginal views and the experiential knowledge of the land.

Pipeline and associated facility construction and operation activities have the potential to directly and indirectly affect wildlife and wildlife habitat through alteration of vegetation, terrain and drainage, and sensory disturbance (e.g., ambient noise, human activity) causing changes in wildlife habitat, movement and mortality risk.

These effects mechanisms or “pathways” define the potential effects identified for the proposed Project as:

- *Change in habitat suitability* - 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. Clearing activities during construction, as well as vegetation management during ongoing maintenance, would result in direct habitat loss or alteration. Indirect habitat loss would occur as a result of fragmentation, creation of edges and sensory disturbance. 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 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.
- *Change in mortality risk* - The creation of corridors, including for the pipeline ROW and access roads, could improve access to wildlife habitat by both predators and humans. Maintaining the pipeline ROW in early seral stages of habitat 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.

Mammals

The construction of the proposed Project would require clearing of vegetation and soil disturbance, creating new linear disturbances, widening existing corridors where the ROW is contiguous with another linear feature, and opening old and regenerating access. The construction of the proposed Project may result in the removal of certain habitat features for mammals (e.g., forage, browse, security cover, thermal cover, dens, and roosts). Most of the Project footprint would be restored following construction, with temporary workspace and a portion of the pipeline ROW allowed to regenerate to natural vegetation communities. A portion of the ROW would require ongoing brushing during operations to meet safety and regulatory requirements, which would result in the long-term maintenance of early seral vegetation (herbaceous and shrub stages) and potential access in currently forested habitats.

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 bear populations.

The Application Corridor would transect eight GBPUs: the Rocky, Moberly, Hart, Omineca, Babine, Cranberry, Stewart, and Khutzeymateen. Portions of Parsnip and Finlay-Ospika GBPUs are also included in the Grizzly Bear RSA. All of the GBPUs that would be crossed by the proposed Project are considered to be viable, with densities ranging from 10 to 38 bears per 1,000 km² (Table 5-11); however the Moberly GBPU is

closed to hunting because the population is less than 100 bears. The Khutzeymateen is also closed, but as a special no hunting area, not because of conservation concerns. MOE has identified objectives for viable GBPUs in BC, including maintaining current population abundance and distribution, and providing sustainable harvest and viewing opportunities where appropriate.

The short- and long-term threat levels for the GBPUs that would be crossed by the proposed Project range from very low (Parsnip, Omineca and Khutzeymateen GBPUs) to very high (Stewart GBU). The anticipated short- and long-term threat level is the vulnerability of the population to threats on multiple scales, including human influence and climate change. Threats are expected to affect habitat suitability, effectiveness and connectivity.

Disturbance from anthropogenic noise created by roads has been found to have a negative effect on habitat use by grizzly bears. Roads are demonstrated to adversely affect grizzly bear habitat effectiveness, fragment habitat (e.g., create barriers/filters to movement; alienate bears from suitable habitat) and increase mortality risk. In the Accounts and Measures for Managing Identified Wildlife, FLNR recommends minimizing the amount of areas with $>0.6 \text{ km/km}^2$ of open road in grizzly bear habitat. Motorized access density of 0.6 km/km^2 was adopted in the Proponent's assessment as a biological threshold for a high magnitude effect, in the absence of mitigation to address access.

Results of the moving window analysis presented in the Application indicate that the existing average motorized access density in the portions of the Rocky, Moberly and Hart GBPUs within the Grizzly Bear SRSA currently exceeds the threshold of 0.6 km/km^2 , suggesting a high risk of grizzly bear mortality and displacement under current conditions in these GBPUs (Table 5-11). The average motorized access densities in the Omineca and Cranberry GBPUs are near, but below the threshold.

Table 5-11: Population estimate, density and anticipated threat level for GBPUs, and existing and project case linear density within the SRSA by GBU

	Population estimate (GBPU)	Estimated population density (bears/1000 km ²) (GBPU)	Anticipated short and long term threat level (GBPU)	Route ¹	Existing Average Density (km/km ²) (SRSA)	Project Case Average Density (SRSA)	Increase in average access density %
Rocky	538	14	High		1.32	1.33	0.9 ↑
Moberly	71	10	Moderate		0.75	0.77	2.2 ↑
Hart	244	13	High		0.80	0.80	<0.1 ↑
Omineca	402	14	Very Low		0.56	0.58	2.7 ↑

	Population estimate (GBPU)	Estimated population density (bears/1000 km ²) (GBPU)	Anticipated short and long term threat level (GBPU)	Route ¹	Existing Average Density (km/km ²) (SRSA)	Project Case Average Density (SRSA)	Increase in average access density %
Babine	313	23	Moderate		0.34	0.36	4.1 ↑
Cranberry	349	30	Moderate	K	0.54	0.55	2.8 ↑
				N	0.54	0.56	3.2 ↑
Khutzeymateen	280	38	Very Low	K	0.26	0.26	0
				N	0.26	0.29	8.5 ↑
Stewart	358	38	Very High	K	0.19	0.20	6.9 ↑
				N	0.19	0.19	0.1 ↑

¹Route – K is the route with Kitsault option; N is the route with Nasoga option

Areas with high habitat value and low mortality risk (i.e. roadless areas) are important for grizzly bears. This core security habitat is defined as an area larger than 10 km² (1,000 ha) with no motorized access. Results of the grizzly bear core area analysis indicate that the proposed Project would intersect 40 core security habitat patches for grizzly bear that are available at existing conditions, but does not cause a reduction in the number of areas above 10 km². The change in the total area of core habitat from existing conditions in the Grizzly Bear SRSA is an estimated 1% reduction as a result of the proposed Project.

The Application Corridor would traverse the proposed Grizzly Drop Wildlife Habitat Area (6-282) for approximately 5.6 km along the Cypress to Cranberry route within the Stuart and Skeena segment, and for approximately 0.5 km along the Kitsault route in the Nass and North Coast segment. The proposed Grizzly Drop Wildlife Habitat Area (WHA) corresponds to the Shenismike Corridor identified in the *Xsu gwin lik'l'inswx: West Babine Sustainable Resource Management Plan*.

Loss of individual bears could occur as a result of bears being destroyed or relocated due to bear-human conflicts. Within the Wildlife RSA, hunting (legal and illegal) is the primary human-caused mortality factor for grizzly bears. The Proponent proposes to 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 Project.

Caribou

The Application Corridor would encounter five northern ecotype woodland caribou herds: Graham, Moberly, Kennedy Siding, Scott and Wolverine. 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 five herds within the caribou RSA. 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 Moberly and Kennedy-Siding herds are in decline, while the trends for the Scott and Wolverine herds are unknown, and the Graham herd is believed to be stable. (Table 5-12).

The Graham, Moberly, Kennedy Siding and Scott herds are managed by the Province as South Peace Northern Caribou (SPNC). The Province announced goals for management of the South Peace Northern Caribou in late 2012, including increasing the population to 1200 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 SPNC herds affected by this proposed Project

The Scott and Wolverine herds are part of the Recovery Action Plan for Northern Caribou Herds in North-central BC (McNay et al. 2008). 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.

Table 5-12: Caribou population estimates and status

	Population Estimate¹	Current Population Trend	Long-term Population Trend
Graham	311	Stable	Unknown
Moberly	22	Decreasing	Decreasing
Kennedy-Siding	30	Decreasing	Decreasing
Scott	22	Unknown	Unknown
Wolverine	341	Unknown	Decreasing

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

The proposed Project would require clearing of caribou habitat and would create new linear corridors in the caribou ranges. Clearing and construction would remove arboreal lichen forage and cover habitat and may increase predator access to caribou.

Construction of the proposed Project would also potentially displace caribou from habitat as a result of sensory disturbance. Sensory disturbance effects would occur intermittently over the construction period as construction activities for the initial and second pipelines progress. Cautionary and critical timing windows restricting activities during sensitive periods for caribou ranges in the Peace Region (Graham, Moberly, Scott, Kennedy Siding) are identified by OGC. Through consultation with FLNR, recommended timing windows have been identified to minimize sensory disturbance to caribou during sensitive post-rut, spring migration and calving periods within the Wolverine caribou range.

The proposed route would avoid designated Ungulate Winter Ranges (UWR), WHAs or High Elevation Winter Range within the caribou ranges crossed, with the exception of the draft Specified Area (UWR u-7-026 and u-7-025) in the Wolverine caribou range. The intent of these draft Specified Areas is to reduce predation risk to caribou from wolves by limiting both the development of roads and trails immediately adjacent to Core Areas and the production of preferred moose browse. The proposed Project would cause approximately 198.3 ha of direct disturbance within u-7-026. The Application Corridor, but not the proposed centerline, would cross a small part (200 m) of UWR u-7-025. Compressor station K3 would be located near that draft Specified Area. The proposed Project would also cross caribou migration corridors (3 locations) and one area of influence (a buffer for disturbance effects) within the Wolverine caribou range.

The proposed Project would result in varying levels of increased functional disturbance (direct and indirect disturbance) in the caribou ranges crossed. There is little additional disturbance in the Graham range due to the Project crossing a small portion of range (45 ha), where functional disturbance is already present. Similarly, in the Moberly range the Project has a larger direct impact (310 ha) but would occur where there is existing functional disturbance. The functional disturbance in the Kennedy Siding, Scott and Wolverine herds as a result of the proposed Project is larger, from 0.3% to 0.6% of the total herd range.

Table 5-13: Functional disturbance within caribou ranges

Herd	Total Area (ha)	Existing functional disturbance		Project Case functional disturbance		
		Total (ha)	%	Incremental (ha)	Total (ha)	% Total
Graham	929,078	385,946.9	41.5	0.2	385,947.1	41.5

Herd	Total Area (ha)	Existing functional disturbance		Project Case functional disturbance		
		Total (ha)	%	Incremental (ha)	Total (ha)	% Total
Moberly	329,121	174,863.7	53.1	29.2	174,892.9	53.1
Kennedy Siding	296,159	108,909.5	36.8	923.8	109,833.3	37.1
Scott	414,939	201,816.6	48.6	2101.3	203,917.9	49.1
Wolverine	1,054,123	357,068.6	33.9	6253.0	363,321.6	34.5

Two compressor stations are proposed within caribou range: compressor station K2 is proposed within the Scott caribou range (KP 219), and compressor station K3 is proposed within the Wolverine caribou range (KP 314), each requiring a temporary work camp. Temporary construction facilities have not been finalized at the time of this assessment. Final siting of permanent and temporary facilities would avoid sensitive habitats such as caribou UWR and WHA, wherever practical. Temporary ancillary facilities (e.g., camps, stockpile sites) and access would be decommissioned and reclaimed following construction. Proposed construction camp locations, in addition to the compressor station camps, have been identified within the caribou ranges including: two within the Moberly range (KP 139 and 141); three within the Scott range (two camps at KP 219 and one at KP 252); one within the Wolverine range (KP 379).

Mitigation identified in the Application includes scheduling clearing and construction activities in caribou ranges in the Peace Region outside of identified critical timing windows, (or if unavoidable, a rationale, mitigation and/or monitoring plan must be submitted to OGC), scheduling clearing and construction activities in the Wolverine range to avoid important periods identified by FLNR and developing an Access Control Management Plan. The Proponent committed to engaging the appropriate regulatory agencies to develop strategies to reduce potential adverse effects on caribou, including the development of site-specific mitigation or offsets.

Moose

Moose populations in BC are generally considered healthy. However, recent declines in the central Omineca, Skeena and other regions of the province 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 the linear corridors created by the proposed Project could increase wolf predation on moose, as well as increase hunting pressure. Although increases in early seral vegetation associated with the Project ROW clearing may increase suitable habitat and local densities of moose, they may also increase the risk of mortality to moose.

The proposed Project would traverse two proposed UWR for moose, both within the Nass and North Coast segment: u-6-009 (primary winter range for 1.3 km and secondary winter range for approximately 3.3 km along the Nasoga route); and u-6-018 (for approximately 2.0 km along the Kitsault route). Draft General Wildlife Measures for the proposed u-6-009 are not available at this time. Draft General Wildlife Measures for the proposed UWR u-6-018 focus on retaining thermal and security cover for moose and minimizing roads within 500 m of the UWR.

Mitigations specific to moose relate to avoiding the creation of new access within moose winter range and, where this is not feasible, deactivating and reclaiming any temporary roads with native vegetation. The Proponent has committed to implementing measures to reduce access (human and predator) along these temporary roads.

Mountain Goat

The proposed Project would cause direct and indirect disturbance to mountain goat habitat. The Project has the potential to cause habitat changes that facilitate access and disturbance that displace mountain goats from preferred habitat. Operational activities such as road access use and helicopter overflights may cause disturbance of goats.

The proposed Nasoga route (Nass and North Coast segment) would traverse UWR u-6-010 for mountain goat, however the proposed tunnel along the Nasoga route would avoid UWR u-6-010, as well as the associated 500 m buffer. The General Wildlife Measures for UWR u-6-010 are intended to maintain forest and vegetation cover and reduce displacement and sensory disturbance to mountain goat.

Mitigation proposed for mountain goats includes avoiding the creation of new access to the extent feasible, and implementation of General Wildlife Measures set out in Order

UWR u-6-010 related to activity within 500 m of a mountain goat UWR, such the scheduling of all clearing and construction activities during the period of June 15 to October 31. The proposed tunnel under UWR u-6-010 would avoid disturbing habitat in the UWR and the associated 500 m buffer.

Bats

There are 10 bat species that potentially occur within the Wildlife LSA, including two species listed as Endangered by the Committee on the COSEWIC. There is limited information available regarding bat habitat, movement, population status, trends and threats, but it is expected the proposed Project could result in habitat loss to bats, through direct clearing of mature and old forest as well as sensory disturbance. The proposed Project would clear 2.9 - 3.4% of the effective habitat for bats within the LSA.

Mitigation specific to bats is focused on protecting and reducing disturbance to identified hibernacula or maternity roosts. Pre-construction wildlife surveys are proposed in the Application to identify habitat features that warrant site-specific mitigation.

Furbearers

The assessment of forest furbearers focused on marten, fisher and wolverine, as these representative species are considered environmental indicators (*i.e.*, 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 and wolverine are blue-listed (Special Concern) in the province. Fisher populations are declining and the primary long-term threat to fisher is habitat loss.

Results from the Project-specific winter tracking surveys indicate that marten/fisher were the most common mustelids identified (Wildlife and Wildlife Habitat TDR in Appendix 2-N). The highest marten/fisher track density was recorded in Upper Peace Segment (4.1 tracks/km/day). Wolverine tracks were less common and only observed in the Lower Peace Segment (0.1 tracks/km/day).

The proposed Project is likely to result in loss of effective habitat to marten and fisher. Within the LSA, the loss of effective fisher natal denning habitat would be 3.1% (Cypress to Cranberry and Kitsault route) to 3.2% (Cypress to Cranberry and Nasoga route). The loss of effective marten year-round living habitat would be 3.1% (Cypress to Cranberry and Kitsault route) to 3.4% (Cypress to Cranberry and Nasoga route). Although clearing for pipeline construction would alter habitat at the patch or feature-

level habitat scale, it is unlikely to preclude marten or fisher use of the modified habitat within the Project footprint and adjacent areas, although individuals might expend more energy to find resources. Habitat fragmentation has the potential to contribute to habitat loss if suitable habitat patches are reduced below threshold levels. Forest clearing may result in the inadvertent felling or disturbance of occupied fisher or marten dens. Human activity, including roads, infrastructure and back-country recreation can adversely affect wolverine habitat selection.

Mitigation for furbearers includes conducting pre-construction wildlife surveys to identify habitat features that warrant mitigation and reduced grubbing near watercourses, wetlands and other wet areas to facilitate reclamation of shrub communities. In addition, the proposed route parallels existing corridors and incorporates existing disturbances where practical, to reduce vegetation clearing and habitat fragmentation. Redistributing large-diameter slash (rollback) over select locations on the ROW (e.g., where high levels of coarse woody debris (CWD) is present prior to construction) is expected to reduce the potential adverse effects from the proposed Project by providing cover and facilitating the movement of furbearers. Measures to reduce the area of disturbance (particularly in riparian areas which are important movement corridors for furbearers), reduce new access and reclaim disturbed areas to natural vegetation would reduce potential adverse effects from the proposed Project on furbearers.

Birds

The Application assessed the potential effect of the proposed Project to four bird community types and eight species of concern. The bird KIs for the proposed Project include: mature/old forest birds, early seral forest birds, grassland / shrubland birds, riparian and water birds, yellow rail, rusty blackbird, common nighthawk, olive-sided flycatcher, Canada warbler, marbled murrelet, northern goshawk, and western screech-owl.

Factors that could alter bird habitat include vegetation clearing, anthropogenic noise and artificial nighttime light. As a result of vegetation clearing, earlier seral vegetation stages would replace previously forested areas along the proposed pipeline ROW until disturbed areas regenerate in the long term after decommissioning. Vegetation clearing would directly decrease available bird habitat by removing potential nesting and perch trees, and by temporarily removing grassland, shrubland and wetland vegetation and creating edge effects and sensory disturbance.

Although much of the Project footprint would be reclaimed following construction and edges would be allowed to regenerate to natural vegetation communities, portions of

the ROW would require ongoing clearing during operations to meet safety and regulatory requirements. Clearing activities would result in the long-term conversion of forest habitat to earlier seral stages (herbaceous and shrub stages). Some disturbed herbaceous, shrubby and wetland habitats would likely regenerate following reclamation in the medium-term. Reductions in habitat effectiveness associated with sensory disturbance (noise, light) at the proposed compressor and meter stations would occur continuously over the operations phase of the proposed Project. Bird species may also experience adverse effects from the proposed Project related to changes in movement and mortality risk.

Effective breeding habitat was assessed for all bird key indicators except Western screech owl which was assessed using year round living habitat. The results of habitat models indicate that for most bird KIs, the proposed Project would reduce effective nesting habitat. Where clearing of forested vegetation creates open habitats for birds that prefer these habitat types (*i.e.*, common nighthawk, grassland / shrubland birds), construction of the proposed Project would initially create additional habitat. The proportionate change in habitat for species with a relatively small area of effective habitat under existing conditions (*e.g.*, common nighthawk, marbled murrelet) is much higher than for those KIs where habitat is more readily available within the Wildlife LSA (*e.g.*, Mature / Old Forest Birds, Olive-sided Flycatcher).

Marbled murrelet is listed as Threatened under Schedule 1 of SARA and is blue-listed by the Province. Main terrestrial threats to marbled murrelet include loss and fragmentation of old-growth nesting habitat. The federal government released the Recovery Strategy for the Marbled Murrelet (*Brachyramphus marmoratus*) in Canada on June 3, 2014, which identifies critical habitat as at least 68% retention of 2002 suitable nesting habitat in the northern mainland coast region where the Project would occur. As of 2011, 97.6% of suitable habitat (420,221 ha) remained in the northern mainland coast region.

The proposed Project would cross land designated under the Mugaha Marsh Sensitive Area from approximately KP 221.6 to KP 222.8. Mugaha Marsh was designated as a Sensitive Area due to its local significance for wildlife habitat values and wildlife viewing and is an important stopover for migrating birds.

The Proponent intends to avoid disturbance to Mugaha Marsh by drilling under it if possible (pending further feasibility studies). The contingency crossing method is conventional trench installation during winter.

The Application Corridor would cross habitat for both the coastal and interior subspecies of northern goshawk, including the North Coast Northern Goshawk Recovery Region (coastal subspecies). The coastal subspecies is red-listed in BC with a Conservation Framework Priority of 1 and federally-listed as Threatened on Schedule 1 of SARA. The North Coast region contains approximately 47% of the *coastal subspecies* habitat in BC and an estimated 70-75 breeding pairs. The recovery strategy and management plan objectives for the northern goshawk coastal subspecies in BC are to manage, conserve and recover northern goshawk habitat, and recover a well-distributed and viable population. The interior subspecies is listed as not at risk federally, and has not been assessed provincially.

Mitigation for birds include conducting pre-construction wildlife surveys to identify habitat features that warrant mitigation and reduced grubbing near watercourses, wetlands and other wet areas to facilitate reclamation of shrub communities. In addition, the proposed route parallels existing corridors and incorporates existing disturbances where practical, to reduce vegetation clearing and habitat fragmentation. Mitigation also includes scheduling clearing and construction activities outside the migratory bird nesting period of May 1 to July 31 where feasible, or conducting migratory bird nest sweeps, as well as reducing the Project footprint and fragmentation to the extent feasible.

Amphibians

The amphibian KIs for the proposed Project include: pond-dwelling amphibians, western toad, northwestern salamander and coastal tailed frog. 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 proposed Project would interact with amphibian indicators via all three of the identified effect pathways, including changes in habitat, changes in movement and increased risk of mortality. Construction and operations of the proposed Project would create new forest clearing, increase the existing corridor width where existing ROWs are paralleled, remove potential site-specific habitat features (e.g., coarse woody debris, small mammal burrows used as daily retreats or for hibernation), and require ongoing clearing as part of vegetation management during operations. Sensory disturbance associated with the proposed compressor and meter stations (artificial light, noise) may adversely affect amphibians in proximity to these developments. Mortality risk for amphibians resulting from the proposed Project is primarily associated with the construction phase.

Construction of the proposed Project may create barriers to amphibian movement (e.g., spoil piles, brush piles, traffic, strung pipe, open trench), depending upon the location relative to breeding and upland habitats, and the season of construction. The extent of amphibian movement across the landscape varies between species. Pond-dwelling amphibians may stay in or near the same waterbody during their lifetime, or may migrate seasonally.

Amphibian species that inhabit Mugaha Marsh include long-toed salamander, western toad, spotted frog, wood frog, and western toad.

The proposed Project would increase the risk of amphibian mortality. Effect pathways include heavy machinery and vehicle traffic, predation risk, creation of artificial ponds and reduced water quality (e.g., sedimentation). Site clearing, watercourse crossings and vehicle traffic would potentially increase the mortality risk for pond-dwelling amphibians during construction and operations (e.g., site-specific maintenance activities).

Mitigation proposed for amphibians include implementation of best management practices for pond-dwelling amphibians such as preserving wetlands, maintaining natural hydrology, maintaining sufficient terrestrial habitat (and access to it) for amphibians to complete all life history phases, mitigating road mortality and reducing the spread of introduced species.

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 proposed by the Proponent include:

- Where practical, the proposed route would parallel existing linear developments and avoids construction of new access (i.e., use existing access) to reduce the fragmentation of habitat patches.
- Deactivate and reclaim all temporary construction access roads, as identified in applicable agreements or regulatory direction.
- Implement measures to reduce access (human and predator) along the pipeline ROW following construction. Measures include using CWD as rollback, mounding, planting trees and/or shrubs for visual screens, and rock piles or berms across the ROW.

- Conduct pre-construction wildlife surveys at selected locations to be determined based on final routing, consultation, previous field work and habitat suitability (e.g., identify habitat features and implement the appropriate setbacks and/or timing windows).
- Implement appropriate vegetation management on a site specific basis as required. For example, in caribou range (particularly Specified Areas) the enhancement of moose winter browse species (red-osier dogwood, willow, paper birch, trembling aspen) should be avoided, while in other areas, such as the NWA, allowing growth of these species would contribute favorably to moose habitat suitability.
- Comply with appropriate regulatory guidelines related to noise during construction and operation of facilities to minimize disturbance related to noise.
- Ensure that noise abatement equipment on machinery is in good working order.

5.9.3 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. These issues and the responses of the Proponent and/or EAO are summarized below.

General Issues and Concerns

To clarify how the wildlife assessment calculated the habitat effects and mortality impacts, some working group members had questions regarding the size of the footprint that was used in the assessment; including the spatial extent of footprint used to quantify Project effects, use of qualitative assessments, how the effects of features not included in the footprint assessment, such as new access roads and wildlife features not identified in baseline surveys, would be identified and assessed, and the use of Survey Intensity Levels (SiL 5) level of survey detail for development of TEM and suitability models used for effects assessment. Validation of suitability models and pre-clearing surveys were requested by some Aboriginal Groups and regulators, related to the limited ground and full plots used in the SiL 5 survey level.

The Proponent responded that spatial information for permanent access roads associated with the proposed compressor stations is available and was included in the proposed Project footprint for quantitative analyses. However, the final locations of temporary and permanent roads required to access the proposed pipeline ROW for construction and operations have not yet been determined. Therefore, these access roads are considered qualitatively in the assessment of wildlife Key Indicators, under the assumption that temporary and permanent

access (for operational access to the right-of-way) would primarily use existing access requiring minimal upgrading. It is acknowledged that substantial upgrades of existing access may be required in some locations, and development of new access may be required to facilitate construction. This technical boundary primarily affects quantitative analyses of changes in habitat suitability and linear density metrics.

An Access Management Plan would be developed for the Project that would identify access to/from the pipeline ROW, permanent and temporary roads, as well as mitigation measures to be implemented for access. Access control measures would be implemented to deter unauthorized motorized access on the proposed pipeline ROW and access during the construction and operations phases. Details of the Access Management Plan would be developed in consultation with the appropriate regulatory agencies and communities during the permitting phase of the Project. The Proponent would implement a monitoring program, to support the implementation of an adaptive management program to ensure efficacy of access control mitigation.

The Proponent responded that the guidance provided in the Standards for Terrestrial Ecosystem Mapping in British Columbia indicates that survey intensity should be determined by the project objectives and the proposed use of the mapping (Resources Inventory Standards Committee [RISC] 1998). The TEM standards also provide guidance on selecting survey level intensity which includes the size of the study area in hectares, mapping scale and some examples of the type of interpretation which can be provided by mapping at various levels of survey intensity. In addition, the Terrestrial Ecosystem Mapping (TEM) standards note that survey intensity level is not always related to scale and that any intensity level can be conducted at any scale (RISC 1998). The interpretation examples provided to guide SiL do not include environmental impact assessment. However, the interpretation examples provided for level 4 and level 5 are the same (i.e. Forestry, wildlife capability; ecosystem, representation; general forest productivity; local resource planning; landscape, management planning). Intensity level 5 is sufficient to support the objectives of the environmental assessment. Additional vegetation surveys would be conducted prior to construction.

Several Working Group members raised questions and concerns with regards to how permanent facilities, including compressor stations and meter stations, were accounted for in the effects characterization. Concerns were raised that compressor stations would result in long-term disturbance of environmental values, particularly wildlife habitat.

Halfway River First Nation requested that compressor stations be re-located to avoid caribou range.

The Proponent noted that all compressor stations would be fenced. Fencing access to compressors would create unnecessary barriers to wildlife movement; therefore, the Proponent does not intend to fence the existing access that would be used to access the proposed K2 (Scott caribou range) and K3 (Wolverine caribou range) compressor stations for construction and operation. The Proponent would implement the mitigation proposed in Table 4.8-8 in section 4.8.6 of the Application to reduce the Project's potential residual effect on wildlife movement and risk of wildlife mortality on access to Project facilities.

The Proponent is committed to working with the appropriate provincial regulatory agencies to develop additional mitigation strategies to reduce the potential adverse effects of the proposed Project on caribou. Examples of strategies may include the development of site-specific mitigation or offsets, such as a Monitoring Plan, Linear Feature Management and Removal Plan, Caribou Habitat Restoration Plan, or financial support for research that contributes to conservation of caribou.

EAO proposes a condition that would require the Proponent to develop a plan that would capture all relevant wildlife mitigation set out in Appendix 3A of the Application, as well as the Environmental Management Plan in one document. EAO has also proposed 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.

Working Group members, notably FLNR, Nak'azdli Band and several other Aboriginal Groups, raised concerns about the creation of new access into wildlife habitat, which could result in increased disturbance and human and predator access to caribou habitat, and increased access for hunters to moose habitat.

The Proponent committed to developing an Access Management Plan and Traffic Management Plan. The Access Management Plan would identify access to/from the pipeline ROW, permanent and temporary roads, as well as mitigation measures to be implemented for access. The Access Management Plan would provide guidelines for blocking and controlling access to previously inaccessible portions of the ROW post-construction, with the objectives of controlling public access along the ROW, reducing line-of-sight and ease of access along the ROW for natural predators, hunters and anglers, and reducing disturbance to

high quality, sensitive wildlife habitat. Details of the Access Management Plan would be developed in consultation with the appropriate regulatory agencies and Aboriginal Groups during the permitting phase of the Project. The Proponent would also implement a monitoring program to support the implementation of an adaptive management program to ensure efficacy of access control mitigation.

EAO proposes a condition requiring development of an Access Management Plan as well as specific Caribou and Grizzly Bear Mitigation and Monitoring Plans, and a plan capturing mitigation for wildlife, including monitoring of mitigation for moose.

Many Working Group members, including several Aboriginal Groups, raised concerns about the baseline data used in the assessment and that reliance on existing data may have affected the level of confidence regarding significance determination for mammals. Furthermore, clarification was requested with regards to how potential fine scale key habitat areas such as hibernacula or roost sites were identified in baseline studies or habitat mapping.

The Proponent committed to completing appropriate pre-construction surveys to identify site-specific habitat features that may warrant mitigation. In addition, the Proponent would engage the appropriate provincial regulatory agencies and Aboriginal Groups to develop mitigation and strategies to reduce the residual adverse effects of the proposed Project and contribution to cumulative effects on specific wildlife and habitats, including grizzly bear and caribou.

The Proponent would also develop monitoring programs in consultation with the appropriate regulatory agencies, and encouraged participants of the Working Group to identify site-specific locations of concern that could be used to inform pre-construction surveys and mitigation planning. The monitoring program would incorporate measurable parameters to support the implementation of adaptive management measures. Implementation of the compliance and monitoring programs would be expected to reduce uncertainty associated with the assessment of potential adverse effects of the proposed Project. The proposed mitigation and monitoring programs would be refined as the Project progresses through detailed engineering and construction planning.

EAO proposes a condition requiring the development of a plan capturing all relevant wildlife mitigation set out in Appendix 3A of the Application, including pre-construction surveys, site-specific mitigation and repeated post-construction effectiveness monitoring as components of the plan.

Blueberry River First Nations and other Working Group members 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.

The Proponent committed to completing a Post Construction Monitoring Plan, and acknowledged that if monitoring resulted in the need for further action, the Proponent would work with the appropriate regulatory authorities to implement an adaptive management approach.

EAO proposes conditions that would require:

- The development and implementation of a Post-Construction Monitoring Program as part of the EMP;
- Consultation on the development of the EMP and other proposed plans with Aboriginal Groups;
- Specific mitigation and monitoring plans for grizzly bear and caribou, which would require a monitoring program, reporting out on the effectiveness of mitigation, and an adaptive management approach; and
- A plan to provide specific information on how and when mitigation measures for wildlife would be implemented throughout the life of the Project, as well as provide a monitoring program to assess the effectiveness of mitigation for moose populations in the Project corridor during construction and operations.

Concerns were raised by FLNR and several Aboriginal Groups about the current status of moose populations and potential impacts to moose from the proposed Project, particularly due to recent population declines and potential effects resulting from increased access and the potential for an increase in hunting. Moose have declined significantly across northern BC over the past decade and cumulative impacts are a concern.

The Proponent acknowledges that hunting pressures could be elevated in areas where linear corridors facilitate motorized access and that hunting could be a key factor for mortality of moose. Mitigation to limit access would reduce the proposed Project's residual effect on moose mortality risk associated with hunting. New access for the proposed Project would be limited by using existing

access wherever feasible and temporary access would be decommissioned and reclaimed following construction.

The Proponent commits to the development of an Access Management Plan for the proposed Project that would identify access to/from the pipeline ROW, permanent and temporary roads, and mitigation measures specific to access. Between construction periods for the initial pipeline and the second pipeline, if and when constructed, temporary roads would be reviewed and the appropriate level of deactivation implemented based on the results of consultation and their location. Upon completion of the Project construction phase, temporary roads would be deactivated. The Proponent would monitor access control measures and implement additional or alternate measures, where warranted, to ensure effectiveness of the mitigation.

EAO proposes a condition requiring the development of an Access Management Plan and a plan for wildlife mitigation including a requirement to assess the effectiveness of the mitigation for moose populations. A condition specific to moose in the NWA is also proposed, requiring mitigation and monitoring.

Caribou

Potential effects to caribou were highlighted by a number of working group members, including:

- EC noted that there is the potential for the proposed Project to destroy critical habitat of the southern mountain caribou (SMC) population. To avoid destruction of SMC critical habitat, EC recommended avoidance of all activities likely to destroy SMC critical habitat as defined in the final Recovery Strategy. For example, alternative means for pipeline construction and operation (i.e. re-routing, tunnelling, etc.) could potentially avoid southern SMC critical habitat if proposed.
- FLNR and several Aboriginal Groups raised concerns about the effects on caribou, in particular the loss of important habitat for caribou, increased access into herd range and the potential for disturbance and movement disruption between seasonal habitats. FLNR noted that many of the herds have well understood movement patterns and it is unclear how the pipeline and associated compressor stations would affect those patterns. In the Wolverine herd the pipeline bisects the herd range and separates an important calving area from the general winter range. Additionally the K3 compressor station is situated in close proximity to a known post-rut aggregation area.

- Several Aboriginal Groups raised concerns about the status of caribou and future ability to practice Treaty or Aboriginal rights to hunt. Blueberry River First Nations requested to be consulted on the development of a caribou monitoring plan. Treaty 8 First Nations raised concerns about the proposed pipeline route through caribou habitat and the potential for increased poaching and resource extraction pressure, and highlighted the need for a comprehensive access management plan.

The Proponent acknowledged that further mitigation would be required to mitigate impacts to caribou. The Proponent has committed to the development of site-specific mitigation strategies in caribou ranges, including detailed information on locations for line-of-sight mitigation and monitoring. The Proponent further commits to working with regulatory agencies to develop and implement appropriate mitigation in alignment with caribou recovery objectives and initiatives.

- Many Aboriginal Groups have raised concerns that the Application did not consider that caribou occur throughout their lands in low density (because they are not captured by the provincially identified caribou ranges), and that these caribou were historically harvested and are of cultural importance.

The Proponent responded that the assessment used the available spatial boundaries (i.e., caribou ranges), which are considered the appropriate scale at which to assess potential effects. The proposed mitigation in section 4.8.6 would be applied outside of caribou ranges to reduce the residual effect of incremental linear disturbance. The Proponent encouraged Working Group members to identify site-specific locations where additional mitigation may be warranted. The Proponent would work with the appropriate provincial regulatory authorities to develop an appropriate mitigation strategy for caribou.

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; however, habitat protection alone is not sufficient to support caribou recovery, as mortality risk also needs to be managed. 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. As identified in the June 2014 federal recovery strategy, existing mapping shows that the proposed Project may overlap a small section of critical habitat for the Kennedy-Siding herd around KP 198. 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 overlap with a draft Specified Area in the Wolverine herd, being considered to reduce predation risk to caribou from wolves by limiting both the development of roads and trails immediately adjacent to Core Areas and the production of preferred moose browse.

The proposed Project would cross areas that may potentially be used for the Peace caribou herds 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. The proposed Project would cross known migration routes in the Wolverine herd range. 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 presiding 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. 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 to support the ongoing recovery, conservation and management of caribou populations potentially affected by the proposed Project.

Grizzly Bear

Concerns in relation to the effects of the proposed Project, including increased access, on grizzly bear, and the lack of identified offsetting and monitoring commitments, were raised by several working group members; FLNR in particular notes that further information would be required at the sub-population level to assess the risk to breeding females (the limiting factor in grizzly bear productivity). EAO is taking a conservative approach to requiring mitigation and monitoring for grizzly bear, given the uncertainty in the potential effects. This approach would include long term monitoring to evaluate the effectiveness of mitigation.

The Proponent responded that it recognizes that the estimated current motorized access density in the Omineca and Cranberry GBPU is approaching the 0.6 km/km² threshold and that the proposed Project and foreseeable future developments would contribute to the cumulative effect. Therefore, they have committed to engaging the appropriate provincial regulatory agencies to develop strategies to mitigate and monitor the residual adverse effects of the proposed Project, including contributions to cumulative effects, on grizzly bear. Examples of strategies may include the development of site-specific mitigation or offsets, such as a Monitoring Plan, Linear Feature Management and Removal Plan, or financial support for research that contributes to conservation of grizzly bear.

EAO proposes a condition that would require the development of a Grizzly Bear Mitigation and Monitoring Plan that 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 a Grizzly Bear Program to support the conservation and management of grizzly bears.

Marbled Murrelet

Environment Canada (EC) has identified the recovery strategy for marbled murrelet and its description and targets for critical habitat. EC 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

EC 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.

EAO proposes a condition requiring a plan capturing all relevant wildlife mitigation set out in Appendix 3A of the Application, including pre-construction surveys, site-specific mitigation and repeated post-construction effectiveness monitoring as components of the plan.

5.9.4 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 and wildlife habitat, as well as the EAO's determination of significance based on the residual effects characterization.

Criteria	Assessment Rating	Rationale
Context	<p>Grizzly bear: High</p> <p>Caribou: High</p> <p>Moose: Moderate</p> <p>Mountain goat: Moderate</p>	<p>Grizzly Bear are highly sensitive to human disturbance. Existing average linear disturbance within the SRSA in the GBPU's in the eastern portion of the proposed Project currently exceeds or is approaching the FLNR-recommended road density threshold of 0.6 km/km². The GBPU's that would be traversed by the Project are not considered threatened.</p> <p>Caribou herds that would be affected by the proposed Project are part of a population unit listed as threatened under SARA. Caribou are highly sensitive to human disturbance and some subpopulations have high levels of disturbance currently within their ranges. Caribou have a low resiliency to disturbance.</p> <p>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.</p> <p>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.</p>

Criteria	Assessment Rating	Rationale
	<p>Marten: Low Fisher: Moderate</p> <p>Bats: Low to High</p> <p>Birds: Low to High Amphibians: Low to High</p>	<p>Furbearers: Marten is not a species of conservation concern provincially or federally and has a low sensitivity to human caused disturbance. Fisher and wolverine have a moderate to high sensitivity to human disturbance as they use mature and old forests have large home ranges and low reproductive rates.</p> <p>The sensitivity of bat populations in the vicinity of the proposed Project is difficult to determine as there is limited information available regarding bat habitat, movement, population status, trends and threats. Some bats species may be sensitive to disturbance of mature and old forest roosting and foraging habitat, while other species use clearings, meadows, wetlands and other openings including forest edges for foraging.</p> <p>The sensitivity of bird and amphibian indicator species ranges from low to high depending on their ability to use disturbed habitat, their reliance on early vs. late seral stage habitat and their current population status.</p>
Magnitude	<p>Grizzly bear: Medium</p> <p>Caribou: Medium to High</p>	<p>The magnitude of potential effects to grizzly bear is considered medium because of the proposed Project's contributions to linear density. Although the proposed Project does not cause the threshold of 0.6 km/km² to be exceeded at the SRSA scale for any GBPUs, localized increases in linear density to above 0.6 km/km² would occur, as well as further increases where density already exceed 0.6 km/km².</p> <p>The magnitude to caribou is considered medium to high because of the potential for enhanced predator access to caribou. EAO considered the</p>

Criteria	Assessment Rating	Rationale
		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, particularly when the proposed pipeline corridor comes between critical habitat and matrix habitat used in different seasons and creates the potential for disruption of movements among critical habitats. 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.
	Mountain Goat: Low to Medium	The magnitude of potential residual effects to mountain goat are considered low - medium because the potential for clearing in a designated UWR for mountain goat would be mitigated by the proposed tunneling under the UWR.
	Moose: Low to medium	The magnitude of potential residual effects to moose are considered low to medium 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 NWA are considered to be medium because of the substantial declines that have already occurred.
	Furbearers: Low	The magnitude of potential residual effects to furbearers is considered low because of the

Criteria	Assessment Rating	Rationale
	Bats: Low Amphibians: Low Birds: Low/negligible	<p>amount of habitat disturbance in the LSA and the mitigation proposed to minimize habitat disturbance and fragmentation and create rollbacks to provide cover are expected to reduce the potential effects.</p> <p>The magnitude of potential residual effects to bats, amphibians and birds is considered low because of the amount of habitat disturbance in the LSA and the mitigation proposed to minimize habitat disturbance and fragmentation is expected to reduce the potential residual adverse effects.</p>
Extent	<p>Local (LSA): bats, Amphibians, birds, furbearers (marten)</p> <p>Regional (RSA): grizzly bear, caribou, moose, mountain goat, furbearers (fisher, wolverine)</p>	Residual effects of alteration of habitat, effects on movement and mortality risk would be limited to the LSA for most VCs, except for large mammals and some furbearers where residual effects for mortality risk and disturbance may extend to a regional scale (RSA).
Duration	Medium to Long term	<p>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 waterbirds would occur in a shorter time frame, however, habitat alteration would be long term considering the length of the construction phase (>10 years) and the subsequent time for regeneration after reclamation.</p> <p>Residual effects on large mammals from increased access by humans and predators are</p>

Criteria	Assessment Rating	Rationale
		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 potentially occur twice and clearing for maintenance activities would occur periodically. Mortality risk from construction would occur potentially occur twice 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 is highly likely to result 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.	
Grizzly bear	EAO considered the medium 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 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.	
Caribou	EAO considered the medium to high magnitude and long-term duration	

Criteria	Assessment Rating	Rationale
		of potential residual effects on caribou. An important aspect of EAO's consideration is the context of 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 will 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.
Mountain Goat		The EAO considered the medium magnitude of potential residual effects on mountain goat, and the potential long term duration of those effects. With the proponent's proposed mitigations, as well as a condition requiring development and implementation of a plan for wildlife mitigation including pre-construction surveys and site-specific mitigation, EAO concludes that residual adverse effects would be not significant.
Moose		The EAO considered the low to medium magnitude of potential 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 an access management plan, and a plan for wildlife mitigation, EAO concludes that residual effects would be not significant.
Furbearers Birds Bats Amphibians		EAO considered the low magnitude of potential residual adverse effects on the remaining wildlife key indicators and medium 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.
Grizzly Bear		There is low to moderate 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 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

Criteria	Assessment Rating	Rationale
		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 proposes conditions requiring the Proponent to develop a mitigation and monitoring plan for grizzly bear that includes an adaptive management strategy, and requires the Proponent to participate in a program to support the conservation and management of regional grizzly bear populations.
Caribou		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. In light of this uncertainty, EAO proposes conditions requiring the Proponent to develop a mitigation and monitoring plan for caribou that includes an adaptive management strategy and requires the Proponent to participate in a program to support the conservation and management of regional caribou populations.
Mountain Goat		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.
Moose		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. In addition, an access management plan is proposed as a condition with requirements for monitoring the effectiveness of the plan.

Criteria	Assessment Rating	Rationale
Furbearers		There is high confidence in the significance determination for furbearers based on a good understanding of the cause-effect relationship and data pertinent to the proposed Project area.
Bats		There is moderate confidence in the significance determination for bats , based on the limited research and literature available to understand the effects of the Project on bats and incomplete data pertinent to the proposed Project area, but high confidence in the mitigation proposed to identify and reduce potential effects on habitat features for bats.
Amphibians		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 is limited data related to hibernation habitat for western toad and effects to hibernating pond-dwelling amphibians.
Birds		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.

5.9.5 Cumulative Effects Assessment

Cumulative effects are expected to occur for wildlife key indicators as a result of the impacts of this proposed Project together with existing and reasonably foreseeable future activities and disturbances.

Existing habitat disturbance has affected approximately 9.3% of the Wildlife RSA. The combined Project and foreseeable developments are predicted to contribute approximately 46,322.2 ha (Kitsault route) or 46,669.0 ha (Nasoga route) of disturbance within the Wildlife RSA, which would act cumulatively with existing disturbance to affect approximately 11% of the Wildlife RSA (both Kitsault and Nasoga routes). The Application states that most of the observed critical thresholds for cumulative habitat loss occur between 50% and 90% loss of functional habitat loss at the landscape (regional) scale for most species, and cumulative effects risk is highest above 70% regional habitat loss. The predicted proportion of disturbed habitat in the Wildlife RSA

under cumulative conditions (11%) is well below this level.

- In addition to proposed mitigation, the Proponent would engage the appropriate provincial regulatory agencies to develop strategies to reduce the cumulative residual adverse effects of the proposed Project on specific wildlife and habitats, including grizzly bear, caribou, Nass moose and Marbled Murrelet critical habitat. Examples of strategies may include the development of site-specific mitigation or offsets, such as: Monitoring Plan – collection of data before, during and following construction of the proposed Project that will allow for improved mitigation implementation, evaluation of mitigation effectiveness, and a basis for development of adaptive measures, where warranted;
- Linear Feature Management and Removal Plan – measures developed with a goal of no net increase in linear feature density in selected sensitive areas for caribou, grizzly bear and Nass moose;
- Caribou Habitat Restoration Plan – measures developed that enhance restoration of habitat disturbed by the proposed Project within caribou range; and
- Financial support for research that contributes to conservation of species at risk affected by the proposed Project (e.g., caribou, grizzly bear).

Grizzly Bear

The change in total area of core security habitat as a result of the proposed Project and reasonable foreseeable developments is a 2.7% reduction; however the overall number of core areas above 10km² would not decrease.

The predicted cumulative contribution of the proposed Project and reasonably foreseeable developments to motorized access density would cause the average densities in the SRSA to increase in all units, including causing the SRSA in the Omineca and Cranberry GBPU to approach the 0.6 km/km² threshold, and resulting in further increases in the Rocky, Moberly and Hart GBPU that are already exceeding 0.6 km/km².

Table 5-14: Predicted change in motorized access density from existing conditions to cumulative conditions in the grizzly bear sub regional study area

GBPU	Route	Existing Conditions	Cumulative Conditions	
		Average Density (km/km ²)	Average Density (km/km ²)	% Change from Existing Conditions
Rocky	Cypress to Cranberry	1.32	1.37	3.8 ↑
Moberly	Cypress to Cranberry	0.75	0.80	6.4 ↑

GBPU	Route	Existing Conditions	Cumulative Conditions	
		Average Density (km/km ²)	Average Density (km/km ²)	% Change from Existing Conditions
Hart	Cypress to Cranberry	0.80	0.81	0.5 ↑
Omineca	Cypress to Cranberry	0.56	0.59	5.6 ↑
Babine	Cypress to Cranberry	0.34	0.37	7.6 ↑
Cranberry	Cypress to Cranberry + Kitsault	0.54	0.58	7.7 ↑
	Cypress to Cranberry + Nasoga	0.54	0.58	8.1 ↑
Stewart	Cypress to Cranberry + Kitsault	0.19	0.21	12.3 ↑
	Cypress to Cranberry + Nasoga	0.19	0.20	5.4 ↑
Khutzymateen	Kitsault	0.26	0.30	14.8 ↑
Khutzymateen	Nasoga	0.26	0.32	22.7 ↑

EAO agreed with the Proponent that additional mitigation to address Project effects, including contributions to cumulative effects, would be warranted to mitigate effects. Accordingly, EAO proposes a condition that would require the Proponent to develop a grizzly bear mitigation and monitoring plan.

The magnitude of residual cumulative effects to grizzly bear are considered medium and effects of the proposed Project interacting with future projects and activities could extend throughout the GBPU. 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 will occur. 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 (Wolverine, Graham) and very high for the Central Group (Moberly/Klinse-Za, Kennedy-Siding, and Scott).

The existing average corridor density indicates the Graham, Moberly and Scott ranges currently are within a moderate risk window for caribou persistence. The Kennedy Siding and Wolverine ranges have corridor densities in the low risk category. The proposed Project and reasonably foreseeable developments will interact with the existing linear developments in the Caribou RSA to increase the average corridor density in all of the caribou ranges crossed by the Application Corridor. Localized effects within the ranges would occur; however, the magnitude of the incremental cumulative effect is negligible (less than 0.1%) at the Caribou RSA scale.

Overall, the cumulative contribution of the proposed Project and foreseeable developments will cause an additional 1% to 5.6% of functional disturbance in caribou ranges (*Table 5-15*).

Table 5-15: Total functional disturbance in caribou herd ranges

Caribou Herd	Total Area (ha)	Existing Functional Disturbance		Cumulative Case Functional Disturbance	
		Ha	%	Ha	%
Graham	929,078	385,946.9	41.5	393,215.2	42.3
Moberly	329,121	174,863.7	53.1	193,454.2	58.8
Kennedy Siding	296,159	108,909.5	36.8	110,673.8	37.4
Scott	414,939	201,816.6	48.6	209,362.0	50.5
Wolverine	1,054,123	357,068.6	33.9	404,049.8	38.3

A requirement for a Caribou Mitigation and Monitoring Plan is proposed as a condition to detail site-specific mitigation, monitoring and adaptive management approach. The Proponent would also be required to provide a monetary amount 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. Taking into account the effects from existing projects and activities to caribou, the status of caribou and the sensitivity of caribou to further disturbance, cumulative effects to caribou are considered to be significant.

Moose in the Nass Wildlife Area

The proposed Project would affect 0.2% (Nasoga route) to 0.4% (Kitsault route) of the high value moose winter range in the NWA available under existing conditions. Foreseeable developments will combine with the proposed Project to cause a cumulative reduction of 1.2% (Nasoga route) to 1.3% (Kitsault route) of high value moose winter range available in the NWA under existing conditions.

The portion of the RSA in the NWA corresponds to the Nass and North Coast segment of the Wildlife RSA. A separate corridor density analysis was also completed for the full extent of the NWA. As expected given the largely undisturbed areas within the larger study area of the NWA, the existing corridor density and proportionate change resulting from the proposed Project and foreseeable developments is smaller than estimated within the Wildlife RSA.

A requirement for a Moose Mitigation and Monitoring Plan is proposed as a condition to assess site-specific habitat use, effectiveness of access and habitat mitigation, and to identify an adaptive management approach for effects to moose.

The residual effects of habitat disturbance, sensory disturbance and creation of access from the proposed Project would likely interact with reasonably foreseeable future projects to create cumulative effects. Taking into account the residual project effects and the sensitivity of moose to further disturbance, cumulative effects to moose are considered to be not significant.

Other Wildlife Key Indicators

Predicted cumulative habitat loss and cumulative effects to mortality risk and change in movement for the remaining wildlife key indicators are expected to be of a low to medium magnitude. Predicted change in habitat from existing conditions is minimal (<5%) for most key indicators and does not exceed 15% for any key indicators. It is expected that future projects would be required to implement similar measures to

mitigate effects to habitat, mortality risk and movement. Cumulative effects to the remaining wildlife key indicators are not likely to be 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), the magnitude of the effects from the proposed Project and the extent of habitat disturbance within the RSA 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 caribou. EAO concludes that residual Project effects to caribou and cumulative effects to caribou are significant.

5.10 Terrestrial Vegetation

5.10.1 Background

The potential for the proposed Project to adversely affect vegetation was assessed in terms of potential effects on the following key indicators:

- Plant Species at Risk or of Special Management Concern⁹
- Ecosystem Effects
- Ecosystems at Risk
- Invasive Plant Species

The Vegetation LSA is as a 400 m wide corridor centered on the proposed route. The RSA is a 2 km wide corridor. The LSA crosses a variety of habitat types, including mixed wood, coniferous and deciduous forests, wetlands cultivation, riparian areas and lacustrine environments. It encounters eight biogeoclimatic zones:

- Boreal White and Black Spruce
- Sub Boreal Spruce
- Englemann Spruce-Subalpine Fir
- Interior Cedar Hemlock
- Mountain Hemlock
- Coastal Mountain-heather Alpine
- Coastal Western Hemlock
- Boreal Altai Fescue Alpine

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

The Proponent used a combination of desktop analysis, TEM, and vegetation field surveys to collect information on the existing terrestrial vegetation communities. Field surveys included: general aerial reconnaissance; early season and late season rare plant (vascular and non-vascular) and rare ecological community surveys; non-native, invasive plant surveys; and TEM field inspections.

Most of the native vegetation within the LSA is forested. Over the last decade, forest pests including mountain pine beetle, spruce beetle and Douglas-fir beetle, have

⁹ Species of special management interest include species that are important for recreation, cultural or traditional use and commercially important plant species.

become an increasing concern. The proposed Project would cross large areas that have been affected by the mountain pine beetle epidemic. The salvage operations of beetle-killed trees are changing vegetation across the Central Interior and converting entire landscapes to early seral plant communities.

The potential effects of the proposed Project on vegetation include changes in vegetation structure and function as a result of clearing prior to construction, operation and decommissioning of the Project.

Plant Species at Risk or of Special Management Interest

Plant species at risk within the LSA include vascular, nonvascular and lichen species that are listed on Schedule 1 of the federal SARA and on the provincial red (threatened) or blue (special concern) lists. A total of 636 plant species at risk (265 red-listed and 371 blue-listed species) were noted by the Proponent as having the potential to occur within the RSA. Approximately 122 km of the Application Corridor was surveyed for rare plants and rare ecological communities.

The potential effects of the proposed Project on vegetation would include:

- Alteration of an occurrence of a plant species at risk, either directly or indirectly due to changes in light levels or hydrology.
- Indirectly affected occurrences of potential habitat for federally listed plant species at risk that may be adjacent to the construction footprint due to changes in light levels or hydrology.

No federally-listed species were observed during the surveys for the proposed Project. However, five red-listed and 11 blue-listed plant species were observed within the Project footprint during the early and late season vegetation surveys.

Ecosystem Effects and Ecosystems and Risk

Ecosystem effects include effects on native vegetation communities and uncommon or unique ecosystem elements (such as grasslands and subalpine/alpine communities) as well as western red cedar and yellow-cedar dominated communities within the Application Corridor. The identification of the vegetation communities (variants) most affected along the Project Footprint investigates which communities occur more frequently than other vegetation communities in the Terrestrial Vegetation RSA. These communities will be disproportionately affected by construction and maintenance activities, and provide a focused discussion of the potential adverse effects on particular

native vegetation communities.

Alpine and subalpine plant communities experience harsh winters and short and cold growing seasons, which result in shrubs, mosses, lichens and herbs that are small, close to the ground and separated by bare soil, rock, ice or snow. As a consequence, subalpine and alpine communities are slow to establish and very susceptible to disturbance.

Western red cedar and yellow-cedar have been identified by the Nisga'a as a species of interest, given their important cultural value, and are therefore considered through the assessment of ecosystem effects.

Ecosystems at risk include ecological communities that are listed on the provincial Conservation Data Centre red or blue lists, OGMAs, non-spatial (i.e. aspatial) old growth areas and interior forest, as well as ecological communities identified in land resource management plans as having conservation concern, that are impacted by the Application footprint. Ecosystems at risk that could occur in the RSA were identified and a total of 18 red-listed ecological communities and 66 blue-listed ecological communities have the potential to occur within the RSA.

Pine mushrooms have been identified as an important economic resource by Nisga'a Nation, Aboriginal Groups and local residents. Potential pine mushroom habitat was identified as occurring within four site series crossed by the Application Corridor.

The Proponent identified and assessed the following potential residual effects of the Project on ecosystems and ecosystems and risk, occurring after the application of mitigation measures:

- Alteration of native vegetation, as well as western red cedar / yellow-cedar-dominated habitat, subalpine / alpine, grasslands, either directly or indirectly due to changes in light levels or hydrology;
- Alteration of up to approximately 6.4% of a variant;
- Alteration of ecosystems of concern, such as ecosystems at risk, old growth forest, or pine mushroom habitat either directly or indirectly due to changes in light levels or hydrology;
- Spread of forest pests; and
- The introduction and spread of invasive plant species.

The Project footprint is predicted to traverse approximately:

- 21 OGMAs, including 115ha of legal and 45 ha of non-legal OGMA on the

Cypress to Cranberry / Kitsault route and 135 ha of legal and 16 ha of non-legal OGMA on the Cypress to Cranberry and Nasoga route;

- 1707 ha of potential old growth on the combined Cypress to Cranberry/Kitsault route, and 1719 ha of potential old growth on the combined Cypress to Cranberry/Nasoga route. (The Application notes these TEM-identified areas of potential old growth are based on Vegetation Resource Inventory data and are likely overestimates of the area of actual old growth forest.)
- 163 ha (Cypress to Cranberry / Nasoga route) to 210 ha (Cypress to Cranberry / Kitsault Route) of potential pine mushroom habitat;
- 47 ha (Cypress to Cranberry / Nasoga route) to 108 ha (Cypress to Cranberry / Kitsault Route) of subalpine/alpine habitat;
- 16 ha (Cypress to Cranberry / Nasoga route) to 22 ha (Cypress to Cranberry / Kitsault Route) of grassland habitat;
- 147 ha (Cypress to Cranberry / Kitsault route) to 323 ha of western red cedar and yellow-cedar (Cypress to Cranberry / Nasoga route); and
- Four red-listed and 23 blue-listed ecological communities as observed during the early and late-season vegetation surveys.

The Application Corridor would also cross three non-spatial old growth orders; the Provincial Non-Spatial Old Growth Order, the Prince George Timber Supply Area Order and the Central and North Coast Order (Ecosystem Based Management Area) where OGMAs have not been spatially identified and mapped.

Invasive Plant Species

The introduction and/or spread of non-native invasive plant species as a result of construction or operations is a concern for Aboriginal Groups, stakeholders and regulators, since many of these species are adapted to disturbance and can displace the native species by reproducing rapidly following disturbance. Non-native, invasive species were generally observed at low abundance and with limited distribution within the Application Corridor. All listed weeds and non-listed, non-native species were recorded at all locations where they were observed during the 2013 vegetation surveys. The Proponent identified and assessed the potential residual effects from the Project to the introduction and / or spread of invasive plant species, occurring after the application of mitigation measures. Relatively few weed species were encountered during vegetation field surveys; those observed were generally located along the eastern portion of the Application Corridor.

Proposed Mitigation and Monitoring

A preliminary mechanism for avoiding or reducing potential adverse effects relates to

route and ancillary siting such that clearing of woody vegetation is limited only to the extent warranted to reduce the loss of forest values and reduce the potential for terrain instability and erosion. Other key mitigation and monitoring measures for terrestrial vegetation identified in the Application include:

- Pre-construction surveys to determine the exact locations of plant species at risk, habitat for federally listed plant species, ecosystems at risk, and invasive species, in relation to the ROW;
- Development and implementation of a Plant Species or Ecological Communities of Concern Contingency Plan, Rare Plant and Ecological Communities Management Plan, and Invasive Plant Species Management Plan. Mitigation measures would include avoidance, reduction of disturbance, and alternative construction and restoration techniques;
- Replanting as necessary of environmentally sensitive areas disturbed as a result of the Project (ecosystems at risk, OGMAs, wetlands, riparian areas). For disturbance to OGMAs, the Proponent would consult with FLNR and licensees in the area to find suitable replacement areas. Re-vegetation of other disturbed areas through natural regeneration or through seeding with the appropriate native seed mix;
- In alpine ecosystems, move floristically rich (moss, lichen, and small herbs) rock boulders out of the work area and return to the work area following construction where practical;
- In old growth areas that cannot be avoided, retain standing trees and large stumps to the extent practical;
- In pine mushroom areas, reduce grubbing to allow the root system to remain intact;
- In identified old growth and pine mushroom areas, narrow the work area to retain patches of natural species including trees, shrubs, herbs and groundcover species, where practical; and
- Post-construction compliance and effectiveness monitoring, and application of adaptive management as required based on monitoring results.

5.10.3 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 vegetation. A non-exhaustive list of key issues and comments, specific to terrestrial vegetation and raised by these groups related to the following:

- Lack of sufficiently detailed baseline data;

- Vegetation effects during operations;
- Further details and information to better understand potential Project effects to OGMAs and Old Forest;
- Potential impacts to whitebark pine;
- Reliance on natural regeneration over seeding or planting; and
- Potential effects from ancillary facilities (including increased access)

Lack of Sufficiently Detailed Baseline Data

Comments from both regulatory agencies and Aboriginal Groups expressed concern with regards to the level of detail associated with collected baseline data. More specifically, the concern was expressed that, given the scale and duration of baseline data collection, it is possible that the location of and potential impacts to many sensitive ecological communities and plant species at risk in the LSA and RSA was not captured.

The Proponent has committed to conducting a number of future studies once the Project footprint has been finalized to further develop detailed mitigation measures. A list of additional studies was provided to EAO, with the understanding that the list may be revised to meet any additional requirements from EAO, OGC, or other government agencies or outcomes of the ongoing consultation program for the Project.

EAO proposes a condition that would require the development and implementation of an EMP in accordance with Appendix 3A of the Application, including the mitigation proposed for ecological communities of concern and plant species of concern.

Pesticide Use and Vegetation Effects during Operations

During the Application Review, inquiries were made by FLNR with regards to the activities, including vegetation management, to occur during the operations phase of the Project. The Nisga'a Lisims Government, Nak'azdli Band and several other Aboriginal Groups also raised concerns about the use of pesticides.

The Proponent has committed to the development and implementation of an Invasive Plant Management Plan related to the construction phase of the project. The Proponent also acknowledged that, during operations, an Integrated Vegetation Management Program would be undertaken to assist ROW monitoring and to maintain pipeline integrity. The plan would include a combination of cultural, biological, chemical and mechanical controls to manage vegetation to ensure the safe, efficient and reliable operation of the pipeline

system. The plan's methods would be developed in consideration of human health, safety and environmental protections.

EAO proposes a condition requiring the Proponent to make reasonable efforts to consult potentially affected Aboriginal Groups, Nisga'a Nation and private land owners regarding options for vegetation control prior to the use of herbicides.

Potential Impacts to Whitebark Pine Ecological Communities

Several comments were made by FLNR during Application Review noting the importance of implementing mitigation options if whitebark pine and associated bird populations of Clark's nutcracker have the potential to be impacted as a result of the project. Specific recommendations were also identified by FLNR for mitigation of impacts and for managing whitepine blister rust.

Whitebark pine and whitebark pine rare ecological communities (including Clark's nutcracker) were not observed during the surveys for the proposed Project. However, the Proponent has committed that, if whitebark pine trees are observed on the footprint, mitigation would be determined in consultation with FLNR and EC based on site-specific conditions.

EAO proposes a condition that would require the development and implementation of an EMP in accordance with section 14 and Appendix 3A of the Application, including the mitigation proposed for plant species and ecological communities of concern.

EAO proposes a condition that would require the Proponent to conduct site habitat assessment surveys for all BC Conservation Data Centre red- and blue-listed plants and ecological communities within the pipeline corridor, and propose mitigation measures to address adverse effects.

Details in relation to OGMAs and Old Forest

Further information from the Proponent about the impacts of the proposed Project on Legal and Non-Legal OGMAs was requested by FLNR and EAO. In particular, additional information was requested on the specific locations of potentially impact OGMAs, as well as the reporting of all impacted OGMA incursions (ha's and km's) by Landscape Unit and biogeoclimatic ecosystem classification zone/variant.

Supplemental information in this regard was provided by the Proponent.

EAO proposes a Condition that requires the Proponent to follow the applicable Replacement Policy or Process issued by FLNR where incursions into old growth and legal, non-legal and proposed OGMA's cannot be avoided, including submissions for replacement areas.

Reliance on Natural Regeneration over Seeding or Planting

Multiple comments were made by FLNR with regards to the possible need to consider native species seeding or planting of seedlings to assist in the timely regeneration of native plant communities and wildlife habitat. NLG also raised concerns that vegetation on the ROW should be managed for the purpose of habitat quality for target species and uses.

The Proponent has provided a Restoration Plan Framework outlining the restoration measures that would be implemented prior-to, during and following pipeline construction and facility installation. The have committed to considering seeding and planting where deemed appropriate, and coordinating with a wildlife specialist regarding concerns about the restoration of sensitive wildlife habitat.

Further Details Regarding Ancillary Facilities and Associated Effects

Further details were requested by multiple Working Group members regarding the location and potential effects of the ancillary sites (e.g. staging areas, stockpile sites, access roads and construction camps) on vegetation and wetland resources. There was concern that these sites could potentially account for significant project-related alteration of vegetation and wetland resources, particularly if rare species or ecosystems are affected.

The Proponent would be required to provide information about temporary ancillary facilities, including access roads, to OGC during permitting, and adhere to the requirements of the *Oil and Gas Activities Act* and regulations, including the Environmental Protection and Management Regulation. The Proponent committed to continue to apply the mitigation hierarchy as construction planning and detailed engineering design advances.

Proposed conditions for the development and implementation of the Wetlands Management Plan and as part of the EMP, the Plant and Ecological Communities of Concern Contingency Plan and a Rare Plant and Ecological Communities Management Plan, would include consideration of all Project components, including ancillary sites.

5.10.4 Characterization of Residual Project Effects

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

- Clearing and disturbance of ecological communities of concern and plant species of concern; and
- Alteration of ecological communities of concern and plant species of concern from the introduction or spread of invasive plants and forest pests.

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	<p>The resilience of plant species at risk and of special management interest varies along the proposed route by species.</p> <p>The resilience of vegetation communities varies along the proposed route. Upland forests are expected to be resilient and regenerate well. Other communities such as alpine and sub-alpine ecosystems are expected to be less resilient.</p>
Magnitude	Low to medium	<p>Magnitude of effects on vegetation communities and plant species is variable, considering the extent and rarity of occurrences. Magnitude is low for most vegetation communities, but medium for uncommon or rare plants or communities. Magnitude of the effects of invasive are low as these species have low densities in the study area and are expected to remain low with mitigation. With proposed mitigation, the spread of forests pests is not expected to increase as a result of the proposed Project.</p>
Extent	Local	<p>The effects of the proposed Project are expected to be confined to the Project footprint with the potential for edge effects such as invasive plant spread and changes in light levels or hydrology, extending into the LSA (200 m either side of the pipeline).</p> <p>Potential effects associated with the spread of forest pests resulting from pipeline construction may extend</p>

Criteria	Assessment Rating	Rationale
		beyond the Project footprint to the RSA (1 km either side of the pipeline).
Duration	Medium, long-term or permanent	<p>The regeneration of terrestrial vegetation varies by species or type of ecological community and site-specific conditions.</p> <p>Long-term: Residual effects in old growth forests, pine mushroom habitat and some ecological communities at risk (e.g. those associated with coniferous trees), and those growing in harsh conditions such as subalpine/alpine communities would not be reversible until the long term.</p> <p>Medium Term: Reestablishment of other types of vegetation such as shrubs and forbs would occur in the medium term.</p> <p>Permanent: Residual effects to alpine or subalpine communities and some grassland communities and ecological communities at risk may be permanent.</p>
Reversibility	Reversible and Irreversible	Residual effects to terrestrial vegetation are expected to be reversible, except that there is the potential for irreversible effects to alpine or subalpine communities and some grassland communities and ecological communities at risk.
Frequency	Once to periodic	The main disturbance would occur during the construction phase, repeated intermittent disturbance would occur during the operations phase, and isolated disturbance may occur during decommissioning and abandonment phases.
Likelihood	The proposed Project is highly likely to result in residual adverse effects to vegetation.	
Significance	<p>Residual adverse effects are considered significant when there is a long-term or irreversible potential 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.</p> <p>EAO considered the low to medium magnitude effect to terrestrial vegetation, the medium 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 the proposed condition requiring the development of the EMP which includes development and implementation of a Rare Plant and Ecological</p>	

Criteria	Assessment Rating	Rationale
		Communities Management Plan, a Plant Species or Ecological Communities of Concern Contingency Plan and an Invasive Plant Species Management Plan, and post-construction effectiveness monitoring. EAO concludes that the proposed Project would not have significant residual effects on vegetation.
Confidence		<p>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.</p> <p>The significance determination and likelihood for vegetation is determined with moderate confidence. EAO believes there is a 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.</p>

5.10.5 Cumulative Effects Assessment

The cumulative effects assessment and significance determination was completed within the context of relevant objectives of the Nisga'a Land Use Plan, as well as the 8 LRMPs and 6 SRMPs encountered along the proposed route. The objectives pertaining to vegetation for the Strategic Resource Management Plans crossed by the Application Corridor are summarized in Table 4.6-2 of the Proponent's Application.

Existing activities and reasonably foreseeable projects or activities in the vegetation RSA include agriculture, forestry, utility activities, natural resource development, oil and gas and other development. Project-related activities involving equipment (clearing, topsoil salvage, grading, backfilling, seed mix selection, restoration, and operations (vegetation control, monitoring and maintenance) could interact with these existing and reasonably foreseeable developments.

Since surface disturbances can affect plant species at risk and of special management concerns, ecosystems including ecosystems at risk, existing activities and the proposed Project would act cumulatively to increase disturbance of these VCs in the Vegetation LSA and RSA.

The total existing disturbance within the vegetation RSA is just over 31,000 ha. The proposed Project would result in approximately 4,000 ha of disturbance and foreseeable future projects in the area would result in over 10,180 ha of additional disturbance, for a total 45% increase in disturbance within the RSA from the baseline case. Cutblocks account for 78% of existing disturbance, and are estimated to create 60% of future

disturbance, with pipelines creating 33% of future disturbance.

It is expected that other operators in the Vegetation LSA and RSA would be subject to similar regulatory guidelines and would implement mitigation that is similar to that identified for the proposed Project. Forestry companies would adhere to similar guidance, best practices and the objectives of the LMRPs.

Residual adverse cumulative effects are considered significant when there is a long-term or irreversible potential 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 significance of cumulative adverse effects to vegetation, EAO has considered the residual effects from the proposed project, the cumulative disturbance to the RSA from the project and reasonably foreseeable projects as well as the reversibility of potential adverse effects to vegetation in the medium to long term. EAO considered that the residual cumulative adverse effects to alpine and subalpine communities, grassland communities, and ecological communities at risk may be irreversible, but that the magnitude of these effects is low to medium. EAO concludes that the cumulative residual adverse effects to vegetation within the RSA are not likely to be significant.

5.10.6 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.

5.11 Marine Environment

5.11.1 Background

The Application assessed potential effects of the proposed Project on the following marine environment VCs:

- Landfall and Nearshore Marine Habitats and Ecosystems (up to 20 m depth);
- Offshore Marine Habitats and Ecosystems and Benthic Areas (>20 m depth); and
- Seabed Sediment and Related Water Quality.

Key indicators were selected for each marine environment VC based on their potential to be affected by the proposed Project. The Application assessed a wide variety of key indicators and species under each VC, including the following (see the Application's Table 4.4-1 for a complete list of key indicators):

- Landfall and Nearshore Marine Habitats and Ecosystems:
 - Vegetation – e.g., salt marsh, rockweed, kelp, eelgrass;
 - Invertebrates – e.g., Dungeness crab, northern abalone, clam beds, sea urchin, epifaunal benthic communities (e.g. hydroids, bryozoans, anemones), infaunal benthic communities (e.g. tubeworms and marine worms), sea cucumbers, octopus;
 - Nearshore fish – e.g., Pacific salmon estuary rearing/migration areas, herring and forage fish spawning areas, eulachon, rockfish, and coastal cutthroat trout at landfalls;
 - Nearshore habitat for nearshore marine bird communities; and
 - Nearshore mammals – e.g., harbour seals and Steller sea lions;
- Offshore Marine Habitats and Ecosystems and Benthic Areas
 - Invertebrates – e.g., sea pen and sea whip beds, sponge reefs, corals, epifaunal benthic communities (e.g. hydroids, bryozoans, anemones), and infaunal benthic communities (e.g. tubeworms and marine worms), sea urchins, crabs (e.g. Dungeness, tanner and king), shrimps and prawns;
 - Benthic fish – e.g., Pacific cod, halibut, rockfish, and lingcod;
 - Pelagic fish – e.g., Pacific salmon (sockeye, pink, chum, coho, chinook and steelhead), herring, eulachon, sand lance and surf smelt;
 - Marine birds – offshore bird communities;
 - Marine mammals – e.g., Pacific white-sided dolphin, killer whale (orca), grey whale, humpback whale; and
 - Marine species and ecosystems at risk – i.e., humpback, gray, killer, sei, fin and blue whale, harbour and Dall's porpoise, Steller sea lion, rockfish, and glass sponge species;

- Seabed Sediment and Related Water Quality:
 - Marine sediment and water quality; and,
 - Marine sediment toxicity and bioavailability.

As shown in Figure 5-2, the proposed Project includes two marine route alternatives to the proposed terminal at Ridley Island in Prince Rupert Harbour:

- Nasoga Route – with routing in Iceberg Bay, Nasoga Gulf, Portland Inlet, Chatham Sound to Ridley Island, and a total length of approximately 105 km; or
- Kitsault Route – with routing in Alice Arm, Observatory Inlet, Portland Inlet and Chatham Sound to Ridley Island, and a total length of approximately 182 km.

Only one of the proposed marine routes would be constructed, and either route would include up to two 42-inch pipelines.

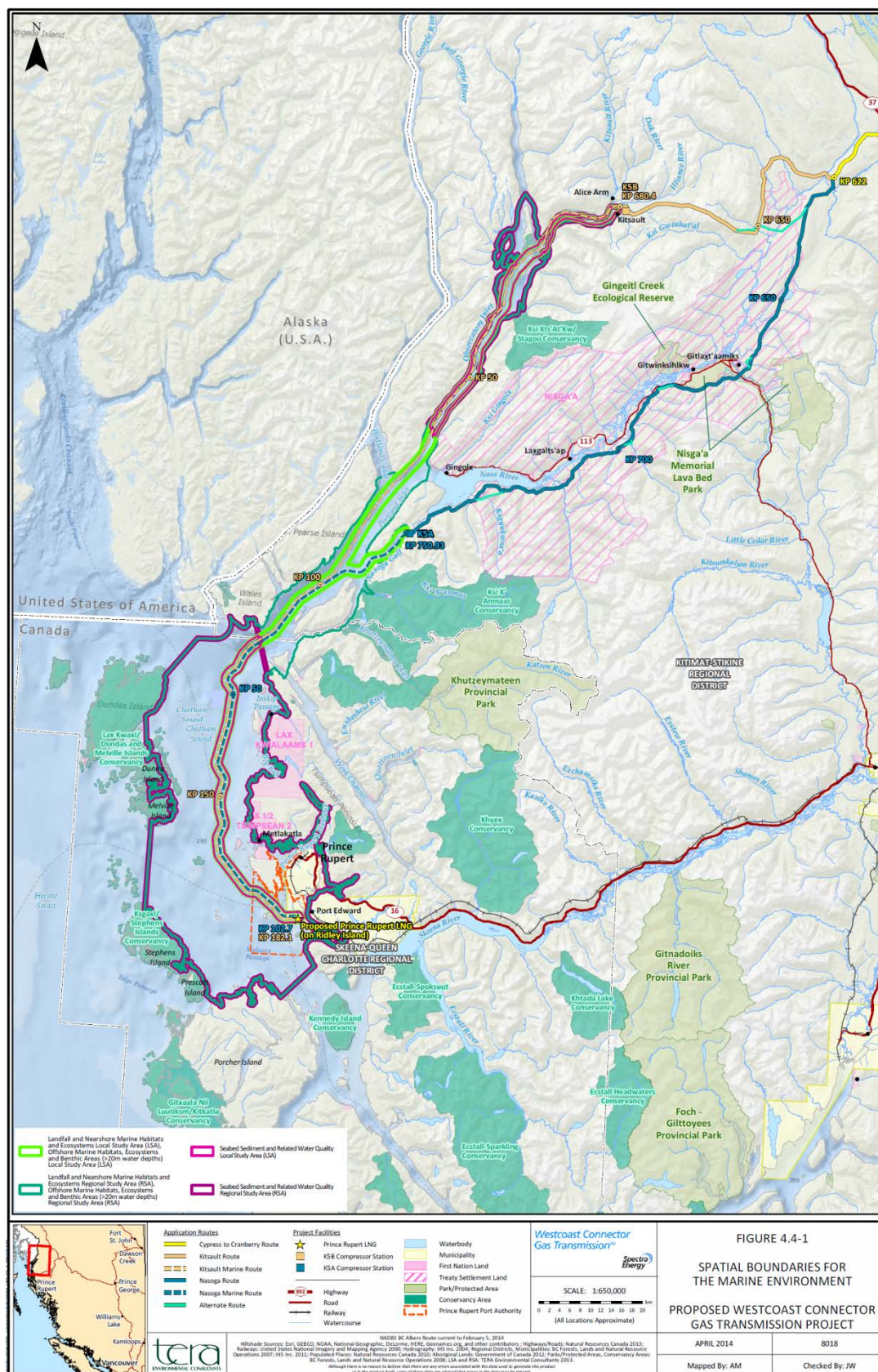
The Marine Environment LSA included a 2 km wide area centred on the proposed marine pipeline routes from Alice Arm and Iceberg Bay/Nasoga Gulf to Ridley Island.

The Marine Environment RSA is divided into two distinctive subareas:

- Northern Fjords – including Portland Canal, Observatory Inlet, Alice Arm, Nass River estuary and Nasoga Gulf; and
- Chatham Sound - including the east side of the Dundas and Stephens Islands, and the mainland shore from Work Channel south to the Skeena River estuary.

The Proponent used a combination of desktop analysis and literature review, field surveys, assessment of species of management concern, and available Aboriginal TEK to obtain information on the marine VCs and associated key indicators.

The marine environment VCs have important interactions with other VCs, including: freshwater fish and fish habitat (section 5.6); wildlife and wildlife habitat (section 5.9); land and resource use (section 9.2); transportation and access (section 9.3); human health (section 10); and accidents, malfunctions and effects of the environment on the proposed Project (section 11).



Regulatory Context

Existing legislation, regulations, guidelines and permitting requirements provide important context for assessing the impacts on the marine environment are listed in Table 2-6 in Part A of this Report. Key federal and provincial legislation relevant in the marine environment include, but are not limited to:

- *Fisheries Act* (federal)
- *Canadian Environmental Protection Act* (federal)
- *Species at Risk Act* (federal)
- *Navigation Protection Act* (federal)
- *Canada Marine Act* (federal)
- *Migratory Birds Convention Act* (federal)
- *Oil and Gas Activities Act* (OGAA) (provincial)
- *Environmental Management Act* (provincial)

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 and fish habitat protection measures include a prohibition, if unauthorized, against serious harm to fish that are part of a commercial, recreational, or Aboriginal (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 provides protection of marine species at risk.

Environment Canada administers the CEPA and *Disposal at Sea Regulations*, which regulate the disposal of material at sea (e.g. dredge material). 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. The PRPA administers the *Canada Marine Act* and associated regulations with 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 landfall site at Ridley Island.

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. Management and protection of marine resources is also regulated by the Province through the *Environmental Management Act* and *Wildlife Act*.

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

This section provides an overview of potential effects in the marine environment and proposed mitigation identified in the Application, and is organized by the Application's three marine VCs.

The proposed Project marine pipeline construction activities would require nearshore trenching for landfalls, offshore seabed modification areas and direct placement of the pipelines on the seabed. Additional details on the marine routes, as well as marine construction methods, are provided in section 2.2 of this Report.

Nearshore Marine Habitats and Ecosystems

The proposed Project would have landfall sites at Ridley Island, Kitsault at the head of Alice Arm (Kitsault Route), and Nasoga Gulf, Echo Cove, and Iceberg Bay West (Nasoga Route).

At each landfall site, construction activities would result in temporary direct effects on nearshore habitats and ecosystems by trenching through intertidal and shallow subtidal zones, as well as indirect effects to adjacent habitat and marine life resulting from sediment re-suspension, transport and deposition. Rock fracturing or blasting may be required to trench through areas of bedrock in the upper intertidal zones, however no underwater blasting is proposed at the landfall sites.

Potential effects to nearshore marine habitats and ecosystems include:

- Temporary alteration/loss of habitat within the landfall construction footprint;
- Temporary alteration/loss of habitat adjacent to the construction footprint due to sediment re-suspension and deposition;
- Displacement/injury/mortality of fish and invertebrates during trenching; and
- Disturbance to fish, marine mammals and birds due to construction noise.

The proposed marine pipeline route and landfall locations were selected to avoid and minimize alteration of sensitive habitat, including eelgrass, which provides important habitat for juvenile salmon, crab and other marine species. None of proposed landfall sites have eelgrass habitat within the construction footprint.

Temporary alteration and loss of habitat within the landfall footprint would arise from trenching through subtidal and intertidal sand or mud habitat; removing vegetated habitat (e.g., rockweed, kelp, algae); removing benthic invertebrates (e.g., clams, crab, urchin); and changing the nature of seabed substrate which would affect its utilization and re-colonization by marine life.

Vegetation and benthic invertebrates are expected to re-colonize naturally within 2-5 years following construction and habitat restoration. Recolonization of rockweed and kelp is expected to occur within 1-3 years. Re-colonization of benthic communities on rocky habitat and rock fill placements would take longer (2 to 6 years) than infaunal colonization of soft seabed areas.

Salt marsh areas within the construction footprint in upper intertidal zones would require restoration by replacing appropriate substrate, replanting material removed during construction, or by planting plugs from adjacent areas.

Nearshore habitat alterations within the construction footprint would include intertidal habitat, subtidal habitat and marine shoreline riparian vegetation. Habitat alteration within the construction footprint at each landfall site is predominantly on intertidal and subtidal mud flat. Other habitat types within the construction footprint include: salt marsh, intertidal gravel, sparsely vegetated gravel or bedrock, bladed kelp and rock weed. Table 5-16 provides a summary of habitat alteration areas by habitat type within the construction footprint at each landfall site.

Table 5-16: Summary of nearshore habitat alteration areas and dredge volumes

Habitat Type	Echo Cove	Iceberg Bay West	Nasoga Gulf	Kitsault	Ridley
Total Area Disturbed (m²)	37,200 m²	32,000 m²	20,500 m²	97,400 m²	173,130 m²
Salt Marsh	2,300 m ²	3,300 m ²	900 m ²	3,800 m ²	30 m ²
Non Vegetated Gravel	0 m ²	12,900 m ²	1,500 m ²	0 m ²	600 m ²
Rockweed	1,100 m ²	5,600 m ²	3,800 m ²	400 m ²	600 m ²
Green Algae on Gravel	0 m ²	2,500 m ²	0 m ²	0 m ²	0 m ²
Kelps/Red Algal Community	0 m ²	0 m ²	5,900 m ²	0 m ²	1,900 m ²
Vegetated Gravel and Bedrock	0 m ²	400 m ²	0 m ²	0 m ²	9,800 m ²
Intertidal Mudflat	23,900 m ²	0 m ²	0 m ²	84,800 m ²	0 m ²
Subtidal Mud	9,900 m ²	7,300 m ²	8,400 m ²	8,400 m ²	160,200 m ²
Total Dredge Volume	15,500 m³	21,960 m³	35,000 m³	186,000 m³	460,000 m³
Construction Footprint Width	70 m	70 m	120-140 m	150 m	70-160 m

Displacement of marine fish and invertebrate species would occur during trench excavation and backfilling as mobile species move away from the disturbance due to habitat disruption, increased suspended sediment and noise. Injury may occur due to sediment accumulation or direct interactions with dredging equipment. Mortality may

occur due to asphyxiation effects from suspended sediment, burial, or entrainment during dredging activities.

Potential effects of habitat alteration and displacement/injury/mortality effects to nearshore fish (e.g., juvenile salmon, eulachon, and herring) are of particular concern at the Ridley Island landfall site, within critical estuary and rearing habitat for juvenile salmon migrating from the Skeena River. The Nasoga Gulf, Iceberg Bay, Echo Cove and Kitsault landfall sites also provide important habitat for nearshore fish, invertebrates, marine mammals and marine birds. A key mitigation strategy proposed in the Application is to schedule in-water construction activities (e.g. dredging) during least risk timing windows to avoid effects to sensitive species and life stages (e.g. juvenile salmon rearing/migration).

Other key issues of concern include potential barrier effects to crab movement and habitat fragmentation from the proposed pipelines to be installed directly on the seabed, particularly in important habitat and harvesting areas for Dungeness crab in southern Chatham Sound and Iceberg Bay. Near shore (i.e., up to 20m depth) the pipelines would be installed in a trench and fully buried below the seabed, and therefore would not obstruct crab movement.

Construction noise from marine vessels (e.g., tug boats, barges, pipelay vessel) and construction equipment operating nearshore during dredging, rock fracturing and pipeline installation has the potential to disturb marine birds, marine mammals and fish in the vicinity, causing temporary displacement. Underwater noise from landfall and nearshore construction activities would be transmitted over several kilometers (i.e., up to 14 km within the northern fjords and up to 37 km within Chatham Sound), which could result in a behavioural response disturbance to marine mammals.

Underwater noise modelling results in the Application indicate that construction noise generated from landfall construction would approach and exceed thresholds for sensory disturbance exhibiting a behavioural response; however, noise levels would not exceed thresholds considered capable of harming or injuring marine mammals. The modelling results indicate that noise levels from landfall construction activities are similar to noise levels generated by current shipping activities such as the BC Ferry from Prince Rupert to Haida Gwaii.

The modelling results in the Application suggest that underwater noise from the pipelines during operations would be below ambient noise levels, and generally below hearing thresholds for toothed whales (e.g., killer whales), and only marginally above hearing thresholds for baleen whales (e.g., humpback whale, gray whale) at the

pipeline. These noise levels are predicted to reduce by approximately 20% 10 m away from the pipe.

With the exception of underwater noise, the other potential effects associated with nearshore construction activities would be restricted to the landfall sites or areas immediately adjacent within the Landfall and Nearshore Marine Habitats and Ecosystems LSA.

Proposed Mitigation and Monitoring

Specific mitigation measures identified in the Application for the landfall and nearshore marine habitats and ecosystems VC included:

- Avoid sensitive nearshore habitats, such as eelgrass beds, intertidal clam beds, important spawning areas and dense kelp beds including canopy kelps.
- Conduct nearshore fish surveys at each landfall site prior to construction to determine timing and species present on a site-specific basis.
- In collaboration with DFO, develop least risk construction timing windows for each landfall site to minimize and avoid effects to fish, invertebrates, marine mammals and marine birds based on species presence and timing (e.g. juvenile salmon rearing, herring spawning, salmon and eulachon migration).
- Incorporate consideration of marine mammal presence when developing construction windows for landfall construction; in particular avoid construction during the period of peak humpback whale presence in Chatham Sound.
- Manage operational noise levels not to exceed 10 dB above ambient noise at the exterior surface of the pipelines and to not exceed ambient noise 10m distant from the exterior of the pipelines to mitigate underwater noise effects to marine mammals.
- Develop a site-specific sediment control plan with mitigation measures including the use of sediment curtains around the immediate work area and adjacent sensitive habitats during dredging activities.
- Conduct preconstruction site surveys to determine if any species of concern (e.g., northern abalone) are present in the construction footprint and determine appropriate mitigation (construction timing/relocation) if necessary.
- Implement a habitat restoration plan that includes stabilizing and replanting disturbed areas of salt marsh and restoration of substrate suitable for recolonization of rockweed and bladed kelps in the intertidal and subtidal zones.
- Conduct on-site monitoring of adjacent salt marsh and eelgrass areas.
- Monitor the effectiveness of habitat restoration measures and, if warranted, implement remedial measures.

- Follow “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters” (Wright and Hopky 1998) and recent updates.

Offshore Marine Habitats and Ecosystems

Field work undertaken in support of the offshore marine habitat, ecosystem and benthic areas assessment included a geophysical survey to map important seabed features along the Application Corridor, including high resolution bathymetry, substrate type and seabed features. This geophysical information was used to identify locations for more detailed investigation of physical and biological characteristics using remote operated vehicle (ROV) surveys, standard sediment grab samples, and sediment core samples. The offshore field surveys focused on sensitive benthic habitats such as hard corals or glass sponge reefs in Chatham Sound, and areas potentially subject to seabed modification (from dredging, blasting and filling activities as well as rock placement under the pipe, which would create a hard substrate).

The proposed marine pipeline route was selected and re-aligned to avoid sensitive marine habitat and ecosystems, including avoidance of glass sponge reefs identified during route surveys in Chatham Sound. Figure 5-3 below shows the proposed route in Chatham Sound and distance away from glass sponge reefs. The image on the right shows a glass sponge reef that was identified during the ROV surveys.

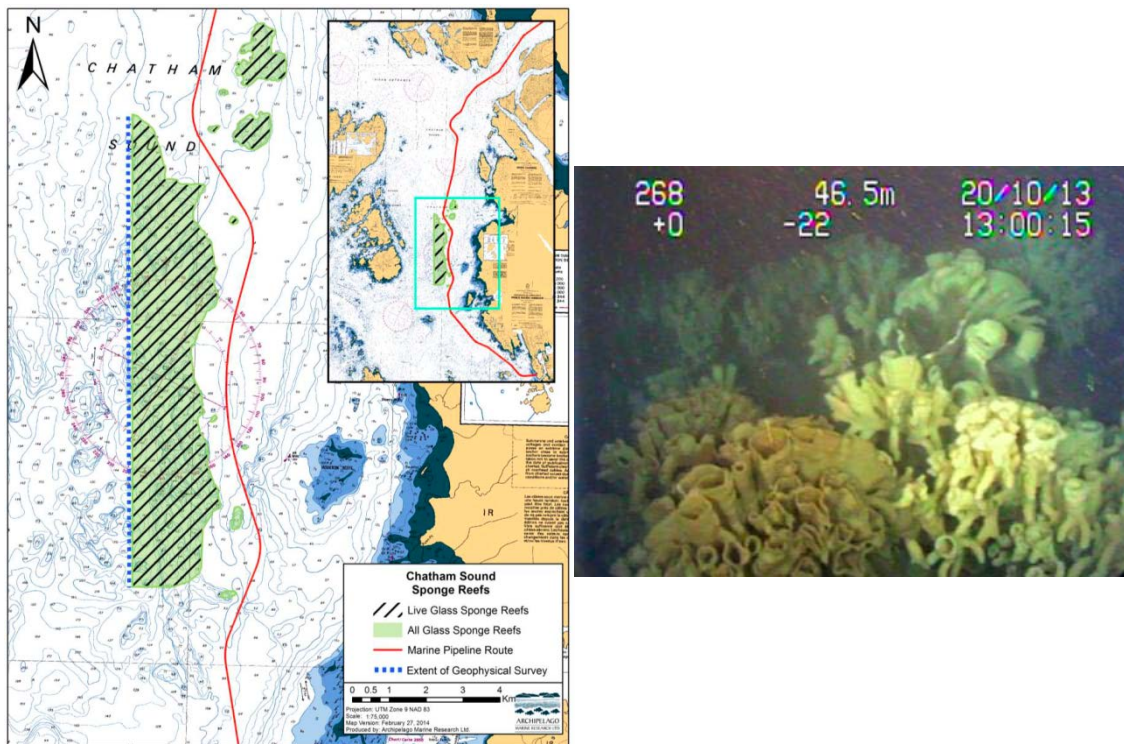


Figure 5-3: Marine Routing to Avoid Glass Sponge Reefs in Chatham Sound

Potential effects to offshore marine habitats and ecosystems include:

- Alteration/loss of habitat within the construction footprint from seabed modification;
- Displacement/injury/mortality of fish, invertebrates and birds during blasting;
- Disturbance to fish, marine mammals and birds due to construction noise; and
- Barrier effect to crab movement.

Potential Alteration/Loss of Habitat and Potential Effects to Fish, Invertebrates, Birds and Marine Mammals

Construction activities have the potential to directly and indirectly affect the offshore habitats and ecosystems through seabed modification and pipeline installation. Seabed modification (i.e., dredging, underwater blasting, and rock placement) would be required in several areas for installation of the pipelines on the seabed.

The pipelines are proposed to be installed directly on the seabed in offshore areas (>20 m depths) along most of the marine route (i.e. Chatham Sound, Portland Inlet, Alice Arm). Offshore pipeline construction would result in a change in seabed habitat features, with the nature of the change dependent upon the type of seabed modification.

The exposed portions of the pipes above the seabed would become a hard seabed habitat feature, somewhat like an artificial reef, and overtime would likely be colonized by marine invertebrates, creating productive fish habitat. These hard substrate features would result in alteration of soft mud bottom habitat which is the predominant habitat type along most of the marine routes.

The seabed along most of the marine routes proposed for direct pipe lay is primarily on mud bottom habitat. Approximately 82% of the seabed habitat within the Kitsault and Nasoga corridors is formed of soft sediments. Direct laying of the pipeline on the seabed in offshore areas is not expected to result in any adverse effects to adjacent habitat from sediment re-suspension.

The total seabed modification areas required for each proposed marine route is summarized in Table 5-17. The majority of seabed modification would be along the Kitsault route, due to the longer marine route and the four seabed modification areas (Figure 5-4).

Table 5-17: Estimated seabed modification areas for each proposed marine route

	Kitsault Route	Nasoga Route
Direct pipe lay on the seabed	21.3 ha	12.1 ha
Excavation (dredge/blast)	8.0 ha	0 ha
Fill (rock)	8.1 ha	0 ha
Total	37.4 ha	12.1 ha

The four seabed modification sites along the Kitsault Route near Alice Arm would result in a permanent alteration of habitat including:

- Alice Rock – 2.27 ha of the seabed would require dredging and blasting and 2.45 ha for rock fill placement
- Liddle Channel – 1.05 ha of the seabed would require dredging and blasting and 1.42 ha of rock fill placement.
- Brooke Shoal – 4.31 ha of the seabed would require dredging and blasting and 2.92 ha of rock fill placement.
- Pearson Point – 1.67 ha of seabed would require rock fill placement; no dredging or blasting is anticipated.

These areas would require seabed modification (dredging, rock placement and possibly underwater blasting) in order to reduce bottom roughness and provide the correct bending radius for the pipe as well as provide adequate draft for the pipelay vessel. Underwater blasting, which may be required at three seabed modification sites (i.e., Alice Rock, Liddle Channel, and Brooke Shoal) would create underwater noise and pressure waves which can kill or injure fish and possibly harm marine mammals. The fill material may be sourced from the seabed modification sites where excavation would generate excess materials consisting of dredged gravels and blast rock.

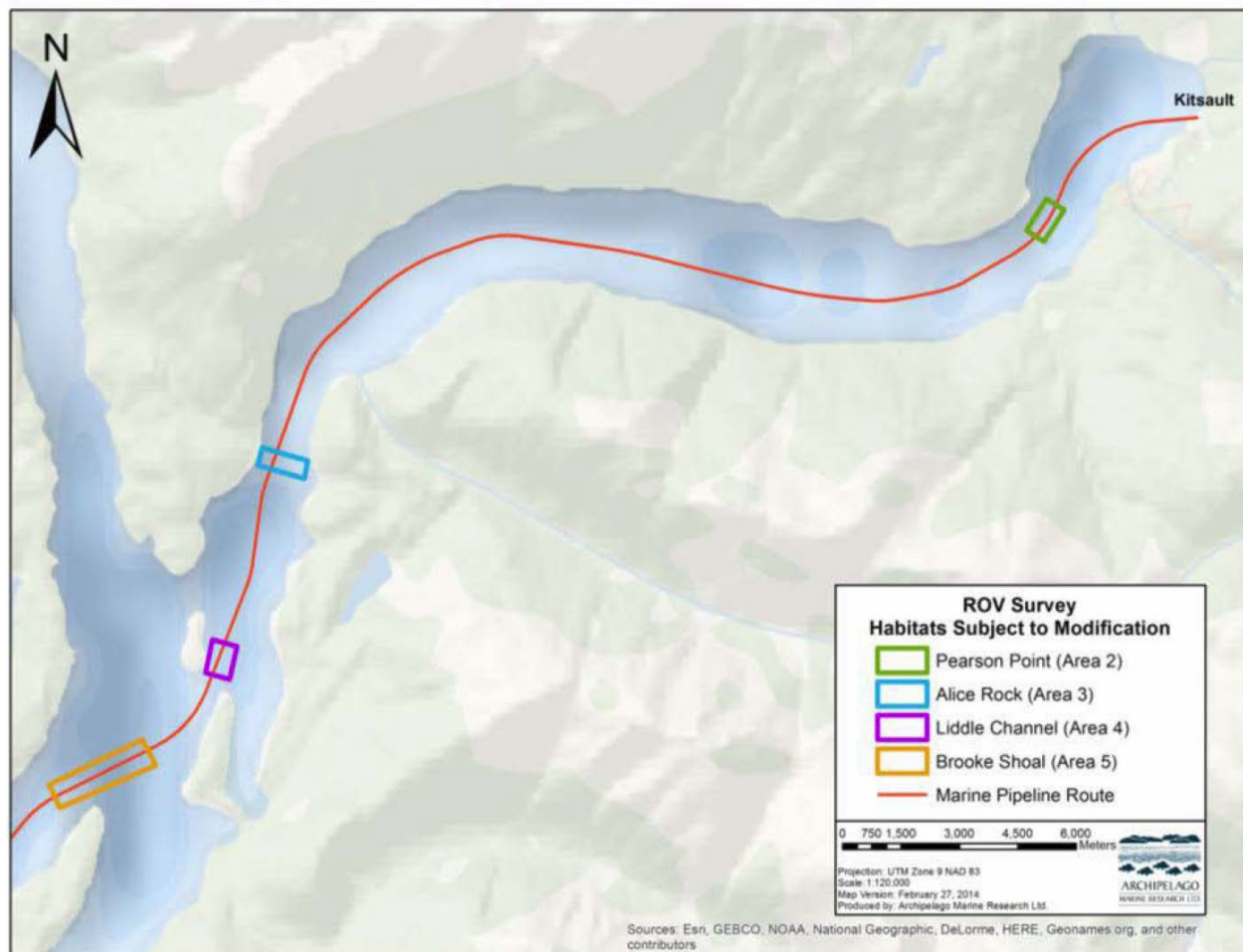


Figure 5-4: Seabed Modification Areas along the Kitsault Route near Alice Arm

Potential Barrier Effect to Crab Movement

The pipelines that are proposed to be installed directly on the seabed in offshore areas could potentially create a physical barrier effect to the movement of mobile benthic invertebrate species, primarily Dungeness crab. This barrier effect could result in habitat fragmentation for species that utilize habitat on both sides of the pipelines throughout their life cycle. Chatham Sound and Iceberg Bay are important breeding and nursery habitat areas for Dungeness crab and important harvesting areas for commercial, recreational and Aboriginal (CRA) fisheries. Barrier effects may be greater for juvenile crab, as studies have shown that they are not able to climb as well as adult crab.

In Chatham Sound the pipelines would go through approximately 40 km of important area for Dungeness crab identified in the Pacific North Coast Integrated Management Area (PNCIMA).

Studies on marine pipelines on the east coast have found that the type of exterior coating on the pipeline, as well as the diameter and overall height of the pipe above the seabed, can affect the ability of benthic invertebrates to scale the exposed portions of the pipeline. The pipelines would have a concrete coating which may improve the ability for crab to climb over the pipe; however, there is still potential for a partial or full barrier effect due to the large diameter of the pipe (i.e., 42" or 48" plus concrete coating). The pipelines are expected to settle into the sediment in areas of soft substrate, which represents the majority (i.e., over 80%) of the proposed route.

The pipeline is proposed to be buried below the seabed in nearshore areas (<20m deep) in trenches at each landfall site. Offshore areas along portions of the marine route may also be buried, either to mitigate potential crab barrier effect, habitat fragmentation or for pipeline protection. Ploughing or jetting operations to lower the pipelines into the seabed has been identified as a potential construction method in areas for the pipe to be partially or fully buried. However, ploughing or jetting in soft substrate has the potential to re-suspend and re-distribute seabed sediments, with potential adverse effects on sensitive adjacent habitat.

Although Dungeness crab can occur at depths to 300 m, they are uncommon at depths greater than 150 m. No Dungeness crab were observed at depths greater than 70 m during an ROV survey of areas in Chatham Sound in October 2013. All were observed within the southernmost portion of the pipeline route, within 10 km of the proposed landfall at Ridley Island (refer to Figure 5-5 below).

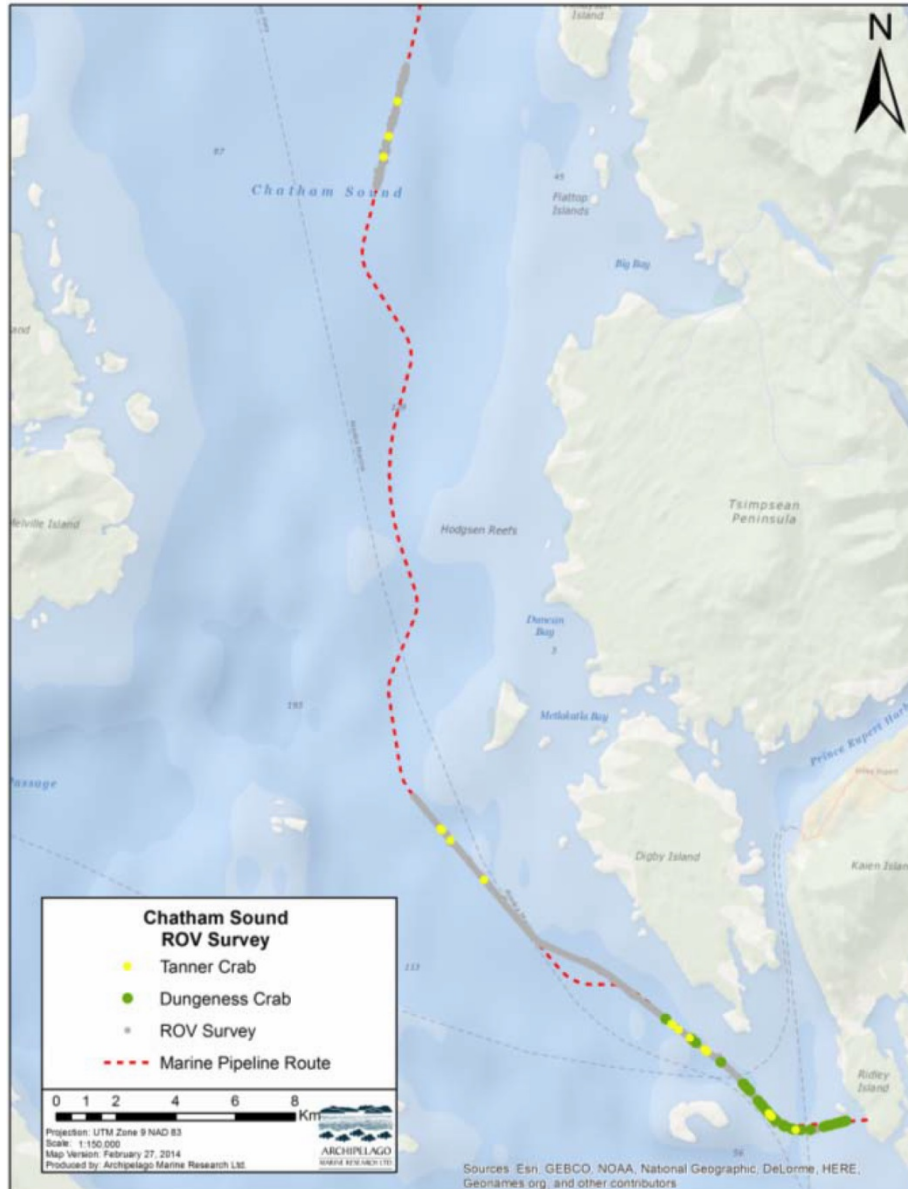


Figure 5-5: Marine Route Survey and Locations of Dungeness Crab in Chatham Sound

Tagging studies referenced in the Application indicate that the scale of Dungeness crab movement varies with location. In southeast Alaska, the movement of crabs inhabiting fjords ranges from hundreds of metres to several kilometres. Off the west coast of Vancouver Island, Dungeness crab movements were limited to about 10 km for males and 14 km for females. In most studies, the primary direction of movement was alongshore, rather than onshore/offshore or cross-fjord. One study found indication of a springtime shoreward migration. Tanner crabs tend to range more widely than Dungeness crabs. Tanner crabs appear to migrate between feeding and mating sites along particular paths. Dungeness crab is the main crab species harvested in CRA fisheries in Chatham Sound and Iceberg Bay.

The Proponent has proposed a Dungeness Crab Mobility Study in 2014-2015 to assess onshore/offshore crab movement in southern Chatham Sound and Iceberg Bay adjacent to the pipeline corridor in order to identify areas where the pipelines may affect crab movement. The study would also help identify areas where the pipelines would be expected to be partially buried from settling in soft bottom mud habitat or require additional measures (e.g., jet plowing or placement of rock bridges) to mitigate potential barrier effects to Dungeness crab.

Proposed Mitigation and Monitoring

Specific mitigation measures identified in the Application for the offshore habitats and ecosystems VC included:

- Avoid pipe placement over documented sensitive benthic habitats identified in marine baseline surveys, including areas of glass sponge reefs, hard corals, and dense soft coral (e.g., sea whip) areas.
- Maintain a 200 m buffer between the pipeline and all glass sponge reefs in Chatham Sound, and do not dredge, plough, or jet the pipeline into the seabed in areas immediately adjacent to glass sponge reefs in Chatham Sound.
- Develop construction timing windows in consultation with DFO for specific seabed modification locations and activities (dredging, blasting, rock placement) in consideration of the presence of salmon (all species), eulachon and herring (all life history stages), lingcod (spawning), marine mammals and birds at blast sites;
- Incorporate consideration of marine mammal presence when developing construction windows for construction activities, in particular avoid pipe-lay in Chatham Sound during the period of peak humpback whale presence.
- Map sensitive habitats for each seabed area subject to modification proposed for dredging or rock placement. Where feasible, modify cut and fill plans to avoid disturbing sensitive habitats, marine vegetation, fish and invertebrate species.
- When feasible stockpile colonized rock material from excavation areas and place on top of fill material to seed colonization for post-construction habitat restoration. Maintain a 1,000 m buffer from identified marine bird colonies for high disturbance activities (e.g., drilling, blasting);
- Comply with DFO's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters*;
- Conduct a Dungeness Crab Mobility Study in 2014-2015 to assess onshore/offshore crab movement in southern Chatham Sound and Iceberg Bay adjacent to the pipeline corridor in order to identify areas where the pipelines may affect crab movement and identify additional mitigation where required.

- Develop and implement a habitat offsetting plan, if and as required by DFO for *Fisheries Act* Authorizations for serious harm to fish, including permanent alteration of habitat and loss of shallow subtidal vegetated habitat, including canopy kelps, at Alice Rock, Liddle Channel and Brooke Shoal.

Marine Water Quality and Sediment Re-suspension

Key potential effects related to marine water quality and sediment re-suspension identified in the Application include:

- Temporary adverse effects to water quality from sediment re-suspension and increased total suspended solids (TSS) in the water column during dredging at landfalls;
- Sediment dispersion and deposition on adjacent habitat from dredging at landfalls and underwater blasting at seabed modification areas; and
- Temporary increased exposure to pre-existing sediment contaminants during dredging at the Ridley Island and Kitsault landfalls and seabed modification areas in Alice Arm.

Construction activities of the proposed Project have the potential to directly and indirectly affect marine water quality through sediment re-suspension, increased TSS and temporary increased exposure to pre-existing (i.e. historical) sediment contaminants. Construction activities with effects on marine water quality and sediment re-suspension include trenching, dredging, side casting and pipeline burial at the Ridley Island, Kitsault, Nasoga Gulf and Iceberg Bay landfall sites, as well as seabed modification (dredging, underwater blasting, rock fill placement) within Alice Arm. Three key areas have the potential to temporarily affect marine water quality, sediment dispersion and increased toxicity and bioavailability of contaminants:

- Ridley Island landfall from trenching, side casting and dredging – 17.3 ha
- Kitsault landfall from trenching, side casting and dredging – 9.74 ha
- Alice Rock – 2.27 ha from dredging and blasting and 2.45 ha from rock fill placement

At the Ridley Island landfall, a total estimated volume of 180,000 m³ of sediment (primarily sand, silt and clay) is expected to be dredged using a clamshell or bucket dredge, side-cast adjacent to the trench and backfilled over the pipe to restore the seabed following installation. An additional estimated 280,000 m³ of soft sediment (primarily silt and clay) is expected to be removed by a cutter suction dredge.

The dredged material from the suction cutter dredge may be loaded onto a barge or vessel for transport to an offshore location for disposal, or temporary storage if it is determined that the material is suitable and can be used for backfill over the pipe. Potential requirements for disposal at sea will require final engineering design, construction details and review by Environment Canada to confirm if disposal at sea permits may be required.

Sediment transport and fate modelling was conducted by the Proponent to simulate sediment re-suspension and deposition due to the proposed excavation and backfill activities, with a total construction duration of 156 days, including 63 days of excavation, 15 days of pipe pulling (no excavation or backfill), 63 days of backfilling the pipeline trench, and 15 days to allow for settling of suspended sediment.

Re-suspension modeling results for the Ridley Island trench construction indicate that TSS concentrations outside of the proposed Project Footprint are unlikely to exceed 25 mg/L. Maximum total deposition following construction is expected to be approximately 34 mm in areas immediately adjacent to the trench excavation. Maximum total deposition is expected to be less than 1 cm at distances greater than 300 m from the construction site and no greater than 5 cm within 300 m of the construction site.

At the Kitsault landfall site in Alice Arm, sediment re-suspension modeling results predict increased TSS concentrations during trench construction to be relatively low (30-50 mg/L) in areas further than 300 m away from the trench, with localized higher levels (150-500 mg/L) in close proximity to the trench. Similar to sediment re-suspension modelling result at the Ridley Island landfall, modelling results at the Kitsault landfall site suggests that the total deposition of sediment is expected to be less than 1 cm at distances greater than 300 m away from the trench site and less than 5 cm within 300 m of the trench site. The levels of increased TSS during construction would result in temporary changes to water quality and increased toxicity and bioavailability of historically contaminated sediment.

Results from sediment re-suspension modelling at the Nasoga Gulf, Iceberg Bay and Echo Cove landfalls indicate similar results for temporary increased TSS levels during trenching; however, less sediment deposition is expected on adjacent areas due to much smaller dredge volumes compared to the Ridley Island and Kitsault landfalls. Additional information on sediment re-suspension and dredge material fate transport modelling results for landfall construction are provided in the Application (Appendix 2-I).

A key issue of concern identified in the Application included the seabed modification proposed at the Alice Rock, which is a large glacial moraine sill at the entrance to Alice

Arm. A cut and fill is proposed at Alice Rock in order to provide sufficient depth for pipelay vessel access and to facilitate installation of the marine pipelines in Alice Arm.

The sill at Alice Rock plays an important role in controlling the flow between Alice Arm and Observatory Inlet and restricts the potential for transport of sediments, including contaminated sediment that are present in the deeper water sections in Alice Arm. Historically contaminated sediments in Alice Arm include approximately 4.1 million tons of mine tailings that were discharged directly to Alice Arm in 1981-1982 during the historic Kitsault Mine operations.

At Alice Rock, 2.27 ha of the seabed would be subject to dredging and blasting and 2.45 ha subject to rock placement, resulting in an alteration of habitat. The cut area would be located on the shallowest portion of Alice Rock at depths of 5 to 30 m. The depth would be increased by up to 15-20 m through dredging and blasting. The rock fill placement area is located north of Alice Rock over the steeply sloped northerly approach. Figure 5-6 shows the seabed modification area proposed at Alice Rock.

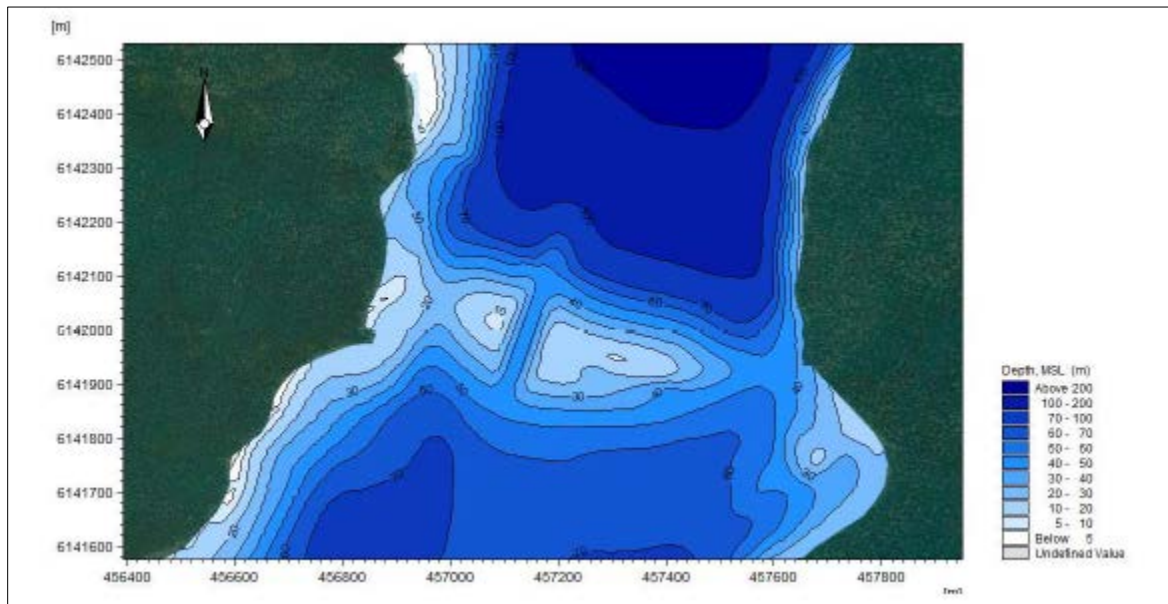


Figure 5-6: Bathymetric Map of Alice Rock Sill with Proposed Cut and Fill

The Application included a three-dimensional modelling study at Alice Rock with further data collection of combined current and water levels to allow a more detailed analysis of the potential cut and fill impacts at Alice Rock on the circulation and transportation of sediment and the potential for the re-mobilization of historically contaminated sediments and transport through the proposed excavated trench at Alice Rock.

Based on conclusions of the modelling study, the proposed seabed modification at Alice Rock is not expected to result in any residual effects to re-mobilization or transport of historically contaminated sediment in Alice Arm during construction or operations.

The Application (section 4.4) seabed sediment and related water quality VC included baseline data including desktop information and results from a sampling program undertaken in late 2013 and early 2014 within Alice Arm and off Ridley Island. Seabed sediments throughout Alice Arm previously impacted by historical mining activities (e.g., direct discharge of tailings from the Kitsault Mine into Alice Arm in 1981-1982) were sampled to determine existing baseline sediment conditions with respect to chemistry (e.g., metals), toxicity, and contaminant bioavailability. Samples were collected from surface (grab samples) and from depth (core samples). Tissue samples were also collected from crab and mussels within Alice Arm. Seabed sediments offshore of Ridley Island, also previously impacted by historical industrial activity, were sampled (surface grab samples and depth integrated core samples) to determine existing baseline sediment conditions with respect to sediment and crab tissue chemistry (i.e., metals, dioxins, furans, PCBs) and assess potential toxicity and bioavailability to marine life.

Marine sediment quality at Ridley Island has historic contamination from pulp mill wastewater discharges associated with the former Skeena Cellulose Pulp Mill on Watson Island from 1978-1991. Core and grab sample analysis indicate arsenic and copper are the only inorganic compounds in excess of CCME Interim Sediment Quality Guidelines (ISQG), but concentrations did not exceed the BC Contaminated Sites Regulation criteria for marine and estuary sediment. Arsenic and copper concentrations are considered to be due to natural geologic conditions. Dioxins and furans Toxicity Equivalency Quotients (TEQ) were determined to be in excess of CCME ISQG guidelines in the upper 60 cm of seabed sediments. The TEQ measures for dioxins and furans in the sediments deeper than 60 cm were all less than the CCME ISQG.

Baseline sediment toxicity test results at six sampling stations along the proposed Ridley Island landfall trench area indicate negligible to low toxicity. Microtox test results from the same samples exhibited low toxicity in all samples and no results exceeded the Environment Canada (2002) acceptable toxicity threshold of 1000 mg/L. Additional detailed baseline information and assessment of effects on marine sediment and water quality at the Ridley Island, Kitsault and Alice Arm is provided in the Application (section 4.4.6) and Marine Technical Data Report (Appendix 2F).

The increased exposure to and bioavailability of pre-existing contaminants due to landfall trenching, side casting and dredging during construction of the landfalls would

be short-term; marine sediment quality and water quality is predicted to return to baseline conditions following completion of construction activities.

The Human Health VC (section 9 of this Assessment Report) provides additional information regarding baseline marine sediment quality, marine water quality, toxicity and bioavailability of historical contaminants near Ridley Island and Alice Arm.

Proposed Mitigation Measures

Mitigation measures related to marine water quality, sediment re-suspension and increased toxicity and bioavailability of historically contaminated sediment at the Kitsault and Ridley Island landfall, identified in the Application (Table 4.4-31), include:

- Minimize the footprint of the trench and volume of sidecast material produced.
- Operate machinery on land or on water (i.e. from a barge or vessel) in a manner that minimizes disturbance to the water body.
- Minimize the time sidecast material remains exposed to tidal and wave generated erosive forces.
- Develop and implement a seabed sediment and marine water quality monitoring plan, and adaptive management plan for dredging based on sidecast fate modelling and the relationship between TSS, sediment contaminant levels and toxicity to the marine environment.
- Develop a site-specific sediment control plan that considers using sediment curtains around the immediate work area and dredge barge where feasible to trap sediment and limit lateral movement of turbid water; limiting the time of exposure of the open trench and sidecast berms; and capping fine sediments sidecast in the intertidal and shallow subtidal zone with coarser (gravel) material.
- Inspect the sediment control measures regularly to confirm efficacy and repair if any damage occurs.
- Use dredging methods that reduce the amount of re-suspended material such as an environmental bucket dredge for fine sediments.
- Limit detonation for blasting during low tide slack water if practical to reduce sediment dispersion.
- Conduct further re-suspension fate modelling if design assumptions alter from those employed in the circulation and sediment transport investigation.
- Conduct pre-construction, construction and post-construction monitoring of seabed sediment and marine water quality to confirm results of the modelling prediction for increased toxicity and bioavailability of contaminants.

5.11.3 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 related to the Marine VCs were raised by Working Group members and the public. A non-exhaustive list of the key issues and comments are as follows:

- Dredging and management of sidecast material;
- Need for additional baseline data, assessment studies, and habitat offsetting plans;
- Potential contaminant bioaccumulation (dioxins / furans) from dredging and historically contaminated sediment;
- Concern over potential impacts to the ecology and productivity of the Skeena River Estuary;
- Potential effects on the movements of crab and other benthic species, and related potential impacts to CRA fisheries.
- Potential effects to marine water quality from discharge of pipeline hydrostatic pressure test water.
- Potential effects due to accidents and malfunctions during construction and operations, such as fuel spills and the discharge of ballast water.

In response to issues raised, EAO requested the Proponent to provide supplemental reports during Application Review to further assess potential effects of the proposed Project in the marine environment, including:

- A Conceptual Habitat Offsetting Plan was requested to identify offsetting measures for project activities with potential to result in serious harm to fish, which may require *Fisheries Act* authorizations and offsetting.
- A detailed HHRA for consumption of seafood at the Ridley Island landfall and Alice Arm was requested to further assess potential increased bioavailability of contaminants and bioaccumulation in marine seafood (e.g. fish, crab, cockles, marine plants) associated with the proposed dredging and re-suspension of historically contaminated marine sediment at the Ridley Island and Kitsault landfalls.

The Human Health VC (section 9 of this Assessment Report) provides additional information regarding sediment re-suspension, marine water quality, bioavailability of contaminants, and conclusions from the HHRA reports for consumption of seafood near the Ridley Island and Kitsault landfall sites.

Dredging and Management of Sidecast Material

Comments from regulatory agencies and Aboriginal Groups expressed concern with regards to the amount of dredging to take place, and management of sidecast material:

- Information gaps were identified in relation to characterization and management of sidecast material;
- Environment Canada and Kitsumkalum First Nation asked several questions related to confirming requirements for Disposal at Sea permits, related mitigation measures and their effectiveness;
- Metlakatla First Nation noted that the Application suggests that approximately 280,000 m³ of dredged materials from the Ridley Island landfall site may need to be disposed at sea, but the disposal of these materials at a disposal at sea site was not included in the Application; and
- MOE indicated that more accurate volumes and area of materials to be dredged and sidecast should be provided prior to construction and further and/or altered mitigation provided based on the revised numbers.

Confirmation of the planned dredging methods and equipment would be provided once the marine pipeline construction contractor(s) is selected. The Proponent noted that currently the preferred method of handling non-contaminated dredge material is to side-cast it adjacent to the pipeline trench for subsequent backfill. Ocean disposal is a secondary or alternative option. The details for ocean disposal requirements would be determined during subsequent design, contracting and permitting processes.

The Proponent committed to provide further detailed information to Environment Canada to determine whether disposal at sea permits would be required. If a disposal at sea permit is required then the proponent would be required to formally apply for one. Environment Canada, in conjunction with other applicable agencies and stakeholders would review the disposal at sea application(s), as required, and consult with Aboriginal Groups.

Kitsumkalum First Nation noted that the use of silt curtains had been proposed to mitigate potential effects from sedimentation, but concern was raised over the potential need to allow for fish passage. They also pointed out that to fully understand the effects to fish and fish habitat there must be a detailed description and an assessment of mitigation measures associated with sediment dredging/sidecast/disposal activities and their potential effects (e.g., changes in fish behavior).

The Proponent indicated that silt curtains to be used around a marine construction site would not block fish movement. If a complete isolation of a work

site were to be undertaken then fish salvage would be performed prior to undertaking work within the isolated area. The models of sediment dispersion and plume concentrations for the landfall sites show that dispersion beyond the construction footprint is expected to be minimal, both in terms of the suspended sediment concentrations (and durations) and the thickness of sediment deposited on the bottom.

EAO proposes a condition that would require the development and implementation of an EMP in accordance with section 14 and Appendix 3B of the Application. EAO also proposes a condition requiring the monitoring of marine water quality and sediment management and monitoring during construction at landfall sites.

Need for Additional Baseline Data, Assessment Studies, and 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. Data gaps in relation to sediment dispersion modelling (for Iceberg Bay), bioaccumulation studies, and human health risk assessments were highlighted, as examples.

During Application Review, Working Group members raised concerns regarding the lack of understanding regarding which areas of the marine pipeline may require *Fisheries Act* authorization for serious harm to fish and offsetting based on recent amendments to the *Fisheries Act*.

The Proponent noted that further field surveys may be required to more accurately quantify the area of existing habitat subject to alteration at the landfall site, and that this would be required by regulatory authorities, such as OGC and DFO for review of permitting applications.

With regards to sediment dispersion modelling, the results of recent (spring 2014) and planned (fall 2014/spring 2015) geophysical investigations would be used to determine whether sediment modelling for the Iceberg Bay sites is warranted. The Proponent further committed to real time turbidity monitoring at these sites during construction activities. EAO proposes a condition requiring sediment and water quality monitoring at landfall sites.

The Proponent provided a supplemental *Conceptual Marine Habitat Offsetting Plan*. The plan included a preliminary assessment of marine habitat alteration areas which may require *Fisheries Act* authorization and offsetting for serious harm to fish; and provided information on proposed offsetting measures.

Applications to DFO (e.g., request for review, or application for authorization) to confirm *Fisheries Act* authorization requirements would require final routing, engineering and construction design details, including: construction timing, habitat restoration, mitigation measures to avoid serious harm to fish; and offsetting measures for unavoidable residual serious harm to fish. The Proponent committed to ongoing consultation with Aboriginal Groups and regulatory agencies for review in developing any final offsetting plans required by DFO.

The Conceptual Marine Habitat Offsetting Plan identified that:

- No offsetting requirements are anticipated for nearshore landfall construction with implementation of avoidance, mitigation and habitat restoration measures.
- No offsetting requirements are anticipated for the Nasoga route option, or direct pipe lay in most offshore areas for the Kitsault Route.
- For the Kitsault route, habitat offsetting is anticipated to be required to offset the loss of vegetated gravel or bedrock habitat at Alice Rock, Liddle Channel and Brooke Shoal seabed modification areas.
- Subject to detailed engineering design and further field surveys, the total area subject to offsetting is estimated to be approximately 3.0 ha based on refinements to routing at Brooke Shoal.

Conceptual offsetting options proposed for the alteration and loss of shallow rocky habitat at the seabed modification areas at Alice Rock, Liddle Channel and Brooke Shoal, include:

- Construction of rock reefs;
- Remediation of the seabed at the former log dump site in Nasoga Gulf; and
- Remediation of other degraded areas within Observatory Inlet, Portland Inlets and Chatham Sound.

It is anticipated that development and implementation of final offsetting plans, if and as required by DFO for *Fisheries Act* authorizations for serious harm to fish, would further mitigate potential residual effects of the proposed Project on marine fish and fish habitat.

EAO proposes a Condition that would require the Proponent to provide any offsetting plans to Aboriginal Groups and NLG prior to their submission to regulatory authorities.

Contaminant Bioaccumulation

Several Working Group members, including Aboriginal Groups, MOE and Ministry of Health (MOH) expressed concerns with regards to dioxin / furan bioaccumulation as a result of dredging operations and sediment disturbance. Kitselas First Nation requested that the upper 0.6 m of sediment be removed to reduce potential for contaminants in suspended sediments. MOE recommended the Proponent develop site specific timing windows with consideration of bivalve shellfish presence, particularly timing for spawning and planktonic larval development in relation to dredging and sediment re-suspension/dispersion.

The Proponent committed to compliance with regulatory requirements pertaining to potential contaminant handling.

EAO proposes a condition that would require the development and implementation of a Marine EMP in accordance with section 14 and Appendix 3B of the Application. EAO also proposes a condition that would require the monitoring of contaminant levels in the water column and, if exceedances occur, would require additional monitoring for the potential bioavailability and bioaccumulation of toxins in marine foods.

Potential Impacts to Skeena River Estuaries

Concerns were raised by Working Group members with regards to potential impacts to the ecology and productivity of the Skeena River Estuary. It was noted that LNG plants and export facilities are proposed for the mid and outer Skeena estuary, including Prince Rupert LNG (PRLNG) on Ridley Island, which the proposed Project would connect to. Lake Babine Nation conducted juvenile salmon surveys to determine the presence of and habitat utilized throughout Skeena estuary in spring 2014. The results indicated 80 to 90% of Skeena salmon juveniles were congregated in the near vicinity of the two proposed LNG plants on Ridley and Lelu islands.

The Proponent agreed that additional information on nearshore fish use of the Ridley landfall site would facilitate the determination of appropriate construction timing windows. The Proponent indicated that it has conducted beach seine surveys for fish in April and May of 2014, and committed to continue these surveys in July and September of 2014. The Proponent was collaborating with the PRLNG Project that was also conducting nearshore fish surveys of the Ridley Island area in 2014. These results were to be combined to develop a better understanding of nearshore fish use of the area. The Proponent committed to continue the surveys in 2015, if required. The Proponent also welcomed any

additional information on nearshore fish use of this area that Lake Babine Nation is able to provide.

The Proponent's Marine EMP, in Appendix 3B of the Application, includes a specific construction mitigation measures regarding development of appropriate timing windows for in-water construction activities in consultation with DFO to avoid and minimize potential effects to fish and fish habitat and avoid sensitive species and life stages (e.g., juvenile salmon rearing and migration timing).

Noise Effects to Marine Mammals

Metlakatla First Nation, Gitxaala Nation and Lax Kw'alaams Band raised concerns related to the proposed Project and cumulative effects of generated noise on marine mammals. Specific concerns related to pipelines as a potential linear barrier generating low-frequency sounds audible to baleen whales, 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 potential cumulative effects of underwater noise on marine mammals, citing research showing the waters off of Prince Rupert as a noise-density "hot spot".

The Proponent indicated that no residual effect on baleen whales is anticipated because the expected operational noise would be only marginally above the hearing threshold of baleen whales. The Proponent would conduct post-construction monitoring of operational noise to verify the modelling results. In addition, mitigation to manage operational noise levels to not exceed ambient noise 10 m from the exterior of the pipelines would be implemented to prevent any residual effect on baleen whales or other marine mammals.

The Proponent intends to use the results of the noise modeling studies undertaken to guide noise reduction mitigation. The Proponent also notes that the proposed PRLNG is currently collecting baseline data on underwater noise in the Prince Rupert area which can be used to further evaluate any increases in underwater noise related to future project developments. In Canada, there are currently no official behavioural response criteria for underwater noise.

EAO proposes a condition requiring marine mammal mitigation and monitoring, which would include identifying geographic areas and timing periods where marine mammals could be affected by construction activities, and would require designating a qualified marine mammal observer.

Impacts to Crab Movements

Kitsumkalum First Nation commented that displacement of mobile invertebrate species due to habitat fragmentation should be added to potential adverse effects. This concern was also expressed by NLG regarding potential effects to crab movement and habitat fragmentation in Iceberg Bay. Concerns were raised by Gitxaala Nation, Metlakatla First Nation and Lax Kw'alaams Band and other Working Group members regarding potential cumulative effects associated with multiple proposed projects in important crab harvesting areas, with potentially up to 4 pipelines in Chatham Sound and 2 pipelines in Iceberg Bay.

The Proponent responded by citing the proposed measures to mitigate habitat fragmentation effects on Dungeness crab if an unburied pipe acts as a barrier.

EAO proposes a condition that would require the Proponent to develop and implement a Crab Movement Mitigation and Monitoring Plan.

Discharge of Hydrostatic Test Water

Concerns were raised by Gitxaala Nation, Metlakatla First Nation, Lax Kw'alaams Band, MOE, Environment Canada and other Working Group members regarding disposal of hydrostatic test water in the marine environment.

The Marine EMP (Application Appendix 3B) identifies procedures and mitigation measures for the withdrawal of seawater for use in hydrostatic pressure testing, treatment and discharge of hydrostatic test water to the marine environment in accordance with applicable regulations and discharge criteria (i.e. CCME and BC Marine Water Quality Guidelines). Discharge of hydrostatic test water to the marine environment would require a waste discharge authorization under EMA and would also require review with Environment Canada to confirm federal authorization requirements or disposal at sea permits under CEPA.

Accidents and Malfunctions

Concerns were raised by Gitxaala Nation, Metlakatla First Nation, Lax Kw'alaams Band, MOE, FLNR, Transport Canada and other Working Group members regarding potential effects in the marine environment from accidents and malfunctions, including: potential construction vessel fuel spills; discharge of ballast water from foreign vessels; spills of hazardous materials from supply barges or the pipelay vessel; and potential pipeline ruptures along the marine route during operations.

Regarding the release of ballast water, the Proponent indicated that they would adhere to the ballast water control and management regulations under the *Canadian Shipping Act*, and specific mitigation measures would be specified in the Marine EMP. The assessment of accident and malfunctions and effects of the environment on the Project are discussed in section 10 of this Report.

5.11.4 Characterization of Residual Project Effects

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

- Alteration of nearshore and offshore habitat
- Disturbance, injury and mortality to marine species
- Water quality effects due to sediment re-suspension and increased toxicity and bioavailability of contaminants

EAO's characterization of the combined residual effects of the proposed Project on the marine environment 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: Moderate to High	<p>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 with higher sensitivity to disturbances including eelgrass and salt marsh, which provide important habitat for juvenile salmon and other species, are avoided where possible and mitigated. Many invertebrates have a high resiliency, while juvenile salmon and other nearshore fish have a moderate resiliency to habitat alteration. Overall, species and habitats in the nearshore and construction footprint have a moderate to high resiliency.</p> <p>Offshore Habitat: Most of the seabed along the pipeline route is formed of mud substrates that are considered to be highly resilient to disturbance. Alteration of shallow vegetated gravel or bedrock habitat is considered to have a moderate resiliency based on increased time required for recolonization. Sensitive habitats such as glass sponge reefs are</p>

Criteria	Assessment Rating	Rationale
		tailings discharges to the marine environment. These areas have been historically exposed to various levels of sediment and water quality contamination. Residual effects from the proposed Project on sediment re-suspension, increased TSS, increased toxicity and bioavailability are considered to have a moderate resiliency.
Magnitude	<p>Habitat: Low to Moderate</p> <p>Species: Low to Moderate (<i>Crabs: Moderate</i>)</p>	<p>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 near shore habitat.</p> <p>Offshore Habitat: Most of the route, the pipe lays on soft sediments resulting in an increase in hard seabed habitat due to the concrete coated pipe surface overlying the seabed sediments, and results in a negligible, and possibly positive impact on overall habitat. Areas subject to seabed modification (dredging, blasting or rock fill) may result in a moderate loss of habitat value and could require habitat offsetting compensation.</p> <p>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 RSA would be relatively small, and in some areas the pipes hard surface and rock fill placement 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 the effectiveness of proposed mitigation measures, requiring effectiveness monitoring and adaptive management measures. The magnitude of residual effects on crab species is therefore expected to be</p>

Criteria	Assessment Rating	Rationale
	Water Quality: Low	<p>moderate, however is not expected to result in any population level effects or a decrease in habitat productivity for crab species within the RSA.</p> <p>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.</p> <p>Impacts due to construction sound levels would be moderate, and at or near the construction site they would approach levels known to cause behavioural response in some fish species. Sound levels would approach and marginally exceed documented thresholds for behavioural response in marine mammals (e.g. Humpback whale), but would not exceed thresholds considered to possibly harm or injure marine mammals. During operations, residual effects are expected to be negligible to low magnitude.</p> <p>Water Quality: With the implementation of the identified mitigation, the magnitude of effects on water quality and re-suspension of historically contaminated sediments is expected to be low.</p>
Extent	<p>Habitat: Project footprint</p> <p>Species: Project footprint to RSA</p> <p>Water quality: LSA</p>	<p>Habitat: Nearshore and offshore habitat alteration construction activities would be primarily within the proposed Project construction footprint. Mitigation is anticipated to limit the extent of habitat alteration outside the construction footprint near dredging at landfall trenches and underwater blasting at seabed modification areas due sediment dispersion and deposition.</p> <p>Species: The displacement and disturbance of marine life would largely be within the LSA. Effects on marine species are not predicted to extend beyond the immediate vicinity of the pipeline LSA, 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 RSA.</p> <p>Water Quality: Sediment and any related</p>

Criteria	Assessment Rating	Rationale
		contaminant dispersion have been modelled and are predicted to remain 1 km on either side of the centreline of the project route within the LSA.
Duration	<p>Habitat: Short-term to permanent</p> <p>Species: Short- to long-term</p> <p>Water Quality: Short-Term</p>	<p>Habitat Direct habitat disturbance would be limited to construction and 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). Seabed modification, if necessary, would permanently modify rocky substrate.</p> <p>Disturbance to marine life would be limited to 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.</p> <p>Water Quality: Sediment dispersion during subsea construction would be short-term (lasting 60-70 days for excavation and 50-60 days for backfilling).</p>
Reversibility	All: Reversible (and irreversible)	All effects would be fully reversible, with the exception of seabed modification from blasting.
Frequency	<p>Habitat and Species: Isolated to Continuous</p> <p>Water Quality: Continuous</p>	<p>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.</p> <p>Water Quality: Most construction activities causing sedimentation and related water quality effects would occur relatively continuously within a 30 to 60-day period at a specific location (e.g., landfall trench excavation areas).</p>
Likelihood	<p>Habitat and Species: There is a high likelihood that effects to landfall and nearshore 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. noise, blasting). There is moderate likelihood of effects on crab movement due</p>	

Criteria	Assessment Rating	Rationale
		<p>to the unburied pipe acting as a barrier, as mitigation and monitoring may eliminate or substantially reduce the residual effect.</p> <p>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. noise, blasting). There is a moderate likelihood of effects on crab movement due to unburied pipeline sections acting as a barrier, in consideration of the mitigation and monitoring measures proposed to reduce the potential residual effects.</p> <p>Water Quality: There is a high likelihood that effects to seabed sediment and related water quality would occur from the proposed Project.</p>
Significance		<p>Residual adverse effects are considered significant when there is a long-term or irreversible potential 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.</p> <p>EAO considered the low-moderate magnitude impact and the generally short-term and reversibility of the effects to the marine environment. EAO considered the mitigation and monitoring measures identified by the Proponent and the proposed conditions, including the development of the EMP, crab movement mitigation and monitoring, sediment and water quality management and monitoring, and marine mammal monitoring. EAO concludes that the proposed Project would not have significant residual effects on the marine environment VCs.</p>
Confidence		<p>The significance determination and likelihood for the marine environment is determined with high confidence, with the exception of the residual effect to crab movement, which is determined with moderate confidence. EAO believes there is a good understanding of Project-VC interactions, effectiveness of proposed mitigation measures, and regulatory compliance requirements associated with various legislation, regulations and guidelines for protection of the marine environment. However, as acknowledged by the Proponent, there is some uncertainty regarding the effectiveness of the proposed mitigation and monitoring measures related to crab barrier effects and underwater noise disturbance to marine mammals.</p>

5.11.5 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. The marine environment relevant to the Project falls under the following resource management plans:

- 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 Band; and
- *Nisga'a Final Agreement*.

An overview of the key developments and activities considered by the Proponent as part of the CEA is summarized below:

- Vessel traffic particularly in the vicinity of Prince Rupert and Prince Rupert port facility operations;
- Fisheries activities including seine, gillnet, trawl and trap fisheries for salmon, herring, eulachon, crab, shrimp, groundfish including halibut, and bivalve shellfish;
- Proposed PRGT project;
- Fairview Terminal expansion and Canpotex Terminal at Prince Rupert;
- 2 proposed LNG terminals at Prince Rupert.

Concerns were raised by Gitxaala Nation, Metlakatla First Nation and Lake Babine Nation over potential cumulative effects from major proposed dredging and disposal operations associated with the other pipeline, port development and LNG plant proposals at Ridley Island. Specific concerns related to potential sediment contamination and bioaccumulation effects given the very high juvenile fish habitat values.

The Proponent noted that they would continue the HHRA study in the Ridley Island area which would augment similar studies undertaken by others (e.g. Prince Rupert LNG Project). Each project would present assessments and if and where necessary appropriate mitigation to address potential issues related to contaminated sediments.

EAO notes that with the recent (Oct 3, 2014) revision of the Pacific NorthWest (PNW) LNG project's previously proposed dredging for the marine terminal jetty and trestle adjacent to Flora Bank (approximately 7 million m³) has now been eliminated.

Kitsumkalum First Nation expressed concern over temporal overlap of construction activities and time required for recovery between the proposed Project and other proposed projects in both the Nearshore and Offshore Marine Environments, emphasizing the need to consider the effects on a species basis (e.g., number of generations affected).

EAO's assessment has considered the duration of effects resulting from the complete construction of the proposed Project (i.e. two pipelines). 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.

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 proposed 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 have been proposed to further mitigate residual effects on fish and fish habitat. If other projects considered in the cumulative effects assessment within the RSA would result in serious harm to fish (if and as determined by DFO), would also be expected to implement similar mitigation and offsetting strategies.

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 short duration.

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 RSA 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.

Regarding the possible barrier to crab movement resulting from multiple pipelines in important crab areas in Chatham Sound (with a total of up to 4 marine pipelines are proposed with the combined PRGT and Proposed projects), EAO proposes a condition for both the proposed Project and the proposed PRGT Project that would require each Proponent 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 the marine environment would not be significant.

5.11.6 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), the EAO is satisfied that the proposed Project is not likely to result in significant adverse effects to the marine environment.

6 Assessment of Economic Effects

6.1 Economy

6.1.1 Background

This section describes the potential adverse effects of the Project on the local and regional Labour Force, the only VC selected for the economic effects assessment. The analysis focuses on the capacity of the Labour Force and the ability of the local and regional labour force to absorb changes in labour demand without adverse effects to existing local and regional economic activity. The beneficial economic effects of the Project are summarized in Section 2.5 of this Assessment Report (e.g. employment, government revenues, business development, etc.).

For the economic effects assessment, the LSA was selected to include communities, including Aboriginal communities, where it can be reasonably expected that adverse economic effects might occur. The RSA extends that area to include the regional districts crossed by the proposed pipeline route, including communities between the Project route and Highways 16 and 97.

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

The Application provides detail for each major RSA community including Aboriginal communities. Table 6-1 provides a brief overview of labour force activity for each regional district crossed by the proposed Project. The labour force activity data helps explain where experienced and skilled industrial workforces exist along the proposed route, and where effects to existing sectors and business activities could occur.

As is shown in Table 6-1:

- In 2011, the unemployment rate was higher than the BC average of 8% in all regional districts crossed by the proposed route with the exception of the Peace River Regional District (PRRD) where the unemployment rate was 6%; 2011 unemployment rates for the other regions ranged between 10% (Regional District of Fraser-Fort George (RDFFG)) and 14% (Skeena-Queen Charlotte Regional District (SQCRD)).
- The unemployment rate in the RSA Aboriginal communities averaged 33%, or three times the regional average (based on Aboriginal Groups for which 2011 data are available).

- In 2011, the labour force participation rate was highest for the PRRD at 75% and lowest for the RDKS at 62%; by comparison, the BC average was 65% and the participation rate in Aboriginal communities was 50%.

Table 6-1: Selected 2011 data on labour force activity

Key Indicators by Regional District (RD) in RSA	Population Aged 15 Years and Over	Selected 2011 Data on Labour Force Activity in RSA				
		Labour Force	Employed	Unemployed	Participation Rate	Unemployment Rate
PRRD	46,465	34,750	32,525	2,220	74.8%	6.4%
RDDFG	74,260	51,355	46,195	5,160	69.2%	10.0%
RD of Bulkley-Nechako (RDBN)	30,780	20,855	18,665	2,190	67.8%	10.5%
RDKS	29,795	18,530	16,135	2,395	62.2%	12.9%
SQCRD	14,875	9,340	8,010	1,330	62.8%	14.2%
All RD crossed by Project	196,175	134,830	121,530	13,295	68.7%	9.9%
First Nations in RSA	3,410	1,705	1,145	560	50.0%	32.8%
British Columbia Total / Average	3,646,840	2,354,245	2,171,465	185,775	64.6%	7.8%

Note: Data may not add due to rounding.

Construction

The Application provides background information on the number of jobs to be generated by the Project, the expected size of the construction workforce, the types of skills required to construct and operate the proposed pipeline and compressor stations, employment practices, and education and training programs. To summarize:

- Direct Project-related employment is expected to total 18,592 person-years (PY) for the four year construction phase, with 13,377 PY of total direct employment estimated to be generated in BC (See Table 2-3 in section 2.5 on Project benefits in this Assessment Report).
- The construction workforce assigned to building the land based pipeline and associated infrastructure/ facilities (92% of the construction workforce) would require a mix of labourers, welders, pipefitters, drivers, equipment operators, supervisors and safety personnel. Labour rates are expected to range from \$39 to \$45 per hour for labourers and from \$58 to \$80 per hour for supervisory and safety employees (based on Pipe Line Contractors Association of Canada, 2013, as reported in the Application).

- The marine portion of the pipeline construction workforce (8% of the total on-site workforce) is expected to comprise a high proportion of workers who are highly skilled and specialized in installing large diameter marine pipelines and are likely to be sourced outside Canada. Some less-skilled positions may involve deck hands, shore workers and support workers involved in tugs, barges and crew transport vessels available in the Prince Rupert area.

As described in the Application and summarized below, the Proponent's consultation process with community representatives identified several concerns with respect to potential Project-related effects on the local and regional labour force and labour markets.

The Application noted that workforce requirements of the Project would exceed available labour supply. The Proponent reported that representatives from regional districts and communities described how communities were already experiencing shortages of skilled and unskilled labour, and that possible Project-related effects on the labour force may be felt most strongly near proposed construction camp locations including those near Hudson's Hope, Mackenzie, Takla Landing and the Nisga'a villages. The Proponent's mitigation strategies to address potential adverse effects related to possible labour shortages are to:

- Develop and implement training programs that focus on Project-specific employment skills and are targeted at local and Aboriginal groups;
- Develop and adhere to a Local Employment Training and Procurement Strategy;
- Provide the construction schedule to businesses, economic development organizations, school districts and post-secondary institutions; and
- Where required, engage labour from outside of the region and province.

The Application identified that the proposed Project may result in the displacement of local workers and distortion of wage rates. It describes how workers moving to higher-paying positions can result in potential labour supply shortages and wage increases for existing service and other jobs as is being experienced in northeast BC where workers have been sought internationally to fill service positions. The Proponent expects the workforce to be sourced in part from outside the RSA which should help limit potential distortion of wage rates.

There may be barriers to obtaining employment for the local workforce. The Application described how unemployed and underemployed people often face multiple barriers to successful entry into the workforce including inadequate skill levels, lack of experience in the oil and gas sector, and difficulties for workers who do not belong to a labour union to secure work on unionized components of the Project. The Proponent expects the

Project to require some lower-skilled positions for which barriers may be lower, such as janitorial, work camp support and labourers' jobs. In addition, the Proponent proposes to undertake the following mitigation strategies:

- Ensure collaboration between the Proponent, training and employment agencies, and trade unions;
- Develop training initiatives that take into consideration local circumstances;
- implement a hiring strategy that will work with existing government funding and service delivery programs, and partner with training and economic development organizations; and
- Provide training initiatives that do not focus solely on Project employment and recognize that communities may benefit from training for positions that provide on-going local and regional services.

There could also be barriers for local businesses to obtain contracts. The Application reported that representatives from communities such as Fort St. James, Hazelton and Hudson's Hope indicated that potential economic and other benefits that are expected to accompany major projects do not tend to occur in their communities as most local businesses lack the capacity or resources to supply goods and services to major projects and/or compete with larger suppliers. To address these concerns, the Proponent proposes to adopt a procurement strategy that maximizes contracts for local businesses and to communicate the construction schedule and construction activities to local economic development organizations.

Operations

During operations, the Proponent expects to require approximately 5 employees for each compressor station, which would include electrical, instrumentation and mechanical specialists with two people required on each shift. Approximately 44 on-site employees are expected to be required to operate the pipeline when all 8 compressor stations are operating.

6.1.3 Project Issues and Effects and Proposed Mitigation Identified during Application Review

During Application Review, questions and concerns were raised by Northern Health, local communities, several Aboriginal Groups (e.g. Blueberry River First Nations, Kitsumkalum First Nation, Nak'azdli Band, and Gitxaala Nation) and other government agencies 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 also provided the Proponent with a request for supplemental information for a range of socio-economic information, including additional detail about construction camps.

In response to these concerns and EAO's information request, the Proponent provided the information in Table 6-2 on peak workforce activity by construction year for each of 14 main camp locations. The Proponent also provided information on a proposed 15th location at KP 750.9 for an additional floating camp.

Table 6-2: Proposed construction section and main construction camps

Approximate Location of Main Camps	KP Location	On-Site Construction Workforce by Year			
		2016 (August - December) ^(a)	2017 at Peak ^(b)	2018 at Peak ^(c)	2019 at Peak ^(d)
Peace River RD					
1 - Near Halfway River	19	510	55	0	0
2 - Near Hudson's Hope	94	430	430	55	0
3B - West of Chetwynd	139	0	175	430	55
3A - West of Chetwynd	141	<u>0</u>	<u>175</u>	<u>430</u>	<u>55</u>
Sub-Total		940	835	915	110
RD of Fraser Fort-George					
4 - Near Mackenzie	219	0	175	680	110
5 - Remote, west of Mackenzie	252	<u>430</u>	<u>550</u>	<u>55</u>	<u>0</u>
Sub-Total		430	725	735	110
Bulkley-Nechako RD					
6 - Remote, north of Fort St James	275.5	0	430	55	0
7 - East of Takla Landing	379	0	175	430	55
8 - West of Takla Landing, near North Takla Lake	423	175	430	55	0
9 - Remote, some 50 km north of Fort Babine	484	0	350	55	0
10 - Remote, near Kisgegas IR north of Kispiox	532	<u>0</u>	<u>175</u>	<u>430</u>	<u>55</u>
Sub-Total		175	1,560	1,025	110
Kitimat-Stikine RD					
11 - East of Cranberry Junction	578	430	430	55	0
12 - Nisga'a Villages/ Nass Camp	654	0	175	55	0
13 - Nisga'a Villages/ Nass Camp	684	175	175	55	0
14 - Possible Float Camp	740	0	175	485	55
15 - Additional Floating Camp	750.9	<u>175</u>	<u>55</u>	<u>55</u>	<u>55</u>
Sub-Total		780	1,010	705	110
Total Land-Based Pipeline		2,325	4,130	3,380	440
Compressor Stations		350	350	350	250
Marine Construction Workforce		190	335	550	60

Approximate Location of Main Camps	On-Site Construction Workforce by Year				
	KP Location	2016 (August - December) ^(a)	2017 at Peak ^(b)	2018 at Peak ^(c)	2019 at Peak ^(d)
Total Workforce		2,865	4,815	4,280	750

- (a) In 2016, construction of the land based portion of the pipeline is expected to start in August and continue for the rest of the calendar year.
- (b) In 2017, for the land based portion of the pipeline, the peak workforce of 4,130 workers is expected to be required for June through October, 3,000 workers are expected for January to March and for November and December, and a minimal workforce is expected during spring break-up in April and May.
- (c) In 2018, for the land based portion of the pipeline, peak or near peak workforce of 3,380 workers is expected to be required for June through October; 2,300 workers are expected for January and February; and a minimal workforce is expected for April and May and for November and December.
- (d) In 2019, construction is expected to be completed for most sections of the pipeline with only the final cleanup crews remaining at several camps during the summer months.

As shown on Table 6-2 and other information provided by the Proponent during Application Review:

- The land-based pipeline construction workforce would peak at 4,130 workers in 2017.
- Approximately 350 workers would be assigned to the construction of compressor stations and they would be lodged at pioneer camps with a capacity for approximately 200 individuals per camp.
- Workers would also be required to construct the marine segments of the pipeline (between 60 and 550 workers per year).
- Each main camp would be used for approximately 30 months in elapsed time.
- The most active construction periods for each camp would include between 4 and 12 months for right-of-way clearing and rock removal, 5 months for pipe installation and 3 to 5 months for final clean-up.
- While each main camp would have a capacity of approximately 1,000 individuals (i.e. 800 construction personnel, 100 client personnel and inspectors and 90 camp contractor personnel), the number of workers at each main camp would likely peak at approximately 500 workers, or half the maximum main camp capacity.

The 2017 peak on-site construction workforce of 4,480 workers for the land based pipeline and compressor stations would represent 3.3% of the 2011 labour force for the five regional districts that would be crossed by the pipeline route, and 34% of workers that were unemployed in 2011 in those same regional districts.

During Application Review, several Aboriginal Groups (e.g. Blueberry River First Nations, Kitsumkalum First Nation, Nak'azdli Band, Takla Lake First Nation, Metlakatla First Nation and Lax Kw'alaams Band) and others (e.g. RDKS, RDBN) expressed

concerns about the distribution of employment opportunities to existing RSA businesses and residents, with some Aboriginal Groups requesting quotas or target numbers of employees by community. 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 long-term benefits from the Project. There was also concern that training would not be delivered in time for local workers to take advantage of higher skilled Project-related jobs.

Community leaders expressed concerns that existing employers may have difficulty sourcing labour as a result of Project labour requirements, particularly during construction when a relatively large workforce may be required.

The Proponent explained that they could not provide reliable estimates of the proportion of employment that could be obtained by existing residents of the LSA/RSA communities. During Application Review, the Proponent indicated its commitment to monitor the effectiveness of training programs, the distribution of employment benefits to existing residents in RSA communities including Aboriginal communities, and the distribution of business procurement contracts (i.e. LSA, RSA and others).

Concerns were also raised by Northern Health and several Aboriginal Groups, about the legacy impacts of the relatively short-term increase in economic activity during Project construction, including the potential adverse effects on vulnerable groups in local communities.

The Proponent responded that the economic effects assessment considered the short-term nature of the construction phase, and that the Proponent's assessment of potential effects on community quality of life took into account economic-related issues.

Lax Kwa'alaams Nation and community representatives were concerned that local businesses and communities would not have sufficient capacity to take advantage of economic benefits that could be expected from Project construction particularly if several pipelines and other projects proceeded concurrently. These concerns are further discussed in section 6.1.5 on cumulative effects.

EAO proposes a condition that, if an EA Certificate is issued, the Proponent would be required to develop a Social and Economic Effects Management Plan (SEEMP) that would include an approach to designing and communicating programs related to employment and contracting opportunities, skills training and

education. The SEEMP would provide for monitoring and reporting on the effectiveness of the mitigations set out in the SEEMP and the Application.

6.1.4 Characterization of Residual Project Effects

After considering all relevant proposed mitigation measures, EAO concludes that the proposed Project would result in the residual adverse economic effect of:

- The creation of a shortage of available labour for some skills.

EAO's characterization of the residual effect of the proposed Project 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	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 4,480 workers would represent 3.3% of the labour force of the five regional districts. However, the peak construction period is likely to attract workers from all over BC and elsewhere, particularly given the temporary nature of the construction work, and short peak construction period (approximately six months) in any pipeline segment. Use of 14 or 15 main construction camps should help mitigate adverse effects on local labour forces.
Extent	Regional	Any potential adverse effects related to the economic environment would primarily be on 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

Criteria	Assessment Rating	Rationale
		highest magnitude effects would be for a shorter duration (i.e. between 6 and 12 months in 2016, 2017 or 2018).
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 RSA economy.	
Significance	Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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 force and employment.	
Confidence	There is a moderate to high level of confidence in the likelihood and significance determination. There is some uncertainty due to the inherent difficulties in accurately predicting how local labour markets may respond to new events.	

6.1.5 Cumulative Effects Assessment

The Application's cumulative effects assessment on the local and regional labour force identifies other proposed industrial projects in northern BC, which includes the RSA, 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 Project pipeline route is the most northern route of the proposed natural gas pipelines listed above, but the potential adverse effects on the labour force would extend to the Project RSA, which broadens the range of projects that could overlap geographically and temporally with this Project.

Project demands on the labour force could adversely affect communities where this and other natural gas pipeline projects (and in particular the Prince Rupert Gas Transmission Project) are planning nearby temporary construction camps including the communities of Hudson's Hope, Chetwynd/ Moberly Lake/Lemoray, Mackenzie, Takla Landing and the Nisga'a Villages/Nass Camp. Other RSA communities that are further from this Project's proposed main camp locations but where demands on the labour force from multiple projects could adversely affect existing economic activity include

Fort St. James, Kispiox, New Hazelton, the Village of Hazelton, Fort Babine and Prince Rupert.

In northeast BC, 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. This may result in some degree of labour demand offset in that region.

In the RDKS and the SQCRD, some \$5 billion in construction projects will 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).

In its Application, the Proponent reported that the analysis of potential cumulative effects on the Labour Force VC was limited by the lack of information on:

- Workforce size, hiring policies and training programs of other major industrial projects;
- Schedule and sequence of construction of other major energy and mining projects;
- Methods of constructing and servicing other major energy and mining projects; and
- Likelihood that planned projects will proceed.

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 was established with financial support from the provincial and federal governments under the Labour Market Partnership Program and comprises representatives from major companies, industry associations and provincial government ministries. In July 2013, the Committee released the BC Natural Gas Workforce Strategy and Action Plan, which details multiple strategies and actions on the local, regional, Canadian and international front 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. (BC Natural Gas Strategy, 2013)

- 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. (Premier's LNG Working Group, 2014)
- Northwest Readiness Project: In December 2013, the BC Ministry of Community, Sport and Cultural Development (CSCD) initiated the Northwest Readiness Project in consultation and collaboration with the BC 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 the Northwest region are prepared to meet infrastructure, health, safety and social services demands as proposed new industrial projects move from concept to construction stages and beyond.

Drawing from data sourced from project proponents, and in consultation with a number of regional stakeholders, the Northwest Readiness Project Team has now begun to develop a standardized set of scenarios of probable employment and population growth resulting from major project development in the region to assist communities with service planning.

- Northwest Regional Economic Collaborative: The BC Jobs, Tourism and Skills Training Northwest Regional Economic Collaborative includes the Northwest Labour Market Partnership, Northwest Tourism Strategy, Regional Investment Readiness and Bio-Energy Investment Attraction. The Northwest Regional Economic 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 BC LNG proponents to coordinate community relations and labour strategies related to the proposed LNG facilities in northwest BC. They include: Petronas' Pacific NorthWest LNG (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 proposes to address potential residual cumulative effects from the Project on skilled labour shortages in the RSA through:

- Continuing to communicate the proposed construction schedule and labour force needs to economic development organizations, local communities and Aboriginal groups; and
- Undertaking training opportunities that emphasize transferrable skills.

EAO proposes a condition that, if an EA Certificate is issued, the Proponent would be required to develop a SEEMP that includes monitoring and reporting on the effectiveness of mitigation set out in the Application and the SEEMP. The SEEMP would be developed in consultation with the Ministry of Community, Sport and Cultural Development (CSCD) with guidance from framework materials provided by EAO.

EAO concludes that, during construction, there would be a high likelihood of medium 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 and the CPD (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 markets.

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), EAO is

satisfied that the proposed Project is not likely to have any significant adverse effects on the economic environment.

7 Assessment of Social Effects

Potential adverse effects of the Project on social values are examined here with respect to three of the four VCs presented in the Application:

- Communities, infrastructure and services;
- Transportation and access; and
- Land and Resources.

A fourth social VC presented in the Application, current use of land and resources for traditional purposes, is considered in Part C of this Report. The potential economic, social and other benefits of the proposed Project are discussed in section 2.5 of this Report.

7.1 Communities, Infrastructure and Services

7.1.1 Background

Project effects on communities, infrastructure and services are examined through the following key indicators:

- Accommodation
- Emergency Services
- Health Care Services
- Social Conditions and Services
- Public Safety and Security
- Recreation Sites and Facilities
- Communications
- Domestic Water Supply (Quantity)
- Government Services
- Solid and Liquid Waste Management

The LSA is a 2 km band centered on the proposed route and the RSA extends that area to include a band of approximately 25 km to the north of the proposed pipeline centreline plus communities between the proposed centreline and Highways 16 and 97.

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

Potential Project effects on communities, infrastructure and services relate primarily to the expected influx of construction workers and associated activity during the Project construction period.

Accommodation

Factors driving the potential Project-related effects on housing and commercial accommodation relate to the large number of workers engaged during the construction of the proposed Project (see section 6 of this Report). In its Application, the Proponent identified two broad types of concerns related to potential Project effects on accommodation:

- Increased demand for temporary accommodation: The Proponent's primary mitigation strategy for accommodating construction workers is the establishment of 14 main construction camps. Construction workers and non-construction personnel may also seek temporary accommodation in communities near the proposed construction camp locations. Workers who are in transit to and from job sites or during time off periods may require overnight accommodation in communities near the Project. Also, non-construction Project personnel such as engineers and senior management staff may require temporary accommodation in LSA communities during construction.

The Proponent notes that the reduced vacancy rates in temporary accommodation would likely benefit the hospitality industry, but may inconvenience travellers and create conflicts in communities with private landowners renting recreational vehicle (RV) parking space in residential areas, resulting in increased noise levels from workers and diesel trucks.

As indicated in the Application, RSA community representatives identified potential solutions to help address potential shortages in temporary accommodation during Project construction (for example, the Districts of Mackenzie and New Hazelton voiced interest in sharing building costs for worker accommodation with the Proponent that could be converted to seniors housing, assisted-living units or affordable housing after Project construction). When the Project construction schedules are more definite, the Proponent plans to communicate accommodation needs and the proposed construction schedule to local operators of hotels, motels, or other temporary accommodations as well as community-based Chambers of Commerce to ensure that providers of temporary accommodation are able to plan for any potential increase in activity.

- Increased rent levels and increased permanent housing costs: The Proponent expects that the establishment of 14 main construction camps and several smaller pioneer / floating camps would help alleviate potential Project-related effects on rent levels and permanent housing costs.

The construction workforce is not expected to relocate to the RSA during Project construction: the Project is in a remote location for most of the pipeline route; the construction work is temporary by nature and requires a relatively short time within each segment of the pipeline route (while each main camp is expected to be in use for approximately 30 months, the most active period when each camp is expected to operate with more than 400 workers is expected to range between 6 and 12 months, usually during pipeline installation); and temporary construction camps would be used to house workers near the ROW and work camp residence would be mandatory for all construction workers.

Emergency Services

The Application describes the emergency services provided in the LSA/RSA by municipal governments, regional districts, and provincial organizations including fire protection, police services, ambulance and medical evacuation, and search and rescue. The Project has the potential to increase demand for local emergency services, including police, fire and ambulance:

- Local RCMP detachments and other emergency responders may be needed to respond to disturbances and incidents resulting from a short-term increase in construction camp population and increased traffic on roads and highways, which may also lead to higher rates of vehicular accidents.
- During operations, the effects would likely be negligible except in the case of an accident or malfunction such as a pipeline leak, fire or explosion.

Construction camps and other work facilities that are outside municipal and regional district fire protection areas are not protected by local fire departments. The Proponent indicates that the construction camps would have on-site emergency personnel, on-site fire suppression equipment and on-site senior medical providers and first-aid personnel in accordance with WorkSafe BC regulations, which would help mitigate the potential effects of camp-related demand for LSA emergency services.

The Proponent also proposes several crime prevention strategies and workforce drug and alcohol policies to mitigate potential adverse effects related to crime incidence and unhealthy behaviours.

Health Care Services

Health care services in the RSA are primarily administered by the Northern Health Authority (NHA), and as described in the Application, several northern BC communities are struggling to provide health care to existing populations. In the Application, the Proponent reports that during the EA, the NHA and several RSA community representatives expressed their concerns that the large workforce involved in the Project may increase pressure on health care services in the LSA/RSA communities.

The Proponent proposes to provide 24-hour medical staff (nurse or equivalent) at the temporary construction camps in accordance with WorkSafe BC and other applicable government regulations regarding occupational safety and health. Medical evacuation services would be available at or near work camp locations for the transportation of sick or injured workers.

In addition to work-based injuries, it is anticipated that construction workers may occasionally require the services of walk-in-clinics, hospitals or pharmacies during their days off. In its Application, the Proponent suggests shift schedules are likely to vary depending on the needs of pipeline contractors, but they may include a mix of 6 days on and 1 day off, 14 days on and 2 days off, or 21 days on and 7 days off. Project expenditures include estimates for travel expenses to allow workers to return home between shifts, and the Proponent expects the majority of construction workers to take the opportunity for longer time off periods (i.e. 7 days). Workers with shorter time off periods of one or two days off may choose to visit nearby communities and, if needed, use local health care services.

Social Conditions and Services

The Application describes existing social conditions in communities in the RSA using the BC Stats indexes of children-at-risk, youth-at-risk, human economic hardship, health problems, education concerns, and crime, which are provided on an annual basis by Local Health Area (LHA). With the exception of the Smithers LHA, all Northern LHAs ranked in the least satisfactory third of provincial LHAs for several areas of concerns.

The Application describes social and mental health services provided in the RSA including programs offering addiction and substance abuse intervention and counselling

services, life skills training, crisis intervention, victim support services, life stress reduction, and other family/ youth outreach and counselling support, although in many RSA communities only some of these services are available.

The Proponent reported that during the Application process, community representatives expressed concern that the proposed construction camps may alter the demographic structure of communities by increasing the number of working age males as they tend to dominate resource development and construction industries. Smaller communities such as Hudson's Hope, Mackenzie, Takla Landing and the Nisga'a Villages could be particularly affected. Also, concerns were raised by representatives from Fort St. John, Prince Rupert, RDBN, NLG and the Lisims-Nass Valley RCMP that the Project may exacerbate existing social issues such as substance abuse and the sex trade.

In its Application, the Proponent indicated that effects such as higher rates of crime, drug and alcohol abuse, unplanned pregnancies and other adverse social effects are typically associated with work camps for mines or other long term development projects, and not from temporary construction camps for pipeline construction. The construction camps for this Project are expected to be occupied for between 2 and 3 years depending on the length and difficulty of the each spread. Also, work schedules allow skilled workers that are hired from an external workforce to travel home during off-time periods rather than remaining in communities near to the construction site.

The Proponent proposes the following mitigation strategies to help prevent adverse effects on social conditions in communities near the proposed construction camps:

- Ensure workers are appropriately trained and monitoring is in place for compliance with the Proponent's code of conduct;
- Enforce the Proponent's drug and alcohol policies;
- Ensure approved safety and medical personnel in temporary construction camps and on construction sites are trained to address mental health and substance abuse issues;
- Adhere to the Proponent's Prolonged Hours of Work Policy to mitigate fatigue; and
- Communicate the Project construction schedule with local representatives to determine potential capacity issues regarding social services.

Public Safety and Security

The Application provides information and indicators of crime by Local Health Area for 2011 including the BC Stats composite indicator ranking of crime concerns.

Similar to potential effects on social condition, the public safety and security of communities near temporary construction camps could be affected by demographic and population changes. Communities that could be adversely affected include Wonowon, Hudson's Hope, Chetwynd, Mackenzie, Fort St. James, Takla Landing, Kispiox, Hazelton and the Nisga'a Villages.

The Proponent proposes the following mitigation strategies to address any potential adverse effect on public safety and security:

- Ensure workers are appropriately trained and monitoring is in place for compliance with the Proponent's code of conduct;
- Ensure that work camp and site security is present to monitor and deter criminal and other undesirable activities;
- Ensure drug free work places and construction camps through the periodic use of drug detection dogs;
- Communicate the proposed construction schedule to RCMP and community representatives; and
- Ensure that Contractors have adequate monitoring and response processes in place.

Recreation Sites and Facilities

The Application identified two outdoor recreation sites and five recreation reserves that are located in the LSA but no provincial outdoor recreation areas, boat launches or campgrounds were identified that may be encroached by Project construction. As identified in the Application, the construction workforce could potentially increase the demand for campgrounds, outdoor recreation sites, trails and boat launches.

The Proponent proposes several strategies to mitigate any adverse effects on outdoor recreation sites. These include adhering to the Access Control Management Plan and Restoration Plan Framework proposed in the EMP, communicating the proposed construction schedule to the FLNR District Recreation Officer, and providing transportation to workers to help minimize the use of private vehicles to and from the Project sites. Also, construction workers residing in temporary construction camps would be required to park their private vehicles at secured storage yard(s) remote from the temporary construction camp sites.

Workers not required to reside in camps would require short term commercial accommodation available in or near their work area. The Proponent proposes t that

non-camp based employees be restricted in their use of nearby outdoor recreation sites as follows:

- If an employee wishes to occupy his own trailer or other accommodation facility, only Project-approved campgrounds or trailer parks may be used;
- The use of provincial or federal campground facilities for purposes of accommodation while employed on the Project would be prohibited; and
- Establishing temporary accommodation on federal or provincial lands adjacent to any lakes, rivers or streams in the vicinity of any work site would also be prohibited.

The Application describes recreational facilities and amenities in the LSA and RSA communities. In the larger centres, these include golf courses, fitness centres, sports fields, skating arenas, curling rinks and swimming pools. Workers who would be housed in construction camps near communities such as Hudson's Hope, Chetwynd, Mackenzie, the Nisga'a Villages and Prince Rupert may increase pressure on local recreation facilities. Such effects, if they occur, would be limited to times when workers are on days off in the LSA/RSA communities.

Each main construction camp would be equipped with amenities such as a workout facility, dining room, recreation hall and a small general store. Also, the Project construction schedule would be communicated to community representatives to alert recreation facility operators of a potential increase in use.

Communications

Temporary construction camps would be designed and built to provide internet access for Project management and communications purposes, and each worker's room would be equipped with television and internet access. The Project vehicular traffic would comply with Forest Service Road (FSR) radio frequencies and the Proponent would develop an independent Project-specific VHF system along the Project which would not conflict with the FSR channels.

Domestic Water Supply (Quantity)

Domestic water supply in the Communities, Infrastructure and Services RSA is drawn from groundwater and surface water sources. The Application provides detailed information pertaining to existing domestic water supply sources.

The Application identifies 34 Points of Diversion; most are for domestic uses, irrigation and power, while other uses include stock water, road maintenance, dust control, water delivery, waterworks and power storage.

Should a community surface water source or related infrastructure be affected during construction of the Project, the Proponent would provide an alternate water source. Where practical, the Proponent would use trenchless crossing methods. The proposed construction schedule would be shared and discussed with potentially-impacted stakeholders and community leads responsible for water supply.

No groundwater wells were identified in the Project footprint and the Proponent does not expect Project construction to encroach upon groundwater wells. Groundwater well infrastructure is also not expected to be affected by Project operations.

Although the potential effect is unlikely to occur, construction activities may affect groundwater supplies or disrupt water flow to wells. The Proponent proposes to provide groundwater well replacement or otherwise supply water if infrastructure is affected during construction of the Project. The Proponent also commits to on-going communication with users of groundwater wells near the proposed pipeline route.

A representative from the City of Fort St. John expressed concern that municipal water supply facilities may experience a sudden increase in water usage to service proposed temporary construction camps for the Project.

The Proponent indicated that it is unlikely that Fort St. John's municipal water supply would be drawn upon due to the distance of the city from the proposed route and temporary construction camps. Potable water for work camps may be supplied by on-site wells or bulk community water supplies, where available. The Proponent expects that the use of water wells would reduce the need to rely on local communities for potable water.

Government Services

Service BC Centres offer government services to LSA residents on behalf of provincial ministries, agencies, Crown corporations, other levels of government and private sector organizations. Incorporated communities provide services such as liquid waste management, snow clearing, domestic water supply, residential garbage collection and road maintenance among many others. Regional districts tend to provide services to unincorporated communities and are responsible for the operation of solid waste facilities with some exceptions.

Some Regional Districts are experiencing issues with maintaining community infrastructure while at the same time responding to major project proposals. The Proponent proposes to continue to communicate the proposed construction schedule in advance to Regional Districts and Municipal representatives so they can resource accordingly.

Solid and Liquid Waste Management

In establishing work camps, the Proponent would be required to comply with all regulatory requirements regarding waste management and disposal and to submit their applications within timeframes required by the various regulatory agencies. Determining which local systems might be used as part of camp operations would be part of more detailed planning by the Proponent as the Project proceeds through construction.

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

This section summarizes the key concerns raised during Application Review regarding Project-related adverse on communities, and infrastructure and services.

Accommodation

Concerns were raised during Application Review by several Aboriginal Groups, including Kitsumkalum First Nation and Metlakatla First Nation, Northern Health and others about the Project-related effects on housing availability as follows:

- Risks associated with mitigation strategies regarding housing of construction workers: It is assumed that a larger 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 RSA communities (e.g. hotels, motels, rental units, RV parks, campgrounds, etc.).
- Campgrounds and recreational facilities: Workers and their families may utilize campgrounds and recreational facilities during the summer months, which would create opportunities for campground operators, but would also potentially cause adverse effects for local residents and visitors.
- Indirect and induced effects: The magnitude of the potential project-related indirect and induced effects on housing availability on RSA communities is unknown. Several communities identified a shortage of rental housing and/or commercial

accommodation. Concerns relating to housing shortages were also reported by LSA Aboriginal communities.

- Project-related effects on non-market housing units: During Application Review, concerns were raised that the Project may 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. (Northern Health, Regional District of Kitimat Stikine, several Aboriginal Groups and others)

In response to these concerns, and at the request of EAO, the Proponent provided preliminary camp locations and estimates of numbers of workers at each camp (see Table 6-2 of this Assessment Report) and re-iterated its commitment to engage in early communication with accommodation providers once Project construction schedules are confirmed.

Table 7-1 compares the information provided by the Proponent during Application Review on the location, scale and proposed start of substantial construction activities at each camp, with data provided in the Application on existing commercial accommodation facilities in several LSA municipalities.

Table 7-1: Commercial accommodation in LSA municipalities near proposed Project camp locations and construction schedule

Potential Project Effects on Temporary Accommodation ^(a)				Scheduled Time of Peak Construction Excluding Clean-up ^(b)		
Municipalities	Accommodation Units	Nearest Main Camp	Camp Location	Start Date	End Date ^(c)	Estimated Personnel
City of Fort St. John	1,785	#1	Halfway River/ Wonowon	Aug-16	Mar-17	510
District of Hudson's Hope	324	#2	Hudson's Hope	Aug-16	Oct-17	430
District of Chetwynd	450	3A & 3B	West of Chetwynd	Jun-17	Oct-17	350
				Jun-18	Oct-18	860
District of Mackenzie	174	#4	Mackenzie	Jun-17	Mar-18	175 to 250
				Jun-18	Oct-18	680
		#5	West of Mackenzie	Aug-16	Oct-17	430 to 550
District of Fort St James	286	#6	North of Fort St James	Dec-16	Oct-17	175 to 430
Takla Landing/ Takla Lake	13	#7	East of Takla Landing	Jun-17	Oct-18	175 to 430
		#8	West of Takla Landing	Aug-16	Oct-17	175 to 430
Fort Babine	not available	#9	North of Fort Babine	Nov-16	Mar-18	175 to 605

Potential Project Effects on Temporary Accommodation ^(a)				Scheduled Time of Peak Construction Excluding Clean-up ^(b)		
Municipalities	Accommodation Units	Nearest Main Camp	Camp Location	Start Date	End Date ^(c)	Estimated Personnel
Kispiox	not available	#10	north of Kispiox	Jun-17	Oct-18	175 to 430
District of New Hazelton	64					
Village of Hazelton	107					
Cranberry Junction		#11	Cranberry Junction	Aug-16	Oct-17	430
Nisga'a Lands	30 ^(d)	12	Nisga'a	Nov-16	Apr-18	175
		13	Nisga'a	Aug-16	Mar-18	175
		14	Floating	Nov-16	Mar-18	175

Notes:

- (a) Commercial temporary accommodation facilities include hotels, motels, bed and breakfasts, resorts, lodges, campgrounds and RV parks.
- (b) Peak construction activities at each camp include clearing right-of-way, rock removal and pipe installation; most camps are not expected to operate in April and May of each year.
- (c) In addition, most camps are scheduled to operate for clean-up for a few more months in either 2018 or 2019.
- (d) Includes 7 bed and breakfasts distributed among the four Nisga'a Villages and the campground at Nisga'a Lava Bed Memorial Provincial Park which offers 23 campsites.

During Application Review, concerns were raised by Northern Health and others that communities near construction camps may have a greater than anticipated number of in-migrant direct, indirect and induced workers relocating temporarily to communities near the Project, resulting in an increase in what is sometimes referred to as a "shadow population", i.e. individuals who may be residing in or near the communities on a temporary basis in RVs, hotels, apartments and/or other living arrangements, with and without their families. Table 7-1 indicates that 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.

In response to these concerns, and given the substantial uncertainties that remain with respect to the potential Project related effects on housing and commercial accommodation, EAO proposes a condition that would require the Proponent to develop and implement a SEEMP in consultation with CSCD and with guidance from framework materials provided by EAO.

Emergency and Other Social Services

During Application Review, several Aboriginal Groups (e.g. Kitsumkalum First Nation and Metlakatla First Nation), regional districts (e.g. PRRD), local residents (Kispiox, Hazelton and other communities), NHA and others raised concerns about the ability of the existing emergency services, social services, recreation and community social resources to meet the demand that may result from Project-related direct, indirect and induced effects associated with construction camps being established near their communities.

The Proponent's supplemental information request showed that while the main camps are expected to have a combined capacity potentially reaching 14,000 workers (i.e. 14 camps each with a capacity of up to 1,000 workers), the number of workers residing at the camps is expected to peak at 4,130 workers for several months in the summer of 2017 (see Table 6-2 of this report).

During Application Review, several community representatives expressed concerns that the scale of the proposed construction main camps was large relative to nearby communities. The Application reported that in early 2012, NHA identified 1,809 temporary construction camp sites in northern BC. The following camps were listed as having a capacity of 200 or more workers:

- 7 large camps in the BC Northeast region including Horn River (700 workers), Kiwigana Lodge (475 workers), Willow Creek (325 workers) and four others;
- Huckleberry Mine (250 workers);
- Mount Milligan Mine (200 workers);
- Kitimat Modernization Project (600+ workers in 2012, but projected to increase to 1,500 workers); and
- Forrest Kerr project (440 workers).
- [EAO notes that the NHA list did not include the more recent 400 worker construction camp for the Red Chris mine.]

During Application Review, there was some concern from smaller communities 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 LSA 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.

Several residents of the Hazelton /Kispiox area and Smithers were particularly concerned with the proposed camp near Kispiox (e.g. effects on crime, increased housing costs and rent levels, social services, workers trespassing on private property, sewage and garbage arrangements, traffic increases, etc.). While pipeline construction was generally viewed negatively, the choice of the Kispiox area for a main camp location raised fears that the area would suffer damage in terms of human presence, pollution and litter.

The Proponent responded that the proposed measures would help mitigate adverse effects to communities near proposed main camp locations including the Kispiox area. The Proponent's mitigation strategies include workforce drug and alcohol policies, crime prevention policies, support for access to counsellors at the main camps and other mitigation measures.

There remain uncertainties relating to the potential of work camp-related demands for community infrastructure and services including: emergency response and protection services (e.g. fire protection, crime prevention, etc.); social and community services (e.g. child care, counselling services, etc.); recreational facilities, etc.

During Application Review, reports on outcomes from other construction camps, preferably of similar scale and in similar settings were requested by NHA, and Kitsumkalum First Nation and Metlakatla First Nation to support a better understanding of the risks of adverse effects posed by the location and scale of the construction camps to sensitive receptors in the LSA/RSA communities.

The Proponent responded that the Application took into account their extensive experience in building pipelines but that additional information to what was provided in the Application was not available.

EAO proposes a condition that would require the Proponent to develop a SEEMP that would include monitoring and reporting on the effectiveness of mitigation in the Application and the SEEMP and, if necessary, adaptive management.

Health Infrastructure and Services

The NHA and others (e.g. Kitsumkalum and Lax Kw'alaams Band) expressed 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.

During Application Review, EAO requested that the Proponent provide quantitative estimates of 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 WorkSafe BC averages of injury rates for the BC oil and gas industry for the years 2008 through 2012, information which is summarized in Table 7-2 below.

Table 7-2: Estimated number of injuries during construction

Estimated Number of Injuries During Project Construction ^(a)	WorkSafe BC Oil and Gas Industry Related Medical Accidents, 2008 to 2012		Estimated Injuries for Project Construction Workforce (based on WorkSafe BC Rates)
	5 Year Total	5-Year Average per 100 PY	
Number of Injuries:			
All injuries	863	0.888	119
Serious injury rate (b)	424	0.436	58
Fatalities	20	0.021	2.8
Person Years of Employment	97,194		13,377

(a) Based on WorkSafe BC Business Information and Analysis 2013, as reported in WCGT Technical memo FLNR 109 (June 23, 2014), page 14.

(b) Serious injuries include claims with 28 or more work days paid, health care costs in excess of the equivalent of 28 or more days paid, a fatality, or one of the 275 selected ICD9 codes, and is first-paid within the month of injury of the three months following.

As shown on the above table, based on WorkSafe BC industry averages and total person years of direct employment in BC, the Project construction phase may result in 119 injuries over the complete 4-year construction period. These injuries may or may not result in medical service requirements beyond services provided in construction camps as approximately half could be considered serious.

According to WorkSafe BC, the most common accident-type of injury consists of “struck by” claims, the most common type of injury consists of various types of muscle strains, and the highest claim costs are from bone fractures. The Proponent expects that many of these types of accidents would likely be treated on site by medical staff based at the temporary construction camps, which would help reduce the potential for increased pressure on local health care facilities.

As a mitigation strategy, the Proponent proposes to develop several plans to prevent accidents and reduce the risks of injury to workers during construction, including a Health Services Management Plan. During Application Review, the Proponent re-iterated their commitment to staff their Project facilities and camps with sufficient numbers of emergency medical personnel and other services. Also, the Proponent proposed to communicate before the construction phase with local and regional health care and social service providers to identify service gaps and resulting issues, and continue these discussions as part of the recommended monitoring and follow-up programs.

Solid and Liquid Waste Management

During Application Review, EAO requested the Proponent to quantify camp-related demands on municipal infrastructure, and identify which local systems the Proponent expected to use.

In response to this request, the Proponent estimated that approximately 190,000 L/day of waste water would be generated for each 1,000 person camp and that the preferred disposal method of treated effluent would be by temporary septic field. Where septic fields are not permitted, the treated waste water would be trucked to the nearest facility that has the capacity to receive the effluent, and discussions would be held with managers of relevant facilities prior to Project construction to determine capacity to accept the treated effluent.

As shown on Table 7-3, the Proponent identified disposal locations for treating waste water in the event that a temporary septic field is not permitted at a particular main camp location, and potential disposal locations for solid waste. Daily incoming volumes of work camp supplies are estimated by the Proponent at 4.5 kg per day per person including food and packaging.

Table 7-3: Potential waste water and solid waste disposal locations by construction camp

Proposed Camp Locations	Proposed Camp Location (KP)	Potential Disposal Locations ^(a)	
		Waste Water ^(b)	Solid Waste
Peace River RD			
1 - Near Halfway River	19	Fort St. John	Fort St. John
2 - Near Hudson's Hope	94		
3B - West of Chetwynd	139	Chetwynd	Chetwynd
3A - West of Chetwynd	141		
RD of Fraser Fort-George			
4 - Near Mackenzie	219	Mackenzie	Mackenzie
5 - Remote, west of Mackenzie	252	To be determined	Fort St. James

Proposed Camp Locations	Proposed Camp Location (KP)	Potential Disposal Locations ^(a)	
		Waste Water ^(b)	Solid Waste
Bulkley-Nechako RD			
6 - Remote, north of Fort St James	275.5	To be determined	Takla Landing/ Fort St. James
7 - East of Takla Landing	379		
8 - West of Takla Landing, near North Takla Lake	423	Smithers	Smithers
9 - Remote, some 50 km north of Fort Babine	484		
10 - Remote, near Kisgegas IR north of Kispiox	532	Hazelton	Hazelton
Kitimat-Stikine RD			
11 - East of Cranberry Junction	578	Kitwanga/ Stewart	Kitwanga/ Stewart
12 - Nisga'a Villages/ Nass Camp	654	Terrace	Terrace
13 - Nisga'a Villages/ Nass Camp	684		
14 - Possible Float Camp	740	Prince Rupert	Prince Rupert
Disposal requirements per person day in camp		190 litres per day	4.5 kg per day

(a) On-going communication would be undertaken with facility managers prior to construction to determine facility/ capacity.

(b) Disposal location in the event that temporary septic fields are not permitted.

During Application Review, communities and regional districts, including Bulkley-Nechako, Peace River, Skeena-Queen Charlotte, as well as MOE expressed concern that an efficient approach to waste disposal may not be possible without sufficient planning lead time.

In response to these concerns, the Proponent has indicated its willingness to work closely with municipalities and regional districts to allow sufficient planning in advance of Project construction regarding camp requirements for municipal infrastructure (e.g. waste water, drinking water, waste disposal, etc.).

EAO proposes a condition that would require the Proponent to develop a SEEMP, which would include planning and implementation for effective engagement with affected Aboriginal Groups, Nisga'a Nation, local governments and provincial service delivery agencies regarding effects related to community level infrastructure, including water supply and waste management strategies.

Domestic Water Supply

During Application Review, at least three members of the public expressed concerns regarding hydrology in the Irene Meadows and Tanker Roads areas on Nisga'a Lands (i.e. two residents and one representing Citizens for Justice Group).

The Proponent responded that they would contact residents in these areas to discuss Project routing and surface and groundwater concerns. The EAO is satisfied that these concerns would be handled through the permitting process.

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 services, health care services, social conditions and services, public safety and security, recreation sites and facilities, and solid and liquid waste management facilities)

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on communities, 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. Takla Landing, Kispiox, Nisga'a Villages, etc.) result in a context of low resiliency and high sensitivity for many of the LSA communities (i.e. several northern Local Health Areas crossed by the pipeline route already rank as some of the least satisfactory in the province for several social concerns such as youth-at-risk, children-at-risk, health and education, crime and/or economic hardship).
Magnitude	<p>Communities, infrastructure and services: Low to medium overall</p> <p>Accommodation: Medium</p>	<p>Communities, infrastructure and services overall: The magnitude of potential effects on communities, infrastructure and services is expected to be of low to medium magnitude overall, after mitigation strategies, monitoring and adaptive management.</p> <p>Accommodation: effects on temporary accommodation in nearby communities likely to be of medium magnitude given existing accommodation units inventory and size of Project (e.g. demand from</p>

Criteria	Assessment Rating	Rationale
	<p>Emergency services: Medium</p> <p>Health care services: Low</p> <p>Social conditions and services: Medium</p> <p>Public safety and security: Low to medium</p> <p>Solid and waste management facilities: Medium</p> <p>Recreational sites and facilities: Low</p>	<p>construction workers in transit, non-camp workers, indirect and induced effects).</p> <p>Emergency and health care services: Main camps are largely self-contained, but remoteness of proposed pipeline route and proximity to relatively small communities (e.g. Takla Landing, Kispiox, Nisga'a Villages, Hudson's Hope, Mackenzie, Fort St. James, etc.) could create challenges in providing emergency services to camp residents; based on average injury rates, requirements for off-site health care services appear relatively low after implementation of Proponent's mitigation strategies and additional monitoring and adaptive management.</p> <p>Social conditions and services and public safety and security: As main camps are largely self-contained, the magnitude of effects on social conditions and services and public safety and security is considered to be generally low, but remoteness of the proposed pipeline route and proximity to smaller communities could result in adverse effects of medium magnitude on social conditions and services for communities that are already vulnerable and may be more challenged to meet increased demands (e.g. construction workers may interact with communities to a greater degree than is anticipated and there could be indirect and induced effects). Implementation of Proponent's mitigation, monitoring and adaptive management strategies should limit effects magnitude.</p> <p>Solid and Waste: Project-related demand for waste management facilities during construction from 14 or 15 main camps is considered of medium magnitude, when compared to existing waste management capacity.</p> <p>The impact on recreational sites and facilities is considered low as workers would have only limited time off, and on-site recreational facilities and activities would be available.</p>

Criteria	Assessment Rating	Rationale
	Domestic water supply (quantity): Low	Project not expected to encroach upon groundwater wells in LSA.
Extent	Community and regional	The effects to communities, infrastructure and services would be primarily within local community population centres, but would also be experienced at the regional level.
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 between 6 and 12 months in 2016, 2017 and/or 2018.
Reversibility	Reversible	Residual adverse effects on communities are expected to be reversible once Project construction is completed.
Frequency	Continuous	The adverse effects 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 communities, infrastructure and services in the LSA and RSA.	
Significance Determination	Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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 communities, infrastructure and services.	
Confidence	There is a high level of confidence in the likelihood and significance determination, particularly in consideration of the on-going monitoring and adaptive management.	

7.1.5 Cumulative Effects Assessment

For the cumulative effects assessment on the Communities, Infrastructure and Services VCs, the primary driver of potential residual 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, Fort St. James, Fort Babine, Kispiox/Hazelton, Nisga'a Villages, Cranberry Junction: PRGT project;
- Prince Rupert/ Port Edward: PRGT project and two proposed LNG facilities including LNG Canada facility to be associated with this Project and the PNW LNG facility proposed for Port Edward.

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 communities, infrastructure and services expected from this Project and other natural gas pipeline and other projects, and develop mitigation strategies to address these effects.

Section 6.1.5 of this Assessment Report described initiatives that focused at least in part on the potential cumulative effects on skilled labour shortages in the RSA. These include:

- BC Natural Gas Workforce Strategy Committee;
- Premier's LNG Working Group;
- Northwest Readiness Project, a project that hopes to develop a standardized set of scenarios of probable employment and population growth resulting from major project development in the region to assist communities with service planning;
- Northwest Regional Economic Collaborative (which includes the Northwest Labour Market Partnership, Northwest Tourism Strategy, Regional Investment Readiness and Bio-Energy Investment Attraction); and
- The BC LNG Alliance, which brings together four major British Columbia LNG proponents to coordinate community relations and labour strategies related to the proposed LNG facilities in northwest BC.

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 totalling 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. Two grant programs, at up to \$500,000 each, will assist communities to develop plans for:

- Asset Management Capacity Building: Grants will support the review of infrastructure capacity (water, sewer, drainage, local roads) and assist communities in determining what additional services are required for their specific growth needs.
- Community Land-Use Planning: Grants will assist local governments in doing the work required so that their land use bylaws, policies and plans align with the needs for industrial expansion and maintain community health and quality of life for existing residents. This could include updating local official community plans or zoning bylaws, or conducting new studies for targeted areas like housing affordability.
- The grants are available to the City of Terrace, City of Prince Rupert, District of Kitimat, District of Port Edward, RD of Kitimat-Stikine, and the Skeena-Queen Charlotte RD.
- Federal government and Aboriginal Groups: The federal government has announced the establishment of a major projects management office in Vancouver to help develop greater cooperation with Aboriginal Groups on energy development.
- 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 the Northern Development Initiative Trust make strategic investments in initiatives that enhance and strengthen businesses and the economy of northern BC.

EAO finds that the relatively large workforces and construction camps proposed for this and other industrial projects being proposed for northern BC could result in adverse cumulative effects on LSA and RSA communities, infrastructure and services.

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 medium 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 pipeline projects with similar short-term peaks in construction activity levels.

The Proponent proposes to address potential residual cumulative effects from the Project on community and regional infrastructure and services in the LSA/RSA 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 ERP and health and safety plans.

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 socio-economic values including the proposed Project's contribution to potential cumulative effects. As part of the SEEMP, the Proponent would be required to update effects forecasts as well as monitor and report upon the actual economic and social effects of the Project once it is underway. The condition reports would be relied upon to assist local, regional and provincial governments in planning for capacity adjustments to infrastructure and services, as well as contribute to ongoing cumulative effects monitoring by governments and government agencies.

EAO determines the magnitude of cumulative residual adverse effects to be medium in magnitude as Project construction would combine with other reasonably foreseeable developments to cause an increase in demand for community and regional infrastructure and services, which in some LSA/RSA communities could exceed existing infrastructure capacity. The effects would pertain to the LSA/RSA, 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 cumulative adverse effects on the LSA/RSA communities and the community and regional infrastructure and services. EAO concludes with moderate confidence that the Project residual adverse cumulative effects on communities, 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 communities, infrastructure and services.

7.2 Transportation and Access

7.2.1 Background

Project effects on Transportation and Access are examined through the following key indicators:

- Marine and freshwater navigability;
- Road condition, traffic and safety;
- Increased access; and
- Airport and railways.

The LSA considered a 2 km band centered on the proposed Project and all communities including Aboriginal communities where it could reasonably be expected that direct effects from the Project would occur. The RSA considered a band of approximately 25 km to the north of the proposed pipeline centreline plus communities between the proposed centreline and Highways 16 and 97 as well as new and existing transportation infrastructure that would be used for Project related activities.

The Application provides baseline information on the LSA and RSA transportation infrastructure including a map of marine shipping channels and anchorage sites, vessel traffic volumes at the PRPA, vehicle traffic volumes on selected major highways, and other information on the RSA road, railway and airport infrastructure.

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

The Potential Project effects on Transportation and Access relate primarily to the expected construction related traffic and influx of construction workers and associated activity during the Project construction period.

Marine and Freshwater Navigability

Marine navigability

The PRPA reported a total of 885 vessel movements into the port in 2013. Ferries accounted for half of that traffic, cargo containers 28%, container ships 15%, and cruise ship, tugs engaged in barging and tankers accounted for the remaining 7%. Commercial fishing, marine recreational activities and commercial recreation operators such as sport fishing guides, boat charters, whale-watching operators and kayak guides operate in marine areas along the proposed marine pipeline route. Shore-based marine activities such as fishing and wildlife viewing are also common.

The proposed marine pipeline route would cross the shipping routes east of the Kinahan Islands (the shipping routes then continue across Chatham Sound, through Brown Passage into Hecate Strait; southern Chatham Sound is also transited by tug traffic engaged in short-sea (coastal) shipping).

The PRPA identifies approximately 30 existing and proposed anchorage sites in the inner harbour, areas of Chatham Sound and other areas. No current or proposed anchorage positions are expected to overlap with the Project. The PRPA has confirmed to the Proponent that several trial anchorage areas that overlap with the Kitsault and Nasoga Marine routes west of Digby Island would be cancelled. The Project marine ROW would exclude anchorage areas to reduce the possibility of ships' anchors damaging the pipeline, while smaller vessels' anchors would be unlikely to damage the pipe(s).

Construction of the marine portion of the Project would be carried out by a specialized pipe-lay vessel approximately 300 m in length which would be present along the marine ROW during construction. Tugs, barges and other vessels would be involved in transporting pipe, equipment, supplies, and workers in the Project area. Examples of how Project construction activities may affect marine navigability include:

- The passage of marine vessels may be restricted or redirected where construction is occurring for: pipe-lay activities; seabed preparation such as underwater blasting at Alice Rock, near the mouth of Alice Arm and in other areas; and the dredging and piling of sidecast material near the landfall site at Ridley Island.
- Shipping channels may be temporarily blocked during construction activities. For example, temporary exclusion zones may be needed around construction vessels and at locations where the pipe has not been completely installed or buried.
- If the marine fuelling station in Prince Rupert is used for refuelling of construction vessels, other marine vessels may have more difficulty accessing the fuelling station.

In general, potential adverse effects on navigability from construction activities would be most likely to occur in narrow channels such as Nasoga Gulf, Observatory Inlet and Alice Arm, and in areas where marine traffic volumes are higher such as in the area west of Ridley Island and around the approach to the Prince Rupert Harbour.

During operation, the potential effects of the Project on navigability would relate to the presence of the pipeline on the seabed and occasional inspection and maintenance activities.

The Proponent proposes the following strategies to help mitigate potential disruption in marine navigability from Project construction:

- Developing a communication plan detailing the methods by which Aboriginal communities, DFO, PRPA, TC, Canadian Coast Guard and BC Ferries, commercial charter and tour operators, fishing industry organizations and other stakeholders would be contacted prior to and during construction;
- Updating navigational charts and/or supplying navigational aids when warranted;
- Using a safety vessel when marine construction is occurring, in particular during blasting activities at Alice Rock and other locations;
- Complying with the NPA;
- Adhering to the Marine Navigation Safety Plan, section 7.2 of the EMP during construction of the marine pipeline; and
- Implementing the mitigation outlined in section 9.0, Accidents and Malfunctions of the Application.

Freshwater navigability

The Project would cross a number of potentially navigable watercourses that are used by commercial tourism and recreational users, as well as some industrial users (e.g. tug and barge operations for timber and mineral products on Williston Reservoir).

The Application identifies 13 watercourses with known navigation uses that would be crossed by the proposed pipeline route:

- Halfway River (KP 31),
- Peace River (KP 93),
- Moberly River (KP 121),
- Nation River (KP 256),
- Driftwood River (KP450),
- Nilkitkwa River (KP 483),
- Shelgyote River (KP 507),
- Babine River (KP 538),
- Skeena River (KP 545),
- Kispiox River (KP578),
- Nass River (Kitsault route at KPK 624),
- Tchitin River (Kitsault route at KPK 639) and

- Cranberry River (Nasoga route at KPN 625).

For each crossing, the Proponent would consider the size and environmental sensitivities of each watercourse and the season or time frame of the construction period when selecting the crossing method. Preliminary primary and alternate watercourse crossing methods for both pipeline and vehicle crossings are presented in the Application (Volume 2, Appendix 2K, Table B-1 “Summary of Watercourse and Fish Bearing Non-Classified Drainage Crossings”).

The Proponent expects the effect on watercourse transportation may be most pronounced on Williston Reservoir, where the pipeline(s) would be laid on the reservoir bed in an east-west direction from Mackenzie. The crossing method across Williston Reservoir would consist of dragging the pipeline from the eastern shoreline to the landfall on the west shore. Construction in Williston Reservoir has the potential to cause minor delays to the transport of log booms or barges. Operational activities are not expected to disturb freshwater navigability.

Road Condition, Traffic and Safety

The Transportation and Access RSA includes five provincial highways: Highways 97, 29, 16, 37 and 113. The proposed Cypress to Cranberry pipeline route would cross Highway 37 (Cassiar Highway) and the proposed Nasoga pipeline route crosses Highway 113 (Nisga’a Highway). The Application indicated that the Project could potentially affect road surfaces, road capacity, traffic volumes and safety, causing some concerns for local residents. The effect of increased traffic on recreational activities was also a concern.

Roads and bridges used to access the Project may need upgrading to increase weight capacity in some areas. During the consultation process, the Proponent identified road segments that were of concern by municipal and Aboriginal representatives (e.g. Mugaha Road near Mackenzie, North Road (north of the Fort St. James), Haqwilget Bridge across the Bulkley River, Mitten Forest Service Road (RDKS)).

The Proponent has committed to developing an Access Control Management Plan and a Traffic Management Plan to support construction-related activities which would require further community consultation to explain delivery frequencies, types of loads, anticipated load sizes, anticipated road maintenance requirements and road bans, and address any concerns the affected communities may have regarding road transportation traffic.

As described in the Application, construction and operations of the Project would entail the use of hazardous materials, including batteries, cleaning products, fuels and lubricants. These materials would be transported in accordance with all applicable federal, provincial and municipal legislation such as the *Transportation of Dangerous Goods Act* and Regulation. The use of FSRs in BC would require obtaining road use permits that specify road maintenance responsibility.

Increased Access

As described in the Application, the Project would open access to previously unroaded areas as a result of new ROW construction. Other roads that would provide access to the Project include FSRs, active roads, deactivated roads, tote-roads (shoo-flies) and greenfield road accesses.

Expanded access may have positive effects for tourism as ATVs and snowmobiles may be able to reach areas that have been otherwise inaccessible. The potential adverse socio-economic effects of this expanded access are discussed in other parts of the assessment, and include the potential spread of invasive plants, increased hunting and fishing pressure, degraded wilderness character and aesthetic alterations.

The Proponent proposes several mitigation strategies relating to controlling and managing access during construction and operations. Decisions about limiting access to Crown lands rest with provincial regulatory agencies. EAO proposes a condition that would require the Proponent to develop and implement an Access Management Plan.

Airports and Railways

Airports and railways would be used for transportation of equipment, materials and workers from supply locations to the pipeline ROW. Municipal representatives have indicated to the Proponent that local airports can accommodate an increase in air traffic and can support the transportation of materials and workers.

Canadian National Railway controls and owns most of the rail lines in northern BC and rail would be used to transport equipment and materials for the Project to pipe yards and the ROW. The Proponent estimates that 8,125 rail car loads would be required for pipe transport, likely to sidings in Fort St. John, Chetwynd, Mackenzie, Fort St. James, Smithers, Carnaby and Terrace.

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

During Application Review, the following concerns were expressed regarding Transportation and Access:

Marine and Freshwater Navigability

During Application Review, Transport Canada (TC) raised several concerns relating to navigability during Project construction:

- Regarding freshwater navigability, TC indicated to the Proponent that it would address navigational issues for the Williston Reservoir and the Skeena River during the regulatory phase, but that under the *Navigation Protection Act* (NPA), both waterways could not be completely blocked during construction and that notices of construction would be required before construction would occur.
- Regarding marine navigability, TC indicated that due to the tight schedules, high operating costs and the rarity of the larger layships, it would be highly unlikely that the Proponent could live up to any commitment to reschedule pipe laying to avoid impacts on tourism or other marine users.
- TC also requested that the Proponent monitor submerged pipes and valves and remove fishing gear that becomes entangled on it.

The Proponent noted the comments regarding the regulatory requirements and that they would communicate with commercial marine tourism operations and other stakeholders to minimize impacts on marine activities. They also agreed to consider removal if fishing gear accumulated on the pipeline.

Road Condition, Traffic and Safety

Ministry of Transportation and Infrastructure (MOTI) and other Working Group members raised concerns regarding Project-related effects on traffic volumes and the RSA transportation infrastructure. In consideration of these questions, EAO requested additional estimates of Project-related traffic volumes on major highways and roads within the LSA.

The Proponent provided Project-related traffic volume estimates during construction for several activities including for pipe transport between selected rail sidings and the proposed ROW, general and heavy equipment transportation, camp construction, fuel transport, camp supplies and crew transport.

Table 7-4 compares the Proponent's estimate of 20,300 truckloads for pipe transport to baseline average annual daily traffic for selected highways, as was

provided during Application Review. The estimate is based on the proposed use of railway sidings in Fort St. John, Chetwynd, Mackenzie, Fort St. James, Smithers, Carnaby (near Hazelton) and Terrace. Pipe transportation is anticipated to begin in late-spring or early-summer 2016.

Table 7-4: Project-related effects of pipeline transport on British Columbia highways

Project Locations (KP)	Recorder Location	Recorder Location	2011 Average Annual Daily Traffic (AADT)	% Project-Related Change in AADT	
				Low Range	High Range
Cypress to Cranberry Route:					
Approx. 54 km Southeast of KP 140.1	Route 97, 0.3 km south of Westcoast Energy pump station No. 2 at Willow Flats, approx. 42 km south of Chetwynd	Willow Flats	1,420	3.2%	15.2%
Approx. 169 km south of KP 182.8	Route 97, 0.2 km north of Route 16, Prince George	Prince George	19,662	0.2%	1.1%
Approx. 148 km south of KP 272.3	Route 16, 5.6 km west of Nechako River Bridge, approx. 7 km west of Fort Fraser	Pipers Glen	2,763	1.6%	7.8%
KP 605.9	Route 16, east of Route 37, Kitwanga	Kitwanga	1,250	3.6%	17.3%
Nasoga Route: KPN 848.2	Route 16, 0.3 km east of Port Edward Road, approx. 10.5 km east of Prince Rupert	Prince Rupert	1,039	4.3%	20.8%
Pipeline transport traffic volumes /day / segment				45	216

Several local residents including the Kispiox Valley Community Association raised concerns about the potential for increased construction related traffic in the Kispiox Valley and in particular on several one-way bridges in the area.

The Proponent responded that construction activity would be temporary and would not proceed without obtaining the required permits and approvals, which would include providing details on camps and access.

MOTI raised concern regarding proximity of the proposed pipeline route to Highway 29N near Hudson's Hope Bridge and Highway 97N in the Pine Pass, as future highway upgrades or expansion plans could be compromised. MOTI also identified other locations of potential concern, including Nisga'a Highway 113, and the highway at Nisga'a Memorial Lava Beds. MOTI is in continued discussions with the Proponent regarding these concerns.

The Proponent responded that it has met with MOTI and is committed to minimizing potentially negative interactions with existing and planned highway infrastructure.

Increased Access

Several concerns were raised regarding increased access to previously unroaded areas (e.g. resident from Smithers and others). These are either discussed as part of the effects assessment on land and resource use (e.g. hunting, fishing, aesthetic alterations) or as part of the environmental effects assessment (e.g. invasive plants, wildlife, fishing resource, etc.).

Airports and Railways

No additional concerns were raised during Application Review.

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 and access:

- Project construction activities for pipeline construction likely to disrupt marine and freshwater navigability; and
- Increase in vehicle traffic likely to increase transportation congestion.

Residual adverse effects related to increased access are discussed in Land and Resource Use (section 7.3) and various environmental effects sections.

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 would occur in some areas of low to moderate resilience, for example the narrow channels of Nasoga Gulf, Observatory Inlet and Alice Arm and certain more congested areas where there is higher volume of marine traffic such as west of Ridley Island and around the approach to the Prince Rupert Harbour; remainder of marine pipeline route is sufficiently wide to be considered of moderate resiliency (e.g. most of Chatham Sound). Freshwater navigability likely to be

Criteria	Assessment Rating	Rationale
		<p>of moderate to high resilience.</p> <p>Transportation: Project construction would rely primarily on the existing road and transportation infrastructure systems to deliver materials and labour to the proposed ROW. While there are some concerns about traffic congestion at certain points on major roads, most have sufficient capacity to accommodate increased traffic.</p>
Magnitude	<p>Navigability: Negligible to medium</p> <p>Transportation: Negligible to medium</p>	<p>Navigability: Magnitude of effects considered to be low to medium as access would be blocked or reduced while pipe-lay or other construction activities are occurring in narrow channels such as Portland Inlet and Alice Arm; also, disruption of navigability in Chatham Sound west of Ridley Island is a strong possibility due to the higher volumes of marine traffic in that area. The disruption of marine navigability is expected to constitute a temporary inconvenience or nuisance to most marine users (low to negligible magnitude). Disruptions to freshwater navigability for recreational users likely to constitute a temporary inconvenience or nuisance.</p> <p>Transportation: Based on the limited data provided by the Proponent, the magnitude of potential Project effects on vehicle traffic is likely to be negligible to low in magnitude relative to existing traffic in most locations, but may be low to medium in some very localized places.</p>
Extent	Local	Most impacts to navigation or transportation would be on specific routes or at very specific areas
Duration	Short-term	Navigation impacts at any one location would typically last days. 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.

Criteria	Assessment Rating	Rationale
Frequency	Once to continuous	Navigation effects would generally occur once at any one location. Transportation effects would be occasional or continuous at any location.
Likelihood	The likelihood is moderate to high that some residual adverse effects would occur during the proposed Project construction.	
Significance Determination	Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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 navigation and transportation.	
Confidence	There is a high level of confidence in the likelihood and significance determination, particularly in consideration of the on-going monitoring and adaptive management.	

7.2.5 Cumulative Effects Assessment

For the cumulative effects assessment on the transportation and access valued component, the primary driver of potential residual adverse cumulative effects is likely to be multiple linear projects being built at the same time thereby creating additional traffic on nearby roads and other transportation infrastructure. There may also be temporary and more permanent cumulative effects on increased access to previously unroaded areas from multiple linear projects.

Regarding potential disruptions of marine and freshwater navigability, one other proposed natural gas pipeline project, PRGT, includes a marine pipeline portion that could potentially contribute to cumulative effects on marine navigability. Traffic associated with other projects, such as LNG terminal facilities, expansion of marine facilities in the Prince Rupert area, the proposed Kitsault mine, and other major projects proposed for the area could contribute to cumulative effects of increased marine vessel traffic. There is no expected potential for impacts to freshwater navigability to cumulate, given the duration of the residual adverse effects of the proposed Project.

The combination of traffic associated with the Project and other major projects proposed for the RSA, including forestry activities, could contribute to cumulative traffic volumes and congestion effects. 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. 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.

The Proponent proposes to develop a Marine Navigation Safety Plan, a Transportation Management Plan and an Access Control Management Plan to help monitor potential Project residual and cumulative effects on Transportation and Access. EAO proposes a condition for the Proponent to develop a SEEMP to monitor and report on the effectiveness of the mitigation set out in the Application and the SEEMP, and if necessary, to describe an adaptive management approach, including the implementation of alternative mitigation, to address unpredicted effects directly related to the Project.

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 to navigation and traffic. EAO concludes that the residual adverse cumulative effects on 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 Application presents two major pipeline corridor route options, the Nasoga Route (853.6 km) and the Kitsault Route (862.5 km), which would traverse the same 622 km corridor from the starting point at Cypress in the PRRD, to Cranberry in the RDKS. The two route options follow different terrestrial and marine routes from Cranberry to Portland Inlet, and the same marine corridor from Portland Inlet to Ridley Island.

Most of the proposed Project would be located on provincial Crown land. The Cypress to Cranberry portion would traverse 597.5 km of provincial crown lands and 24.5 km of private (freehold) land. The Nasoga Route would traverse an additional 28.4 km of provincial Crown land, 97 km of Nisga'a Lands and 106.2 km of marine corridor. The Kitsault Route would traverse an additional 58.4 km of provincial Crown land and 182.1 km of marine corridor. The pipeline would terminate on Prince Rupert Port Authority (PRPA) lands on Ridley Island.

Assessment of effects on land and resources focused on the following key indicators:

- Wilderness
- Parks and Protected Areas
- Outdoor recreation
- Aesthetic visual resources
- Commercial fishing
- Forestry
- Mining
- Agriculture
- Guide outfitting
- Trapping
- Tourism
- Energy production and transmission
- Human habitation
- Land use plans

The study areas for the Project footprint include the permanent pipeline ROW and all potential locations for temporary construction camps and other construction workspaces. The LSA is a 2 km band centered on the proposed route, and the RSA is a 25 km band to the north of the proposed route combined with a broader band to the south of the proposed route which incorporates communities along Hwy 97 and Hwy 16.

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.

Wilderness

Four identified wilderness areas would be crossed by the Project between Cypress and Cranberry totalling approximately 97 km of the pipeline route, and a fifth area may be crossed by the Kitsault pipeline route option for an additional 14 km.

Potential Project effects on wilderness areas include reduced wilderness character due to access, clearing and helicopter overflights during Project construction. The disturbance effects of pipeline ROW maintenance activities during operations are expected to be much lower in magnitude than the construction effects, but the presence of the cleared ROW would persist through the duration of Project operations.

Mitigation measures suggested by the Proponent are outlined in the environmental effects section 5.9 of this report, and include maintaining a reasonable construction timeline to reduce the duration of activities and effects on land use, reducing the construction footprint width in areas of high wilderness character, and using existing access roads and trails, where feasible and safe to do so, rather than developing new access.

Parks and Protected Areas

The Nasoga Route would cross a portion of the Nisga'a Memorial Lava Bed 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. The Park (and Hwy 113) would be crossed near KP 667 for approximately 1.2 km, with the route then running near to, but mainly outside the southern boundary of the park between KP 671 and KP 681.

The Proponent intends to implement an underground trenchless crossing under the lava of the Park (if practical); however, a Park Boundary Amendment would be required to remove the area from the Park. Routing discussions continue to occur between the Proponent and NLG.

The Cypress to Cranberry route would cross the Mugaha Marsh Sensitive Area near the District of Mackenzie between KP 221.4 and KP 222.6. This sensitive area was

designated for its importance as songbird habitat and as an area for bird research. Early public concern regarding the potential pipeline's proximity to a bird banding station and other activities in Mugaha Marsh led to refinements to pipeline routing and construction methods in this area. The Proponent indicates that crossing under the area with trenchless crossing methods (if practical), adhering to the objectives of the Mugaha Marsh Sensitive Area Plan and communicating with FLNR regarding construction scheduling would result in no residual adverse effects related to the sensitive area crossing for both the construction and operations phases of the Project.

The combined pipeline routing options would cross 17 legal and 5 non-legal OGMAs designated under the *Forest and Range Practices Act*, which have been established to protect biodiversity and other values. Construction of the Project would result in clearing old growth trees in these OGMAs, which would alter the forest structure and potentially require establishing replacement OGMAs in some cases.

Mitigation strategies identified by the Proponent include avoiding OGMAs where feasible within the application corridor, reducing effects on old growth attributes where avoidance is not feasible, proposing replacement OGMAs where OGMA function is compromised, and communicating with FLNR and forest licence holders. The Proponent expects there to be residual adverse effects on OGMAs after implementation of mitigation measures.

Outdoor Recreation

A variety of outdoor recreational activities take place in the RSA, including hunting, angling, hiking, camping, cycling, cross-country skiing, snowmobiling, ATV use, wildlife viewing, paddling and downhill skiing. Recreation areas are often remote areas, with the level of outdoor recreation activity varying seasonally. The Application provides background information on recreational hunting and fishing activities in the LSA including freshwater and tidal waters fishing, and notes the potential for the Project to disrupt or restrict recreation activities during the construction period.

FLNR regulates hunting in the province, which is divided into 225 wildlife management units (WMU), and the Application Corridor crosses 13 different WMUs.

Provincial, regional and water-specific regulations apply to freshwater angling in BC, and regulations may also change for specific waters in-season. Management of salmon fisheries in both tidal and freshwater areas is governed by DFO. Angling for all other freshwater fish species is regulated by FLNR. The RSA includes many freshwater rivers and lakes where BC residents, non-residents and Aboriginal groups visit for angling

opportunities. The Nass, Skeena, Babine and Kispiox rivers are known as prime destinations for fishing for steelhead and salmon. These rivers support guiding operations and fishing lodges.

Sport fishing in tidal waters in BC is regulated by DFO and is subject to specific regulations for species, area and season, as well as daily catch limits and gear restrictions. Tidal water anglers primarily target Chinook and Coho salmon and halibut, and to a lesser degree, rockfish, lingcod, Dungeness crab and other species. Recreational fisheries are open year-round for most species in both Pacific Fishery Management Areas (3 and 4) crossed by the Application Corridor, but most salmon fishing occurs between May and September, coinciding with migrations of the Nass River and Skeena River stocks.

A 2009 survey identified the busiest recreational tidewater fishing areas in terms of the relative number of boat trips as the Tree Nob Group between Melville and Stephens islands, north and west of Dundas Island, and southern Chatham Sound, particularly the Lucy Islands.

Some concerns raised during early consultation initiatives by the Proponent include:

- Use of chain linked fencing around Project facilities may be a hazard to snowmobilers;
- The importance of the Babine River as a steelhead fishing area;
- Potential use of Diana Lake Provincial Park by Project construction personnel;
- Construction of the Project may limit the usability and accessibility of outdoor recreation areas including snowmobile and hiking trails;
- Construction activities may restrict access to users of the Nisga'a Memorial Lava Bed Park and the Mugaha Marsha Sensitive Area;
- Construction may not only disrupt access to areas preferred by hunters, but the noise and other construction activities may discourage use in the immediate area;
- Instream works may interfere with fishing in affected waterbodies;
- Curtailed access to marine recreation areas during Project construction, including saltwater fishing which would be affected by the presence of the pipe lay ship and service vessels, and by seabed preparation activities; and
- Risks to marine safety from increases in marine traffic related to Project construction.

No adverse effects of the Project on outdoor recreation opportunities during the operations phase were identified.

Mitigation measures proposed by the Proponent to address potential disruption of access to outdoor recreation activities during Project construction include:

- Adhering to an Access Control Management Plan.
- Reduce effects to recreational sites and trails where practical.
- Construct trail crossings at right angles to trails, where practical.
- Establish tree buffers between any trail and access road.
- Install visible signage along any trail and access road crossing, warning users of the crossing.
- Reduce dust, noise and continuous traffic in or near a recreation site.
- Where road access has the potential to impact a recreation site, ensure adequate buffering with trees or earth berms.
- Use access barriers or flag persons during periods of activity within recreation sites to prevent public safety issues as required.
- Restrict construction activities to off-seasons or periods of low use to reduce disruption and inaccessibility for users, where practical.
- Prohibit recreational fishing and hunting by Project personnel on or near the proposed Project site, ROW, access roads, permanent facility sites, work camps and ancillary sites.
- Communicate the proposed Project construction schedule to recreationists by posting signs.

The Proponent indicates that it is unlikely that the Project's construction schedule can be adjusted sufficiently to avoid all interference with outdoor recreation activities, and that some residual adverse effects may occur.

Aesthetic Visual Resources

Scenic viewing is an important aspect of recreation and tourism activities on BC's forest lands. Forested portions of the Project footprint would be altered as a result of both construction and operations. Clearing of the pipeline ROW and access roads would produce linear features that would remain visible even after restoration activities. Visual effects are most likely to be experienced where viewers are present near communities, recreation areas, navigable waterways and roads.

The proposed compressor stations would also visibly alter the landscape. The K5, Kitsault or Nasoga location remains dependent on a routing decision. The potential site would be located above the community of Kitsault or in the Nasoga Gulf. The Kitsault site is forested and is topographically shielded from view. The Nasoga site is on a knoll

overlooking Nasoga Gulf, which is an area used by recreational boaters and for commercial fishing. The station would be an industrial facility that would be visible from a substantial distance, particularly over water to the south.

Artificial lighting may also introduce potentially adverse visual effects during construction and operations. Residents of the Gantahaz subdivision in Mackenzie expressed concerns regarding increased artificial light that may be visible from the K2 compressor station.

The Application indicates that the Cypress to Cranberry route would cross nine scenic areas with Retention Visual Quality Objectives (VQOs) and the Nasoga route would cross three scenic areas with Retention VQOs and one scenic area with a Preservation VQO. Project activities would result in the clearing of forest in these areas designated as visually sensitive to timber harvesting. The proposed Project may not be consistent with the management direction of these VQOs.

The Proponent conducted a Viewshed Modelling Analysis to better understand the ongoing visual effects of the Project after completion of the construction phase. Through consultation with stakeholders and Aboriginal groups, as well as through literature review and site visits, 22 viewpoints were selected for final modelling of visual effects of the Project (pipeline ROW and compressor/meter stations).

In many areas the Project would not be visible from ground level viewpoints due to trees acting as a natural screen and the topographic complexity of the pipeline route. Areas where visual effects of the Project would be evident include road, trail and waterway crossings, steep slopes, and coastal areas where the Project would be visible from the water including Alice Arm, Echo Cove, Iceberg Bay and Nasoga Gulf.

The Proponent indicates that specific mitigation at particular viewpoints may be feasible through installation of visual barriers, by following existing linear features where practical, and by adhering to the Restoration Plan Framework.

Commercial Fishing

Commercial fishing is historically, culturally and economically important to BC's coastal communities. The Application provides information on the importance of commercial fishing to the RSA region and level of effort by area and type of fishery. In addition to the direct economic contribution of commercial fisheries, fish processing facilities located in Prince Rupert, Port Edward and Lax Kw'alaams Band and other fishing

related industries help contribute to the social capital and community resilience of Prince Rupert and other northern coastal communities in the RSA.

The RSA marine component overlaps with DFO Pacific Fisheries Management Areas (PFMA) 3 and 4 and major commercial fisheries active in those areas include the crab trap fishery, the prawn trap fishery, the shrimp trawl fishery and salmon by seine and gillnet. Groundfish fisheries in the RSA include the groundfish hook and line fisheries and the halibut fishery.

Aquaculture operations for shellfish and marine plants are present on a small scale and are planned for future expansion. The Project has been re-aligned to avoid a Metlakatla Shellfish Aquaculture tenure application for an area west of Prince Rupert.

The Proponent's consultation process with commercial fishers and other stakeholders identified several concerns with respect to potential Project-related effects on commercial fishing, discussed below.

Disruptions of fishing activities during construction

During Project construction, fishing vessels may be temporarily unable to access portions of fishing grounds while construction vessels are preparing the seabed and laying marine pipeline, and during specific construction activities such as underwater blasting that would take place in Alice Arm, or dredging near landfall sites. Temporary constraints to navigation could 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 Ridley Island.

The potential effect is applicable to all fisheries but may be pronounced for the salmon seine and gillnet fisheries that typically occur for short periods in July (but occur from mid-June to the end of August), which would likely coincide with the construction timing for the marine pipelines. The timing and common locations of selected other important commercial fisheries in the RSA include:

- Dungeness crab and king crab fishing occurs year round, in particular in Liddle Channel;
- Shrimp beam trawling also occurs year round in areas of Chatham Sound, in the southern part of the sound and west of Big Bay; and
- The prawn trap fishery typically occurs from May to late June, with potential areas of interaction in Nasoga Gulf, Alice Arm and Paddy Passage.

The Proponent proposes several strategies to mitigate the disruption of commercial fishing activities during Project construction, including:

- Implementing a fisheries advisory committee to facilitate ongoing communications;
- Developing a communication plan detailing the methods by which fishers would be contacted prior to and during construction; and
- Coordination of construction timing to avoid salmon fishery openings in areas critical to the seine and gillnet fisheries, if practical (avoidance of these infrequent but important fishery openings would be facilitated by implementation of the communication plan).

In addition to developing a communication plan, further mitigation that would be undertaken by the Proponent includes:

- Updating navigational charts and/or supplying navigational aids when warranted;
- Using a safety vessel when marine construction is occurring, in particular during blasting activities at Alice Rock and other locations; and,
- Adhering to the Marine Navigation Safety Plan during construction of the marine pipeline.

The disruption of fishing activity may cause financial losses to commercial operators, especially in the case of salmon fisheries, which are subject to short and infrequent openings. The Application notes that a compensation program for lost economic opportunity may be applicable if disruptions to fishing activities cannot be avoided.

Fishing gear loss or damage during construction and operations

During construction, the potential exists for construction vessels to interact with commercial fishing vessels engaged in fishing, which could result in loss of, or damage to, fishing gear. The possibility of gear entanglement during construction may be most likely for fisheries where gear is deployed at the surface, such as salmon gillnet or seine fisheries. Floats, traps and groundlines from crab and prawn traps may also become entangled with construction vessels.

Mitigation measures include coordination of construction timing to avoid salmon fishery openings, communication with active fisheries for pipe laying activities taking place during fishing seasons, and establishing a compensation plan for lost or damaged fishing gear.

During operations, the proposed pipelines would be present on the seafloor, except where the pipes are buried or drilled beneath the seafloor. Fishing gear, such as trawl nets, groundlines and traps may become caught on the pipes and lost or damaged. The area west of the Ridley Island landfall may have the highest potential for this effect to occur, because fishing effort in the area is high for crabs, prawns and shrimp.

Near the approach to the Ridley Island landfall, a sub-sea isolation valve (SSIV) would be installed as a safety measure and fishing gear such as crab or prawn traps and groundlines may become caught up on the valve. (The SSIV protects the pipeline in the case of an emergency shutdown, preventing an uncontrolled release of natural gas.) As a measure of prevention, the location of the pipe including the SSIV would be made available through GPS and on updated CHS marine charts.

Interactions with bottom gear are unlikely where the pipeline is present in very deep areas, such as areas of Portland Inlet, where bottom fishing activity rarely occurs. The highest potential for gear loss is likely to be bottom trawl nets from the shrimp trawl fishery which take place in depths up to 200 m in Chatham Sound (DFO 2013c, as reported on page 6-114 of the Application). Shrimp trawling boats west of Big Bay in Chatham Sound typically run parallel to the shore but also cross the Project in this area. The crab and prawn trap fisheries generally take place in depths of less than 100 m.

If gear loss does occur and fishers have followed the gear loss process that would be established by the Proponent, then financial compensation would be available.

Forestry

The Application Corridor would cross the Peace, Mackenzie, Fort St. James, Skeena-Stikine, Kalum and North Coast forest districts, and the Fort St. John, Dawson Creek, Mackenzie, Prince George, Bulkley, Kispiox, Kalum, Nass and North Coast Timber Supply Areas (TSAs). In addition, the proposed route would cross two Tree Farm Licences (TFLs), five woodlots, the McLeod Lake Mackenzie Community Forest, and five Permanent Sample Plots in the Peace and Skeena-Stikine Forest Districts.

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 land base associated with the pipeline ROW, temporary disruption/alteration of forestry operations in tenured areas during Project construction, and disturbance of Permanent Sample Plots. The Project may also cause disruption to non-timber forest product harvesting.

Construction of the proposed route would entail clearing forested areas along the Project footprint (generally 70 m wide, with additional areas for temporary workspaces and permanent Project facilities). Much of the Project footprint would overlap the operational timber harvesting land base (THLB) for forest tenure holders, including TSA licence holders, TFLs, woodlots, community forests, and other forest licensees. A Reclamation Plan would be implemented by the Proponent to replant commercial tree

species on temporary workspace in forested areas, but the long-term ROW (55 m) in forested areas would be re-vegetated with low-growing native vegetation rather than trees, to maintain pipeline integrity. Other long term removals from THLB may result from recruitment of new areas to replace infringements on OGMA's, WHAs, and UWRs.

Volumes of merchantable timber harvested from the Project footprint would have the potential to disrupt timber markets and timber flows to processing facilities. The Application indicated that some 835,000 m³ of timber could be harvested during clearing of the Project footprint. 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.

The proposed Project would also require intensive temporary use of forestry roads managed by various forest licensees during the construction phase. Use of these access roads would necessitate coordination with forest licensees. The long-term presence of the pipeline and associated facilities may adversely affect future forestry activities, with on-going restrictions on blasting activity near the Project, and crossing and road use agreements between tenure holders potentially reducing forestry development options.

Mitigation measures include the development of a Timber Salvage Plan, communication and coordination with tenure holders and forest managers, compensation for losses, and providing merchantable timber harvested on Nisga'a Lands to the Nisga'a Lisims Government.

The Application Corridor (Cypress to Cranberry portion) crosses five Permanent Sample Plots (PSPs) which provide valuable information over time on growth and yield characteristics of forest stands, as well as many other forest values. While PSPs are not designated as protected areas, they are generally identified with map notations and there is an expectation that they be considered in any harvest planning.

Mitigation suggested by the Proponent includes avoiding crossing PSPs where practical, and communicating with FLNR to determine appropriate mitigation where crossing cannot be avoided.

The Application provides a review of commercial non-timber forest product harvesting (NTFP) activities and associated marketed products. Very little is known about the overall economic significance of this highly unregulated economic sector, but the Application notes there is important social value to the activities beyond purely economic considerations. Country food, recreational and commercial harvesting of non-timber forest products tends to be comingled.

Four main categories of products are noted including:

- Edible mushrooms;
- Wild berries, fruits and vegetable products;
- Floral greenery and craft products; and
- Landscaping and site restoration products.

Potential adverse effects of the Project noted in the Application include loss of growing sites due to Project clearing activities, improved access leading to more harvesting pressure on resources, slow reestablishment of some species due to Project use of herbicides and/or fertilizers, and reduced product value due to equipment emissions, dust or other contaminants.

Mitigation measures include communication of construction schedules with harvesters, avoiding areas of high NTFP productivity, retaining non-merchantable timber for use as chips or mulch, and employing alternative vegetation management to encourage NTFP propagation.

Mining

The Application Corridor would cross areas of high metallic and industrial mineral potential as well as active tenures, including 22 mineral tenures, 5 placer claims and 14 coal tenure claims. An additional 55 tenure claims are located within the Land and Resources LSA.

The Application Corridor would not cross active mine sites (other than aggregate pits), but there are 17 known mineral occurrences within the LSA. The Nasoga route would cross 5 active aggregate pits and there are a further 11 aggregate pits located within the LSA.

There are two developed prospects that may be directly affected by the Project. The Kitsault Mine project near Kitsault townsite is a proposal by Avanti Mining Inc. to redevelop an historic molybdenum mine that produced for short periods of time between 1968 and 1982. The Kitsault Mine received a BC EA Certificate in March 2013, and approval from the federal environmental assessment process in June 2014. The Kwanika property is a developed copper-gold deposit discovered in 2006 approximately 50 km east of Takla Landing. The property has been the subject of extensive exploratory drilling activity by Serengeti Resources since its discovery.

Potential adverse interactions between the Project and mining/mineral exploration activities were identified in the Application. These include the following:

- The Project would cross an access road to the Kitsault Mine property, which may limit access to the mine site and surrounding exploration sites during Project construction. Additionally, the presence and operations of the Project pipeline could limit blasting activities related to construction and operation of the Kitsault Mine. The Proponent is in discussions with Avanti Mining Inc. to avoid potential disruptions to future mine development.
- The Application Corridor runs near the Kwanika property at KP 366.5 and early discussions with Serengeti Resources led to rerouting the Project to avoid claim areas to the north. The Proponent has indicated that communication with Serengeti Resources would be ongoing to avoid potential disruptions to future mine development.

Mitigation measures for disruption of mining and mineral exploration recommended by the Proponent include:

- Adhering to a Traffic Management Plan,
- Adhering to an Access Control Management Plan,
- Develop access agreements where needed,
- Return existing access routes to their former condition, or better,
- Compensate mineral tenure holders, as needed, and
- Communicate the proposed Project construction schedule with MEM, tenure holders and other potentially affected mining initiatives.

The Proponent expects some residual adverse effects related to disruption of mining and mineral exploration after implementation of these mitigation measures.

Agriculture

Agriculture includes farming (food crops, forage production, dairy and other livestock in fenced paddocks) and use of range land for cattle production. Most of the farm lands encountered by the proposed Project are located along the eastern portion of the Land and Resources RSA in the Peace River Regional District. Approximately 71 km of the first 108 km of the Cypress to Cranberry Application Corridor runs through private and crown lands designated under the ALR. Non-farm use of ALR lands for oil and gas or ancillary purposes in the PRRD requires application to the OGC.

The Application Corridor would cross six active range tenures along the Cypress to Cranberry route in the Peace, Mackenzie and Skeena-Stikine forest districts.

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 PRRD, Hudson's Hope, RDKS and the BC Ministry of Agriculture raised concerns during pre-Application technical discussions regarding Project effects on soil productivity, erosion management and weed control. In the Application the Proponent proposes mitigation measures for potential Project effects on agriculture.

Guide Outfitting

Guide outfitting is an important source of economic revenue in rural BC, with approximately 245 guide outfitters each holding a licence to pursue guiding activities in an area with defined boundaries. Guide outfitters offer a variety of services and experiences to non-resident hunters, although big game hunting is usually the dominant product offered. The Application provides locations and lengths of Application Corridor segments that would cross 12 guiding territories, all of which would be crossed by the Cypress to Cranberry Route, and one that would also be crossed by either the Kitsault or Nasoga Route.

Guide outfitting relies on access to the land base during select seasons and depends on the presence of suitable habitat for target species (the most active guide outfitting period is typically during the fall). The proposed Project's construction phase would involve vegetation clearing, land disturbance and the use of heavy machinery. Activities during the construction phase may affect the quality of the experience for those purchasing the services of guide outfitters if their operations are located in proximity to the proposed route. In addition, construction phase activities that disrupt access to select areas used by guide outfitters could affect guide outfitter operations.

Mitigation measures include implementing and adhering to the Access Control Management Plan and Restoration Plan Framework, developing agreements with potentially-affected guide outfitters, restricting helicopter flights in areas of importance for guiding activities, and discussing access needs and construction schedule with guide outfitters.

Trapping

Trapping activities are regulated through a system of registered trapline areas. Most trapping activity is focused in the winter and spring seasons (i.e., September to May).

The registered trapline system sets harvest guidelines for beaver, fox, marten, mink, muskrat, raccoon, skunk, squirrel and weasel, lynx, bobcat, wolverine, fisher, otter, wolf and coyote.

The Application provides detail on trapline areas crossed by the Application Corridor, the locations of the crossings, the total number of trapline areas that would be crossed (75, although some trapline boundaries would be crossed more than once), and the distance crossed for each of the trapline areas (up to 50 km per trapline) that would be disturbed by pipeline construction.

The proposed Project's construction phase would involve vegetation clearing, land disturbance and the use of heavy machinery to construct the proposed route. Construction activities have the potential to affect access to traplines and disrupt existing trapping activities. Pipeline construction is expected to be carried out throughout the year, except during break-up in the spring.

Pipeline operations are not expected to adversely affect trapping activities. While some preferred habitats for martin and fisher are expected to be lost to the pipeline ROW, effects are expected to be low in magnitude with little effect on furbearer populations.

Mitigation measures include implementing the Access Control Management Plan and Restoration Plan Framework, developing agreements with trap line holders where there are demonstrated losses, and communicating the construction schedule and routing with trap line holders.

Tourism

In 2010, Tourism BC identified 400 commercial nature-based tourism businesses in northern British Columbia that offered a wide variety of land-based, freshwater and marine tourism activities. The types of businesses and activities include:

- Lodges, guest ranches and guide outfitters;
- Land-based activities such as guided-hiking, mountain biking and ATV experiences in the summer and ski touring, snowmobiling and heli-skiing in the winter; and
- Freshwater and marine tourism activities such as guided fishing, river rafting, kayaking/ canoeing, sail cruising, etc.

Freshwater and Land-Based Tourism

The Project would cross five commercial recreation tenures, including three that are multiple-use tenures, one for guided freshwater recreation and one for heli-skiing. Other

commercial freshwater and land-based tourism activities in the RSA that are identified in the Application include:

- Guided fishing activities in the Babine River Corridor Provincial Park, which is 1.9 km southwest of KP 529;
- Several guided fishing lodges in the vicinity of Babine Lake and along the Babine River; and
- The Bear Claw Lodge located on the Kispiox River 0.5 km southwest from KP 571, offers several guided activities throughout the year including angling, horseback riding, heli-skiing, mountain pack trips on horseback and rafting.

In its Application, the Proponent reported that concerns were raised by the Babine River Foundation (BRF) about the protection of wildlife and potential effects of increased access in the Babine River area. The BRF's members include the Babine Norlakes Lodge (35 km south of KP 483.8), Babine Steelhead Lodge (30.6 km south of KP 484.0), the Silver Hilton Main Lodge (12.5 km southeast of KP 505.0) and the Silver Hilton Triple Header Lodge (13.0 km south of KP 492.6), which typically operate from September through November.

During Project construction, freshwater and land-based tourism activities could be affected by construction noise, access restrictions and altered visual aesthetics. Mitigation measures to address potential Project effects include adhering to the Access Control Management Plan, coordinating construction timing with tourism operators, developing agreements for any economic losses, and communicating the Project construction schedule.

The Project operations phase is not expected to affect commercial freshwater or land based tourism activities.

Marine Tourism

Construction of the Project could affect marine tourism activities, such as whale watching, bear watching, sport fishing and ocean kayak tours, due to access restrictions in narrow channels, during landfall construction and due to increased volumes of marine traffic. Marine tourism activities tend to occur at specific times of the year (e.g., bear watching in May and June, whale watching peaks in late summer) and focus on certain portions of the RSA. Construction of the Project may or may not be occurring when and where marine tourism is occurring.

Mitigation measures to address potential Project effects include implementation of the Marine Navigation Safety Plan and Access Control Management Plan, restricting

construction activities during peak tourism seasons, developing agreements for demonstrated economic losses, and communication of the construction schedule. Operations of the Project are not expected to affect marine tourism.

Energy Production and Transmission

The Project would be expected to cross:

- 30 oil and gas pipeline tenures (from KP 0 to KP 160);
- Transmission lines at 17 locations, including 15 crossings between KP 88 and KP 158, one crossing at KP 229 and a crossing of the Northwest Transmission Line at KP 609; and
- 4 wind energy tenures including Lynx Creek, Dokie Ridge and Pine Ridge in the Peace River Regional District and Kshadin Peak on the Kitsault route.

Interactions between the Project and energy production and transmission facilities are expected to be minimal. Electricity transmission lines crossed by the proposed Project would not be de-energized during construction. The placement of future towers for wind energy or electricity transmission would need to avoid the pipeline ROW, but otherwise the facilities can coexist without conflict.

Mitigation measures to address potential effects include avoiding construction in areas of existing energy production and transmission facilities; maintaining industry standard distance from existing tower infrastructure and ensuring proximity and crossing agreements are in place prior to construction; and communicating Project schedule with tenure holders.

Human Habitation

Approximately 3.5% of the terrestrial portion of the Application Corridor would cross private (freehold) lands, including an 18.5 km segment in the Beryl Prairie area, and four shorter segments in the Regional District of Peace River, the District of Hudson's Hope, and (depending on route options) in the Kispiox Valley. Unincorporated communities within 5 km of the Application Corridor include Lemoray, Bulkley House, Gitlaxt'aamiks and Alice Arm. No human habitation has been identified near the proposed compressor station sites and, consequently, no measurable effects are expected from construction or operations of these facilities.

Project construction may affect cabins and other human-occupied dwellings in the LSA outside of communities. Only a small number of such isolated rural residences were

identified during Project assessment. The disturbance would be greatest during the construction phase, when clearing, grubbing, excavation and pipe installation occur. The noise, dust, access disruptions and presence of an industrial activity could be expected to affect the quiet enjoyment of isolated rural houses and cabins.

Mitigation measures suggested by the Proponent to limit adverse effects of Project construction include adhering to Traffic Management Plan, Access Control Management, and Restoration Plan, reducing width of construction footprint near inhabited areas, and communicating construction schedule with local residents. The Proponent expects some level of residual disturbance to residences, cabins, and other human-occupied areas outside of communities after implementation of suggested mitigation.

Land Use Plans

The proposed pipeline route would traverse:

- 10 Land and Resource Plan (LRMP) areas, including the Nisga'a Land Use Plan area;
- Six Sustainable Resource Management Plan (SRMP) areas;
- The Coast Land Use Decision area;
- The Central and North Coast Order Boundary;
- Many First Nations land management plan areas;
- Seven Official Community Plan areas, covering four regional district rural areas as well as the District of Hudson's Hope, the District of Mackenzie, and the City of Prince Rupert; and
- The Port of Prince Rupert 2020 Land Use Management Plan.

Many of these plans have designated areas with special management objectives concerning human activities and developments that are directed at conserving ecological values, and scenic vistas. The Application details where the pipeline route overlaps with specific management zones designated by each of those plans.

The Proponent found that no specific goals, objectives or policies have been identified in the plans that are inconsistent with the key indicators considered under the Land and Resources VC. For the Land and Resources VC, the plans would not preclude construction and operations of the proposed Project.

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 the key concerns raised are summarized in this section.

Parks, Protected Areas, and Other Designated Areas

Public concern was expressed regarding the Nasoga route crossing of Nisga'a Memorial Lava Bed Park, and any impact to the lava or amendment to Park boundary.

The Proponent responded that the proposed directional drill crossing would go beneath the park and not disturb the surface or protected values of the Park. However, an amendment to the Park boundary would be required.

The EAO proposes a condition that, if a Park Boundary amendment is granted with regards to construction within Nisga'a Lava Bed Memorial Park, it would require the Proponent to consult with Nisga'a Nation and BC Parks to determine the most appropriate timing for construction, to conduct pre-construction site surveys, and to develop and implement mitigation measures to avoid or minimize impacts to any red- or blue-listed, or culturally important lichen and plant species.

Several residents of Mackenzie and representatives from the McLeod Lake Mackenzie Community Forest expressed concern with development in the Mugaha Marsh Area. It was noted that although the Proponent proposes crossing under the area with trenchless crossing methods, a trench crossing remains a possibility.

The Proponent responded that they would continue the dialogue to reduce potential adverse effects on the Mugaha Marsh area and to develop measures that would benefit the community forest. The Proponent also stated that bird habitat values and the outdoor recreational values in the Mugaha Marsh Area would be maintained following pipeline construction.

Outdoor Recreation (including hunting and fishing)

At the request of EAO during Application Review, the Proponent conducted an analysis of the potential interaction between the Project and the BC Recreation Features Inventory. The Kitsault Alternate of the Kitsault route would cross the Nass River at the point of intersection, which is considered a recreational feature of Very High

significance and high sensitivity. The Nasoga route would cross two recreational features of Very High significance and High sensitivity. One of the features crossed by the Nasoga route is an area adjacent to the Nass River and the second is the Nass River. The Cypress to Cranberry route does not cross any recreational features of Very High significance.

Forty recreational features of High significance would be crossed by the proposed Project. Of these, 19 were identified as having high sensitivity, 19 were of medium sensitivity and 2 were of low sensitivity.

During Application Review, concern by was raised about two specific areas of recreational importance to local residents:

- A resident of Aiyansh requested that the Proponent avoid disturbing the Little Stinker hotsprings area and access to that area.; and
- A resident of Smithers noted the importance of the Kotsine Pass First Nation Trail.

The Proponent responded that hotsprings would be avoided with a target distance of avoidance of at least 200 m. Other measures are also proposed to minimize effects on hotsprings of blasting activities during Project construction. The Proponent indicated that it would endeavour to identify and avoid the Kotsine Pass First Nation Trail if possible.

In follow-up, NLG indicated that hotsprings should be avoided by at least 500 m on Nisga'a Lands.

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 Control Management Plan which would include access control measures (e.g., signage, road closures, restrictions, access control structures, vegetation screens) 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 Environmental Management Plans (EMP).

Aesthetic Visual Resources

During Application Review, EAO requested additional information from the Proponent on Project related effects on visual resources. The Application had indicated that approximately 60 visually sensitive areas with established VQOs would likely be affected. The Project effects assessment focused on 13 areas with Retention or Preservation VQOs, but did not provide information on the other 47 affected areas.

The Proponent responded that the Application Corridor overlaps portions of 108 known Visual Landscape Inventory (VLI) polygons, of which 67 are visually sensitive areas with established Visual Quality Objectives (VQOs) and 9 have recommended Visual Quality Classes. Areas where established VQOs may be difficult to achieve with the unnatural geometric nature of the Project footprint disturbance include 42 VLI polygons with VQOs of Preservation (1), Retention (13), and Partial Retention (28).

To mitigate the visual effects of straight linear boundaries created by the pipeline ROW, the FLNR requested that the Proponent include design as a mitigation strategy for the ROW clearing, especially in areas with a Retention or Partial Retention VQO. The BC Government's Visual Landscape Design Manual was noted as a source of guidance on techniques to address this type of visual disturbance. FLNR also suggested the Proponent monitor visual changes and VQO achievement by following FLNR's Forest and Range Evaluation Program (FREP) Visual Quality Effectiveness Protocol.

EAO proposes a condition that would require the Proponent to develop a Visual Quality Management Plan in consideration of FLNR's Visual Landscape Design Training Manual (1994), prior to construction. The plan must demonstrate consideration of FLNR policy where the Project footprint would intersect areas with VQOs and describe the activities undertaken to minimize effects to VQOs.

Commercial Fishing

Gitxaala Nation, Transport Canada, Nisga'a Nation, Metlakatla First Nation and others asked potential disruptions of commercial fisheries activities during construction, particularly in relation to very short fisheries openings. The Application acknowledges that the construction period may coincide with the seine and gillnet fisheries. They asked the Proponent for more detail on communication plans and other mitigation measures related to those fisheries.

The Proponent responded that details on the fisheries advisory committee would be developed in collaboration with government agencies and others prior to construction. The Proponent also responded that they would work with Gitxaala Nation, other coastal Aboriginal Groups, and commercial fishermen to identify any potential scheduling conflicts relating to the commercial seine and gillnet fisheries prior to construction to avoid or minimize any potential negative interactions, as is described in the EMP.

During Application Review, Gitxaala Nation asked for detail on the compensation program for lost economic opportunity that may be applicable if disruptions to fishing activities cannot be avoided. EAO also requested additional details or principles for the framework.

The Proponent responded that a compensation program would be provided according to signed agreements prior to commencement of construction activities where possible. In general, a voluntary claim and compensation fund would be established for the Project one year prior to the start of the marine construction where claims eligible for compensation would align with the following general guiding principles and criteria:

- a. Efforts would be made to ensure that legitimate claims are resolved in a cost-effective and timely manner;
- b. The damage or loss must be suffered by a registered and active commercial or Aboriginal fishers engaged in a recognized fisheries opening (commercial and Aboriginal);
- c. Any actual or consequential damage (including loss of profits) due to damage or loss of fishing gear was caused by the construction and/or operation of the Project;
- d. The fisher made all reasonable efforts to take note of the location and status of the Project and the timing of any related installation or maintenance programs, and efforts to avoid or interference with such programs, and;
- e. The fisher follows the established protocol for notification and documentation of an incident to the Proponent.

Forestry

During Application Review, FLNR and others raised several concerns related to the use of merchantable timber to be harvested from the Project construction footprint, and the potential for long-term effects related to reductions in the 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 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 7-5 below, which presents the impact to THLB in each management unit. The table shows the overlap of the Project footprint with THLB and non-THLB lands and the overlap of THLB with the long-term Project ROW. The overlap area of the long-term ROW (55 m) with THLB would be modest (substantially less than 1%) for most management units.

During Application Review, in response to concerns that other long term removals from THLB could result from recruitment of new areas to replace infringements on OGMAs, WHAs, and UWRs, the Proponent estimated the permanent removal from OGMAs at 183.84 ha, Wildlife Tree Retention Areas (WTRAs) at 47.14 ha, WHAs at 3.69 ha and UWR at 198.87 ha, for a total of 433.54 ha.

Table 7-5: Summary of the Project footprint in THLB and non-THLB, by administrative unit

	Gross Area (ha)	THLB Area (ha)	Project Footprint Average of 70 M			Long-Term ROW of 55 M	
			THLB cleared (ha)	% of THLB cleared	Non-THLB cleared (ha)	THLB cleared (ha)	% of THLB cleared
Fort St. John TSA	4,670,000	1,058,540	337.5	0.03%	215	273.9	0.03%
Dawson Creek TSA	2,300,000	758,200	462.4	0.06%	402.9	370.2	0.05%
Mackenzie TSA	6,410,000	1,360,000	760.7	0.06%	212.3	654.6	0.05%
Prince George TSA (all in Fort St. James FD)	7,970,000	3,096,125	471.4	0.02%	494.4	471.4	0.02%
Bulkley TSA	762,734	283,510	100.2	0.04%	31.1	86.3	0.03%
Kispiox TSA (a)	1,296,751	360,669	646.7	0.18%	305.5	508.5	0.14%
Kalum TSA (b)	2,300,000	(b)	(b)	(b)	597.3	(b)	(b)
North Coast TSA	1,800,000	145,808	46.6	0.03%	180.8	42.2	0.03%
Sub-Total TSAs	27,509,485	7,062,852	2,825.5	0.04%	2,439.6	2,407.1	0.03%
Area Based Tenures (c):							
TFL 48 - Canfor (d)	643,239	356,756	N/A		N/A	N/A	N/A
TFL 1 - Coast Tsimshian Resources LP	(b)	(b)	(b)		119.4	(b)	(b)

	Gross Area (ha)	THLB Area (ha)	Project Footprint Average of 70 M			Long-Term ROW of 55 M	
			THLB cleared (ha)	% of THLB cleared	Non-THLB cleared (ha)	THLB cleared (ha)	% of THLB cleared
WL 0263 - John Steward	600	600	0		0	0	0.0%
WL 1190 - Banyon Consulting	620	620	7.7	1.24%	0.2	5.6	0.90%
WL 1915 - Dale Benke	N/A	N/A	0.3		0.0	0.2	
McLeod Lake Mackenzie Community Forest (e)	<u>24,664</u>	<u>24,664</u>	<u>54.8</u>	<u>0.22%</u>	<u>0.7</u>	<u>43</u>	<u>0.17%</u>
Sub-Total - Area-Based Tenures	669,123	382,640	62.8	0.02%	120.3	48.8	0.01%
Total TSAs & Area-Based Tenures	28,178,608	7,445,492	2,888	0.04%	2,560	2,456	0.03%

N/A: Not available

(a) Includes Kispiox and Cranberry TSAs.

(b) Most of Project footprint in Kalum TSA and TFL 1 is in Nisga'a Lands, which has not been included in THLB.

(c) Includes woodlot licences listed by Proponent; for woodlots, entire area is assumed to be THLB.

(d) Area located near or within Dawson Creek TSA boundaries.

(e) Area located near or within Mackenzie TSA boundaries; total area is assumed to be THLB.

During Application Review, the McLeod Lake Mackenzie Community Forest (MLMCF) raised concerns that the pipeline route would permanently remove 80 ha for the ROW and an undetermined amount for access roads and work areas (by comparison, the Proponent notes that 54.8 ha would be harvested during construction and 43 ha would not be regenerated during operations). MLMCF also raised concern that approximately 12,500 m³ of merchantable timber would be removed from the ROW, which represents a large loss of timber harvesting opportunity for the future for which they expect to be compensated. (The Proponent notes 17,682 m³ of merchantable timber volume is in the 70 m ROW). Other concerns raised by MLMCF included:

- MLMCF requested an agreement with the Proponent about which type of permit would be used to remove the timber;
- The pipeline ROW may occupy the easiest ground on which to build roads and this may force the MLMCF to build roads in more difficult terrain which results in greater expense.
- MLMCF would likely need to cross the pipeline to harvest timber and then to carry out reforestation and ongoing forest tending activities.
- The pipeline may isolate blocks of timber by making them too expensive to access.
- MLMCF's Forest Stewardship Plan (FSP) and possibly site plans would have to be amended to account for the pipeline.
- While the pipeline is being constructed, the harvesting plans of the MLMCF may be disrupted resulting in greater costs.

In response to the concerns raised by the MLMCF, the Proponent committed to further meetings and discussions with MLMCF to reach consensus on timber use/ownership, forest plan amendments, placement and costs for ROW crossings and road location and use. The Proponent indicated that it is committed to minimizing impacts on MLMCF and other forest tenure holders to the extent possible, reducing future costs and impacts through joint planning on subjects such as construction schedules and access road locations that can be beneficial to both WCGT and the current tenure holders.

During Application Review, the Proponent provided additional detail on the proportion of timber harvest volumes that would originate from THLB and non-THLB lands. The Proponent's analysis in Table 7-6 shows that 61% of the timber harvested would originate from the timber harvesting land base (THLB) and 39% would originate from non-THLB lands.

Table 7-6: Proportion of Project timber volume harvest from timber harvesting land base

Project Footprint Timber Harvesting Land Base (THLB) and Non-THLB	Merchantable Timber	Non-Merchantable Timber	Total	% of Total Volume
Volume within:				
Timber Harvesting Land Base (THLB)	514,100	68,607	582,707	61%
Non-THLB	<u>320,831</u>	<u>54,747</u>	<u>375,578</u>	<u>39%</u>
Total	834,931	123,354	958,285	100%
% of Total	87%	13%	100%	
Hectares within:	Area of Merchantable Timber (ha)	Area of Non-Merchantable Timber (ha)	Total Area (ha)	% of Total Area
Timber Harvesting Land Base (THLB)	1,628	1,260	2,888	53%
Non-THLB	<u>1,143</u>	<u>1,417</u>	<u>2,560</u>	<u>47%</u>
Total	2,771	2,677	5,448	100%
% of Total	51%	49%	100%	

During Application Review, FLNR, RDBN, ABCPF, COFI and others expressed concern with log and wood fibre utilization.

The Proponent's supplemental analysis showed in total, 87% of harvested timber (approximately 835,000 m³) is expected to be merchantable timber.

In order to mitigate Project-related effects on forestry operations, the Proponent proposed developing Timber Salvage Plans and undertaking extensive consultation with tenure holders through the permitting process related to the construction phase, as well as during pipeline operations as may be required.

The Proponent also committed to continued dialogue with appropriate regulatory authorities in the development of clearing and timber salvage planning, and the resulting merchantable and residual fibre use.

EAO proposes a condition that would require the Proponent to develop a Timber Salvage Strategy to ensure appropriate management of merchantable and non-merchantable timber. In addition, EAO proposes a condition that would require the Proponent to consult with entities holding timber tenures in the development of the Timber Salvage Strategy, the Access Management Plan and the Traffic Management Plan, to help mitigate associated adverse effects on the forest sector. FLNR, ABCFP, COFI and BCTS were engaged in the development of these proposed conditions and mitigation measures to reduce the potential effects of the proposed Project on forestry operations.

Mining and Other Industrial Activities

An owner of several mineral tenures northeast of Mackenzie, which would be crossed by the proposed pipeline route, expressed concerns the any pipeline crossing could result in higher costs and impede further exploration work. .

The Proponent met with the tenure holder and confirmed that the proposed alignment would not go through the tenure area.

A placer and mineral tenure holder on the north side of Mugaha Creek also expressed concern that the pipeline route may impinge access to the area.

The Proponent met with the tenure holder and determined that the access to the tenure area would not be impacted.

During Application Review, MOTI noted three aggregate pits and one quarry that could be adversely affected by the pipeline ROW and a proposed laydown/camp facility location. Discussions with the Proponent are on-going to minimize effects to gravel and rock reserves.

Agriculture

EAO requested that the Proponent provided additional information regarding the areal extent of temporary and long term disruptions in the ALR.

The Proponent clarified that only the 4.6 ha of ALR lands for the K1 compression station and another 0.09 ha for permanent access roads would be unavailable for

agricultural production during the operations phase, as other ALR lands disrupted during construction (584.5 ha) could be returned to full agricultural production once the post-construction reclamation phase is complete.

Guide-Outfitting

Three guide-outfitters expressed concerns related to the Project including a guide-outfitter at the north end of Takla Lake (Double Eagle Guides and Outfitters), a guide-outfitter based in Moberly Lake (Pine River Outfitters Limited) and a guide-outfitter that operates 120 miles northwest of Fort St. James (Fehr Game Outfitters). Their concerns included the potential overlap of the pipeline route with their guiding areas, potential wildlife displacement as a result of construction, a desire for a clear construction schedule, and a lack of communication from the Proponent on whether existing wilderness camps would need to be relocated.

The Proponent responded that they would continue to engage in further consultation with Double Eagle Guides and Outfitters and Pine River Outfitters Limited as the proposed pipeline would cross their guiding territories. The Proponent responded that even though the pipeline route would be outside the territory of Fehr Game Outfitters, they were willing to participate in discussions with them regarding any concerns they may have with the Project.

Trapping

No specific concerns were raised by individual trappers during Application Review that were not already discussed in the Application.

Tourism/Commercial Recreation

During Application Review, concerns were raised that tourism jobs related to recreational fishing and eco-tourism activities may be adversely affected by increased industrialization of the Kispiox Valley (mentioned by the Kispiox Valley Community Association and several residents from Kispiox, Telkwa, Smithers and other communities).

The Proponent responded that the Application includes an extensive review of the effects on fish and fish habitat as well as land and resource uses, and that the Project would not proceed without the appropriate approvals, permits and or authorizations.

At the request of the EAO during Application Review, the Proponent provided additional information on the five commercial recreation tenures expected to be disturbed by the

Project. In all cases, the area where construction activities would be carried out represents less than 1% of the total area under tenure.

Human Habitation

Several property owners and individuals residing near a potential Project staging area near Nass Camp (Irene Meadows) expressed concerns that the location would be in a healthy forested area, that other lands already cleared nearby exist (e.g. Nass Camp), that their properties are in close proximity to the potential staging area including one resident whose property is less than 500 m from the proposed location, and there would be potential for increased traffic during construction.

The Proponent responded that they are still considering staging areas and route options for that portion of the pipeline route.

Land Use Plans

During Application Review, the Bulkley Valley Community Resources Board and several residents expressed concern relating to access management and consistency with values stated in the Bulkley Land and Resource Management Plan (LRMP) area, and in particular the creation of circular access routes.

Several residents, an Aboriginal Group member, and others expressed concerns with a possible work camp being located in the Kispiox Valley (i.e. between KP 560 and KP 580) and with the crossing location for the Kispiox River. Primary concerns relate to retaining fish habitat values as described in the Kispiox LRMP for that region.

In response to the concerns raised about the Bulkley LRMP and the Kispiox LRMP areas, the Proponent re-iterated that the detailed design of the pipeline route would consider the values expressed in the Bulkley LRMP area as well as the fish values and sensitivities of the Kispiox Valley and the values expressed in the Kispiox LRMP. Impacts to the Bulkley LRMP and Kispiox LRMP areas would be considered and minimized as part of the regulatory process undertaken by the OGC. The Proponent also referred to its intention to develop and implement a Traffic Control Management Plan and an Access Management Plan. Fish impacts are discussed further in section 5.6 of this Report.

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 (if Nasoga route is pursued);
- 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;
- Access restrictions and other disruptions to commercial and recreational activities;
- Alteration and disturbance of some privately owned lands; and
- Variation from current visual quality objectives in some visually sensitive areas.

Summarized below is the EAO's assessment 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 (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	All: Low to moderate sensitivity and resiliency	Most parts of the local and regional study areas generally 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.
Magnitude	<p>Park: Low</p> <p>Forestry: Low to medium</p> <p>Fishing: Low to medium</p>	<p>Park: A Park Boundary Amendment would be required to remove a relatively small area from the Park. Assuming trenchless pipeline construction techniques are feasible, the values protected by the Park would not be directly impacted.</p> <p>Forestry: The potential Project effects on alteration of forestry operations in tenured areas during construction are considered to be low to medium 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 licensee is expected to be unavailable for forestry for the duration of the Project. Effects on smaller licensees, such as the McLeod Lake Mackenzie Community Forest and individual woodlots are expected to be of medium magnitude.</p> <p>Commercial fishing: Temporary construction activity could displace the activities of commercial fishers, resulting in residual effects of medium magnitude, but</p>

Criteria	Assessment Rating	Rationale
	<p>Mining: Low to medium</p> <p>Activity disruption: Low to medium</p> <p>Private land: Low</p> <p>Visuals: Medium</p>	<p>with mitigation this is of low likelihood. The potential damage from fishing gear entanglement with construction vessels engaged in marine pipe-lay activities expected to be low in magnitude after mitigation and financial compensation. Impacts to crab are discussed in section 5.11.</p> <p>Mining: Project construction activities may disrupt access to aggregate pits, two specific mineral prospects (Kitsault and Kwanika properties) that are under active development, as well as many other mineral and coal tenures, resulting in effects of medium magnitude. The presence and operations of the Project may result in long term effects of low magnitude, by limiting close proximity blasting activity and/or road access development related to future mineral exploration or development.</p> <p>Activity disruption: During Project construction, disruption of other activities is considered to be low to medium in magnitude due to noise, access restrictions and disruptions to visual aesthetics. The potential effects from increased access along the proposed terrestrial route (mainly during construction but some increased access during operations) are considered to be low in magnitude after mitigation.</p> <p>Human habitation: Residual effects are expected to be of low magnitude; compensation would be provided for direct impacts.</p> <p>Visuals: The magnitude of effects on visual quality (alteration of visually sensitive views) is expected to be medium 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.</p>
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 regional activity and use (e.g.,

Criteria	Assessment Rating	Rationale
		recreational uses, guide outfitting, visual quality).
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 associated with operations would persist for the life of the Project (e.g., alienation of THLB, visual quality).
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 (50 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. A residual effect to the Park would only occur if the Nasoga route is selected.	
Significance	Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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	There is a high level of confidence in the likelihood and significance determination.	

7.3.5 Cumulative Effects Assessment

The cumulative effects analysis in the Application outlines several potential effects on Land and Resources. However, there is a lack of available information on the precise location, footprint, schedule and design of many of the reasonably foreseeable future developments.

Park: Within the Nisga'a Lava Bed Memorial Park there is the potential for cumulative effects of the proposed Project with the proposed Prince Rupert Gas Transmission (PRGT) 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 Amendments require substantial 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 834,931m³ of merchantable timber, which represents 3.6% of the total allowable annual cut (AAC) for the forestry management units across the pipeline route and long term removals from THLB of those same management units averaging less than 0.1%. The Project would be in close proximity to the proposed PRGT pipeline for approximately two thirds of the land-based portion of the Project and several forestry management units would be crossed by both proposed projects. The most affected forestry management units that would be crossed by both projects include the Dawson Creek TSA, the Mackenzie TSA, the Fort St. James Forest District of the Prince George TSA, the Kispiox TSA, and North Coast TSA. The Nisga'a Lands and several other licences including TFL 48 in the Northeast (Canfor), TFL 1 in the Kalum Forest District and the McLeod Lake Mackenzie Community Forest would also be crossed by both projects. 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 RSA. The residual effects of the proposed Project are not expected to cumulate with other reasonably foreseeable projects and activities.

Other activities: Other reasonably foreseeable future developments could occur within the wider land and resource RSA, and while they would not necessarily overlap spatially with the Project footprint, they could 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.

- 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.

Visuals: The Proponent's cumulative effect assessment on visually sensitive areas identified that the infringement of multiple projects and activities on the various categories of VQOs would reduce the ability of the Province and forest harvesting licensees to meet visual quality management objectives. As a consequence, the combined effect of existing and proposed projects including forest harvesting on VQOs would require further discussion with FLNR to determine trade-offs between development and visual resources.

Cumulative effects on visual resources could result not only from multiple disturbances to a given scenic area, but also from combined increases in the total number of known scenic areas affected. EAO proposes a condition requiring the Proponent to develop a Visual Quality Management Plan in consultation with FLNR and OGC, and in consideration of FLNR's Visual Landscape Design Training Manual (1994)..

Additional mitigation strategies to address cumulative effects:

To help address potential residual cumulative adverse effects on land and resource uses, the Proponent indicates its willingness to participate in discussions with applicable federal, provincial and local government agencies, as well as other proponents of future projects and forestry operators as may be applicable to:

- Identify the appropriate level of combined development and potential trade-offs regarding Land and Resource Use; and
- develop innovative strategies to reduce cumulative effects of several proposed projects with potentially overlapping effects.

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 to land and resource use. EAO concludes that the residual adverse cumulative effects on 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.

8 Assessment of Heritage Effects

8.1 Heritage Resources

8.1.1 Background

Heritage 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 six VCs:

- Historic Sites
- Archeological Sites (including Coastal Zone and Marine Sites)
- Paleontological sites
- Artifacts
- Fossils
- Features

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 historic sites; and
- Increased access to heritage sites.

The LSA for heritage resources is the same as the Project footprint in addition to specific areas outside, but in close proximity to the LSA for the purposes of gathering information from previously recorded archeological sites and incorporating relevant related TEK into the Archaeological Impact Assessment (AIA). The RSA considers the Borden blocks crossed by the proposed Project. A Borden block is used throughout Canada to track archaeological sites and artifacts that come from them; each block measures approximately 16 km by 16 km.

Historic and architectural sites protected under the *Heritage Conservation Act* (HCA) are provincially regulated by the Heritage Branch of FLNR. Historic places may also be formally recognized and protected under the *Local Government Act*, and regulated by local governments.

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 Archaeology Branch and Heritage 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, and was required to comply with *Archaeological Overview Assessments as General Land Use Planning Tools – Provincial Standards and Guidelines* (2009).¹⁰ The AOA, which involved developing an "archaeological potential" model to guide field work, 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. Aboriginal participants contributed to the assessment during the TEK study. During the field studies along the proposed route, participants identified several areas of archaeological potential based on knowledge of ideal conditions for campsites, hunting and trapping grounds, cache pits and culturally modified trees (CMT). 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. A description of the objectives, methods and engagement of potentially affected Aboriginal communities on the archaeological field surveys are provided in section 3.0 of the Application.

The Proponent is presently completing the required AIA. The primary objectives of the AIA are to:

- Identify and evaluate archaeological resources within the project area;
- Identify and assess all impacts on archaeological resources that might result from the project; and

¹⁰ www.for.gov.bc.ca/ftp/archaeology/external/!publish/web/professionals/FIA_AOA_Standards_2009.pdf

- 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 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.

During the AIA, the Proponent continued to invite participants from Aboriginal communities along the proposed route to accompany the archaeological field studies and to share any knowledge of their traditional territories which they feel is important to understanding past cultural landscapes. Heritage sites of importance to the Aboriginal groups that are not already protected under the HCA are being identified by the Proponent through Aboriginal participation in the field studies and through traditional land use studies.

The Application identified a number of previously recorded sites within one km of the proposed Project, which included:

- 45 artifact scatters
- 10 transportation sites
- 13 fishing features
- 14 cultural depressions
- 80 culturally modified trees (CMTs)
- 5 structures
- 14 ceremonial/religious
- 20 habitation sites
- 2 subsistence features
- 23 shell middens.

As of April 2014, the Application states that more than 5,150 subsurface tests have been excavated within the proposed Project Footprint. Among the heritage resource sites identified were 63 previously unrecorded archeological sites and 22 unrecorded historic sites.

A palaeontological study was conducted by a qualified Palaeontologist in September, 2013. The Application Corridor was flown over with a helicopter September 5-9, 2013,

and focused on an area containing sedimentary bedrock of the appropriate age to contain fossils, and investigating exposed glacial surficial deposits that could contain ice age fossils. Several areas of high potential were identified along the eastern segments of the Application Corridor. The Application Corridor does not encounter any previously designated palaeontological sites. Field work conducted in summer 2013 located two areas with palaeontological remains. The Proponent would include a full palaeontological report with the final AIA.

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. Key measures to mitigate the heritage impacts would include:

- Completing AIA site investigations;
- Developing a Heritage Resources Discovery Contingency Plan, in the event of discovery of heritage sites during the impact assessment;
- Suspending work in proximity to archaeological or historic sites discovered during construction;
- Prohibiting the collection of any archeological or historical resources;
- Monitoring selected areas during construction where there is high palaeontological potential;
- Re-examining proposed routes on the west end for palaeontological potential; and,
- If the crossing of, or the route approaching the Peace River crossing is to be trenched, the area would be closely examined for vertebrate trace fossils.

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

During Application Review, comments on heritage resources were raised by FLNR, Lax Kw'alaams Band, Nak'azdli Band, Doig River First Nation, Gitxaala Nation, Blueberry River First Nations, Metlakatla First Nation, Kitsumkalum First Nation, Gitxsan, and Lake Babine Nation.

FLNR's comments mostly requested additional clarification from the Proponent and provided clarification of the regulatory or policy requirements. Lax Kwa'laams Band, Blueberry River First Nations and Kitsumkalum First Nation requested additional detailed archaeological assessment, which the Proponent would make available to

Aboriginal Groups as part of the AIA process. Many of the above-mentioned Aboriginal Groups expressed concerns about the potential impacts on archeological and heritage resources in their territory, including residual effects and cumulative effects. In addition, Blueberry River First Nations, Lake Babine Nation, Metlakatla First Nation and Kitsumkalum First Nation were dissatisfied with the baseline information used in the Application. Doig River First Nation and Gitxaala Nation expressed concern about specific areas of high archaeological potential and areas of cultural significance (including Ridley Island) during the Heritage working group meeting on July 14th. Gitxsan requested archeological monitoring during construction of the proposed Project, and associated funding, to be conducted by accredited Gitxsan monitors. Nak'azdli Band commented that the number and quality of archeological sites to be disturbed within their traditional territory may be high in magnitude depending on whether or not excavating the site will adversely affect the spiritual or cultural value of the site.

The Archaeology Branch expressed concern over the Proponent's proposed mitigation to "arrange for emergency archaeological excavation of previously unidentified sites endangered by pipeline construction wherever such sites warrant attention and can be excavated without interfering with the construction schedule." The Archaeology Branch noted that if unavoidable conflicts with protected archaeological sites were encountered, such discoveries would require authorization under provincial statute in order to alter. Sites that could not be avoided may have to be mitigated under a HCA Section 14 permit issued by the Archaeology Branch, or, at the very least require a Section 12 Alteration Permit. This includes a requirement to consider Aboriginal Interests.

The Proponent responded that avoidance is always the preferred means of mitigation. When avoidance is not feasible, mitigation for a site would be developed on a case-by-case basis in consultation with the appropriate regulatory authorities and applicable Aboriginal Groups and if any previously unknown archaeological sites are encountered during construction, then the Heritage Resource Discovery Contingency Plan would be implemented (see section 5.8 of Appendix 3A of the Application).

In response to the Proponent's conclusion of no residual effects on heritage resources, the 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 100% of the data at an archaeological site.

Metlakatla First Nation expressed concern that the AIA is incomplete and therefore an assessment of impacts to archeological sites, cumulative effects, and residual effects cannot be made. In addition, Metlakatla First Nation commented that Metlakatla First Nation TEK information has not been incorporated into the AIA.

EAO notes that with only a partially completed AIA at this time it is not possible to fully quantify the specific number of archaeological sites that would potentially be impacted by the proposed Project. However, heritage resources are protected under the *Heritage Conservation Act*, which includes a stringent permitting process, consultation requirements, and mitigation measures for potentially affected sites that would be established by the Archaeology Branch and OGC. Avoidance of heritage resources is EAO's primary recommendation. If avoidance is not feasible, site-specific mitigation plans would have to be developed in consultation with the Archaeology Branch, informed by discussion with impacted Aboriginal Groups.

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.

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on heritage resources, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context		Heritage resources are protected under the <i>Heritage Conservation Act</i> . 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 medium	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

Criteria	Assessment Rating	Rationale
		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	<p>EAO notes that heritage resources are protected under the <i>Heritage Conservation Act</i> and the mitigation measures for potentially affected sites would be determined in consultation with the Archaeology and Heritage Branch and OGC.</p> <p>Considering the above analysis and having regard to the conditions identified in the TOC and the CPD (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.</p>	
Confidence	<p>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.</p> <p>Confidence in the likelihood and significance determination is high, given that provincially required mitigation programs would be conducted and would be based on input from Aboriginal communities and regulatory bodies.</p>	

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 HHRA framework, and considered Human Health as the VC. The Application considered how the proposed Project could cause changes to the quality of soils and sediment, country food, noise, air quality and water, resulting in impacts health risks.

The LSA was a 2 km wide band centred on the proposed project right-of-way (1 km on either side of the centreline) and a 20 km x 20 km area centred on each compressor station. The RSA is described as a band approximately 25 km north of the proposed centreline, plus communities between the project corridor and Highways 16 and 97.

Human health effects were assessed in relation to compliance with the *Public Health Act*, which is the responsibility of the Ministry of Health. Health Canada's mandate includes the protection of human health from exposure to chemicals and noise.

Guidelines and objectives for air, water, soil and sediment quality, as well as acoustic levels, are discussed in their respective sections of this report.

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

Screening-Level HHRA for Contaminated Sediment

The assessment of effects on human health as a result of sediment quality focused on the potential for disturbance of contaminated sediment in the marine environment. Installation of the pipeline from land to marine sections of the proposed Project would involve dredging and sidecasting of sediment, and burial of pipe in areas of historical contamination. The landfall for entry to Alice Arm and the approach to Ridley Island were identified in the Application as areas of elevated contamination. 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 potentially pose a risk to humans who eat seafood harvested from the area.

The Alice Arm alternative route passes through an area of known marine sediment contamination from metals mining at Kitsault. Arsenic, cadmium, chromium and iron were identified as the primary metals of concern to human health.

The marine approach to Ridley Island would be buried in sediment historically contaminated with polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs) which, at specified concentrations, are understood to be toxic to humans.

Screening-level HHRAs were conducted to identify the level of contamination in sediment at each site which could result in a risk to human health. The Application reported that levels exceeded background and regulatory guidelines / standards for contaminants, and the screening results suggested that further study was warranted for both sites. Details of the subsequent HHRAs, submitted during Application review, are provided below.

Proposed Mitigation Measures

The Proponent proposed the following key mitigation measures related to dredging and handling of contaminated sediment at the Ridley Island and Alice Arm Landfalls:

- Minimize the footprint of the trench and volume of sidecast material produced;
- Follow DFO operational statement's mitigation measures for dredging to the extent practical;
- Operate machinery on land or on water (i.e., from a barge or vessel) in a manner that minimizes disturbance to the water body;
- Use dredging methods that reduce the amount of re-suspended material such as an environmental bucket dredge for fine sediments;
- Minimize the time sidecast material remains exposed to tidal and wave generated erosive forces;
- Develop and implement a marine water quality monitoring plan, based on sidecast fate modelling and the relationship between TSS, sediment contaminant levels and toxicity to the marine environment;
- Develop a site specific sediment control plan that considers employment of one or more for the following measures (1) sediment curtains around the immediate work area, (2) cap fine sediments sidecast in the intertidal and shallow subtidal zone with coarser (gravel) material or uncontaminated sediment; and
- Inspect the sediment control measures regularly to confirm efficacy and repair if any damage occurs.

Potential Health-Related Project Effects to Soils, Air and Water Quality, Noise and Country Foods

Soil Quality – The proposed Project could result in increased concentrations of chemicals in surface soils during construction or operations because of minor fuel spills, other chemical spills, or ML/ARD sources as a result of accidents or malfunctions. Such changes in soil quality could potentially lead to adverse effects on human health through direct exposure (such as incidental soil ingestion or skin contact). Section 5.4 of this report describes the proposed Project's potential for impacts to soil quality and provides an overview of mitigation measures to reduce these potential impacts.

Noise – The proposed Project could result in increased noise levels, leading to disturbance of residents or wildlife during construction and operations. Impacts to wildlife from noise are considered in section 5.9. Section 5.1 of this report describes the proposed Project's potential for health impacts from noise levels and mitigation measures proposed to avoid or reduce the potential impacts to health.

Respiratory Health – The proposed Project could result in increased concentrations of one or more CACs above AAQOs, leading to potential adverse respiratory or inflammatory effects in sensitive people during construction and operations. Section 5.2 of this report describes the proposed Project's potential for health impacts from changes to air quality and specifically CACs, and mitigation measures proposed to avoid or reduce the potential impacts to health.

Water Quality – The proposed Project could result in increased concentrations of chemicals or total suspended solids in local streams, lakes or wells which could: lead to potential adverse health effects. Section 5.7 of this report describes the proposed Project's potential for impacts to water quality.

Country Food Quality – Adverse changes to surface soils, water or sediment, occurring during construction and operations, could result in chemical transfer from soil to vegetation and on up the food chain to wildlife and then humans who consume traditional and country foods – possibly leading to adverse human health effects. Several potential direct impacts to country foods were identified in the Application including application of pesticides or herbicides and disturbance of chemicals within the environment.

Given mitigation measures proposed to protect soils and sediment, water, vegetation and wildlife, the Application does not propose additional mitigation measures specifically to manage food chain transfer of contaminants as no bioaccumulation of contaminants is predicted.

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 and/or EAO are summarized below.

HHRA for Consumption of Seafood at Marine Landfall Sites: Ridley Island

EAO, MOH, MOE, Lake Babine Nation, Metlakatla First Nation, Kitsleas First Nation and Kitsumkalum First Nation raised the need for further information and clarification regarding the potential for increased toxicity and bioavailability of PCDD/Fs resulting from dredging and sidecast activities that could impact important marine resources and human health.

On April 22, 2014, with EAO's screening decision to accept the Application for review, EAO issued an information request to the Proponent for a detailed HHRA for the approach to Ridley Island. The Proponent submitted a stand-alone HHRA entitled *Consumption of Seafood from the Ridley Island Landfall* (August 20, 2014). This study considered the question of the human health risks from regular and prolonged consumption of seafood (crab and sole were used as representative seafood consumed) from the area of historical contamination at Ridley Island as compared with the same risks at a reference site.

The HHRA found that despite three to six times greater concentrations of PCDD/Fs at the Ridley Island Landfall site sediment as compared with the reference site, the levels of toxins in crab and sole were comparable. The calculated risks associated with human consumption of crab and sole at each site were also similar. See section 5.11 (Marine Resources) of this Report for a more detailed discussion of marine water quality. The Ridley Island HHRA concluded that current risk to human health is low from eating seafood in the vicinity of Ridley Island at current contamination and uptake levels. However, it should be noted that the hazard quotients exceeded Health Canada's acceptable threshold.

Dredge and sidecast activities were modelled and with the application of mitigation measures such as silt curtains or the use of dredge methods that produce less suspended sediments (such as an environmental dredge). The HHRA projected the future condition would be similar to current conditions with, the exception of a period of approximately three months, where there could be an increase in concentrations of PCDD/Fs bound to suspended sediment in the water column.

These measures and others would substantially reduce the amount of suspended sediment produced and thus suspended sediment migration. The HHRA concluded that the potential hazard to human receptors resulting from the disturbance and re-suspension of existing sediments is low. EAO proposes a condition that would require the Proponent to develop and implement a Marine Sediment Management and Monitoring Plan which would identify mitigation to minimize sediment dispersion at shore transition sites.

The potential for bioaccumulation was considered in the Proponent's second report entitled *Supplemental Investigation, Ridley Island Site, Westcoast Connector Gas Transmission Project, Ridley Island BC* (September 8, 2014), by examining whether lower trophic level aquatic organisms (e.g. cockles, eelgrass and bladed kelp) that live in and on the sediments, may have a greater potential uptake of PCDD/Fs from sediments. The PCDD/Fs concentration in the tissue of cockles, eelgrass, and bladed kelp harvested from the Ridley Island approach were very low, non-detect or near non-detect in all samples. The toxicity was similar to that of Dungeness crab and rock sole presented in the earlier August 20, 2014 HHRA. The low level of uptake from sediment to into organisms indicates that PCDD/Fs are not bioaccumulating and are unlikely to biomagnify. At the low PCDD/Fs concentrations found across tested organisms, it is unlikely that bioaccumulation or biomagnification as a result of dredging activities at the Ridley Island approach would occur; however there are uncertainties associated with the assessment of bioaccumulation potential.

The Proponent will be conducting additional studies to determine if a relationship exists between TSS, sediment contaminant concentrations, turbidity and toxicity. If so, this would be used to develop water quality objectives and thresholds during construction. In this way on-site turbidity monitoring during construction can be used to manage the dredging operation to reduce concentrations of re-suspended and released contaminants.

The Proponent is also completing a bioaccumulation study utilizing sediments collected from the Ridley Island approach, and sediments collected from the reference site. This study would provide a site-specific assessment of bioaccumulation, and identify whether there is a potential for biomagnification.

EAO proposes a condition requiring sediment and water quality monitoring and adaptive management mitigation at shore transition sites. If there are found to be exceedances, the Proponent would be required to monitor the potential bioavailability and bioaccumulation of toxins in marine foods.

HHRA for Consumption of Seafood at Marine Landfall Sites: Alice Arm

Working Group members raised the need for further information and clarification regarding the potential for increased toxicity and bioavailability of metals resulting from dredging and sidecast activities that could impact important marine resources and human health at the Alice Arm Landfall.

The Proponent submitted a supplemental report entitled *Seafood Consumption Human Health Risk assessment, Alice Arm BC* (Aug 20, 2014), which identified the baseline risk to human health from consuming seafood in Alice Arm and predicted the incremental risk to human health from consuming seafood (crab and mussels) from Alice Arm after the installation of the proposed Project. The HHRA estimated the future condition would be similar to current conditions (assumptions and mitigation would be similar to that proposed for the Ridley Island Landfall as described above).

The Alice Arm HHRA concluded that current risk associated with the consumption of crab harvested in Alice Arm under current conditions is negligible and the risk associated with the consumption of mussels under current conditions is low. The HHRA concluded that post-construction conditions are expected to be similar to the current conditions and that bioaccumulation of metals in marine foods is unlikely to occur as a result of increased concentration of metals in the water column during dredging.

Mitigation measures proposed to manage sediment re-suspension are summarized as follows:

- Continuous water quality monitoring during construction;
- Implementation of best management practices to limit the sediment re-suspension; and
- Implementation of a post construction monitoring plan to determine the success of mitigation measures instituted during construction.

EAO proposes a condition requiring sediment and water quality monitoring and adaptive management mitigation at shore transition sites. If there are found to be exceedances, the Proponent would be required to monitor the potential bioavailability and bioaccumulation of toxins in marine foods.

MOE requested that the HHRA determine material bioavailability of contaminants and inform disposal at sea criteria.

The Proponent indicated that they would consult with the regulatory authority (Environment Canada) on the eventual location of an offshore disposal site, obtain all necessary permits and follow the rules and regulations associated with such disposal.

Metlakatla First Nation raised the concern that side cast contaminated sediment at the Kitsault landfall site could contaminate other sediment and asked for clarification on how long the material would be disturbed.

The Proponent replied that the anticipated dredging time at Kitsault landfall is three months, and referred to the Application for clarification on contaminant levels.

MOE requested clarification on why there is a low probability of adverse human health effects due to disturbance of contaminated seabed sediments near Alice Arm.

The Proponent clarified that low metals/acid volatile sulphide ratios measured in sediment samples collected from the proposed Alice Arm dredging site indicate that metals release are not expected to be high (Cantwell et.al. 2008); that tides and currents at the head of Alice Arm are expected to dilute any pocket of dissolved metals in water to concentrations much lower than that developed for the elutriate toxicity test; that the aquatic community at the head of Alice Arm appears healthy even though the changing tides cause significant re-suspension of sediment every incoming and outgoing tide; and finally that they would institute best management practices to limit the sediment re-suspension, as outlined in the mitigation provided in the marine EMP.

MOE requested that monitoring be conducted during and after construction to check validity of elutriate testing and bioaccumulation modelling.

The Proponent confirmed that monitoring needs be conducted during and post-construction and also confirmed that additional pre-construction water quality monitoring is planned to assist in development of construction monitoring action levels. A description of the proposed monitoring is provided in section 14.2.1 of the Application.

Other Issues and Concerns

Other key issues and concerns, related to human health, raised during Application Review are outlined below.

Members of the public raised concerns related to air quality changes creating impacts to human health, and these are described in section 5.2.

Working Group members, including MOE, Metlakatla First Nation, Blueberry River First Nations, questioned how the Proponent could be confident that country foods would not be impacted (e.g. from herbicide use or from a petroleum spill), when all harvesting locations of country foods have not yet been identified.

The Proponent indicated that while some information was available at the time of submitting the Application, additional information continues to be gathered (including socio-economic and traditional land use studies and continued identification of country food harvesters), and would be used to inform ongoing discussions between the Proponent and country food harvesters as well as in the development of compatible management strategies. The Proponent indicated that they would continue to identify country food harvesters by posting publicly available information and directly notifying Aboriginal groups and stakeholders regarding activities such as vegetation management. The Proponent also indicated that the impact pathway is long (spill, soil, plant uptake, harvesting, consumption and health effect) and as a result, adverse human health effects are unlikely to occur.

As part of their EMP, the Proponent would also be required to develop and implement management plans for invasive plant species and rare plant and ecological communities. EAO also proposes a condition requiring the Proponent to make reasonable efforts to consult potentially affected Aboriginal Groups, Nisga'a Nation and private land owners regarding options for vegetation control prior to the use of herbicides.

Kitsumkalum First Nation, Lax Kw'alaams Band and Blueberry River First Nations requested that the Proponent consider perceived contamination of country foods and resulting alienation from food harvesting, and requested clarification of any plans to monitor and communicate with affected Aboriginal Groups during construction and operations which would be designed to manage this potential effect.

The Proponent indicated that further understanding and identification of sensitive environmental or cultural sites would be developed through site-specific

traditional use information collection prior to construction (Appendix 3A of the Application).

It is anticipated that ongoing engagement could, at the request of an Aboriginal Group, include fact-sharing and education aimed to address the perceived contamination of foods in and around the proposed Project area.

Mitigation measures related to air quality, water quality, soils, wildlife and vegetation are described in their respective sections of this report.

9.1.4 Characterization of Residual Project Effects and Conclusions

The proposed Project would have the following residual effect on human health:

- Adverse human health effects due to the disturbance of contaminated sediments at Ridley Island and Alice Arm.

Residual effects in relation to air quality and acoustics have considered possible impact to human health. See sections 5.1 (Acoustics) and 5.2 (Air Quality) for additional detail.

Summarized below is EAO's assessment of the expected residual effects of the proposed Project on human health, as well as EAO's level of confidence in the effects determination (including their likelihood and significance).

Criteria	Assessment Rating	Rationale
Context	Low sensitivity and High resilience	Potentially sensitive human receptors may be utilizing the marine environment for country food harvest. There is arsenic, cadmium, chromium, iron and polychlorinated dibenzo-p-dioxins and furans, all known to cause toxicity in humans in marine sediment in a limited area used for marine harvest. However these areas are not the only marine areas used to harvest foods, nor are foods harvested from the marine environment the exclusive source of nutrition for harvesters.
Magnitude	Low	The availability of contaminants to marine organisms is expected to be relatively low. Exposure pathway of effect is long (disturbance of sediment, marine organism uptake of contaminants of concern, marine food harvesting, consumption of marine foods and resulting health

Criteria	Assessment Rating	Rationale
		<p>effect) and it is uncertain whether the effect would occur in any particular person harvesting seafood.</p> <p>Should any detectable human health effect occur it is expected that it would be low in magnitude, given the toxic characteristics of the potential marine foods contaminants.</p>
Extent	Local	The source of potentially contaminated seafood would be limited to the local areas and health effects, if any, would be limited to those people harvesting seafood within that area.
Duration	Short to long term	It is anticipated that biological uptake of contamination in marine organisms that are regularly harvested for human consumption could occur during construction, a period of approximately 3 months, but would cease following construction. Contaminants may persist in marine foods post-construction. A health effect detected as a result of the consumption of contaminated marine foods may last longer than the physical work or activity.
Reversibility	Reversible or irreversible	Some changes to human health may be reversible when the exposure ceases, while others may persist.
Frequency	Rare to infrequent	<p>Contamination of marine foods would occur once during construction (pipe laying and dredging) whereas the consumption of potentially contaminated marine foods could occur over the course of the subsequent years. The frequency of harvesting potentially contaminated seafood would decrease over time, as the individuals harvested reach the end of their lifecycle.</p> <p>Potential for human health impacts would correspond with harvesting for a period of years following construction, and contaminated organisms could be harvested and consumed at any point during their lifetime.</p>
Likelihood	Likelihood of residual effects to human health is low.	

Criteria	Assessment Rating	Rationale
Significance Determination		Taking into consideration the low magnitude of the potential effect, as well as their short to medium duration and reversibility, EAO concludes that the potential residual effect of the proposed Project on human health is not likely to be significant.
Confidence		The significance determination and likelihood rating for potential residual effects are determined with high confidence, based on the proposed mitigation measures that include compliance with water quality guidelines, follow up monitoring programs and proposed EA Certificate conditions.

9.1.5 Cumulative Effects Assessment

There is little to no potential for cumulative adverse human health effects due to the disturbance of potentially contaminated seabed sediments in Alice Arm, as there are no reasonably foreseeable projects or activities would be expected to interact with the residual effects of the proposed Project.

Near Ridley Island there is the potential that the proposed Project's residual adverse effects may interact with the proposed PRLNG terminal, and possibly other activities in the port area. The various projects' dredging activities would result in the disturbance of sediments that contain concentrations of dioxins and furans. Due to the relationship between the proposed Project and PRLNG, if the proposed Project is constructed, then the LNG terminal would also be constructed, which increases the likelihood of potentially adverse cumulative effects. The results of the Proponent's detailed HHRA and subsequent implementation of mitigation are expected to mitigate potential adverse effects on human health that would result from the uptake of dioxins and furans in marine organisms consumed by people.

Lax Kw'alaams Band and Gitxaala Nation raised the concerns around cumulative effect and resulting health effect from disturbance of the multiple pipeline and facilities projects being proposed near or at Ridley Island.

There were several other projects considered, including PNWLNG, PRGT, and Campotex. Because of the concern for sediments in this area, they would minimize the sediment dredging and minimize total suspended solids using best management practices. The Proponent indicated that if six potential LNG plants are built, the proposed Project might amount to 1% of the dredging in that area. The Proponent has considered the issues and does not believe there would be interactions with the PNW LNG or PRGT pipeline.

Section 5.11 describes EAO's response and related condition for the concern around cumulative effects in the marine environment.

In determining the significance of cumulative adverse effects to human health, EAO has considered the residual effects from the proposed Project, the cumulative disturbance to the RSA from the Project and reasonably foreseeable projects. EAO considered that the residual cumulative adverse effects to human health are expected to be of low magnitude and would be the subject of substantial regulation, mitigation and monitoring.

EAO concludes that the residual cumulative adverse effects to human health from the proposed Project and reasonably foreseeable future projects are not likely to be significant.

9.1.6 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 to human health.

10 Accidents, Malfunctions and Effects of the Environment on the Proposed Project

10.1 Background

During the construction or operation of the proposed Project, unplanned events could occur resulting in impacts to environmental, social, health, heritage or economic values. Unplanned events could arise from accidents or malfunctions associated with Project activities, or could be the effects of environmental processes on project components or activities. Section 9 of the Application describes Accidents and Malfunctions and Section 10 of the Application describes 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 review of the Application, Working Group members were actively engaged in considering questions related to potential risks associated with the proposed Project. Responses and clarifications were provided by the Proponent during meetings and through written questions-responses within the working group tracking table and associated technical memos and are summarized in this section.

Members of the public raised general concern regarding possible impacts to people and the environment from a spill or leak from the pipeline.

The following sections identify possible unplanned events and describe the contexts within which they could arise, as well as the potential effects and key mitigation measures proposed to address each event. Issues raised during Application Review are presented and EAO's conclusion on the significance of the risk posed by accidents or malfunctions and of the effects of the environment on the Project.

10.2 Accidents or Malfunctions

The Application considered the following potential accidents or malfunctions to have a medium to high potential risk (before consideration of mitigation measures):

- Spills;

- Pipeline leak or failure;
- Fire or explosion;
- Motor vehicle accident;
- Sediment release into a watercourse; and,
- Acid rock drainage/metal leaching.

The Application also details potential effects from power outages, fly rock from blasting and third party risks, which were predicted to pose a low risk to VCs. A summary of questions and responses regarding acid rock drainage/metal leaching is provided in section 5.7 of this report.

10.2.1 Spills of Hazardous Substances

Spills primarily present a risk during construction, where a release of hazardous materials in the vicinity of the project or into a watercourse could occur. Without the application of mitigation measures hazardous materials could impact soils, fish and wildlife habitat, surface and ground water quality. The results of a major spill could also impact land use including traditional land use, cultural and recreational sites, and human health.

Key mitigation proposed to address spill hazards include:

- Implementation of the EMP and related plans including: the Spill Contingency Plan, 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 and design to avoid incident management such as:
 - Engineering design to identify no-drill zones at proposed trenchless crossings and reduce the potential for an inadvertent drilling mud release;
 - Requiring that all construction vehicles carry spill prevention and clean up materials and that personnel are trained in use of containment and cleanup equipment;
 - Following best practices for storage and handling of hazardous materials and fuels; and,
 - Keeping equipment and fuel handling away from sensitive receptors including watercourses, vegetation, riparian areas etc.

There are also specific regulatory requirements for emergency response planning that would be that would be addressed in OGC permitting.

10.2.2 Pipeline Leak or Failure

The risk of pipeline leakage or failure, both terrestrial and offshore, is rare, given the proper implementation of mitigation measures.

Natural gas is considered non-toxic and has low solubility in water. In the event of a natural gas pipeline rupture, pressurized gas within a natural gas pipeline 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). Within the marine environment, a natural gas pipeline rupture would be expected to bubble to the surface and dissipate into the air.

As a result of the SCADA systems required for pipelines, the release of natural gas would be minimized, and the impact to overall GHG emissions would be minimized.

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 10.2.3 of this report.

During the construction of the proposed Project, there is a possibility that project machinery could accidentally hit and rupture of a third-party crude or sour gas pipeline. A rupture and release of sour gas or crude oil could result in adverse effects to fish or wildlife and their habitats, wetlands, vegetation, current use of land and resources including for traditional purposes, and human health and property.

Mitigation proposed to prevent, prepare for and respond to a third-party pipeline leak or rupture include:

- Identify all third-party pipelines before the start of construction and reach appropriate agreements with third-party operators and follow best practices for minimum separation between pipeline trenches;
- Coordinate with emergency response agencies to ensure that appropriate communications, understanding and cooperation are in place before the start of construction;
- Implement 24 hour monitoring and an annual visual maintenance procedure; and,
- In the event of a pipeline leak or failure, activate the Proponent's Emergency Response Plan and dispatch emergency personnel to the site.

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.

10.2.3 Fires or Explosions

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 and lightning strikes as well as human sources.

A fire or explosion could adversely impact aquatic and wildlife habitat and vegetation, loss or damage to property and human health and safety.

Mitigation proposed to prevent and respond to fires or explosions include:

- Implement fire safety and response training for all personnel including the use of fire-fighting equipment, proper disposal of hot or burning material (including cigarettes);
- Maintain all construction equipment in good working condition;
- Ensure that necessary fire-fighting equipment is available on-site;
- Manage storage and burning of cleared vegetation according to best management practices;
- Develop and adhere to a Fire Suppression Contingency Plan during a fire or high fire hazard conditions; and,
- Incorporate best management engineering design and construction methods including appropriate blasting techniques.

10.2.4 Fly Rock from Blasting

Hazards exist when bedrock removal is necessary and the creation of fly rock from blasting can result when explosives are used to construct the proposed Project. Should fly rock from blasting occur, the worst-case scenario would be high velocity rock particles causing death or injury to a construction worker or wildlife. Rock particles entering a watercourse could cause fish mortality. In addition, unexpected detonation could cause death or injury to a construction worker if the person is in close proximity.

Mitigation proposed to prevent and respond to fly rock from blasting include:

- Follow best practices for storage and handling of all explosives and ensure that construction workers have reviewed safety protocols and procedures;

- Use blasting mats, as required, to control fly rock for all blasting activities and control traffic where blasting is to occur;
- Notify local residents of the blasting schedules at least 48 hours prior to blasting and use warning sirens, blasting controls and monitoring where warranted to limit risk to the public and wildlife; and,
- Use specialized blasting techniques and incorporate appropriate precautions to protect ecological resources.

10.2.5 Marine Vessel Accidents

Marine vessel accidents are most likely to occur during construction of the marine pipeline. They are most often caused by human error, however, could also occur due to equipment failure, extreme weather-related events and/or neglect. There are three types of marine vessel accidents that could have potential adverse effect on the marine environment: leakage or collision resulting in discharge of the vessel's fuel; accidental discharge of ballast or bilge water; and grounding of a vessel. The worst-case scenario for a marine vessel accident during construction involves a collision with another vessel leading to a human fatality and/or discharge of the vessel's contents into sensitive marine environments where invasive species may be introduced.

Mitigation to prevent and respond to marine vehicle accidents includes:

- Implementation of the Marine Navigation Safety Plan¹¹, Spill Contingency Plan and clean-up measures;
- Appropriate communication;
- Education of marine workers and screening of contractors;
- Following vessel operating procedures and conducting hazard assessments;
- Postings on charts;
- Vessel safety reviews/records; and
- Adherence to regulatory requirements, including but not limited to:
 - *Marine Transportation Security Act*;
 - *Transportation of Dangerous Goods Act*;
 - *Canadian Ballast Water Control and Management Regulations*; and
 - *Canada Shipping Act*.

¹¹ The Marine Navigation Safety Plan would be prepared in consultation with Transport Canada, PRPA, Aboriginal Groups and stakeholders prior to the start of construction. The plan would comply with the *PRPA Harbour Operations, Practices and Procedures* and the *Canada Marine Act*. Refer to section 11.3 of this report for more information.

10.2.6 Motor Vehicle Accidents

Motor vehicle accidents during Project construction or operations could adversely affect health and wellbeing of workers or the public, could cause property damage, or could result in spills. The worst-case scenario for a motor vehicle accident would be one causing death or injury to a person or wildlife. Vehicle collisions with wildlife are considered in section 5.9 of this report. Accidental spills and fires are discussed separately within this section.

Mitigation proposed to prevent and respond to motor vehicle accidents include:

- Actively manage vehicular movements during construction;
- Limit construction activity to surveyed right-of-way, approved temporary workspace, existing roads and approved shoo-flies;
- Transport workers between construction camps and the worksites using multi-passenger vehicles; and,
- Implement safety training on the requirements of the operation of Project-related vehicles, including speed restrictions.

10.2.7 Sediment Releases into Watercourses

A sediment release in a watercourse could occur from the release of drilling mud during trenchless crossing installation under a river (e.g., HDD). A release of large amounts of sediment in the event of an accident or malfunction could adversely impact aquatic life and habitat, vegetation, wetlands and/or wildlife and drinking water.

In the event of a sediment release in a watercourse, the Proponent would be required to comply with all regulatory requirements, including those relating to spill response, reporting and disposal.

Sections 5.6 and 5.7 of this report discuss the potential effects of sediment release into watercourses during construction activities and describe concerns raised during Application review.

Mitigation proposed to prevent and respond to sediment releases include:

- Implementation of relevant EMPs including the Directional Drilling Procedures and the In-stream Drilling Mud Release Contingency Plan;
- Implementation of standard trenchless crossing measures where a trenchless crossing is planned or the implementation of a contingency crossing method; and,

- Implementation of a monitoring plan that combines water quality monitoring with other monitoring methods.

Section 5.6 of this report provides an overview of measures to mitigate riparian habitat loss or alteration and to reclaim wetlands in the event of a drilling mud release.

10.2.8 Issues and Concerns Raised During Application Review

Nisga'a Lisims Government noted that hazard scenarios do not cover areas of human settlement potentially impacted by blasting.

The Proponent clarified that the route has been specifically chosen to avoid settlements and no blast scenario could affect human nearby settlements. An emergency response planning zone would be developed specifically for this project and would depend on the final detailed design of the pipeline system.

Nisga'a Lisims Government raised concern with worker safety from regular activities such as excavation, drilling, blasting etc. citing that a Nisga'a community member was killed during a blasting-related landslide during road building on a past project.

The Proponent indicated that they have programs in place that result in zero industry and zero work-related illness culture.

Blueberry River First Nations raised a concern that fly rock blasting and motor vehicle accidents could impact on traditional land use.

The Proponent responded that there were no interactions identified, since it is anticipated that they would be mitigated effectively.

Blueberry River First Nations raised the following concerns of a missing effects pathway related spills and contamination, pipeline leaks, fires or explosions, fly rock, motor vehicle accidents, and sediment releases into fresh watercourses. (a) The perceived risk of several potential accidents and malfunctions (rather than predicted risks of accidents and malfunctions) on traditional land use activities. Risk perception has a very strong influence on human behaviour and can be the pathway that results on a significant adverse effect on Blueberry River First Nations rights and interests. (b) Reduced access to a traditional land use site due to the above-listed potential accidents and malfunctions.

The Proponent indicated that further understanding and identification of sensitive environmental or cultural sites would be developed through site-specific traditional land use (TLU) collection prior to construction (Appendix 3A of the Application).

It is anticipated that ongoing engagement could, at the request of an Aboriginal Group, include fact-sharing and education aimed to address the perceived contamination of foods in and around the proposed Project area, including as a result of accidents or malfunctions.

Gitxaala Nation and Metlakatla First Nation: indicated that the consequence associated with a marine vessel accident resulting in a release of exotic species into Chatham Sound is unknown and therefore the risk cannot be characterized as low, but rather moderate to high. This should be considered by regulators.

The Proponent indicated that the event is very rare; this would suggest a lower risk. The Proponent also indicated that they would follow the *Canadian Shipping Act* and the Ballast Water Control and Management Regulations.

Kitsumkalum First Nation and Lax Kw'alaams Band requested additional detail and clarification regarding effects, planning and protection against spills into the marine environment including from secondary equipment failure. Kitsumkalum First Nation was concerned with impacts to high value environmental and cultural features. Lax Kw'alaams Band requested clarification on whether more mainline isolation valves in the marine environment could reduce the likelihood, frequency or severity of accidents and malfunctions.

The Proponent explained that the pipeline system is monitored electronically utilizing leak detection sensors from a control center on 24/7 basis. Should the system detect a leak, it would automatically close valves on both sides of the leak, to isolate it. The valves close in minutes. As part of the pipeline integrity plan the pipeline would also be routinely monitored by aircraft, underwater ROVs and inline inspection tools. An emergency plan would go into effect immediately upon indication of a leak to secure the area to protect the public and environment. Once the area is secured, repair measures would be initiated before the system could be restored to normal operations. The pipeline is designed to standards that take into account isolation valve locations and measures to protect the pipeline. Depending upon the location and type of leak, the amount of gas that would be released into the atmosphere would vary based

on water depth, seabed topography, opportunity to draw down pipeline gas at the compressor station or the LNG terminal.

The Proponent committed to model a realistic unplanned spill scenario in the marine environment as part of the detailed pre-construction planning.

Kitsumkalum First Nation raised concern with impacts to marine bird species or mammals from an accidental spill in the marine environment.

Proponent explained that natural gas, unlike oil, does not “spill” [please see section 10.2.2 of this report for more description], and that there would be an extremely low risk that this would result in the mortality of marine birds or marine mammals. Spills of other hydrocarbons are considered low risk.

MOE requested clarification on the contents of drilling mud.

The Proponent clarified that drilling mud is made from bentonite clay which is non-toxic and water based.

Transport Canada raised the concern that this section should consider accidents or malfunctions as a result of pipe cargo transfer to barges and lay ship.

The Proponent responded that the transfer of pipe cargo would be included as part of the installation procedures developed by the installation contractor.

West Moberly First Nations raised concerns around potential impacts to drinking water quality and other environmental values resulting from a loss of containment of drilling fluids during the HDD of 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 very little 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.

10.3 Effects of the Environment on the Proposed Project

Environmental processes assessed with respect to their potential to affect the proposed Project and result in effects to Valued Components include:

- Extreme weather events;
- Predicted future climate scenarios;
- Seismic events;
- Subsea geohazards;
- Volcanic events;
- Forest fire;
- Slope stability and mass wasting events;
- Forest pests and pathogens;
- Marine clays;
- Sediment transport and scour (including effects of wave action); and,
- Chemical and mechanical weathering (including encrusting marine species).

River Ice was also considered as a possible environmental process that could impact a pipeline, but it was not identified as posing a risk on this particular project.

10.3.1 Extreme Weather Events

The proposed Project would cross a diverse landscape where extreme weather events may occur such as large snowfalls, avalanches, high winds, lightning and high amounts of rain leading to flooding or high stream flows. The potential adverse effects from extreme weather events include delays in construction schedule; and disturbance or obstruction of right-of-way access to Project facilities. Construction schedule delays could impact the Proponent's ability to work within wildlife or fishery timing windows.

Project design measures in consideration of extreme weather include:

- Avoid placing pipeline and facilities in areas subject to lateral erosion, scour, flooding or related geohazards where possible or provide suitable mitigation measures;
- Installation of diversion berms, erosion controls (including re-vegetation);
- Adjusting pipeline burial depth to avoid scour and lateral erosion;
- Optimize the construction schedule; and,

- Implementation of an Adverse Weather Contingency Plan including corrective management following extreme weather.

10.3.2 Predicted Future Climate Scenarios

Changes in global climate conditions are affecting British Columbia's landscapes, communities and economic activities. Extreme weather may intensify and adversely affect critical infrastructure. Effects of extreme weather events, wildfires and landslides are discussed individually in this section, and mitigation measures are described.

Mitigation for changing weather and climate scenarios would be captured through implementation of the Environmental Monitoring Program. Adaptation of management plans through the project lifecycle from pre-construction surveys through post-construction monitoring and maintenance would enable real-time consideration of changing climate conditions.

10.3.3 Seismic Events and Associated Effects

Seismic conditions from northern Vancouver Island to Haida Gwaii and the area west of Kitimat are largely influenced by the oceanic Pacific Plate and most of the seismic events near the coast are associated with the Queen Charlotte Fault. Seismic events are less common on the mainland coast in Kitimat and eastward. The proposed Project could experience potential adverse effects related to natural seismic events, including ground motion, liquefaction, and active fault rupture. The potential adverse effects from natural seismic events include displacement and loading of pipeline at a fault crossing, pipeline uplift, leading to flexural strain and possible exposure of the pipeline; and dynamic loading and straining of the pipeline due to differential ground motion.

To decrease the likelihood and consequence of seismic effects on the proposed Project, the Proponent proposes to undertake:

- Fault-crossing mitigation;
- Aboveground design with heavy-wall pipe;
- Special trench geometry and backfill;
- Buoyancy control to prevent pipeline uplift in areas where liquefaction may occur;
- Densification or compaction of soil; and
- Increased drainage to decrease soil saturation.

10.3.4 Subsea Geohazards

Subsea and marine geohazards have been identified as potential concerns during operation of the proposed Project. These hazards include turbidity flows, differential erosion and settlement, seismic mobility, fault break to bottom, marine rockfall and shallow to deep-seated slides. While in some cases these geohazards are highly unlikely, a worst case scenario could cause damage to the pipeline leading to pipeline failure or rupture, as well as possible support failure.

The following steps were proposed to mitigate the potential effects of subsea or marine geohazards:

- Avoid areas at risk of marine geohazards;
- Heavy-wall pipe constructed and engineered to withstand hazards and prevent leakage/rupture; and,
- Seabed modification and investigative design related to the properties of bottom sediments.

There are also a few locations along the proposed Project that are subject to very thin river ice, predominantly during spring.

10.3.5 Volcanic Events

No evidence of recent volcanic activity has been identified and the potential for a volcanic eruption in the near future is considered very low. The proposed Project pipeline route crosses the Nisga'a Memorial Lava Beds Provincial Park. A potential effect on the proposed Project could be the settlement of lava tubes from previous volcanic eruptions in this area. The presence of voids in the lava tubes could be a safety concern during drilling and construction; in addition, any settlement over time could cause pipeline to shift.

Mitigation proposed to decrease the potential effects of seismic activity or settlement in the lava tubes include:

- Micro-seismic monitoring and thermal imaging would be considered;
- Using underground trenchless methods during construction; and,
- Implementation of EMP and Environmental Health and Safety Policy during construction and drilling.

10.3.6 Forest Fires

Factors that influence the probability and magnitude of wildfires include vegetation type, ignition source, and weather conditions, including relative humidity, air temperature, forest moisture, precipitation, wind speed and wind direction. The potential effects of fire on the proposed Project would be a delay of construction activities and construction-related traffic would be suspended in potentially affected areas. During the operations phase, forest fires are unlikely to adversely affect the buried pipeline; however, they could affect above ground facilities and maintenance activities.

To mitigate the impact of a forest fire and any delay to the construction schedule, the Proponent would implement the Fire Contingency Plan.

10.3.7 Slope Stability and Mass Wasting Events

Landslides and other mass wasting processes are naturally occurring along the proposed Project route or could be induced by construction of the proposed Project or as a result of earthquakes or other events. The potential effects of slope stability and mass wasting events identified by the Proponent include loading, deformation, or exposure of the proposed pipeline during construction and operations.

Project design measures in consideration of slope stability include:

- Stabilization measures including prompt re-vegetation of slopes and cut and slope grade measures;
- Strain relief excavation;
- Surface water controls;
- Deep burial of the pipe; and,
- Measures to protect the pipe and ditch where necessary.

Follow-up terrain monitoring is also proposed post-construction to identify and conduct maintenance along the length of the pipeline during operations.

10.3.8 Forest Pests and Pathogens

Tree removal as a result of mountain pine beetle infestation may cause alteration of the natural hydrological conditions because of increased total runoff. The hydrologic effects of tree removal because of mountain pine beetle infection could adversely affect the Proponent's ability to reclaim areas affected by forest pests or pathogens.

The Proponent would conduct post-construction monitoring and engage in further reclamation activities, as warranted, to mitigate the effects of hydrologic effects of tree removal because of mountain pine beetle.

10.3.9 Marine Clays

During the retreat of the glaciers, marine clays were deposited in the Nass Estuary and valley, and in the Alice Arm area up to elevations of about 225 m above present-day sea level. The mineralogy, chemistry and grain size of the marine clays make them more susceptible to earth flow failures, especially on seepage slopes with high pore-water pressure. Marine clays may create strain on the pipeline from lateral loading of loss of support due to flow or ground instability on the proposed right-of-way.

To mitigate the potential effects of strain on the pipeline from lateral loading by marine clays, the Proponent would conduct additional geotechnical field characterization and further refine the route to avoid areas of marine clay. Where necessary, ground condition improvements would be made and mats, gravel pads and specialized equipment would be used as needed during construction.

10.3.10 Sediment Transport and Scour (including effects of wave action)

Terrestrial sections of the pipelines would be subject to lateral erosion and scour along streams, potentially exposing or damaging pipelines. Marine segments of pipeline could be subject to a variety of environmental forces such as lateral and/or wave erosion, scour and avulsion. Pipeline support on the seabed is one of the potential concerns and scour of sediments around the pipeline due to currents could result in loss or change of support conditions. Worst case scenario is this would cause pipeline failure or rupture.

The following mitigation measures have been proposed to reduce the effects of sediment transport and scour:

- Route optimization and designing streaming crossings to provide adequate cover against lateral erosion and scour;
- Adjusting pipeline burial depth to avoid scour and lateral erosion;
- Implementing trenchless crossings and additional protection including gravel or riprap, protection over the pipeline and protective berms.

10.3.11 Chemical and Mechanical Weathering (including encrusting marine species)

The presence of water and contaminants in the gas can lead to corrosion along the inside wall of the pipeline. The extent of the corrosion depends on the concentration and combination of contaminants present in the pipeline. In addition, oxidation of sulphide minerals contained within the rock mass can produce sulphuric acid, leading to ML/ARD. If left unmitigated, ML/ARD could result in acidic ground or surface water coming into contact with the pipeline. Internal and external corrosion may result in leaks, rupture or catastrophic failure. Similarly, encrustation by some marine organisms could also result in external corrosion mechanisms on bare steel.

The Proponent would implement the following mitigation measures to reduce the effects of weathering:

- Avoidance and mitigation of ML/ARD conditions;
- Coatings chosen to be suitable for prevailing conditions including concrete coating for marine segments; and,
- Cathodic and anodic protection systems.

10.3.12 Issues and Concerns Raised during Application Review

Halfway River First Nation raised the concern that future climate extremes and increased precipitation could impact on soil erosion and result in mass wasting and terrain instability.

Proponent confirmed that ongoing detailed design will inform potential changes in stability, erosion and other geohazards and would be mitigated appropriately.

Halfway River First Nation raised a concern with pipeline construction on wet soils.

The Proponent indicated that they would implement a Wet Soils Contingency Plan. These plans typically enable the suspension of construction activity in excessively wet conditions.

OGC raised questions related to potential environmental hazard effects on the proposed Project from seismic events causing pipe uplift, offshore effect management via project design, high winds, avalanches and snow events on un-buried pipes and reiterated that mitigation measures for particular hazards would be required during permitting.

Regarding uplift and ground movement, the Proponent confirmed that field investigations with respect to lithology, soil properties and the potential for ground movement (static or seismically induced) is ongoing. Should problem areas be identified, mitigative engineering would be undertaken.

The Proponent clarified that there are no planned areas of above ground pipeline. There are a few aerial crossings which would be designed in consideration of appropriate wind and other loadings stresses. It was also confirmed that elevated pipelines and aerial crossings would not be considered in areas where there is potential for adverse snow loading due to avalanches or snow creep.

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, which would include Emergency Response Plans to address preparedness, prevention and response to an accident or malfunction or an effect of the environment on the proposed Project throughout the construction and operational phases. The EMP and related plans are described in section 11 of this report.

Based on the combination of project design measures, implementation of EMPs, and recognizing the recommended conditions (which, if approved, would become legally binding as a condition of a Certificate), the 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 Valued Components 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 Parts of the Environmental Management Plan

The Application (section 14) provided a summary of the proposed EMP for construction and operation in both the terrestrial and marine environments. Preliminary draft EMPs (terrestrial/marine) were also provided in Appendices 3A and 3B of the Application. The Proponent's EMP 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 unplanned 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, hydrovac cutting handling, contaminated soils 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 mitigation measures required to protect Valued Components with the proposed Project area.

Emergency Response Plans would be included in the EMP 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.

Health and Safety plans would provide direction to enable compliance with WorkSafe BC regulations and adherence to applicable standards and codes, including those of Spectra Energy and the Canadian Standards Association.

If the proposed Project receives an EA Certificate, the names of the final plans developed by the Proponent may vary from those identified below following direction from regulators and consultation. EAO proposes a condition that would require the Proponent to develop the EMP and associated management and contingency plans proposed in the Application.

11.2 Proposed Environmental Management Plan – Terrestrial

The preliminary Terrestrial Environmental Management Plan (Appendix 3A of the Application) contains both general and site-specific environmental protection measures for the terrestrial environment. The preliminary plan is supported by environmental alignment sheets, as well as a number of management and contingency plans.

Management Plans

- *Access Management Plan* – A framework for this plan is provided in Appendix 3A of the Application. Objectives of the plan, once developed, would be to control public access along the pipeline right-of-way, especially where new access is created or existing access is improved, and to outline measures for reducing line-of-sight and ease of access to hunters, anglers and natural predators.
- *Air Quality Management Plan* – This plan provides guidance for construction and operation practices to ensure that air quality meets appropriate standards and objectives.

- *Integrity Management Plan* – The safe operation and long-term integrity of Project infrastructure would be managed through this plan and related integrity management systems.
- *Invasive Plant Species Management Plan* – Short- and long-term monitoring and management procedures for the control of problem vegetation are outlined in this plan.
- *Metal Leaching / Acid Rock Drainage Management Plan* – This plan describes mitigation strategies to manage rock with acid rock drainage and/or metal leaching concerns that may be encountered before and during construction. The plan serves to manage the associated environmental risks and liability by characterizing the ML/ARD potential of the materials involved.
- *Restoration Plan* – A framework for this plan is provided in Appendix 3A that describes the goals of restoration and measures to be implemented prior to and during construction to facilitate restoration of the land.
- *Sediment and Erosion Control Plan* – This plan provides both general and Project-specific measures to control the erosion of disturbed soils during construction and to reduce sedimentation to receiving water bodies.
- *Soil Handling Management Plan* – Guidelines for preserving the quality and quantity of soils in ALR lands are outlined in this plan. The goal of the plan is to reduce the potential impacts of pipeline construction on these lands and to ensure their continued agricultural land capability.
- *Traffic Management Plan* – This plan provides guidance for the use of vehicles on the pipeline right-of-way and associated access roads. The goal of the plan is to reduce potential impacts and disturbance to landowners, stakeholders and the land in general, including native vegetation, riparian areas and areas of high erosion potential.
- *Waste Management Plan* – This plan outlines the specific handling, storage and disposal procedures for solid, liquid and hazardous wastes that would be generated throughout the Project.
- *Water Quality Monitoring Plan* – This plan outlines the proposed water quality monitoring activities to be undertaken during both open water and winter seasons for trenchless and trenched crossing methods, as well as vehicle crossings and

beaver dam removals in order to measure and document total suspended solids and turbidity during construction.

- *Watercourse Crossing Plans* – Once crossing methods and specific crossing locations have been determined, Watercourse Crossing Plans would be developed to provide guidance in the planning, constructing and restoration of watercourse crossings to reduce or avoid effects on fish, fish habitat, riparian areas and downstream water users.
- *Rare Plant and Ecological Communities Management Plan* – This plan outlines specific mitigation measures for working around rare ecological communities, rare plants and lichens and vegetation communities of special interest.

Contingency Plans

- *Spill Contingency Plan* – This plan contains specific measures and instructions in the event of an accidental release of hazardous materials, including spill containment, reporting and notification requirements.
- *Fire Contingency Plan* – Specific measures and instructions for fire suppression during construction are provided in this plan, as well as contingency measures in the event of a wildfire.
- *Soil Erosion Contingency Plan* – This plan provides general measures for reducing the risk of soil erosion and for controlling sediment deposition in the case of erosion events.
- *Soil Handling Contingency Plan* – This plan contains measures to be applied in situations where the loss of soil productivity is possible. The goal of the plan is to reduce the effects on soil productivity from construction activities.
- *Drilling Mud Release Contingency Plan* – This plan provides contingency measures to be applied in the event of a release of drilling mud during trenchless watercourse crossing construction.
- *Fish Species of Concern Contingency Plan* – This plan outlines assessment options and site-specific mitigation to be implemented where sensitive fish species or their habitat is discovered during construction.
- *Flood and Excessive Flow Contingency Plan* – Where flooding or excessive stream flows could occur during construction, this plan provides contingency

measures to reduce potential impacts to watercourses and surrounding areas.

- *Heritage Resource Discovery Contingency Plan* – This plan provides measures for managing the discovery of previously unidentified heritage resources or human remains.
- *Plant of Concern Contingency Plan* – This plan outlines the steps to be taken in the event that rare plants, rare ecological communities or vegetation communities of special interest are discovered prior to or during construction.
- *Contaminated Soils Contingency Plan* – Where suspected contaminated soils are encountered during construction, this plan provides measures to be taken, including notification procedures.
- *Siltation of Watercourses Contingency Plan* – Should an extreme precipitation/stream flow event threaten or render existing erosion and sediment control measures inadequate, this plan provides contingency procedures for the protection of watercourses.
- *Soil/Sod Pulverization Contingency Plan* – This plan would be implemented where sod integrity on pasture lands, hay lands or topsoil has been disturbed to the extent that it creates an unacceptably high erosion risk.
- *Wet/Thawed Soils Contingency Plan* – The purpose of this plan is to reduce terrain disturbance and soil structure damage through rutting or compaction in the event of thawed soils during frozen conditions and/or excessively wet soils during non-frozen conditions.
- *Wildlife Encounter Contingency Plan* – This plan describes measures to prevent or control human-wildlife conflicts by providing guidance for preventing mortality of wildlife, reducing disturbance and reducing wildlife-related safety concerns for all phases of the Project.
- *Traditional Land Use Sites Discovery Contingency Plan* – The measures in this plan would be implemented in the event that TLU sites are identified during pre-construction studies, or sacred sites are identified during construction.
- *Hydrovac Cuttings Contingency Plan* – Should hydrovac excavation be necessary during construction, this plan identifies procedures for handling, storing and disposing of the hydrovac slurry in accordance with applicable

regulations and guidelines.

- *Adverse Weather Contingency Plan* – This plan outlines mitigation measures to be taken in the event of adverse weather to allow for continued construction activities while reducing the potential for adverse environmental effects.

Post-Construction Monitoring Program

Following the restoration phase of the proposed Project, post-construction monitoring would be conducted at key locations along the pipeline route. The post-construction monitoring framework presented in section 14.2 of the Application describes how the program would serve to evaluate the effectiveness of the environmental protection measures, document the recovery of disturbed areas, and provide recommendations and mitigation for any new environmental issues that may have arisen throughout the Project. The program would be conducted during the first, third and fifth years following the first full growing season after final clean-up and restoration.

11.3 Proposed Environmental Management Plan – Marine

The preliminary Marine Environmental Management Plan (Appendix 3B of the Application) contains both general and site-specific environmental protection measures for the marine environment. The plan is supported by marine environmental alignment sheets and a number of management plans and contingency plans as described below.

Management Plans

- *Marine Waste Management Plan* – This plan outlines procedures for the storage, handling, transportation and disposal of waste generated during construction of the marine portions of the Project. The plan includes procedures for the management of solid waste, sewage, hazardous waste, and ballast and bilge.
- *Marine Traffic Management Plan* – The purpose of this plan is to provide measures to manage the construction vessel traffic and to reduce the potential for vessel encounters and corresponding impacts.
- *Marine Navigation Safety Plan* – This plan would be developed in consultation with Transport Canada, the Prince Rupert Port Authority, Aboriginal groups and other stakeholders and would outline practices and procedures to be used by survey, construction, support and post-construction inspection vessels for safe marine navigation.

- *Seabed Sediment and Related Water Quality Monitoring Plan* – The purpose of this plan is to monitor the potential short-term risks due to dredging at Alice Arm and Ridley Island and to verify the levels of metals contamination in surface sediments at the Alice Arm landfall site, as well as the dioxin and furan levels in surface sediments at the Ridley Island landfall site.

Contingency Plans

- *Marine Spill Contingency Plan* – This plan provides measures for recognizing and responding efficiently to any marine pollution incident in order to reduce impacts to public health and the environment.
- *Marine Heritage Resource Discovery Contingency Plan* – This plan provides procedures to be followed in the event that marine heritage resources are found in nearshore and offshore areas.
- *Marine Species and Ecological Communities of Concern Discovery Contingency Plan* – In the event that marine species and ecological communities of concerns are discovered prior to or during construction, this plan provides procedures to be implemented for their protection.

The EMP outlines a number of general and activity-specific measures to be implemented during construction. Section 4.3 of the preliminary Marine EMP (Appendix 3B) outlines specific procedures for the withdrawal and treatment of seawater for hydrostatic pressure testing and the release of hydrostatic test water in accordance with applicable regulations.

Post-Construction Monitoring Program

Post-construction monitoring specific to the marine onshore and offshore environment would be conducted to verify the condition of the construction ROW following restoration and to evaluate the success of seabed and vegetation restoration, as well as erosion and sediment control efforts. Post-construction monitoring would also involve the development of a habitat restoration plan to address methods to stabilize areas disturbed by landfall construction.

11.4 Issues Raised During Application Review

A summary of specific issues raised by Working Group members related to the implementation of mitigation and Environmental Management is provided below. Themes of interest to Working Group members and members of the public included:

effective implementation of proposed mitigation measures; access management; the importance of qualified professionals oversight on the implementation of mitigation; and the importance of ongoing monitoring to confirm mitigation efficacy in combination with mitigation adaptation, as needed.

FLNR expressed concern regarding the effectiveness of environmental monitoring activities and noted that the successful recognition of rare plants and species is often difficult and can take years of training. While sightings of vegetation and wildlife species of concern would be reported to the Environmental Inspector (EI), FLNR was concerned that without specialized knowledge, occurrences of rare plants could be missed.

The Proponent committed to retain the services of Vegetation Resource Specialists to identify the rare plants and communities of concern. These specialists would be available to the EI throughout construction. The Proponent also indicated that several vegetation surveys have been completed and other surveys are being planned. The Rare Plant and Ecological Community Management Plan would be finalized prior to construction and would outline the mitigation options for plant species and communities of concern. The Environmental Alignment Sheets would be amended, as required, to incorporate any additional mitigation measures.

FLNR requested clarification on the proposed post-construction monitoring schedule and the measurement and monitoring of restoration activities.

The Proponent indicated that vegetation monitoring and management would be conducted throughout the service life of the pipeline. Interim reclamation and monitoring would be conducted between completion of the initial pipeline and construction of the second pipeline. Full restoration and post-construction monitoring would follow the construction of the second pipeline. In the event the second pipeline is significantly delayed beyond the current schedule or not constructed, final clean-up and the full post-construction monitoring program would be implemented following construction of the first pipeline and repeated following construction of the second pipeline. The relative success of land restoration activities would be measured against the adjacent representative site conditions while taking into consideration natural variation and the status of restoration at the time of the assessment.

Lake Babine Nation, Kitsumkalum First Nation, Gitxaala Nation, Lax Kw'alaams Band, Metlakatla First Nation and Blueberry River First Nations requested the inclusion of Aboriginal Groups in the mitigation development and implementation process for the proposed Project, including environmental management plans, emergency

preparedness, site-specific mitigation (and monitoring) in high-priority areas and opportunities for environmental monitoring. Kitsumkalum First Nation and Lake Babine Nation also requested to be consulted on permits and approval applications prior to their submission to the respective governing bodies.

The Proponent indicated that Aboriginal Groups would be consulted in the development of the marine environmental management plan and provided with opportunities for environmental monitoring. The Proponent also indicated that regulatory requirements would be followed regarding consultations and notifications to First Nations in the permit and approval applications. EAO proposes a Certificate condition that would require the Proponent to consult with with Aboriginal Groups in the development of the EMP.

The Proponent also committed to undertake construction and post-construction monitoring to ensure effective (and where necessary, adaptive) mitigation is undertaken and to ensure that post-construction the mitigation measures have been effective.

Transport Canada explained that Marine Spill Contingency, Marine Waste Management, Marine Traffic Management and Marine Navigation Safety Plans would be required, which are fully compliant with the *Canadian Shipping Act* and Prince Rupert Port Authority regulations.

MOE/MOH noted that the categories of waste in the Waste Management Plan did not align with the legislation in BC, specifically liquid and solid non-hazardous wastes, and industrial wastes. MOE/MOH requested that the Proponent review the requirements and conditions of the Hazardous Waste Regulation and incorporate them into the Plan.

The Proponent provided a conceptual level EMP in the Application and would be required to develop the detailed EMP and all associated plans for delivery and review to First Nations and regulatory authorities prior to the start of the relevant stages of work. The EMP and its comprising plans would be aligned with applicable regulatory requirements.

FLNR, MOE/MOH, NLG and Metlakatla First Nation raised concerns regarding the procedures for hydrostatic testing and whether these would be conditions of the EA Certificate. Metlakatla First Nation and MOE/MOH inquired about the regulations governing the release of test water to the marine environment.

The Proponent outlined in the Application mitigation measures that would be followed for hydrostatic testing in the marine environment and indicated that the pipeline would be pressure tested in accordance with applicable codes and specifications. Refer to Appendix 3B of the Application (draft preliminary Marine EMP) for details.

EAO proposes a condition that would require the Proponent to develop the EMP in accordance with section 14 and Appendices 3A and 3B of the Application.

11.5 Compliance Reporting

The Proponent would be required to report on compliance in relation to EA conditions, as periods specified in the EA Certificate. Compliance reports would be provided to the appropriate regulatory authorities and other parties for review. 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 Groups¹² 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 May 6, 2013, the 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:

¹² “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 May 6, 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_385_35572.html.

- 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 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 VC document, draft Application Information Requirements, the draft Section 11 Order, Proponent's Application for an EA Certificate, and EAO's draft Assessment Report, including Part C 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 Application Information Requirements, 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 two drafts 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.

EAO considered Treaty 8 rights to hunt, trap and fish and the *prima facie* claims to Aboriginal title and Aboriginal rights to hunt, fish, trap and gather plants adjacent to, and generally around, the proposed Project.

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, several modifications to the Section 11 Order were made during the EA:

- Dene Tha First Nation was added to Schedule C (July 9, 2013);
- The Schedule B Gitksan (Territories) were amended to include Xsugwin Liginxw as a territory in place of Xsugwin and Liginxw (July 9, 2013);
- Doig River First Nation was moved from Schedule C to Schedule B (February 21, 2014);
- Prophet River First Nation was moved from Schedule C to Schedule B (May 29, 2014);
- At the request of the Gitanyow Hereditary Chiefs Office, replaced “Gitanyow (Hereditary Chiefs Office)” on Schedule B with a list of each Wilp (February 21, 2014); and
- Following consultation with Gitksan Hereditary Chiefs, the names of the Gitksan territories on Schedules B and C were replaced with a list of Huwilp being consulted.

EAO has considered all comments received from Aboriginal Groups’ including relevant information provided by Aboriginal Groups during the Application Review. During all 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 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 the EAO or received directly from the Aboriginal Groups in the Consultation Reports, in tracking tables and in other correspondences.

EAO reviewed the Proponent’s responses to all comments that were received from Aboriginal Group representatives in the Working Group and recorded those comments in the Issues Tracking Table. EAO required the Proponent to update the Issues Tracking Table and supporting Technical Memos as appropriate and EAO considered

the comments and issues in the development of this Assessment Report. In addition, EAO arranged specific Working Group meetings and offered to meet with individual Aboriginal Groups to review responses and any additional concerns of 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 1, 2014 to demonstrate how EAO considered all Aboriginal Groups' comments received up until October 1, 2014. Comments and feedback on the draft received up until October 15, 2014 were considered in this Report. Between October 15, 2014 and October 28, 2014, EAO shared pertinent revisions to this document with several Aboriginal Groups, in light of comments and additional information received.

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 51st 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 were 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 were consulted at a deeper consultation level throughout the EA.

After re-assessing the strength of claim to Aboriginal title for each Aboriginal group who asserted a title claim, the 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 was 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 cultural affiliation and/or tribal council or association:

Treaty 8:

- Blueberry River First Nations
- Dene Tha' First Nation
- Doig River First Nation
- Fort Nelson First Nation
- Halfway River First Nation
- McLeod Lake Indian Band
- Prophet River First Nation
- Saulteau First Nations
- Treaty 8 Tribal Association
- West Moberly First Nations

Carrier First Nations:

- Carrier Sekani Tribal Council
- Lake Babine First Nation¹³
- Nak'azdli Band
- Takla Lake First Nation
- Tsay Keh Dene First Nation
- Tl'azt'en Nation
- Yekooche First Nation

Tsimshian:

- Gitxaala First Nation¹⁴

- Kitselas First Nation
- Kitsumkalum First Nation
- Lax Kw'alaams Nation¹⁵
- Metlakatla First Nation

Gitxsan (*Huwilp*):

- Geel
- Nii Kyap
- Gitludahl
- Tsa Buk
- Gwii Yeehl
- Wii Gyet
- xGwoimtxw
- Wii Mugulxw
- Haiwaas
- Miluulak
- Delgamuukw
- Guutkunuxw¹⁶
- Luus
- Wii Hlengwax
- Yagosip
- Antgililbix
- Wii Gaak
- Wii Minosik
- Luutkudziiwus

¹³ 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.

¹⁴ Gitxaala Nation was identified in the Section 11 Order as "Gitxaala First Nation". For the purposes of this Report, Gitxaala Nation will be used.

¹⁵ 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.

¹⁶ Gitgwinuxw was identified in the Section 11 Order as "Guutkunuxw". For the purposes of this Report, Gitgwinuxw will be used.

- Kliiyem Lax Haa
- Gyologyet
- Djogaslee
- Lelt
- Mauus
- Yal
- Tenim Gyet
- Wii Eelast
- Giist
- Baskyatsinhlikit
- Gwininitxw

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 8,¹⁷ 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:

¹⁷ 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 in 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 exercised those rights may result in an infringement of the Treaty.

Eight modern-day bands that were consulted about the proposed Project were, or are evolved from, the original signatories to Treaty 8: Saulteau 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 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)
- *Gispuwudha* (killer whale)
- *Laxsgiik* (eagle)
- *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.

In 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.

13.3.1 *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.

13.3.2 *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. 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.

13.3.3 *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.

13.4 Gitksan

The Gitksan share a common society, culture and language with their Tsimshian and Nisga'a neighbours. The Gitksan 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 developed partly as 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 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, led by a hereditary chief (*Simgiigyey*). 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 *Simgiigyey* 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 *Simgiigyey* 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 *Liligit*.

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 *Simgiigyet* whose *huwilp* could be impacted by the proposed Project. As such, 11 *Simgiigyet* were identified as potentially directly impacted by the proposed Project and were consulted at the deeper end of the *Haida* spectrum. EAO consulted *Simgiigyet* 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 of the consultation spectrum and will be considered as one Aboriginal Group, unless otherwise specified.

13.5 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 in their traditional territory. 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 of land. The Gitanyow fished for sockeye, Chinook and steelhead salmon at house-owned fishing sites and made use of permanent weirs 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 *Simgiigyet* (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.¹⁸

In addition, the Proponent offered funding to all Aboriginal Groups listed in Schedule B, and as of October 3, 2014, 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. An interim capacity funding agreement was signed with Kitsumkalum First Nation and partial funding was provided, but the parties have not concluded a final capacity funding agreement as of October 3, 2014. Proponent capacity funding had been offered but not yet been accepted by McLeod Lake Indian Band, Lake Babine Nation and Lax Kw'alaams Band.

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 environmental assessment 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 two Schedule B Aboriginal Group added by a Section 13 Order to participate in the Working Group, along with federal, provincial and local government agencies¹⁹.

¹⁸ For each Aboriginal Group in Schedule B, \$5,000 was provided during the pre-Application phase and \$10,000 during Application Review. For the 11 Gitksan *huwilp*, \$1,000 each was provided 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.

¹⁹ Doig River First Nation was added to the Working Group on February 21, 2014, and therefore did not attend the March and April 2013 Working Group meetings, and were not provided the draft AIR for the Working Group's review and comment. The 11 Gitksan *huwilp* listed on schedule B are counted as one of the 16 Aboriginal Groups.

During the Pre-Application Stage of the EA, nine Working Group meetings were held:

- February 26, 2013: Initial Working Group teleconference to discuss role of Working Group members and content of the Section 11 Order. The meeting was attended by Gitxsan *wilp* Geel, and representatives of Kitsumkalum First Nation, West Moberly First Nations, Sauteau First Nations, Takla Lake First Nation, and Metlakatla First Nation.
- March 12-13, 2013: Introductory Working Group meeting held in Fort St. John to discuss the VC rationale and to discuss the draft AIR document. The meeting was attended by representatives of Fort Nelson First Nation, Kitsumkalum First Nation, Nak'azdli Band, Gitxsan Development Corporation, West Moberly First Nations, Halfway River First Nation, McLeod Lake Indian Band, Sauteau First Nations, Takla Lake First Nation, Metlakatla First Nation, and Gitanyow Hereditary Chiefs Office.
- May 15-16, 2013: Marine Working Group meeting held in Prince Rupert. The meeting objective was to identified additional marine information requirements or clarifications needed for the draft AIR. The meeting was attended by representatives of Kitsumkalum First Nation, Nisga'a Lisims Government's fisheries representatives, Kitselas First Nation, Metlakatla First Nation, and Gitxaala 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 WG members in planning and allocation of resources for participating in upcoming Application Reviews. 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 environmental assessment process and the role of the Working Group. The Proponent provided an overview of the proposed Project. 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, 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.

- February 6, 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, Gitxsan Nation, Nak'azdli Band, Lake Babine Nation, McLeod Lake Indian Band, Tl'azt'en Nation, Sauteau First Nations, Takla Lake First Nation, Kitselas First Nation, Metlakatla First Nation, Nisga'a Lisims Government, Kitsumkalum First Nation, and Lax Kw'alaams Band.
- February 12, 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 Kitsumkalum First Nation, Lax Kw'alaams Band, Kitselas First Nation, Nisga'a Lisims Government, Lake Babine Nation, Gitanyow Hereditary Chiefs and Metlakatla First Nation.

During the Application Review Stage of the EA, 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 14-17, 2014: EAO held Working Group meetings in Prince George and through teleconference to discuss heritage, wildlife and terrestrial, fish and water, socio-economics and health effects. The meetings were attended in person or via teleconference by representatives of Blueberry River First Nations, Doig River First Nation, Gitxsan Hereditary Chiefs, Kitselas First Nation, Lake Babine Nation, Halfway River First Nation, Lax Kw'alaams Nation and Nak'azdli Band.
- July 21-22, 2014: EAO held marine technical working group meetings in Prince Rupert. The meetings were attended by representatives of Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams Nation, Nisga'a Lisims Government, Metlakatla Band, and Lake Babine Nation.
- July 18, 2014, July 25, 2014 and August 1, 2014: In response to 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 Rupert for Tsimshian Aboriginal Groups, the July 15, 2014 meeting was held in Prince George for Treaty 8 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 of the EA. As a matter of practice, EAO provided meeting summaries from Working Group meetings for their review and comment. During Pre-Application, which began in February 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 18 Schedule B participating Aboriginal Groups;
- EAO required the Proponent to produce a Valued Component selection document in February 2013, which was made available for review and comment;
- 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 Valued Components 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 the Application Review Stage, which began on May 6, 2014, and ended on November 3, 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 (Freshwater/Marine);
- Nisga'a Lands Fish and Fish Habitat Technical Data Report;
- Ridley Island Human Health Risk Assessment;

- 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 Table of Conditions and Certified Project Description; and
- EAO's draft Assessment Report to the responsible Ministers.

Comments and information, including Traditional Land Use Study information, received from Aboriginal Groups until October 31, 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 tracking tables (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 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. *Simgiigyey* 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 pipelines 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, the provincial Environmental Mitigation Policy and the proposed province-wide Cumulative Effects Management Framework, and Pipeline Corridor Analysis.

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 Aboriginal Consultation Reports with Aboriginal Groups at prescribed milestones during the EA process. These documents were reviewed by Aboriginal Groups prior to submitting formally to EAO, to enable updates in light of input received and concerns expressed by Aboriginal Groups. The intent of these documents is 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 the Application Review Stage of the EA.

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 route and existing pipeline facilities, and rights of way in northeast BC, telephone calls and written communication as well as a comprehensive project website. The Proponent has committed to continue to use these methods during ongoing consultation. The Proponent-led engagement involved:

- Information sharing on the proposed Project regarding terrestrial (vegetation/reclamation, wildlife), aquatic (water quality and fish), air quality (dust management and GHG emissions), heritage (petroform 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;
- Traditional Land Use Study (TLUS);
- Meetings to specifically discuss route options and proposed changes;
- TEK studies; and
- Engagement on economic benefits, contracting, education and training opportunities.

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 Environmental assessment timelines, number of projects, and capacity of Aboriginal Groups to participate in the assessment process

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, have 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 to all Schedule B Aboriginal Groups and in most cases 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 concerns over the potential impacts of multiple pipelines in the BC north have been increasing. In response, EAO undertook a Pipeline Corridor Analysis (PCA), a strategic level assessment developed as a collaboration involving EAO, OGC, FLNR, and MOE to identify how the proposed pipeline corridors may overlap known and legally-designated resource values on the land. Potential overlap between the pipeline corridors and a given resource value does not equal impact, but awareness of potential overlaps allows users to focus their attention on certain locations or values of greater potential risk.

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 Groups²⁰ for their review and use.

EAO has adopted a planned approach to the multiple proposed LNG-related projects to ensure specific project EAs are conducted in the context of proposed LNG development. This approach enables Aboriginal Groups, communities and stakeholders in northern BC to have opportunities to participate in both project-specific EAs and the discussion of cross-project potential impacts and benefits.

This 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;

²⁰ http://forsite.ca/pca/pca_login.html

- 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.

Each of these initiatives is 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 Valued Component 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 an initial draft AIR was developed, EAO required the Proponent to produce a VC selection document in January 2013, which was made available for review and comment by the Working Group. EAO continued to extensively 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 update EMPs presented in the Application. The Proponent would continue to consult with and involve Aboriginal Groups and the NLG in development of the various plans and in refinements prior to required submissions to regulators. Plans would also be updated prior to and during construction based on site-specific 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.

Furthermore, on May 5, 2014, Doug Bloom, President of Westcoast Connector Gas Transmission Ltd, wrote to inform EAO that the Proponent "commits never, either now or in the future, to seek to convert the proposed Project to an oil transmission system."

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 can be 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 requested that the Proponent assess the potential effects of the proposed Project on VCs in the area of the proposed Project footprint, the local study area, and the regional study area. If an EA Certificate was granted, the OGC would be responsible for permitting the proposed Project during the detailed design stage of the proposed Project.

The EA has included the consideration of ancillary sites, including, storage areas, construction camps, and access roads, and the preliminary locations of construction camps, as described in Part B Section 2.2 of this Report. The specific footprints were not included because the locations for these would be developed during the

construction planning and detailed engineering design and in many cases the locations are informed by Proponent-led discussions with Aboriginal Groups. If an EA Certificate is granted, the OGC would be the primary provincial agency responsible for permitting ancillary facilities.

The Proponent is required to reclaim the proposed Project area post-construction. Conditions of the EA Certificate would require that the Proponent carry out their environmental management program as detailed in Section 14 and Appendices 3A and 3B of the Application.

EAO proposes a Condition that would require the Proponent to continue to engage with Aboriginal Groups regarding issues and site-specific mitigation post-EA. This could include any concerns regarding use of the proposed Project area, and Access Control Management Plan that requires the Proponent to provide information on all access (temporary and permanent) requirements. EAO understands that the Proponent is committed to ongoing engagement with Aboriginal Groups.

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 right-of-way or over new Crown land or private land. As part of a pipeline application to OGC, companies 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 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 Group's concerns regarding cumulative effects as it 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, on Aboriginal

Interests when assessing the seriousness of impacts on Aboriginal Interests. EAO drew on relevant information provided by the Proponent regarding 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.

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 Pipeline Benefit Discussions and Other LNG-Related Initiatives

The Province, led by 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.

16.6.1 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 between the Proponent and each Aboriginal Group. However, as of the date of completing this Assessment Report, no such agreements have yet been concluded.

Table 16-1 provides a summary of the status of Project Agreements between the Proponent and each Aboriginal Group.

Table 16-1: Status of Economic Benefits Agreements between the Proponent and each Aboriginal Group consulted as of September 5, 2014.

	Aboriginal Group	Economic Benefits Agreement Principles and Objectives Tabled	Status of Economic Benefits Agreement Negotiations
1	Blueberry River First Nations	Yes	Working to initiate
2	Doig River First Nation	Yes	Working to initiate
3	Gitanyow Hereditary Chiefs Office	Yes	Contracting/employment

	Aboriginal Group	Economic Benefits Agreement Principles and Objectives Tabled	Status of Economic Benefits Agreement Negotiations
			discussions held
4	Gitxaala Nation	Yes	Contracting/employment discussions held
5	Gitxsan Nation	Yes	Contracting/employment discussions held
6	Halfway River First Nation	Yes	Contracting/employment discussions held
7	Kitselas First Nation	Yes	Contracting/employment discussions held
8	Kitsumkalum First Nation	Yes	Contracting/employment discussions held
9	Lake Babine Nation	Yes	Contracting/employment discussions held
10	Lax Kw'alaams Band	Yes	Contracting/employment discussions held
11	McLeod Lake Indian Band	Yes	Contracting/employment discussions held
12	Metlakatla First Nation	Yes	Contracting/employment discussions held
13	Nak'azdli Band	Yes	Contracting/employment discussions held
14	Prophet River First Nation	Yes	Working to initiate
15	Saulteau First Nations	Yes	Contracting/employment discussions held
16	Takla Lake First Nation	Yes	Contracting/employment discussions held
17	Tsay Keh Dene First Nation	Yes	Contracting/employment discussions held
18	West Moberly First Nations	Yes	Contracting/employment discussions held

Source: Westcoast Connector Gas Transmission Pipeline Ltd.

16.6.2 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, 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 phased 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.

16.6.3 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 propose 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 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.

16.6.4 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.

16.7 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 EI is the on-site Company representative responsible for site compliance with the Project specific environmental documents or commitments (e.g., EMP and specific permit/approval conditions). Specific responsibilities include the following:

- Working co-operatively with Project personnel to address environmental issues and ensure conformance with the environmental program and other project specific and regulatory environmental requirements;
- Exercising 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;
- Providing appropriate and timely communications to on-site personnel and to the Project Manager and Environment Lead concerning environmental program performance and any non-conformance;
- Taking immediate action to address any project works that are perceived to be non-confirmatory to the environmental program;
- Providing appropriate liaison, as required, throughout the construction period, with regulatory agencies and other stakeholders on environmental issues;
- Facilitating on-site environmental inspections by regulatory agencies;
- Preparing site inspection reports to document environmental compliance with ongoing activities; and
- Additional responsibilities for the EI at key construction activities are outlined in the EMP (Volume 3, Appendices 3- A and 3-B).

The EI will be required to have a minimum of 3 years experience in environmental inspection and although not strictly required would typically be an accredited professional (e.g. RPBio; RPF; P.Ag.). The EI may be a Qualified Environmental Professional.

16.8 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	Dene Tha First Nation 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 Gitxaala Nation	Cumulative effects and multiple projects are considered in section 16.5 of Part C.

Key Issue	Aboriginal Group	EAO Response
	Gitanyow Metlakatla First Nation Lax Kw'alaams Band Takla Lake First Nation	
Capacity funding and timelines	Doig River First Nation McLeod Lake Indian Band Carrier Sekani Tribal Council Tsay Keh Dene Nation Saulteau First Nations Kitselas First Nation Takla Lake First Nation Gitxsan Blueberry River First Nations West Moberly First Nations Gitxaala Nation Metlakatla First Nation Gitanyow Lax Kw'alaams Band Nak'azdli Band Halfway River First Nation	Capacity funding and timelines are considered in section 14.1 and 16.1 of Part C.
Air quality	Dene Tha First Nation Takla Lake First Nation Tsay Keh Dene Nation Lake Babine Nation Nak'azdli Band	Effects of air quality are considered in section 5.2 of Part B. 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.
GHGs and impacts to climate	Dene Tha First Nation Takla Lake First Nation Tsay Keh Dene Nation Lake Babine Nation Nak'azdli Band	Effects of GHGs are considered in section 5.3 of Part B. EAO proposes 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	Doig River First Nation McLeod Lake Indian Band Saulteau First Nations	Economic effects are considered in section 6 of Part B, and economic benefits including training and

Key Issue	Aboriginal Group	EAO Response
<p>including economic benefits</p> <ul style="list-style-type: none"> • Transient workforce should not reduce Aboriginal Group opportunities 	<p>Kitselas First Nation Gitxsan Halfway River First Nation Tsay Keh Dene Nation Takla Lake First Nation Kitsumkalum First Nation Gitanyow Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Nak'azdli Band</p>	<p>employment initiatives being discussed with Aboriginal Groups and the Province are discussed in section 13.2.1 of Part C.</p> <p>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:</p> <ul style="list-style-type: none"> • Identifying economic opportunities tailored and specific to each Aboriginal Group under agreements with the Proponent that would remain confidential • 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. <p>EAO proposes a condition that would require the Proponent to develop and implement a 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.</p> <p>The Proponent has committed to continue engagement with Aboriginal Groups about construction planning and Project design, including communication of the schedule of construction activities.</p> <p>The Proponent has been actively involved in discussions with local training organizations, post-secondary</p>

Key Issue	Aboriginal Group	EAO Response
		<p>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.</p> <p>Partnership announcements for local education and training initiatives would be proposed to start in mid-2014.</p>
<p>Aboriginal Interests</p> <ul style="list-style-type: none"> • Maintaining Treaty rights • Monitoring potential effects • Loss of knowledge, traditional skills • Loss of resources • Traditional foods • Inadequate consideration of TLU/TEK 	<p>Doig River First Nation Nak'azdli Band Carrier Sekani Tribal Council Takla Lake First Nation Kitsumkalum First Nation Halfway River First Nation Blueberry River First Nations West Moberly First Nations Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band</p>	<p>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 proposes a condition that would require the Proponent to update the EMP presented in the Application in consultation with Aboriginal Groups. Any additional TEK/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.</p>
<p>Accidents and Malfunctions</p> <ul style="list-style-type: none"> • Pipeline safety • Marine spills • Seismic activity • Acid rock drainage • Risk of fire or explosion 	<p>Kitselas First Nation Kitsumkalum First Nation Dene Tha First Nation Takla Lake First Nation Saulteau First Nations Gitxsan Prophet River First Nation West Moberly First Nations Blueberry River First Nations Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Nak'azdli Band</p>	<p>Accidents and malfunctions are considered in section 10 of Part B.</p> <p>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 Valued Components associated with the Project.</p>
<p>Upstream development including fracking</p>	<p>Halfway River First Nation McLeod Lake Indian Band Takla Lake First Nation Blueberry River First Nations</p>	<p>EAO acknowledges the concerns of Aboriginal Groups regarding potential effects from upstream development. EAO has focused its assessment</p>

Key Issue	Aboriginal Group	EAO Response
	Tl'azt'en Nation	<p>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.</p> <p>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</p>
<p>Consultation</p> <ul style="list-style-type: none"> • Adequacy • Determining who to consult • What constitutes consultation • After certificate issued • Meaningful opportunity to provide input 	<p>Carrier Sekani Tribal Council Nak'azdli Band Gitxsan Kitsumkalum First Nation Blueberry River First Nations Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Halfway River First Nation</p>	<p>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 appropriately address such effects.</p> <p>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 who's House Territories are potentially affected by a proposed Project.</p>
Increase in access	<p>Halfway River First Nation Tsay Keh Dene Nation Kitsumkalum First Nation Saulteau First Nations</p>	<p>Access roads are considered in section 17 of Part C and section 7.2 of Part B.</p>

Key Issue	Aboriginal Group	EAO Response
	Nak'azdli Band Takla Lake First Nation	
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 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.
Soil erosion and terrain stability	Halfway River First Nation Kitselas First Nation Saulteau First Nations Metlakatla First Nation	Erosion and soil is considered in section 5.4 of Part B and terrain stability is considered in section 5.5 of Part B.
Human health concerns <ul style="list-style-type: none"> Compressor stations Impact on water source Risk of contamination of country foods Cumulative effects 	McLeod Lake Indian Band Gitxsan Kitsumkalum First Nation Saulteau First Nations Takla Lake First Nation Tsay Keh Dene Nation Kitselas First Nation West Moberly First Nations Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Nak'azdli Band	Human health is considered in section 9 of Part B.
EA methodology: Baseline information and Valued Component (VC) selection <ul style="list-style-type: none"> 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 First Nation Gitanyow Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Takla Lake First Nation Halfway River First Nation	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.
Social effects	Kitsumkalum First Nation Kitselas First Nation Takla Lake First Nation Blueberry River First Nations West Moberly First Nations Metlakatla First Nation Gitxaala Nation Lax Kw'alaams Band Nak'azdli Band	Social effects are considered in section 7 of Part B, with the assessment of the following VC's: Communities, infrastructure and services; transportation and access; and land and resource use. EAO proposes a condition that would require the Proponent to develop a SEEMP. The SEEMP would include on-going monitoring, adaptive

Key Issue	Aboriginal Group	EAO Response
		management and reporting of the Project's social and economic effects
Old growth Forests	McLeod Lake Indian Band Saulteau First Nations Gitxsan Nak'azdli Band Takla Lake First Nation	Old growth management areas are considered in section 5.10 of Part B.
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 information with Aboriginal Groups and working group members in order to adhere to principles of administrative fairness. Further, 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 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 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 include construction disturbance of a ROW of approximately 55 m in width, extending to 100 m in some locations to facilitate construction. The total length of the proposed pipeline route would depend on the final route option selected and would be approximately 854 km (Nasoga) to 862 km (Kitsault) in length. The Proponent plans to develop an initial pipeline followed by the potential construction of a second pipeline if and as economic conditions permit. If developed, the second pipeline would be constructed generally within the same 55 m ROW, with some exceptions, and would require additional permitting. 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 five compressor stations along the proposed pipeline route at full build-out. Section 2.2 in Part A of this Report contains a complete description of the proposed Project.

Aspects of the proposed Project that would affect traditional use of the land in the short term, with possible longer term effects, include:

17.1.1 Installation of pipelines and compressor stations

- Installation of up to two 48-inch diameter pipelines that would remain underground throughout the life of the Project, which would preclude use of that particular underground area.
- For the proposed marine sections (including the Ridley Island landfall), there would be two up to 42-inch diameter pipelines, except for the portion of marine pipelines across Iceberg Bay which would be up to 48 inches in diameter.

- Potential disruption of the use the land for gathering places, sites described as being of sacred significance, trails, travelways and home sites through ROW clearing, which may alter connectivity to trails and travelways²¹. Specific locations or sites that may be impacted by the proposed route are 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 of up to five compressor stations that would require up to 35 ha²² 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. Meter stations would be constructed at up to three locations; the first two would be co-located at compressor station sites and the third would be largely within the Pipeline Corridor.
- Noise effects may affect the enjoyment of the immediate vicinity of the station, 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 regards 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 five compressor station locations.

17.1.2 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 roads required for project construction and operation would be upgraded roads versus 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

²¹ Travelways is a term used to refer to watercourses that are used to access traditional land use areas, whereas the term trail, is used for land-based access to traditional land use areas.

²² Except for the K5A Nasoga Compressor Station, which would require up to 65 ha for the full build-out scenario with 2 pipelines.

would be permanent, while roads developed for construction would be reclaimed and deactivated, unless otherwise authorized 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 for either the compressor stations at Kitsault or Nasoga.

17.1.3 Construction camps

- The Proponent proposes to operate up to 17 main construction camps to support the construction of the proposed Project. Pioneer (small) camps ranging in size from 3 to 7 ha would accommodate 200 to 250 workers, and main camps of approximately 35 ha in size would accommodate up to 550 workers. Two camps may be floating marine camps.
- The number of personnel at each camp would generally peak for 4-12 months, depending on the location. Section 2.2 of the Assessment Report provides the location, operational period, and estimated personnel required for the proposed construction camps. Section 6 of the Assessment 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 Project area and its surroundings, including the frequency and timing of such uses by each Aboriginal Group;

- The baseline conditions of selected Valued Components, 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 Valued Components;
- 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 Valued Components 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 Project area to exercise Aboriginal Interests;
- The relative importance of the 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 Groups, 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, that 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 Valued Components assessed in Part B of the Assessment 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 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 construction planning to avoid or mitigate key areas of concern.

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 the Application section 1.4.3. 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 interests 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.

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. Additionally, Aboriginal Groups raised concerns about the status of caribou and future ability to practice Treaty or asserted Aboriginal rights to hunt.

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.

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 Valued Components 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 5.9 (Part B) of the Assessment Report. Other issues related to wildlife and hunting, including non-Aboriginal (recreational) hunting, access management and regional 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 residual effect to caribou is expected to be significant, while residual effects to all other key indicator species would not. The magnitude of the residual effects to grizzly bear would be medium, low to medium for moose and mountain goat, and medium to high for caribou, while all others species would be low. The proposed Project would be expected to change the amount of available habitat for mammals, as a result of vegetation clearing, blasting, soil handling and sensory disturbance from human activity.

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.

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.

17.2.1.1 *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. Potential residual effects are predicted for the wildlife and wildlife habitat VC, and are characterized in section 5.9.4 of the Assessment 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 LSA for the proposed Project is a 2 km wide corridor. The LSAs are intended to capture the direct and indirect impacts from the proposed Project, while the RSA is 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 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:
 - 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
 - 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.

- Potential Project effects from sensory disturbance, predation risk, hunting risk and road mortality that may affect moose and mountain goat are predicted to be low to moderate magnitude following implementation of proposed mitigation. Effects to caribou are expected to be of moderate to high magnitude and of medium magnitude for grizzly bear, therefore the existence of caribou or grizzly bear within the traditional territory of an Aboriginal Group known to hunt these species could increase the impact of the proposed Project to its Aboriginal Interest associated with hunting.
- Overall habitat disturbance from the proposed Project would be relatively small and would be reduced during operations by re-vegetating the ROW. Vegetation clearing along the ROW and re-vegetation 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 existing disturbances.
- With regard to the cumulative effects assessment, the current level of disturbance within the wildlife RSA is 9.3% and would be projected to increase to approximately 11% as a result of the proposed Project. Generally, the Project's contribution to wildlife disturbance in the RSA is minimal.
- An Aboriginal Group's access to the proposed Project area to hunt may be restricted within its territory where it overlaps with the Project area for a short period due to safety reasons during the construction period and during specific events in operations. The construction of the second proposed pipeline would result in a second period of short-term construction disturbance. However the geographic extent of these lands is generally small. Engagement of Aboriginal Groups during construction planning, as required by a proposed EAO Condition, would be expected to mitigate some of these short term effects.
- The potential exists for increased access to the general public to key hunting areas that 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 majority of works would be confined to the construction phase for two pipelines if the second pipeline is constructed, and are temporary. The timelines for construction would involve site preparation as early as 2016, with the majority

of construction works undertaken in 2016 -2020, and a potential second construction window from 2021-2024. It is possible that construction on each pipeline from site preparation to site revegetation could be greater than 4 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 pipelines.

- 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 overlaps 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 that were relatively proximate to the Project footprint could indicate a greater potential effect on that Aboriginal Group's Aboriginal Interest associated with hunting.
- 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:
 - Development of 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 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;
 - Development and implementation of a Human-Wildlife Conflict Management Plan that would include measures to prevent any direct bear mortalities associated with the construction and operations of the Project;
 - Mitigations specific to moose relate to avoiding the creation of new access within moose winter range and, where this is not feasible, deactivating and reclaiming any temporary roads with native vegetation. The Proponent has committed to implementing measures to reduce access (human and predator) along these temporary roads;
 - Fencing access to compressors would create unnecessary barriers to wildlife movement; therefore, the Proponent does not intend to fence the existing access that will be used to access the proposed K2 (Scott caribou

range) and K3 (Wolverine caribou range) compressor stations for construction and operation;

- Soliciting input from Aboriginal Groups on monitoring requirements for the proposed Project, including mitigation and monitoring related to traditional use sites; and developing a community engagement process to facilitate site access to the proposed Project area for Aboriginal Groups to undertake traditional practices;
 - 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;
 - In relation to habitat concerns and Old Growth Management Areas, seeking to reduce Project Corridor effects by avoiding OGMA's where practicable and minimizing corridor width; and
 - Completing pre-construction TLU discussions with Aboriginal Groups to identify hunting sites that warrant mitigation. Mitigation could include one or more of the following measures: adhering to species-specific timing constraints; limiting the use of chemical applications to treat invasive species; and considering alternative site-specific mitigation strategies recommended by participating Aboriginal Groups.
- Proposed Conditions of the EA Certificate include:
 - Continued engagement by the Proponent with Aboriginal Groups regarding construction scheduling, the development of the Environmental Management Plan and other plans as required by regulatory authorities;
 - Development of a Wildlife and Wildlife Habitat Management Plan that contains site specific habitat mitigation measures and moose monitoring requirements for areas outside of the Nass Wildlife Area;
 - Development of a Caribou Mitigation and Monitoring Plan, a Grizzly Bear Mitigation and Monitoring Plan, a Moose Monitoring Plan for the Nass Wildlife Area;
 - A requirement for the Proponent not to conduct helicopter or fixed wing flights over ungulate winter ranges during critical timing windows;
 - Replacement or recruitment of new areas for protection where Old Growth Management Areas where incursions are unavoidable;
 - A requirement for the Proponent to retain Environmental Inspectors, who would have full authority to cease construction activities inconsistent with the Certified Project Description or relevant regulatory requirements;

- A requirement for the Proponent to avoid or mitigate any disruption for Aboriginal Groups to carry out traditional use activities, including trapping, during operations; and
- A requirement for the Proponent to consider Traditional Use Study (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 proposes a Condition that would require a five year 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 proposes a condition that requires any improvements to mitigation as a result of the Post-Construction Monitoring on the first pipeline be applied to the construction of the second pipeline, if the Proponent proceeds with construction of the second pipeline.

Overall, EAO predicts that potential residual effects from the proposed Project would cause significant effects to caribou populations, but not to any other wildlife species. A more detailed assessment on potential effects of the proposed Project on wildlife and wildlife habitat is contained in section 5.9.4 of Part B of this report.

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 Fish and Fish Habitat RSA, nine of which are fish species at risk. Several fish species (e.g., salmon and eulachon) are harvested by Aboriginal Groups in aboriginal and commercial fisheries; and are an important part of Aboriginal culture, current and traditional use activities, and source of food for subsistence.

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 5.6 of Part B of this Report. Potential effects to marine fish and fish habitat associated with construction of the marine pipeline route are assessed in section 5.11 of Part B of this Report.

The proposed Project corridor would cross the Peace River, Fraser River, Skeena River, Nass and Coastal watersheds with the majority of crossings in the Peace River watershed. The proposed Cypress to Cranberry-Nasoga route on land would cross a total of 344 fish-bearing watercourses. The Cypress to Cranberry-Kitsault Route would cross a total of 464 fish-bearing watercourses.

The majority of fish-bearing watercourse crossings would be constructed using an isolated trench method with additional measures to avoid and minimize potential impacts to fish and fish habitat. Open cut trench methods would only be used for non-fish bearing watercourse crossings, or where the channel is dry or frozen to the bottom. For the Cypress to Cranberry-Nasoga Route, a total of 22 watercourse crossings, including most of the large river crossings, are proposed be crossed using an underground trenchless crossing technique (e.g., HDD). A total of 15 trenchless crossings are proposed for the Cypress to Cranberry-Kitsault Route. Construction of the second pipeline would occur along the same route and within the same corridor, and would have a second disturbance at each watercourse.

Potential effects and mitigation for the protection of freshwater fish and fish habitat were included in the Application section 7.5 and summarized in section 5.6 in Part B of this Assessment Report.

The potential effects of watercourse construction activities including increased erosion and adverse effects on water quality and fish populations were identified by Aboriginal community TEK participants. Potential cumulative effects on fish and fish habitat from past activities such as transmission lines, and the potential effects of proposed multiple crossings on a single watercourse, were also identified by Aboriginal community TEK participants.

Potential residual effects on fish and fish habitat in the freshwater environment associated with pipeline and access road watercourse crossings during construction and operations of the proposed Project include:

- Alteration or loss of riparian habitat;
- Alteration or loss of instream habitat;
- Increased suspended sediment concentrations;
- Potential for mortality or injury to fish;
- Temporary blockage of fish movements;
- Increased potential for fish mortality or injury due to an increase in access; and
- Disturbance of instream habitat due to a potential increase in access.

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:

- Limited access or increased public access to traditional fishing areas; and
- Change to the local harvesting locations as well as broader ecological effects and increased harvest pressure on fish populations.

Aboriginal Groups raised concerns related to aquatic resources and the Aboriginal Interest associated with fishing, including:

- Potential effects of proposed Project construction activities on fish, fish habitat, riparian habitat and spawning areas;
- Cumulative impacts of the proposed Project over time;
- Potential erosion and sedimentation from construction activities;
- Increased access to watercourses and isolated areas via construction access roads, leading to overfishing and damage of riparian areas;
- Changes to water quality affecting the overall health of animals, fish and people;
- Disruption of natural water cycles, flow, and drainage patterns;
- Contamination of water from machinery used during construction; and
- Effects of hydraulic fracturing on fish, fish habitats and watersheds.

Factors considered in the assessment of potential effects on the Aboriginal Interest associated with fishing included the Application's assessment of the Marine Environment VCs (section 4.4 including nearshore and offshore marine ecosystems) and Freshwater Fish and Fish Habitat VC (section 4.5) and EAO conclusions in Sections 5.11 and 5.6.6 of this Report. EAO concluded on each of the proceeding factors that no significant adverse effects are expected to marine and freshwater fish and fish habitat. Other relevant VCs related to assessing potential effects on fishing

include transportation and access (Application Section 6.1.3) and section 7.2 of this Report that includes an assessment of potential effects of the proposed Project on marine and freshwater navigability, including commercial and recreational marine traffic within the proposed Project area and Transportation and Access RSA.

17.2.2.1 *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 LSA 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 effect on aquatic VCs 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 Valued Components. Residual effects to freshwater fish and fish habitat and the marine environment are characterized in Sections 5.6 and 5.11 respectively of this Report, and would not be significant;
- Potential for inhibiting an Aboriginal Group's access to fishing areas. An Aboriginal Group's access to certain fishing areas may be restricted for a limited period during Project construction. However, the geographic extent of this effect is generally small. Additionally, the construction period within each territory is short and engagement with Aboriginal Groups during construction scheduling is expected to mitigate some of these short term effects;
- The majority of works would be confined to the construction phase of each pipeline (if the second pipeline is construction) and the effects are temporary. The timelines for construction would involve site preparation as early as 2016, with the majority of construction works undertaken in 2016 -2020, and a potential second construction window from 2021-2024. It is possible that construction on each pipeline from site preparation to site revegetation could be greater than 4 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 pipelines;

- Potential impacts of the proposed Project during construction and operations include:
 - Mortality or injury to culturally important fish species (e.g., salmon);
 - 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
 - Increased fishing harvest pressure (e.g., recreational angling) resulting from increased access to previously inaccessible areas along the proposed ROW and associated access roads.
- 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 areas of major, fish-bearing watercourse crossings that overlap or are in proximity to the proposed Project, could indicate a greater potential effect on the Aboriginal Group's Aboriginal Interest associated with fishing;
- EAO considers that 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 regards to fishing to be high. These mitigations include:
 - Developing a plan for offsets (e.g., habitat compensation), on marine, aquatic and riparian values, if and as required by DFO for *Fisheries Act* Authorizations, and submit plans to Aboriginal Groups, if requested, for information sharing purposes;
 - 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. For medium to large watercourses with high fish and fish habitat sensitivity, construction concerns, channel stability concerns, and high flows trenchless crossing methods would be applied. The Application included a total of 22 proposed trenchless crossings;
 - Detailed mitigation for watercourse crossings would be further developed in permitting, as required by DFO and OGC, in consultation with Aboriginal Groups;
 - Site-specific mitigation would be informed by the detailed description of each watercourse crossing provided by the Fish and Fish Habitat Technical Data Report and the mitigation described in section 7 of the Application and the Environmental Management Plan;

- Disturbance of riparian vegetation during construction would be kept to a minimum, leaving as much existing riparian vegetation intact as practical. Mitigation 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;
- The Proponent's proposed Project location and design has been primary key 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*;
- 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 *EMPG*, which includes avoidance of potential areas of groundwater upwelling or conducting works directly upstream of sensitive fish-rearing or spawning areas. The *EMPG* includes several mitigations for watercourse crossings (e.g., crossing methods, least risk timing windows, riparian management areas) to minimize and avoid potential effects fish and fish habitat; and
- 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.

For a complete list of the Proponent's proposed mitigation see Application Section 4.5.2.5 and section 5.6 of Part B of this 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:

- A requirement for the Proponent to develop and implement a Freshwater Water Quality Monitoring Plan to address onsite water quality monitoring associated with construction. The Plan must include monitoring at upstream locations and downstream of the location of disturbance;

- A requirement for the Proponent to provide any plans for offsets on marine, aquatic, riparian, or in-stream values to Aboriginal Groups, if requested; and
- A requirement for the Proponent to develop and implement a construction monitoring program for Aboriginal Groups. The Proponent must also avoid prohibiting access during 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 the residual effects to freshwater fish and fish habitat and the marine environment from the proposed Project are not expected to be significant. A more detailed assessment on potential effects of the proposed Project on freshwater fish and fish habitat is contained in the Application in section 5.6 and section 5.6.2 of Part B of this Report.

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 VCs 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.

17.2.3.1 *EAO response*

EAO understands that an Aboriginal Group's trapping activities depend, in part, on the status of furbearer/bird 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 5.9 of the Application and in Part B section 5.9 of this 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 VCs. Low magnitude residual effects are predicted in relation to furbearers associated with trapping;
- The wildlife LSA for the proposed Project considered a 2 km corridor. EAO concluded that effects on wildlife and wildlife habitat may extend as far as the

boundaries of the wildlife RSA, which considered a 30 km wide corridor centred on the proposed pipeline route. 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 right-of-way. 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 for two pipelines if the second pipeline is constructed, and are temporary. The timelines for construction would involve site preparation as early as 2016, with the majority of construction works undertaken in 2016 -2020, and a potential second construction window from 2021-2024. It is possible that construction on each pipeline from site preparation to site revegetation could be greater than 4 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 pipelines;
- 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, could indicate a greater potential effect on the Aboriginal Group's Aboriginal Interest associated with trapping;
- Creating increased access to the general public to key trapping areas that may result in increased and damaging pressures on wildlife and wildlife habitat;
- The Proponent's proposed mitigation is presented in the Application to 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 that the effectiveness of these mitigations to be high. Mitigation would include:
 - Conducting pre-construction wildlife surveys for furbearers to identify habitat features that warrant mitigation and reduced grubbing near watercourses, wetlands and other wet areas to facilitate reclamation of shrub communities;
 - Soliciting input from Aboriginal Groups regarding monitoring requirements for the proposed Project, including mitigation and monitoring related to

traditional use sites, and to develop a community process to facilitate site access, subject to safety requirements, to the proposed Project area for Aboriginal Groups to undertake traditional practices;

- Under Proponent-Aboriginal Groups MOUs and Pipeline Agreements, the Proponent would continue to invite Aboriginal Groups to participate and observe fieldwork being conducted on the proposed Project site;
 - Complete pre-construction TLU discussions with Aboriginal Groups to identify trapping sites that warrant mitigation. Mitigation may include one or more of the following measures:
 - Maintaining access to traplines;
 - Moving of trapline equipment by the trapper prior to construction;
 - Alternative site-specific mitigation strategies recommended by participating Aboriginal Groups;
 - Provide Aboriginal Groups with the proposed construction schedule and maps of the proposed route; and
 - Before construction, notify trappers on an ongoing basis to confirm the timing and location of proposed Project activities.
- 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 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 will be required.

Proposed conditions of the EA Certificate include:

- Continued engagement with Aboriginal Groups regarding construction scheduling, as well as the development and implementation of the Environmental Management Plan;
- Development of a Wildlife and Wildlife Habitat Management Plan that contains site specific habitat mitigation measures and moose monitoring requirements for areas outside of the Nass Wildlife Area;
- A requirement for the Proponent to retain EIs, who will have full authority to cease pre-construction and construction activities that are inconsistent with the Certified Project Description or relevant regulations;

- The Proponent must avoid prohibiting access during Project operations for Aboriginal Groups to carry out traditional use activities identified in Traditional Use Studies provided to the Proponent prior to construction; 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.

EAO concluded that the proposed Project would have low magnitude effect on furbearers, and 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.

17.2.4 Gathering

Aboriginal Groups have indicated that they gather plants for subsistence and medicinal purposes within the RSA. 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. 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.

The Application included VCs related to Aboriginal Groups gathering activities including ecological communities of concerns and plant species of concern.

- The proposed Project has the potential to result in adverse effects including:
 - Clearing native vegetation and movement of soil during construction;
 - Periodic brushing and localized disturbance to ground vegetation and soils and maintaining an early seral stage during operations; and
 - Introducing or causing the spread of invasive plants and forest pests.

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.

17.2.4.1 *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 4.6 of the Application and EAO's assessment in Part B section 5.10 of this Report.

The Proponent's assessment of the effects of the proposed Project on wetlands is detailed in section 4.7 of the Application and EAO's assessment in Part B section 5.8 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 LSA, which considered a 300 m wide corridor. Effects to wetlands may extend as far as the boundaries of the wetlands LSA, which considered a 2 km wide corridor. EAO determined that the proposed Project would not have significant adverse effects on plant species of concern, ecological communities of concern, or wetlands.

No significant effects are predicted for ecological communities of concern and plant species of concern. 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 ecological communities of concern as low to medium, varying depending upon rarity, type and size of ecological communities at risk affect. EAO assessed the magnitude of adverse effects to wetlands as low to medium.

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 effects of the proposed Project on Aboriginal Groups' Aboriginal Interests associated with gathering is informed by the analysis of potential residual effects on relevant Valued Components;
- The proposed Project would be relatively small in terms of overall vegetation clearing and alteration, which would be reduced during the operation phase by re-vegetating the ROW. Once re-vegetated, 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. As part of the Proponent's Reclamation Plan, they would encourage a vegetative cover similar to that of the adjacent land and use an appropriate native seed mix. Traditionally- or culturally-important plant species would be avoided, salvaged, conserved, or transplanted, when possible. The Proponent would continue to consult with the appropriate agencies and Aboriginal Groups in development of the Reclamation Plan. Full, natural re-vegetation would occur after decommissioning;

- Access restrictions impacting gathering activities, during construction would be for a limited period, and the geographic extent of these lands is relatively small;
- The majority of works would be confined to the construction phase for two pipelines if the second pipeline is constructed, and are temporary. The timelines for construction would involve site preparation as early as 2016, with the majority of construction works undertaken in 2016 -2020, and a potential second construction window from 2021-2024. It is possible that construction on each pipeline from site preparation to site revegetation could be greater than 4 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 pipelines;
- 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 overlaps, or is in proximity to, the proposed Project, 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 that the effectiveness of mitigation to be high. Mitigation would include:
 - Provide Aboriginal Groups with the proposed construction schedule and maps of the proposed route;
 - Following best practices for clearing, invasive plant management, mountain pine beetle management, reclamation and maintenance;
 - Using leave patches and single leave trees and creating buffers with additional trees and shrubs, where practical;
 - Avoiding grading, reducing the creation of temporary workspace, and not placing log decks closer than 20 m from the edge of forest where practical;

- Placing woody material on the ROW after construction at specified locations;
- Allowing areas to naturally re-vegetate or seeding areas with native seed mix;
- Avoiding the clearing of large trees and standing dead trees, where feasible; and
- Development of an Ecological Community of Concern and Plant Species of Concern Discovery Contingency Plan.

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 scheduling, as well as the development and implementation of the Environmental Management Plan;
- A Restoration Plan that outlines the establishment of vegetative cover compatible with surrounding vegetation and land use, as well as consideration of wildlife and fish habitat requirements with operations requirements;
- 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 condition is also proposed requiring the Proponent to adhere to the objectives of the Sensitive Area Plan for Mugaha Marsh, including a requirement to utilize winter construction if trenchless crossing methods are not feasible;
- The Proponent must also avoid prohibiting access during Project operations for Aboriginal Groups to carry out traditional use activities identified in Traditional Use Studies provided to the Proponent prior to construction;
- 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 consider and implement Aboriginal Groups' requests that pesticides not be used and, if possible under current legislation, develop alternative methods of vegetation control.

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.

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 field work, 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 AIA. The primary objectives of the AIA are to:

1. Identify and evaluate archaeological resources within the proposed 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.

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.

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.

17.2.5.1 *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 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 would include:

- Completing AIA site investigations;
- Developing a Heritage Resources Discovery Contingency Plan, in the event of discovery of heritage sites during construction (The contingency 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;
- If remains are found, mitigating the area before allowing construction to proceed at this specific location; and
- Removing identified palaeontological resources, as recommended by the professional palaeontologist.

The greater the number of archeological, habitation or sites described as being of sacred significance identified by an Aboriginal Group that overlaps or is in proximity to the proposed Project, the more serious the potential effect to that Aboriginal Group. With only a partially completed Archaeological Impact Assessment, neither the 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 the requirements of the *Heritage Conservation Act* must be fulfilled prior to construction, which includes further consultation and discussion of avoidance or mitigation for potentially affected sites with the Archaeology Branch and OGC.

For a more detailed assessment of potential impacts to heritage values and cultural sites for each Aboriginal Group, see the specific section for each Aboriginal Group that follows in section 18 below.

17.2.6 Potential effects to 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 two marine route options to the proposed terminal at Ridley Island near Prince Rupert Harbour, including:

- Nasoga Route, including: a 3 km crossing of Iceberg Bay; and 103 km marine corridor through Nasoga Gulf, Portland Inlet, Chatham Sound to Ridley Island; or
- Kitsault Route, including: Alice Arm, Observatory Inlet, Portland Inlet and Chatham Sound to Ridley Island with a total length of approximately 182 km.

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 2 km of the proposed marine route landfall at Ridley Island, however the proposed marine route crosses through their asserted harvesting area.

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 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 Ridley Island; and
- Potential effects of blasting on marine mammals and wildlife, especially along the pipeline route approaching Ridley Island.

Several other Aboriginal Groups with asserted traditional territories which are not within the marine environment (e.g. Lake Babine Nation, Gitanyow Hereditary Chiefs) have expressed concerns regarding potential 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 Ridley Island landfall.

The proposed marine pipelines would be installed on the seabed with several areas along the Kitsault Route requiring seabed modification. Landfall areas nearshore would require dredging a trench for the pipeline to be installed below the seabed.

Potential effects of the proposed Project on Aboriginal Interests within the marine environment are primarily limited to the construction windows and include:

- Potential biophysical effects to resource harvesting areas, 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 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 construction activities with potential effects on marine navigability include:

- Dredging near the landfall site at Ridley Island, which may impede navigability of small vessels transiting between Coast Island and Ridley Island;
- Landfall sites at either the Nasoga Gulf or Kitsault routes; and
- Underwater blasting at Alice Rock, near the mouth of Alice Arm if the Kitsault route is selected for construction.

VCs and factors considered in the assessment of potential effects on the Aboriginal Interests regarding resource harvest activities in the marine environment include:

- Marine Environment VCs (Application section 4.4):
 - Nearshore and Offshore Marine Habitat and Ecosystems, including: fish, marine mammals, marine birds and marine vegetation);
 - Marine Sediment and Related Water Quality;
- Freshwater Fish and Fish Habitat VC (Application section 4.5) including potential effects on fish species and fish habitat (e.g. salmon spawning habitat);
- Human Health VC (Application section 4.8) including:
 - Human Health Risk Assessments (HHRA) for consumption of seafood near Ridley Island and Alice Arm;
- Current and Traditional Use of Land and Resources for Traditional Purposes VC (Application section 6.1.5); and
- Transportation and Access VC (Application section 6.1.3) including assessment of potential effects of the proposed Project on marine navigability, including commercial and recreational marine traffic within the proposed Project Area.

EAO concluded that residual effects on all the above VCs are not expected to be significant. Residual effects are expected on nearshore fish habitat, including for juvenile salmon near Ridley Island, but there would be no significant adverse effects on fish and fish habitat, contamination of seafood, or transportation, marine navigability and access VCs.

The Proponent's Application identifies several mitigation measures for potential effects to marine transportation and access in the Marine Environmental Management Plan (Appendix 3B), including: a Marine Traffic Management Plan and a Marine Navigation Safety Plan to mitigate potential project interactions and effects on other marine users, including Aboriginal Groups.

17.2.6.1 *EAO response*

EAO understands that an Aboriginal Group's 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.

The following key factors and accommodations 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 for each pipeline, if the second pipeline is constructed;
- 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, dredging) at marine pipeline landfalls for both the Kitsault and Nasoga route options, including: Ridley Island, Nasoga Gulf, Nass Bay, Iceberg Bay and Alice Arm;
- Potential effects to marine transportation and access for fishing vessels associated with construction activities within the proposed marine route in deep water/offshores areas (i.e., Chatham Sound, Portland Inlet) are expected to be limited to a 500 m vessel safety exclusion zone around the pipe lay vessel and supply barge; and area near other construction vessels and anchorage locations. The pipe lay vessel is expected to be able to install approximately 2-4 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. The geographic extent of the marine corridor is relatively small. Additionally, the construction period for each pipeline within each area within the marine corridor is short (60-90 days at most sites except landfalls which project three to six months) and engagement with Aboriginal Groups during construction scheduling is expected to mitigate some of these short term effects;
- Potential impacts of the proposed Project during construction and operations include:
 - Alteration/loss of habitats within the landfall Project footprint;
 - Alteration/loss of habitats adjacent to the proposed Project footprint due to sedimentation;
 - Displacement/injury/mortality of invertebrates, fish and birds within and adjacent to the proposed Project footprint due to trenching, material sidelaying and related activities; and
 - Disturbance to fish, birds and marine mammals due to construction noise.

Other potential effects in the marine environment related to fishing, include:

- Potential effects to marine habitat, including salmon and juvenile salmon habitat in the Skeena estuary, from dredging landfalls and seabed modification along the Kitsault route;

- Potential for the increased bioavailability of contaminants due to dredging and re-suspending historically contaminated sediment around Ridley Island and Alice Arm;
- Potential effects to crabs, particularly Dungeness crabs, due to a migration barrier effect from multiple proposed marine pipelines on the seabed; and
- Potential disruption of marine travel navigability/interruption of travelways and access to fishing areas.

The Proponent has proposed mitigation to avoid and minimize potential effects to the marine environment, including:

- Marine Environmental Management Plan including:
 - Marine Spill Contingency Plan;
 - Marine Heritage Resource Discovery Contingency Plan;
 - Marine Species and Ecological Communities of Concern Discovery Contingency Plan;
 - Marine Traffic Management Plan;
 - Marine Navigation Safety Plan; and
 - Seabed Sediment and Related Water Quality Monitoring Plan;
- Aboriginal Consultation Plan;
- Marine Construction and Operations Environmental Management Plan; and
- Provincial and federal legislation and regulatory requirements associated with marine pipeline construction including: *OGAA* and *EPMR*, *Environmental Management Act*, *Water Act*, federal *Fisheries Act* and *Navigation Protection Act*.

In response to concerns raised by Aboriginal Groups and comments on the draft Assessment Report, EAO proposes several specific conditions related to the marine environment, including development and implementation of the following plans:

- Marine Access Traffic Management Plan;
- Fisheries Interaction Plan;
- Marine Mammal Monitoring Plan;
- Crab Movement Mitigation and Monitoring Plan;
- Marine Sediment Management Plan; and
- Marine Sediment and Water Quality Monitoring Plan.

EAO has also proposed a specific Condition requiring the Proponent to develop and implement a Marine EMP in consultation with Aboriginal Groups and relevant regulatory authorities, in accordance with Section 14 and Appendix 3-B of the Application. The

Proponent would be required to discuss the development of the Marine EMP with Aboriginal Groups on this and other plans set out in the Table of Conditions.

Another Condition would require the Proponent to provide any plans for offsets on marine values to Aboriginal Groups, if requested. The Marine EMP, outlined in Section 14 and Appendix 3B of the Application, includes development of site-specific timing windows for in-water construction activities in consultation with DFO to avoid and minimize potential effects to fish and fish habitat and avoid sensitive species and life stages (e.g., juvenile salmon, eulachon, herring, and crab). The Marine EMP also includes a Marine Traffic Management Plan for minimizing potential effects to marine navigation and marine uses including commercial, recreational and Aboriginal fisheries.

Section 16.5 of this report provides additional information in response to common concerns raised by Aboriginal Groups regarding assessment of cumulative effects. The factors considered in EAO's assessment of potential impacts on specific Aboriginal Interests include consideration of cumulative effects on VCs assessed in Part B 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 terrestrial and marine 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. Travelways typically refer to a freshwater or ocean watercourse that is used to access traditional land use areas, where a trail is used for land-based access to traditional land use areas.

Longer term effects of the proposed Project, if certified, are predicted to include:

- ROW clearing may disrupt use of lands and marine areas 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 existing infrastructure, such as existing FSRs, would be used to the extent practical during construction. In remote sections of the pipeline route where road access does not exist, access would be constructed along the proposed pipeline ROW. Some deactivated roads may be reactivated and existing resource roads would be used wherever possible to reduce disturbance. The roads to compressor stations and meter stations would be permanent, while roads developed for construction would be reclaimed. Access roads built for the construction of the initial pipeline would be used for the construction of the second pipeline, if constructed.

17.2.7.1 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 for two pipelines if the second pipeline is constructed, and are temporary. The timelines for construction would involve site preparation as early as 2016, with the majority of construction works undertaken in 2016 -2020, and a potential second construction window from 2021-2024. It is possible that construction on each pipeline from site preparation to site revegetation could be greater than 4 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 pipelines;
- 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;
- Other uses of the areas along the pipeline corridor and access roads for other purposes would generally not be precluded, particularly given that the pipeline is intended to be buried or submerged. 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 42-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 of the ROW. 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. The section includes a consideration of the comments and input received from Aboriginal Groups during the period October 1 – 15, 2014.

Potential impacts of the proposed Project on Aboriginal Interests are characterized in general terms in section 17 of this 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 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 Nations, which will be discussed upfront in this section.

Cumulative Effects on the Treaty 8 Rights to Hunt, Trap and Fish

The contribution of the proposed Project to cumulative effects has been raised during the EA review. Treaty 8 First Nations have expressed the opinion that landscape crossed by approximately the first 240 km of the proposed Project has already been subject to extensive industrial development relating to oil and gas, forestry and mining. In addition, Treaty 8 First Nations have indicated that cumulative effects to this landscape has not been sufficiently addressed in the Application and not sufficiently mitigated as part of the EA process.

EAO Response

In considering the significance of cumulative effects in relation to impacts on Treaty 8 rights, EAO has drawn on relevant information provided by the Proponent regarding VC associated with the exercise of Treaty 8 rights, including the baseline conditions of the VCs, consideration of other activities or development in the local or regional area that are in proximity to the proposed Project that may contribute to the current condition of the VCs, and the residual and cumulative effects analysis in Part B for that VC. The discussion of potential impacts on Treaty 8 rights is captured in the subsequent section.

EAO has considered mitigation measures in the Application and the Table of Conditions in the context of appropriate impact assessment methodology and has determined that cumulative effects assessment has been conducted appropriately.

However, in light of concerns expressed by Treaty 8 First Nations, EAO requested the MNGD and the OGC provide a forecast of natural gas development for northeast BC. This forecast will be 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.

An important overarching consideration is that the Proponent has proposed to construct up to two pipelines within a common right of way to reduce cumulative effects and the overall impact multiple projects may have on the environment.

The following sections contain EAO's assessments 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 hectares (ha): Blueberry River Indian Reserve (IR) 205, comprising 1,148.5 ha; and the South Parcel of Beatton 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 cross approximately 170 km of the area asserted by Blueberry River First Nations as its traditional territory. Almost all of this length falls outside the area the Province understands to be its area of traditional use, based on sources indicating historical use by ancestral family groups associated with modern day Blueberry River First Nations.
- The first compressor station for the proposed Project, located at KP1 of the proposed route, is within Blueberry River First Nations' asserted traditional territory. This compressor station will require up to 35 ha of land. A temporary work camp will be located at this site in order to house workers.
- Although information on construction camps is preliminary, the proposed construction camps at KP 19 and 71 are expected to fall within Blueberry River First Nations' asserted traditional territory.
- The Proponent estimates the proposed Project would not involve construction of any new permanent or temporary access roads within the area asserted by Blueberry River First Nations as its traditional territory. All access roads would be upgraded existing roads.
- Given the nature and location of the proposed Project, EAO's assessment of the potential impact to Treaty 8 rights as discussed below, EAO is of the view that the duty to consult Blueberry River First Nations lies at the middle of the *Haida* spectrum.
- Blueberry River First Nations was listed in Schedule B of the Section 11 Order.

Summary of consultation

Blueberry River First Nations was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on the Application. Blueberry River First Nations was also provided with opportunities to attend working group meetings, workshops, and to meet with EAO staff directly. EAO provided Blueberry River 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, to assist with costs associated with their participation in the environmental review. The Proponent provided capacity funding for Blueberry River First Nations to engage in discussions regarding the proposed Project Capacity funding under a Capacity Funding Agreement dated March 2013.

Blueberry River First Nations participated in the EA process by attending advisory working group meetings; providing comments on the draft Application Information Requirements; participating in Application Evaluation (screening); providing extensive comments on the Application which included responses to the Proponent's responses to Blueberry River First Nations' comments; and providing comments on Aboriginal Consultation Reports #2 and #3. On October 24, 2013 and July 3, 2014, Blueberry River First Nations and EAO met to discuss the proposed LNG-related projects and the EA process. Blueberry River First Nations also participated in the Natural Gas Pipeline Workshop on May 29-30, 2014.

In addition to EAO-led consultation activities throughout the EA process, Blueberry River First Nations met and corresponded with the Proponent. A summary of the Proponent's engagement activities with Blueberry River First Nations as well as the Proponent's proposed mitigation to issues raised is provided in Aboriginal Consultation Reports #1, #2, and #3.

Blueberry River First Nations participated in archaeology surveys from January 12 to 15, 2014, and participated in the 2013 bio-physical program. The Proponent has offered funding to Blueberry River First Nations to conduct TLUS and socio-economic studies for the proposed Project, but an agreement to undertake these studies has not yet been reached. The final results of the TLUS could be incorporated into detailed project planning should the project receive an EA certificate, as per the proposed certificate condition relating to Traditional Use Studies. The Proponent's Technical Workforce Strategy Manager commenced initial discussions in September 2013 with Blueberry River Ventures regarding contracting and employment opportunities.

A draft TLUS titled, “Draft Blueberry River First Nations Knowledge and Use Desktop Review”, was provided to EAO on October 16, 2014, and EAO’s Assessment Report was updated to reflect site-specific details reported in the TLUS.

The TLUS 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 55 m in width and the final permanent ROW would be approximately 55 m for two pipelines (and approximately 32 m for one pipeline), with approximately 5 m on either side of each pipeline maintained clear of large woody vegetation.

The TLUS 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 LSA used by EAO for terrestrial vegetation is a 400 m wide corridor, and for wildlife a 2 km wide corridor intended to capture the direct and indirect impacts from the proposed Project.

The spatial boundaries depicted in the TLUS that are used in relation to cultural, environmental, habitation, subsistence and transportation site-specific use values for the Project Footprint, LSA and Regional Study Area (RSA) differ from those used by EAO for wildlife (in section 6.2.1), fish and fish habitat (section 6.2.2), vegetation (section 6.2.4), and archaeology and cultural heritage (section 6.2.5). 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 TLUS 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.

On October 16, 2014 Blueberry River First Nations provided a letter to EAO responding to the request for comments on the revised draft Assessment Report. Blueberry River First Nations expressed dissatisfaction with the timelines of the EA and concern that previous Blueberry River First Nations concerns were not captured or were mischaracterized by EAO, as well as concern that baseline data was missing or inadequate. Blueberry River First Nations also requested greater consideration of upstream impacts and provided comments on the draft Table of Conditions.

Blueberry River First Nations expressed concern about the cumulative impacts from the existing levels of development throughout their territory and the induced development that would result from this and other proposed Projects intended to develop the gas for export as LNG. Blueberry River First Nations is also of the view that the cumulative effects assessment should be conducted on a Blueberry River First Nations territory basis, including the upstream forecast impact outcome scenario.

Blueberry River First Nations has expressed concern that EAO has not properly characterized their Treaty 8 rights. Blueberry River First Nations indicates that Treaty 8 rights extend to oral terms and must be interpreted liberally, generously and favourably towards Treaty 8 signatory First Nations, that under Treaty 8 they were “promised the right to practice our traditional mode of life for generations to come, so long as the sun shines and rivers flow.” Blueberry River First Nations indicates this way of life extends to more than hunting, fishing and trapping and extends to cultural, spiritual and other practices, sustaining their way of life and to pass cultural and traditional practices to future generations.

EAO considered Blueberry River First Nations’ comments on the draft Assessment Report received on October 16, 2014 and incorporated them into this final version of the Report where appropriate.

Potential impacts of the proposed Project to Blueberry River First Nations’ Treaty 8 Rights and other Interests

Hunting

Key issues raised by Blueberry River First Nations’ in relation to its Treaty 8 right to hunt include:

- Caribou populations:
 - Historical distribution of herds in preferred hunting areas should be restored;
 - Caribou in Blueberry River First Nations’ territory are predominantly in low density and outside specified ranges (therefore not included in analysis of potential impacts);
 - Cumulative impacts to caribou are already significant; caribou have surpassed a critical threshold in many preferred hunting areas and for density of linear disturbance in the lower Peace area, and have been locally extirpated in many areas of Blueberry River First Nations’ territory. Any further adverse effect is therefore significant; and
 - Specific commitments should be made to long term post-construction monitoring of cumulative effects to caribou and caribou habitat, including funding commitments and review/involvement by Blueberry River First

Nations;

- Grizzly bear populations:
 - Grizzly bears are important for Blueberry River First Nations cultural practices; and
 - Grizzly bears have experienced local extirpations and declines. Linear road density for grizzly bear is already close to or beyond acceptable thresholds;
- Furbearers have surpassed thresholds for habitat degradation and habitat fragmentation in the lower Peace area. Traditional knowledge indicates that furbearers are declining;
- Moose are of particular traditional and practical importance. Traditional knowledge indicates moose populations are declining;
- Concern about decline in moose population including real or perceived contamination or health impacts on moose;
- Decline in wildlife populations (in particular moose) due to industrial development;
- Baseline data for grizzly, caribou, moose, furbearers, and their habitats are inadequate:
 - Should consider historical distribution of animals;
 - Winter track survey methodology is too general, and relies too heavily on modeling. It should consider multiple years;
 - Vegetation sampling strategy was not reliable enough to consider ecosystem effects; and
 - Lack of baseline data on wetland distribution across the pipeline route;
- Application fails to consider Aboriginal Groups', including Blueberry River First Nations', conservation objectives for maintaining and restoring preferred wildlife species;
- Unclear whether evidence supports effectiveness of mitigation measures chosen for species at risk and of cultural concern, including but not limited to caribou and moose;
- Impacts to OGMAs;
- Insufficient information on increased access to unroaded areas, and the implications for this access to Blueberry River First Nations hunting and fishing;
- Concern about increase in traffic, new/improved access roads making hunting more difficult or unsafe, and wildlife more scarce as they move away from the region;
- Blueberry River First Nations-specific baseline and trend data for current use of lands and resources for traditional purposes is not included:
 - Sources that were considered did not include the lands that would be affected by the proposed Project;

- Traditional land use sites listed capture only a small fraction of Blueberry River First Nations' traditional land and resource use in the RSA; and
- The list of factors considered as comprising Blueberry River First Nations traditional land and resource use is inadequate;
- Assessment of effects to Blueberry River First Nations rights is problematic:
 - Completed without Blueberry River First Nations input or adequate Blueberry River First Nations -specific information;
 - Should consider Blueberry River First Nations territory boundaries;
 - Duration and seriousness of effects have been underestimated;
 - Methodology should have considered context and real and perceived risks in characterizing effects;
 - Conclusion of no potential effects on Blueberry River First Nations Treaty rights is troubling; and
 - Mitigations and/or other accommodation measures in Blueberry River First Nations territory should be developed in consultation with Blueberry River First Nations;
- Concerned with Proponent's conclusion of no significant adverse impacts to wildlife/wildlife habitat or current land and resource use for traditional purposes; and
- Should be detailed construction and monitoring plans that include thresholds for additional mitigation, including compensation, for wetlands within Blueberry River First Nations territory with high habitat or cultural values.

Blueberry River First Nations identified that grizzly bear, moose, caribou, and fur-bearers are preferred wildlife species. The Application also identifies elk, bison, deer, grouse, waterfowl, rabbit, and mountain sheep as important to Blueberry River First Nations members. Most Blueberry River First Nations members currently voluntarily refrain from hunting caribou for conservation reasons, although some community members hunt caribou occasionally in the Butler Ridge range or at Caribou Mountain north of the Williston Reservoir and Peace Reach.

Primary hunting locations for elk and moose are at the Cache Creek, Halfway River, and Farrell Creek watersheds, and between the Lower Pine and Moberly Rivers and between the Moberly and Peace Rivers on the south side of the Peace River. These last three areas could cross the proposed Project.

The Application identified the following hunting and trapping sites:

- 67.1 km west of KP 0 at Chowade River; and
- 22 km east of KP 43 at the confluence of the Cameron and Halfway Rivers.

Blueberry River First Nations commented that the information on traditional use provided in the Application captures only a small fraction of Blueberry River First Nations traditional use sites.

The TLUS identifies 39 subsistence sites within 250 m of the proposed Project, 126 sites within 5 km of the proposed Project and 338 sites within 25 km of the proposed Project. Subsistence harvesting values are defined, in part, as including important fishing, hunting, trapping and gathering areas. The TLUS also indicates there are 9 environmental sites within 250 m of the proposed Project, 25 sites within 5 km of the proposed Project and 72 sites within 25 km of the proposed Project. Environmental values are defined, in part, as including bear dens, habitat for mountain goats and blackbirds and mineral licks. The TLUS provides that to account for margin of error and to protect confidentiality of locations, all reported use value point locations are randomized by 250 m and are shown with a 1 km buffer. 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 report. EAO notes that the subsistence areas, defined as including hunting areas in the TLUS, are located within 250 m of the Project to 25 kilometres away from the proposed Project route.

Although the TLUS provides that there are 39 subsistence sites within 250 m from the pipeline footprint, uncertainty remains regarding the degree of impact on each of the sites listed. The information provided does not detail which of the 39 sites refer to hunting sites, nor the frequency of their use, and the depiction of the location of the identified sites is randomized within 250 m.

In consideration of the information presented in the TLUS, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project may result in minor impacts to Blueberry River First Nations' Treaty 8 right to hunt in the area of the proposed Project.

Trapping

Blueberry River First Nations raised key concerns regarding changes to wildlife, wildlife habitat and the Treaty 8 right to trap, including:

- Furbearers have surpassed thresholds for habitat degradation and habitat fragmentation in the lower Peace area. Traditional knowledge also indicates that furbearers are declining;
- Baseline data for furbearers and their habitats are inadequate:
 - Should consider historical distribution of animals;

- Winter track survey methodology is too general, and relies too heavily on modeling. It should consider multiple years;
 - Vegetation sampling strategy was not reliable enough to consider ecosystem effects;
 - Lack of baseline data on wetland distribution across the pipeline route; and
 - Should include TEK/TLU input from Blueberry River First Nations;
- Application fails to consider Aboriginal Groups', including Blueberry River First Nations', conservation objectives for maintaining and restoring preferred wildlife species;
- Unclear whether evidence supports effectiveness of mitigation measures chosen for species at risk and of cultural concern, including but not limited to caribou and moose;
- Impacts to OGMAs;
- Insufficient information on increased access to unroaded areas, and the implications for this access to Blueberry River First Nations hunting and fishing;
- Blueberry River First Nations-specific baseline and trend data for current use of lands and resources for traditional purposes is not included:
 - No traditional land use study was completed as an input;
 - Sources that were considered did not include the lands that would be affected by the proposed Project;
 - Traditional land use sites listed capture only a small fraction of Blueberry River First Nations' traditional land and resource use in the RSA; and
 - The list of factors considered as comprising Blueberry River First Nations traditional land and resource use is inadequate;
- Assessment of effects to Blueberry River First Nations rights is problematic:
 - Completed without Blueberry River First Nations input or adequate Blueberry River First Nations -specific information;
 - Duration and seriousness of effects have been underestimated;
 - Methodology should have considered context and real and perceived risks in characterizing effects;
 - Conclusion of no potential effects on Blueberry River First Nations Treaty rights is troubling; and
 - Mitigations and/or other accommodation measures in Blueberry River First Nations territory should be developed in consultation with Blueberry River First Nations;
- Concerned with Proponent's conclusion of no significant adverse impacts to wildlife/wildlife habitat or current land and resource use for traditional purposes; and
- Should be detailed construction and monitoring plans that include thresholds for

additional mitigation, including compensation, for wetlands within Blueberry River First Nations territory with high habitat or cultural values.

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 report.

The Application notes that Blueberry River First Nations members own trap lines in areas around the Blueberry River IR 205, north of the Sikanni Chief River, east to Milligan Hills, and west to the Blueberry River. These areas are not in proximity to the proposed Project.

The Application identified the following hunting and trapping sites:

- 67.1 km west of KP 0 at Chowade River; and
- 22 km east of KP 43 at the confluence of the Cameron and Halfway Rivers.

Blueberry River First Nations commented that the information on traditional use provided in the Application captures only a small fraction of Blueberry River First Nations traditional use sites.

The TLUS identifies 39 subsistence sites within 250 m of the proposed Project, 126 sites within 5 km of the proposed Project and 338 sites within 25 km of the proposed Project. Subsistence harvesting values are defined, in part, as including important fishing, hunting, trapping and gathering areas. The TLUS provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations are randomized by 250 m and are shown with a 1 km buffer.

Although the TLUS provides that there are 39 subsistence sites within 250 m from the pipeline footprint, uncertainty remains regarding the degree of impact on each of the sites listed. The information provided does not detail which of the 39 sites refer to trapping sites nor the frequency of their use, and the depiction of the location of the identified sites is randomized within 250 metres.

In consideration of the information presented in the TLUS, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife and wildlife habitat current and traditional land use – as discussed in section 17.2.3 of this report – the proposed Project is expected to result in negligible impacts on Blueberry River First Nations' Treaty 8 right to trap in the area of the proposed Project.

Fishing

Blueberry River First Nations raised the following key concerns related to the Treaty 8 right to fish including:

- Blueberry River First Nations Aboriginal fisheries and the distribution of preferred species at these sites have not been identified by the Proponent;
- Insufficient information on increased access to unroaded areas, and the implications for this access to Blueberry River First Nations hunting and fishing;
- Concerned with lack of baseline data on fish and fish habitat;
- Declines in quantity and quality of fish and water attributed to industrial development and large dams in the region;
- Lack of baseline data on wetland distribution across the pipeline route, including lack of relevant TEK and TLU input from Blueberry River First Nations;
- Blueberry River First Nations-specific baseline and trend data for current use of lands and resources for traditional purposes is not included:
 - No traditional land use study was completed as an input;
 - Sources that were considered did not include the lands that would be affected by the proposed Project;
 - Traditional land use sites listed capture only a small fraction of Blueberry River First Nations' traditional land and resource use in the RSA; and
 - The list of factors considered as comprising Blueberry River First Nations traditional land and resource use is inadequate;
- Assessment of effects to Blueberry River First Nations rights is problematic:
 - Completed without Blueberry River First Nations input or adequate Blueberry River First Nations -specific information;
 - Should consider Blueberry River First Nations territory boundaries;
 - Duration and seriousness of effects have been underestimated;
 - Methodology should have considered context and real and perceived risks in characterizing effects;
 - Conclusion of no potential effects on Blueberry River First Nations Treaty rights is troubling; and
 - Mitigations and/or other accommodation measures in Blueberry River First Nations territory, including the fish habitat offset plan, should be developed in consultation with Blueberry River First Nations;
- Should be detailed construction and monitoring plans that include thresholds for additional mitigation, including compensation, for wetlands within Blueberry River First Nations territory with high habitat or cultural values;
- Concerned that DFO has not provided a list of high risk crossings. DFO should be involved in EA;
- If there are impacts occurring within the territory, then the ecological offsets should be done within the territory; and

- Cumulative effects of continually increasing watershed road density and impacts to spawning:
 - Information on road density should be considered on a watershed basis and applied to understand effects on Blueberry River First Nations treaty rights.

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 report.

The Application noted that Blueberry River First Nations members fish bull trout, walleye, suckers, arctic grayling, Dolly Varden, rainbow trout, kokanee (land-locked sockeye salmon), jackfish/pike, whitefish, and lingcod. Fishing locations include the Halfway, Peace, Doig, Beatton, and upper Beatton Rivers, but Blueberry River First Nations members focus their fishing effort mainly on the Halfway River and streams flowing into the Peace River from the Alberta border to the eastern Williston Reservoir. Cache Creek and Farrell Creek are particularly important. The only specific fishing sites identified in the Application is at 37.6 km east of KP 65, at the confluence of the Halfway and Peace Rivers.

The proposed Project corridor would cross approximately 52 major watercourses with indicated fish presence from KP 0 to KP 400²³.

Blueberry River First Nations commented that the information on traditional use provided in the Application captures only a small fraction of Blueberry River First Nations traditional use sites.

The TLUS identifies 39 subsistence sites within 250 m of the proposed Project, 126 sites within 5 km of the proposed Project and 338 sites within 25 km of the proposed Project. Subsistence harvesting values include important fishing, hunting, trapping and gathering areas. The TLUS provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations are randomized by 250 m and are shown with a 1 km buffer. Uncertainty remains regarding the degree of impact on each of the sites listed. Project impacts on fishing activities are unknown as the information does not provide which of the 39 sites refer to fishing sites and the depiction of the location of the identified sites is randomized within 250 metres.

²³ The Pipeline Corridor reported by the Proponent in Treaty 8 area is described from KP 0 to KP 400. EAO notes that the Pipeline Corridor from KP 0 to about KP 200 occurs in an area recognized by BC as the western boundary of Treaty 8, and 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.

In consideration of the information presented in the TLUS, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish and fish habitat – as discussed in section 17.2.2 of this report – the proposed Project is expected to result in minor impacts on Blueberry River First Nations' Treaty 8 right to fish in the area of the proposed Project.

Gathering

Blueberry River First Nations identified the following concerns related to plant communities and gathering activities:

- Impacts to OGMA's;
- Concerned with Proponent's conclusion of no significant adverse impacts to terrestrial vegetation or current land and resource use for traditional purposes;
- Baseline data for terrestrial vegetation wetlands, and ecosystems are inadequate:
 - Vegetation sampling strategy was not reliable enough to consider ecosystem effects;
 - Lack of baseline data on wetland distribution across the pipeline route; and
 - Lack of relevant TEK and TLU input from Blueberry River First Nations;
- Plants of cultural importance have not been meaningfully considered in the Application;
- Blueberry River First Nations-specific baseline and trend data for current use of lands and resources for traditional purposes is not included:
 - No traditional land use study was completed as an input;
 - Sources that were considered did not include the lands that would be affected by the proposed Project;
 - Traditional land use sites listed capture only a small fraction of Blueberry River First Nations' traditional land and resource use in the RSA; and
 - The list of factors considered as comprising Blueberry River First Nations traditional land and resource use is inadequate;
- Should be detailed construction and monitoring plans that include thresholds for additional mitigation, including compensation, for wetlands within Blueberry River First Nations territory with high habitat or cultural values.

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 report.

The following Blueberry River First Nations plant gathering sites were identified in the Application:

- Crosses at KP 30.7 at Halfway River;
- Crosses at KP 93 at Peace River; and
- Crosses at KP 121 at Moberly River.

Blueberry River First Nations commented that the information on traditional use provided in the Application captures only a small fraction of Blueberry River First Nations traditional use sites.

Plant gathering for subsistence and medicinal purposes continue to be practiced by community members. According to the TLUS, picking berries is an important activity not only for sustenance but also for family and group bonding and teaching. Community members expressed concerns that development in the asserted traditional territory was causing a decline in edible berries.

The Application noted that Blueberry River First Nations members gather plants for medicinal and subsistence use throughout the Peace River Valley, including

- Medicinal plants gathered at Pink Mountain;
- Mint and Labrador tea harvested along Halfway River; and
- Berries harvested at the Bear Flats, north of Fort St John, in the southern portion of the Pine River Valley, around Butler Ridge, and in the Monias Lake region.

It is not clear whether these sites along Halfway River, the Pine River Valley and Butler Ridge are in proximity to the proposed pipeline route. The species harvested include chokecherries, Saskatoon berries, blackberries, blueberries, cranberries, Saskatoon berries, strawberries, raspberries and huckleberries.

The TLUS identifies 39 subsistence sites within 250 m of the proposed Project, 126 sites within 5 322 km of the proposed Project and 338 sites within 25 km of the proposed Project. Subsistence harvesting values include important fishing, hunting, trapping and gathering areas. The TLUS provides that to account for margin of error and protect confidentiality of locations, all reported use value point locations are randomized by 250 m and are shown with a 1 km buffer. Uncertainty remains regarding the degree of impact on each of the sites listed. The information provided does not detail which of the 39 sites refer to gathering sites, nor the frequency of their use, and the depiction of the location of the identified sites is randomized within 250 m.

In consideration of the information presented in the TLUS, the Proponent's proposed mitigation measures and proposed conditions of any Environmental Assessment Certificate issued, and EAO's conclusion of no significance adverse effects to wetland

function or terrestrial vegetation – as discussed in section 17.2.4 of this report – the proposed Project is expected to have minor effects on Blueberry River First Nations' gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Blueberry River First Nations identified concerns related to culturally important sites, trails and travelways including:

- Lack of baseline information and description of specific effects to most of the navigable waterways in Blueberry River First Nations territory that may be affected by the proposed Project;
- Heritage impacts were assessed without Blueberry River First Nations input, and assessment is inaccurate:
 - Blueberry River First Nations members have extensive knowledge of heritage and archeological sites across their territory that were not included;
 - Relevant previously documented information on trails, travelways, and culturally important sites was not included;
 - Specific heritage sites within Blueberry River First Nations territory are not listed in the application; and
 - Finding of no residual effects is inaccurate, and a cumulative effects assessment to heritage values is required.
- Blueberry River First Nations-specific baseline and trend data for current use of lands and resources for traditional purposes is not included:
 - No traditional land use study was completed as an input;
 - Sources that were considered did not include the lands that would be affected by the proposed Project;
 - Traditional land use sites listed capture only a small fraction of Blueberry River First Nations' traditional land and resource use in the RSA; and
 - The list of factors considered as comprising Blueberry River First Nations traditional land and resource use is inadequate;
- Assessment of effects to Blueberry River First Nations Treaty 8 rights is problematic:
 - Completed without Blueberry River First Nations input or adequate Blueberry River First Nations-specific information;
 - Duration and seriousness of effects have been underestimated;
 - Methodology should have considered context and real and perceived risks in characterizing effects;
 - Conclusion of no potential effects on Blueberry River First Nations Treaty rights is troubling; and

- Mitigations and/or other accommodation measures in Blueberry River First Nations territory should be developed in consultation with Blueberry River First Nations.

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 of this report.

The Application noted that important gathering places and sites described as being of spiritual or sacred significance for Blueberry River First Nations members include Red Creek, the land near Pink Mountain and in the Muskwa-Kechika Management Area. There is an elder and youth culture camp located at Bear Flats, and the Pink Mountain cabins are used to teach youth traditional knowledge and hunting skills. Sacred and burial sites are found at the Blueberry River bridge, Umbach Creek, Aitken Creek, west of the confluence of the Beatton River, and at Attachie. None of these sites are in proximity to the proposed Project.

Historically, Blueberry River First Nations were seasonally nomadic, and a dense network of trails connecting bush camps, hunting grounds, and fisheries ran through the Peace River valley. The Application noted only one trail or travelway crossing the proposed Project corridor at KP 30.7, Halfway River.

The Application lists burial sites at:

- 51.9 km east of KP 56, downstream near Bear Flats;
- 39.4 km east of KP 65, at Attachie; and
- Crossing at KP 93, Southside of Peace River.

The Application lists gathering places and sites described as being of sacred significance at:

- 19.2 km west of KP 2, at the confluence of the Halfway and Chowade rivers;
- 51.7 km east of KP 57, near Bear Flats;
- 16.5 km west of KP 59, the hill north of Butler Ridge; and
- 39.4 km east of KP 65, at Attachie.

With the exception of the burial site identified on the south side of Peace River at KP 93, none of the above-listed sites, features, or areas are in proximity to the proposed Project.

Blueberry River First Nations commented that the information on traditional use provided in the Application captures only a small fraction of Blueberry River First Nations traditional use sites.

The TLUS identifies 4 cultural/spiritual sites, 5 habitation sites and 8 transportation sites within 250 m of the proposed Project. The TLUS identifies 22 cultural/spiritual, 23 habitation and 14 transportation sites within 5 km of the proposed Project, and 79 cultural/spiritual, 109 habitation and 52 transportation sites within 25 km of the proposed Project. The TLUS provides that to account for margin of error and to protect confidentiality of locations, all reported use value point locations are randomized by 250 m and are shown with a 1 km buffer.

In consideration of the information presented in the TLUS, the Proponent's proposed mitigation measures and proposed conditions of any Environmental Assessment Certificate issued, and EAO's conclusion of no significance adverse effects to heritage valued components – as discussed in section 17.2.5 of this report – the proposed Project is expected to have negligible adverse effects on Blueberry River First Nations' use of culturally important sites in the area of the proposed Project.

Other matters of concern to Blueberry River First Nations

During the EA process, Blueberry River 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 16.8. Other concerns raised by Blueberry River First Nation and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Concerned that there will be no federal CEAA review of the proposed Project; pipeline should be considered as part of the federal review for the facilities projects.	On October 24, 2013, the federal government amended the <i>Regulations Designating Physical Activities</i> under the <i>Canadian Environmental Assessment Act, 2012</i> , removing non-National Energy Board-regulated pipelines. Therefore a federal EA is not required for the proposed Project.
Inadequate and inaccurate assessment of treaty rights and interests, inadequate baseline data and lack of appropriate mitigation measures.	<p>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.</p> <p>The Proponent committed to develop and update – and EAO has set out a proposed condition to require the Proponent to do so – the EMPs presented in the Application to reflect a number of comments made by Aboriginal Groups.</p> <p>EAO reviewed the TLUS submitted by Blueberry River First Nations. The Proponent will continue to consider additional TLUS information contained in this TLUS and any other traditional use information</p>

Key Issue Raised	EAO Response
	obtained, to inform detailed planning or additional site-specific mitigation during construction. EAO has also proposed a condition requiring the Proponent to avoid prohibiting access for Aboriginal Groups to carry out traditional use activities identified in TLUS during Project operations.
<p>Ancillary facilities' locations still unknown, so unable to properly assess environmental impacts.</p> <p>Requests EAO undertake a scenario projection that estimates impacts based on projected locations</p>	See section 16.4
<p>Extensive industrial development that has already significantly undermined Blueberry River First Nations treaty rights and practices has not been considered. Blueberry River First Nations objected to the modelling forecast provided and its conclusions in contrast to their own scenario identifying up to 66% of Blueberry River First Nations lands having been disturbed by oil and gas activities in addition to other anthropogenic activities.</p>	<p>EAO shared an upstream development forecast scenario with Aboriginal Groups in light of these concerns. Ministry of Natural Gas Development (MNGD) and OGC are responsible for upstream oil and gas tenuring and regulation. Blueberry River First Nations' questions, concerns and requests for baseline data and modelling assumptions have been related to these two agencies for further discussions.</p>
<p>In their TLUS, Blueberry River First Nations recommends:</p> <ul style="list-style-type: none"> • Verification of Blueberry River First Nations proposed Valued Components; • A complete Blueberry River First Nations knowledge and use study specific to the proposed Project; and • Assessment of Project effects on Valued Components conducted to identify potential for significant impacts to Blueberry River First Nations knowledge, use and rights, particularly in relation to existing cumulative impacts. 	<p>These matters relating to baseline studies in northeast BC have been raised in the context of the Ecosystem Stewardship Initiative discussions, in which Blueberry River First Nations have been invited to participate.</p>

18.1.2 Dene Tha' First Nation

Context

- Dene Tha' First Nation is a signatory to Treaty 8.
- Dene Tha' First Nation has seven reserves totaling 2307 hectares, all of which are outside of BC.
- In 2014, Dene Tha' First Nation had a registered population of about 2913. The on-reserve population was about 2030 with 883 individuals living off reserve. Dene Tha' First Nation's custom electoral system elects its Chief and eight Councillors.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to overlap the area understood to be the asserted traditional territory of Dene Tha' First Nation. However, the proposed Project falls outside of areas for which information currently available to EAO indicates historical use by Dene Tha' First Nation members. Dene Tha' First Nation was listed in Schedule C of the Section 11 Order.
- In response to the Section 11 Order, Dene Tha' First Nation expressed their desire to be on Schedule B of the Section 11 Order. EAO requested further information to support traditional use of the proposed Project area but no further information was provided.
- Given the nature and location of the proposed Project and EAO's assessment of the potential impacts to Dene Tha' First Nation's Treaty 8 rights, EAO is of the view that the duty to consult Dene Tha' First Nation lies at the low end of the *Haida* spectrum.

Summary of Consultation

Dene Tha' 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 Dene Tha' 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.

The Proponent offered Dene Tha' First Nation one time funding to engage with the Proponent and to participate in the EA process.

Dene Tha' First Nation provided comments to EAO in relation to the draft Application Information Requirements. Dene Tha' First Nation also informed EAO of its intention to conduct a TUS.

Potential Impacts from the proposed Project to Dene Tha's Aboriginal Interests

EAO did not receive any comments from Dene Tha' First Nation during Application Review with respect to the proposed Project.

As Dene Tha' First Nation did not provide any additional information regarding this current or historic use of the Project area, EAO considered the impact of the proposed Project to the area understood to be their area of traditional use. The area understood to be Dene Tha' First Nation's area of traditional use lies outside of the LSA and RSA 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 LSAs are intended to capture the direct and indirect impacts from the proposed Project, while the RSA 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 LSA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into the area understood to be Dene Tha' First Nation's area of traditional use.

Taking into consideration the potential residual adverse effect from the proposed Project, and the distance of the proposed Project to Dene Tha' First Nation's area of traditional use, EAO concludes that the proposed Project is not expected to result in any adverse effects on their Treaty rights to hunt, trap or fish, nor are adverse effects expected to their gathering activities or culturally important sites.

Other matters of concern to Dene Tha' First Nation

During the EA process, Dene Tha' 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 16.8. Other concerns raised by Dene Tha' First Nation and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Soild and waste management	<p>See section 7.1 (Communities, Infrastructure and Services) of Part B of the Assessment Report for information related to solid and liquid waste from the proposed Project.</p> <p>Refer to Table 7-4 of Part B of the Assessment Report for information on identified disposal locations for treating waste water in the event that a temporary septic field is not permitted at a particular main camp location, and potential disposal locations for solid waste.</p>

18.1.3 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 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 Blueberry River First Nations' boundary information and EAO's understanding at the time of the ancestral ties with Doig River First Nation, EAO added Doig River First Nation to Schedule B of the Section 11 Order on February 21, 2014.
- There are three compressor stations proposed to be located from KP 0 to KP 400 with seven preliminary construction camp locations (KP 19, 71, 184, 219, 257, 316 and 376).

- The Proponent estimates the proposed Project would not involve construction of new permanent access nor new temporary access roads in Doig River First Nation's area of traditional use.
- Doig River First Nation is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to 5 BC 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

Doig River First Nation was invited to review and provide comments on the Proponent's First Nations 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, workshops and to meet with EAO staff directly.

EAO provided \$10,000 in capacity funding to Doig River First Nation during the Application Review phase of the EA process to assist with costs associated with their participation in the environmental review. The Proponent provided a Capacity Funding Agreement for Doig River First Nation dated May 2014, in support of ongoing consultation, TLUS, Job Readiness Study and participation in a third party technical review.

EAO met with Doig River First Nation on January 24, 2014 related to the request to be on Schedule B of the proposed Project. Doig River First Nation provided comments to EAO on the screening of the Application. Doig River First Nation attended Working Group meetings on February 5, 2014 and July 14-17, 2014 and a Treaty 8 Working Group meeting on July 18, 2014 to discuss potential impacts to Treaty rights. In addition, Doig River First Nation participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

Saulteau First Nations, West Moberly First Nations, Prophet River First Nation, 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. The results of this technical review have not yet been received by EAO.

The Proponent offered Doig River First Nation the opportunity to conduct a TLUS to inform the Application, site specific mitigation, and detailed construction planning to identify strategies to avoid, reduce or mitigate potential adverse effects on TLUS activities.

The TLU study was provided to EAO on September 23, 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 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 LSA 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 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 Regional Study Area (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 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.

Study Area	Distance from Proposed Project	Number of Site Specific Use Values
Project footprint	250 metres	130
Local Study Area	five kilometres	292 (includes footprint)
Regional Study Area	25 kilometres	696 (includes 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. Particular areas of greatest use by Doig River First Nation are listed within the RSA; one reference is specifically made to the Project Footprint. Important areas used by Doig River First Nation are listed within the project footprint and LSA, unless otherwise noted for the RSA:

- Further information related to observations, existing and future use of these areas is presented in the study as part of the on-the-ground fieldwork section of the study. These areas include: West of Wonowon between the Cameron River and Halfway River used for camping and hunting moose and elk. An important spiritual place is located in this area and the report recommends consultation with Halfway River First Nation;
- Halfway River area used intensively for gatherings, camping and fishing. The road running east/west to the north of Halfway River is reported as used heavily for hunting, camping and berry picking;
- South of Halfway River and north of Beryl Prairie. Use of trails to travel to gatherings, go fishing and hunt moose and elk. Also reported are ceremonial places where drumming and dancing take place;
- Hudson Hope to the W.A.C. Bennett Dam. The road between these two locations is used to visit Williston Lake, pick berries and hunt;
- Peace River at the Peace Canyon Dam. Used intensively for fishing as well as camping and berry picking (saskatoons). Habitat observations are made for large game on the north side of the Peace River (deer, elk, moose, black bear and

grizzly bear) and furbearers (marten, lynx, weasel, fisher, rabbits) and grouse on the north and south sections of the river;

- Johnson Creek Road. Heavily used trail for camping and hunting;
- Upper Moberly River area. Used for hunting large and small game (moose, rabbits and grouse) and harvesting berries and medicines;
- Pine Pass. Camping, fishing and harvesting plants (juniper bark and rhubarb), wolverine hunting northeast of the pass and a hunting trail; and
- Williston Lake Reservoir. Where the project footprint crosses the Williston, blueberry picking sites as well as habitat observations for grizzly bear and moose.

Doig River First Nation elected to complete a job-readiness study in place of a socio-economic study to assist their members in preparing for upcoming work on the Proposed Project. The Proponent's Technical Workforce Strategy Manager offered to meet with Doig River First Nation to discuss business and employment opportunities during Aboriginal Business Match 2014. The Proponent will continue to provide additional information as it becomes available throughout all stages of the proposed Project.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Doig River First Nation 5 times to discuss capacity funding, communications protocol, TLU studies and participation in a job readiness review. 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 WCGT Aboriginal Consultation Reports #1, #2 and #3.

Potential Impacts from the proposed Project to Doig River First Nation's Treaty 8 rights and other Interests

Hunting

The Application states that moose is the most hunted and consumed animal by Doig River First Nation, followed by elk and deer. The following broad hunting areas were identified and described in the Application (section 11, Table 11.3-1):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Hunting	
19 km east of KP 77	Farrell Creek
Crosses at KP 93	Peace River and Peace River Valley
19 km east of KP 94	Boucher Lake

The TLU study identified 38 subsistence site specific-use sites within project footprint, 76 in the LSA and 256 in the RSA. Maps of the general location of these sites are included in the TLU. It is not clear the proportion of site specific sites relating to hunting rather than fishing, gathering or drinking water collection sites. The TLU reports within the project footprint subsistence values include hunting moose. Within the LSA, subsistence values relate to small and large game hunting (moose, deer, elk, black bear and grouse) and within the RSA, subsistence values relate general hunting. The TLU reports a number of environmental sites (17 within the project footprint, 38 in the LSA and 92 in the RSA). Environmental values relate to high value habitat observations, animal sightings and evidence of use as well as game trails. The LSA environmental values were similar and included mineral licks and an eagle's nest. No specific mention is made to RSA environmental values in the study. Hunting north of Beryl Prairie (moose and elk) was referenced in the study. Doig River First Nation noted the area where the proposed Project would follow the transmission line from the Johnson Creek Road toward the Moberly River is a good area for hunting.

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 TLU 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 Project 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 (right-of-ways 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 (right-of-ways 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.

Section 17.2.1 of this report characterizes the potential impacts of the proposed Project on Aboriginal Groups' hunting activities. EAO notes that 1 of the 3 key hunting areas identified by Doig River First Nation would be impacted by the proposed Project route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to have negligible impacts on Doig River First Nation's Treaty 8 right to hunt in the area of the proposed Project.

Fishing

Section 11 (Table 11.3-1) of the Application identifies four important fishing locations for Doig River:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
Crosses at KP 31	Halfway River
80 km east of KP 62	Beatton River
Crosses at KP 93	Peace River
12.4 km northwest of KP 168	Moberly River

Of the subsistence site specific-use sites presented in the TLU within project footprint reference 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 are similar to the project footprint (no mention of whitefish) and a general reference is made to fishing within the RSA. Of the listed environmental value sites, reference is made to a heavily used fishing area within the project footprint. A fishing place is referenced within the LSA environmental values with no specific reference in the RSA. Specific reference in the TLU is made to high value fishing in the Halfway River (bull trout, grayling, whitefish and jackfish) in the vicinity of where the pipeline would cross the river. The fish in the Halfway River are considered very healthy (no presence of mercury in the river). A fishing area near where the project would cross the road near the confluence of Ruddy Creek and Kobes Creek north of Beryl Prairie was referenced including a member visiting the river to show younger participants.

Members noted in the study fishing for bull trout and grayling in Doonan and Callazon Creeks. Moberly Lake is reported as a historical fishing site. 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 Project footprint at water crossings;
- Contamination or perceived contamination of fish in the Project footprint and LSA. Contamination impacts could be felt downstream beyond the RSA; and
- Cumulative impacts of the Project, together with other industrial operations, on contamination or perceived contamination of water and fish throughout the Project footprint, LSA and RSA and downstream for large distances.

EAO notes that 2 of the 4 key fishing areas identified by Doig River First Nation cross the proposed pipeline route. The other 2 areas are located 12 and 80 km away from the proposed Project route.

The proposed Project corridor would cross approximately 52 major watercourses with indicated fish presence from KP 0 to KP 400.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Doig River First Nation's Treaty 8 right to fish in the area of the proposed Project.

Trapping

Section 11 (Table 11.3-1) of the Application identifies a broad trapping area which is important to Doig River First Nation.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
19 km east of KP 94	Boucher Lake

Site specific-use sites presented in the TLU under the subsistence value category that relate to trapping include wolverine. No specific reference is made to furbearers in the

LSA and a general reference is made to harvesting within the RSA under the subsistence value category. For the environmental value category sightings of furbearers are indicated within the project footprint. No specific reference is made to animals that could be trapped for the LSA or RSA under the environmental values category.

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. Doig River First Nation noted the area where the proposed Project would follow the transmission line from the Johnson Creek Road toward the Moberly River is a good area for trapping as is the logging roads around Callazon Creek and Doonan Creek.

Doig River First Nation members noted marten are seen to be declining with industrial development and loss of forested habitat and similar to ensuring a successful moose hunt, members have to go a distance to ensure trapping success. Observations of ill animals that cannot be eaten are increasing.

Concerns regarding potential project interactions with Doig River First Nations trapping are similar to those listed under hunting (e.g. sensory disturbance, habitat alteration and fragmentation, contamination/potential contamination). It is not clear from the study if there is a concern with workers trapping animals or relaying good trapping sites.

As key trapping areas identified are 19 km from the pipeline centre line, direct project impacts to these sites are not anticipated.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts to Doig River First Nation's Treaty 8 right to trap in the area of the proposed Project.

Gathering

Section 11 (Table 11.3-1) of the Application identifies one gathering area which is important to Doig River First Nation.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plane Gathering	
Crosses at KP 93	Peace River Valley

Both cultural/spiritual values and subsistence values include plant gathering sites including muskeg tea, huckleberries, blueberries, saskatoons, and raspberries occur within the project footprint. Within the LSA medicinal plants picking areas and plant gathering sites for berries (blueberries, huckleberries, choke cherries and raspberries) and rhubarb are listed. Medicinal plant picking areas including mint, poplar and jack pine root are listed in the RSA. The study references gathering sites throughout the RSA including Halfway River and Mugaha Valley.

The study lists a number of concerns regarding potential Project interactions with Doig River First Nation gathering including:

- Direct removal of food plants, use plants and medicinal plants and fungi in the Project footprint during pipeline construction;
- Replacement of native species in the Project footprint with non-native species during reclamation (if this practice still continues);
- 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;
- Contamination of plant and fungi picking sites due to the spraying of herbicides along the right-of-way or roads in the Project footprint and LSA; and
- Concern or uncertainty about contamination deterring DRFN members from gathering plants and fungi in the Project footprint and LSA.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in negligible impacts on Doig River First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Section 11 of the Application identifies spiritual and grave sites in the vicinity of North Bank and five gathering places for Doig River First Nation:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places	

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
75 km east of KP 62	Fort St. John
9.1 km east of KP 85	Lynx Creek
17 km east of KP 81	Farrell Creek
38 km east of KP 65	Attachie
52.8 km east of KP 59.1	Bear Flat

No specific trails or habitation sites were identified for Doig River First Nation.

The TLU study 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 project footprint is a reference to an important spiritual place and the recommendation that Halfway River First Nation be consulted about potential impacts to this site. An elder's camp held by the Saulteau First Nation and attended by Doig River First Nation members is also contained within the project footprint. Historic trails and waterways used by Doig River First Nation to travel to join Halfway River First Nation in hunting and harvesting in the mountains is referenced. Within the LSA, ceremonial and gathering places, place names and a significant area including the location of Dane-zaa people's first encounter with white people is referenced. Throughout the RSA, the importance of teaching areas, water use sites and travel corridors to travel to other Aboriginal communities is referenced in the report.

The study lists a number of concerns regarding potential Project interactions with Doig River First Nation habitation, use and access to lands and waters including:

- The destruction of or lack of access to specific important sites for harvesting resources or cultural activities due to the creation of the pipeline;
- 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 Doig River First Nation 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; and
- Cumulative impacts on use and access from other industrial activities in the area adding to the impacts of the proposed Project.

With respect to intangible cultural heritage and connection to the land, the Doig River First Nation reported the following concerns:

- The direct destruction of important spiritual sites to the north of the Halfway Reserve;
- The disturbance of important spiritual sites to the north of the Halfway Reserve by the noise, pollution and increasing traffic and numbers of people that are associated with Project construction and maintenance;
- 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;
- Reduced access to large areas of land that are used for cultural activities or teaching areas;
- A reduction in the connection Doig River First Nation members feel towards particular sites and the landscape in general due to changes in the visual aesthetics, character and feel of the landscape, the loss of land and increased noise, garbage and disturbance from traffic and non-Aboriginal hunters, and fears over contamination;
- Reduced opportunities for teaching Doig River First Nation 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.

In consideration of the information provided 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 report - the proposed Project is expected to have negligible impact 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 16.8.

18.1.4 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 Gohhtche* (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 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 proposed upstream development on its Treaty rights. EAO considered the potential for impacts to Fort Nelson First Nation treaty 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 Application

Information Requirements and the acceptance of the Application to EAO for review. Fort Nelson First Nation was also provided an opportunity to attend working group meetings, workshops, to meet with EAO staff directly, and to review and comment on the draft Assessment Report. EAO did not receive any comments from Fort Nelson First Nation with respect to the proposed project. Fort Nelson First Nation participated in the Natural Gas Pipeline Workshops on February 4, 2014 and May 29-30, 2014.

Potential impacts of the proposed Project to Treaty rights

The area understood to be Fort Nelson First Nation's area of traditional use lies outside of the LSA and RSA 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 LSAs are intended to capture the direct and indirect impacts from the proposed Project, while the RSA 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 LSA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into the area understood to be Fort Nelson First Nation's area of traditional use.

Taking into consideration the potential residual adverse effect 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 rights to hunt, trap and fish, nor are adverse effects expected to Fort Nelson First Nation's gathering activities or culturally important sites.

18.1.5 Halfway River First Nation

Context

- Halfway River First Nation is a signatory to Treaty 8 and a member of the Treaty 8 Tribal Association. 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 focussed 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 383 km of Halfway River First Nation's area of what EAO understands to be Halfway River First Nation's traditional use²⁴. Halfway River First Nation was listed on Schedule B of the Section 11 Order.
- There are three compressor stations proposed to be located from KP 0 to KP 400 with seven preliminary construction camp locations (KP 19, 71, 184, 219, 257, 316 and 376).
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Halfway River First Nation area of traditional use.
- Given the nature and location of the proposed Project, and EAO's consideration of the potential impacts of the proposed Project to the Halfway River First Nation's treaty rights, EAO's view is that the duty to consult Halfway River First Nation is 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 First Nations residing in and around the Peace River Valley area of northeastern BC. EAO consults directly with member nations of the

²⁴ EAO notes that the Pipeline Corridor from KP 0 to about KP 200 occurs in an area recognized by BC as the western boundary of Treaty 8, and 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.

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 Application Information Requirements, Section 11 Order, the Proponent's First Nations 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. The Proponent provided a Capacity Funding Agreement dated July 2013 for Halfway River First Nation to engage in discussions regarding the proposed Project.

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 February 5, 2014, July 14-17, 2014 and a Treaty 8 Working Group meeting on July 18, 2014. In addition, Halfway River First Nation participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014. EAO met with Halfway River First Nation and the Proponent on September 2, 2014 to further discuss route selection and data requests. Halfway River First Nation raised a key concern regarding the proximity of the pipeline to the IR.

Halfway River First Nation elected to conduct TLU and TEK studies. The final Traditional Land Use and Ecological Knowledge (TLU) report was not provided within the designated timeframe and was not included in the EA Application. However, the final results of the TLU studies were provided to EAO September 3, 2014 and considered within the EA process. Of primary concern to Halfway River First Nation are adverse effects from the proposed Project upon existing dwellings, spiritual sites, water quality, food and medicinal plants, wildlife and wildlife habitat, and subsequent fishing, hunting, trapping, plant gathering, and cultural activities arising primarily due to the proximity of the pipeline route to the IR.

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 suggests a multiple stage process for identifying impacts to traditional use locations and the mitigation of these impacts. In part, Halfway River First Nation requests 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. Finally, Halfway River First Nation suggests that options for accommodation should be considered to reduce the impact of development and then the final step is to implement the strategy and provide compensation.

Halfway River First Nation elected to conduct a socio-economic study. The final socio-economic report was not provided within the designated timeframe and was not included in the EA Application. An interim socio-economic report was received post filing of the EA Application on June 13, 2014. The final results of the socio-economic study will form the basis for on-going dialogue between the Proponent and Halfway River First Nation to inform detailed planning and ongoing discussion of mitigation measures during all phases of the proposed Project and provided further funding for TLU, TEK and Socio-Economic Studies.

The Proponent's Technical Workforce Strategy Manager contacted Halfway River First Nation Ventures on March 19, 2014 regarding contracting and employment opportunities. The Proponent provided business and employment information including a list of business and employment opportunities and a link to the proposed Project's vendor registry. Halfway River First Nation requested that the Proponent address its concerns regarding route selection before discussing economic benefits. The Proponent will continue discussions and share proposed Project information with local and Aboriginal businesses throughout the proposed Project.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Halfway River First Nation to discuss economic benefits, route selection, compressor stations and investigative use permits. 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 proposed Project Aboriginal Consultation Reports #1, #2 and #3.

Potential impacts from the proposed Project to Halfway River First Nation's Treaty 8 rights and other Interests

Halfway River First Nation is deeply concerned about the amount of industrial development in their traditional territory over the last 50 years and their ability to keep

CP 212 (directly south of Halfway River First Nation's IR 168) and areas proximate to IR 168 from industrial development in order to practice their treaty rights as part of their seasonal round. CP 212 is 14,400 ha and is understood to have a protection notations (Crown Land map reserve, no mineral reserve staking notation, and a petroleum and natural gas resource review area) put in place by the Province. Halfway River First Nation has significant concerns with the proposed Project's route, as it is located approximately 300 m from Halfway River First Nation's IR 168, and 1.6 km from CP 212. Halfway River First Nation objects to the current route of the proposed Project and in response to the opportunity to review the draft Assessment Report has reiterated their request to explore alternative routing options.

Halfway River First Nation expressed concern regarding the Proponent's Haystack Alternative Route as that route option is in close proximity to Halfway River's reserve, and would have potential effects on several habitation sites, hunting areas and culturally sensitive areas, as well as potential effects on the ability of Halfway River First Nation to access CP 212. Halfway River First Nation has advised EAO that on September 29, 2014, the Proponent committed to undertake a consultation process with Halfway River First Nation with the objective of moving the current proposed Project route 4.1 km from IR 168 and 3.9-4.9 km from CP 212. An alternative route is currently under discussion between the Proponent and Halfway River First Nation with the objective of moving the current proposed Project route further from IR 168 and from CP 212.

Halfway River First Nation expressed that they do not consider the proposed EA certificate condition not allowing fishing, hunting or trapping by 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 raised key concerns regarding wildlife, wildlife habitat and the treaty right to hunt including:

- Effects on moose habitat and population;
- Effects to safety and decreased hunting opportunity as a result of an influx of non-Aboriginal hunters;
- Increased access of non-Aboriginal hunters to Halfway River First Nation's hunting sites;
- Concern regarding the proposed Project's potential effects on already reduced wildlife populations, especially moose and other preferred species; and
- Potential effects on wildlife habitat including nesting and calving areas, wildlife corridors and mineral licks.

The TUS provides that hunting areas around the Cameron River fall within the 2 km buffer zone of the proposed Project. Bear, moose and elk are all listed as important large game hunted between the 0 KP and 30 KP markers. Moose, deer, elk, black bear, chicken, rabbit, geese and ducks are hunted in in and around IR 168 and CP 212.

The Application states that hunting is a common activity among Halfway River First Nation members. Species hunted include moose, caribou, bear, marmot and lynx. The following hunting and trapping areas were identified and described in the Application (Section 11, Table 11.2-1):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Hunting	
67.1 km west of KP 0	Chowade River
22 km east of KP 43	Confluence of Cameron and Halfway rivers

In response to the review of the draft Assessment Report, Halfway River First Nation expressed concern that the table above does not reflect that Halfway River First Nation hunts in many areas other than these, including areas proximate to the Project (such as areas around the reserve and CP212), and that the distance to the Chowade River appears to be incorrect. EAO notes that the confluence of the Chowade River and the Halfway River is approximately 19 km west of the proposed Project. 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 report. EAO notes that the hunting areas described in the TUS are within 2 km of the proposed pipeline route and two hunting areas identified in the Application are located 20 to 67 km away from the proposed pipeline route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report - the proposed Project is expected to result in moderate impacts on Halfway River First Nation's Treaty 8 right to hunt in the area of the proposed Project.

Fishing

Halfway River First Nation raised key concerns regarding fish and fish habitat and the treaty right to fish including:

- Potential effects on watercourses and watercourse crossings;

- Concern regarding proposed Project's potential impacts to fishing practices;
- Localized effects on water quality and quantity;
- Effects of climate change on existing water resources;
- Potential loss or alteration of instream and riparian habitat; and
- Low water levels and water use during exploration and development.

The TUS indicates that the area from 0 KP to 30 KP near Cameron River supports current fishing activities of Halfway River First Nation. Halfway River First Nation indicated there are 20 stream crossings and six fishing areas within the first 60 km of the proposed Project route.

The Application and submissions provided by Halfway River First Nation during the EA state that Halfway River First Nation fishes various species of trout including brook, Dolly Varden, rainbow and bull trout, in addition to whitefish, grayling, jackfish, and northern pike.

Section 11 (Table 11.2-1) of the Application identifies one important fishing location for Halfway River First Nation:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
37.6 km east of KP 65	Confluence of Halfway and Peace rivers

EAO notes that the fishing area identified in the Application is over 5 km away from the proposed pipeline. However, in response to the review of the draft Assessment Report, Halfway River First Nation expressed concern that the table above does not reflect that Halfway River First Nation fishes in many areas other than this, including areas proximate to the Project (such as areas around the reserve and CP212).

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential 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 report - the proposed Project is expected to result in minor impacts on Halfway River First Nation's Treaty 8 right to fish in the area of the proposed Project.

Trapping

Halfway River First Nation raised key concerns regarding wildlife, wildlife habitat and the treaty right to trap including:

- Integrity of traplines; and
- Loss of income

The TUS indicates that the area from 0 KP to 30 KP near Cameron River supports current trapping activities. Marten, fisher, lynx, beaver, wolverine and porcupine are trapped in CP 212.

Section 11 (Table 11.2-1) of the Application identifies two trapping areas which are important to Halfway River First Nation.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
67.1 km west of KP 0	Chowade River
22 km east of KP 43	Confluence of Cameron and Halfway rivers

EAO notes that the trapping area described in the TUS is within the proposed pipeline route and the trapping areas identified in the Application are over 5 km away from the proposed pipeline. In response to the review of the draft Assessment Report, Halfway River First Nation expressed concern that the table above does not reflect that Halfway River First Nation traps in many areas other than these, including areas proximate to the Project (such as areas around the reserve and CP 212), and that the Halfway River First Nation holds two traplines which are overlapped by the proposed Project corridor. EAO notes that the confluence of the Chowade River and the Halfway River is approximately 19 km west of the proposed Project.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in minor impacts on Halfway River First Nation's Treaty 8 right to trap in the area of the proposed Project.

Gathering

Halfway River First Nation raised a key concern regarding vegetation and gathering including:

- Potential effects and need to maintain traditional foods for cultural, spiritual, medicinal and subsistence purposes.

The TUS indicates that the area from 0 KP to 30 KP near Cameron River supports berry harvesting and medicinal plant gathering. CP 212 contains a broad range of plant

resources, including sap and roots from the balsam tree, chokeberries, Saskatoon berries, blueberries, cranberries, raspberries, strawberries, and gooseberries. Other plants, special woods and bark are collected for food, dyes, and medicine. Wild tobacco is collected for spiritual ceremonies. Within the first 60 km of the proposed Project route, there are 455 ha of sensitive or rare plant communities and 2,342 ha of currently intact forests and wetland complexes.

Section 11 (Table 11.2-1) of the Application identifies three plant gathering areas which are important to Halfway River First Nation.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
Crosses at KP 30.7	Halfway River
Crosses at KP 93	Peace River
Crosses at KP 121	Moberly River

EAO notes that all gathering areas identified by Halfway River First Nation would be crossed by the proposed Project footprint. In response to the review of the draft Assessment Report, Halfway River First Nation expressed concern that the table above does not reflect that Halfway River First Nation gathers in many areas other than these, including areas proximate to the Project (such as areas around the reserve and CP 212).

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects – as discussed in section 17.2.4 - 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

Section 11 (Table 11.2-1) of the Application identifies several habitation and burial sites as well as gathering places, sites described as being of sacred significance and trails and travelways which are important to Halfway River First Nation. The TUS study also provides that east of the Williston Reservoir and excluding the region between the 130 km and 140 km markers, every km marker from the 0 km marker of the proposed Project through to the 200 km marker has a transportation corridor associated with it.

The TUS also provides that place names, gravesites and other locations considered of spiritually significance were found within the 2 km buffer from the origin of the proposed Project footprint to the 50 km marker and again from the 80 km marker to the 100 km

marker. This encompasses a region from the Cameron River south to the Peace River illustrating the extent of culturally significant areas for the proposed Project.

The TUS provides that habitation areas currently used, as well as campsites or villages historically used, are located from the 0 KP to 130 KP and additional campsites from the 160 KP to 220 KP.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Habitation	
270 m east of KP 30	Halfway River IR No.168
600 m west of KP 30	Halfway River Settlement
Burial Sites	
51.9 km of KP 56	Downstream near Bear Flats
39.4 km east of KP 65	Attachie
Crosses at KP 93	Southside of Peace River
Gathering Places and Sites Described as being of Sacred Significance	
19.2 km west of KP 2	Confluence of Halfway and Chowade
51.7 km east of KP 57	Near Bear Flats
16.5 km west of KP 59	Hill north of Butler Ridge
39.4 km east of KP 65	Attachie
Trails and Travelways	
Crosses at KP 30.7	Halfway River

EAO notes that there are culturally important sites, trail and travelways, located within the proposed Project route. In response to the review of the draft Assessment Report, Halfway River First Nation expressed concern that the table above does not reflect that Halfway River First Nation uses many areas other than these, particularly in areas proximate to the Project.

Halfway River First Nation emphasized the need to maintain connectivity between culturally significant sites, and expressed concern that increased access would result in increased access to sites described as being of sacred significance.

In consideration of the information provided 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 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 16.8. Other concerns raised by Halfway River First Nation and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Concern regarding pushing discussion of detailed design to permitting	See section 16.4 If an EA certificate is granted by Ministers and the proposed Project moves to the permitting process, more detailed information regarding the proposed Project would be shared with Aboriginal Groups by the Proponent and the relevant regulatory authorities.
Halfway River has not been provided with updated or finalized Aboriginal consultation reports	Aboriginal Consultation Reports have been posted to EAO's website. Aboriginal Consultation Reports 1 and 3 have been posted separately, and Aboriginal Consultation Report 2 was posted with the Application.

18.1.6 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 approximately 206 km of the McLeod Lake Indian Band's territory. McLeod Lake Indian Band is listed in Schedule B of the Section 11 Order.
- There are three compressor stations proposed to be located from KP 0 to KP 400 with seven preliminary construction camp locations (KP 19, 71, 184, 219, 257, 316 and 376).
- The Proponent estimates the proposed Project would involve construction of approximately 2 km of new temporary access roads and no new permanent access roads in McLeod Lake Indian Band's area of traditional use.
- Given the nature and location of the proposed Project and EAO's assessment of the potential impacts to Treaty 8 rights, EAO is of the view that the duty to consult McLeod Lake Indian Band lies at the middle end of the *Haida* spectrum.

Summary of consultation

McLeod Lake Indian Band was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's First Nations 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 \$5,000 in capacity funding to McLeod Lake Indian Band during the pre-Application phase and \$10,000 in capacity funding during the Application Review phase of the EA process to assist with costs associated with their participation in the environmental review. Capacity Funding including funding for a Traditional Land Use Study, in support of ongoing consultation has been offered to McLeod Lake Indian Band by the Proponent. To date, an agreement for funding has not been reached, other than a nominal amount for initial discussion.

McLeod Lake Indian Band did not provide comments to EAO on the EA. McLeod Lake Indian Band attended working group meetings on February 5-6, 2014. In addition,

McLeod Lake Indian Band participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014. The Proponent's Technical Workforce Strategy team commenced initial discussions in February 2014 with Duz Cho Group of Companies regarding contracting and employment opportunities.

McLeod Lake Indian Band participated in archaeology surveys from January 13 to 15, 2014 and the winter wildlife survey from January 30 to February 4, 2014. McLeod Lake Indian Band participated in biophysical studies in 2012 and 2013. McLeod Lake Indian Band was provided with the 2012/2013 Biophysical Results Review for the proposed Project. Sauteau First Nations, West Moberly First Nations, McLeod Lake Indian Band, Prophet River First Nation and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project. The results of this technical review have not been received by EAO.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with McLeod Lake Indian Band to discuss route selection, compressor stations and investigative use permits. As well, McLeod Lake Indian Band Chief and Council participated in a field visit in North-East BC to view the proposed route through McLeod Lake Indian Band territory, as well as look at examples of existing ROWs. 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 WCGT Aboriginal Consultation Reports #1, #2 and #3.

Potential Impacts from the proposed Project to McLeod Lake Indian Band's Treaty 8 rights and other Interests

Hunting

McLeod Lake Indian Band raised key concerns regarding wildlife, wildlife habitat and the treaty right to hunt including:

- Loss of wildlife habitat;
- Concerns regarding caribou and moose habitat;
- Increased access for recreational harvesters;
- Important moose habitat and moose licks potentially effected during construction; and
- Effects to beaver habitat and beaver lodge/dams.

The Application states that McLeod Lake Indian Band members hunt or trap moose, elk, mule and white-tailed deer, bear, marmot, beaver, rabbit, grouse, ptarmigan geese and

ducks. Waterfowl species hunted include Canada goose, mallard, pintail, blue and green winged teal, and greater and lesser scaup.

Section 11 (Table 11.6-1) of the Application identified the following key hunting locations of McLeod Lake Indian Band:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Hunting Locations	
Crosses at KP 29 to 31	Area south of the Halfway River Reserve
76.2 km east of KP 85	Area around the lower Pingel Creek and Eight Mile Creek east of Taylor
5.3 km east of KP 89	South side of the Peace River from Hudson's Hope to Taylor north of the Pine River
Crosses at KP 93	Peace River
25.5 km southeast of KP 97	Between Chetwynd and the east end of Moberly Lake east to the Pine River
21.5 km east of KP 70	The lower reaches of Dunlevy Creek
42.6 km southeast of KP 161	Reynolds Creek
27.6 km southeast of KP 153.2	Parsnip River

EAO notes that two hunting areas identified by McLeod Lake Indian Band cross the proposed pipeline route and the other 6 areas are located between 5 and 42 kilometres away from the proposed Project route.

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this 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

McLeod Lake Indian Band raised key concerns regarding fish and fish habitat and fishing including:

- Effects on water quality;
- Disturbance of headwaters and spawning areas;
- Erosion and sedimentation from construction activities;
- Disruption of natural water cycles, flow and drainage patterns and potential for flooding; and

- Contamination of water from machinery used during construction; and
- Effects on watercourses.

McLeod Lake Indian Band members are reported to harvest bull trout and Dolly Varden, Rainbow trout, arctic grayling, whitefish, coarse fish, suckers, char and lingcod found in the McLeod Lake Indian Band traditional territory. Section 11 (Table 11.6-1) of the Application identifies the following key fishing locations for McLeod Lake Indian Band:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
Crosses at KP 93	Peace River
Crosses at KP 121	Moberly River
100 m southeast of KP 153.2	Pine River
At KP 226	Williston Reservoir

EAO notes all fishing areas identified by McLeod Lake Indian Band cross or are adjacent to the proposed pipeline route. The proposed Project corridor would cross approximately 52 major watercourses with indicated fish presence from KP 0 to KP 400.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on McLeod Lake Indian Band's Treaty 8 right to fish in the area of the proposed Project.

Trapping

McLeod Lake Indian Band stated key concerns regarding wildlife, wildlife habitat and trapping including:

- Marten may leave the area due to construction activities resulting in loss income;
- Potential effects on traplines; and
- A request for recognition of trapline owner rights and notification to registered trappers prior to scheduled construction.

Section 11 (Table 11.6-1) of the Application identified the following key trapping areas which are important to McLeod Lake Indian Band:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping Locations	
Crosses at KP 29 to 31	Area south of the Halfway River Reserve
76.2 km east of KP 85	Area around the lower Pingel Creek and Eight Mile Creek east of Taylor
5.3 km east of KP 89	South side of the Peace River from Hudson's Hope to Taylor north of the Pine River
Crosses at KP 93	Peace River
25.5 km southeast of KP 97	Between Chetwynd and the east end of Moberly Lake east to the Pine River
21.5 km east of KP 70	The lower reaches of Dunlevy Creek
42.6 km southeast of KP 161	Reynolds Creek
27.6 km southeast of KP 153.2	Parsnip River

EAO notes that two of the eight trapping areas identified by McLeod Lake Indian Band cross the proposed pipeline route. Other areas are located between 5 to 76 km away from the proposed pipeline route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use— as discussed in section 17.2.3 of this 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

McLeod Lake Indian Band raised key concerns regarding vegetation and gathering including:

- Concern with herbicide spraying; and
- Loss of berry patches.

Plant gathering for subsistence, medicinal and utilitarian purposes is widely practiced by McLeod Lake Indian Band members. Medicinal species harvested include: Labrador tea, mint tea, devil's club, strawberries, juniper, violet, fireweed, red willow, Jack pine, balsam, pine bark, and pine sap. Wetlands are important to McLeod Lake Indian Band members and are considered a valuable resource. Medicinal plants harvested from wetland areas include rhubarb, fiddleheads, stinging nettles, wild rice, wild onion, devil's club and Labrador tea. Berry species harvested include blueberries, soapberries, cranberries, Saskatoon berries, raspberries, chokecherries, currants and gooseberries.

Other harvested plants include wild onion, muskeg peat, violet, red willow, dandelion, pine mushroom, juniper and fireweed.

Section 11 (Table 11.6-1) of the Application presents the following plant gathering areas of importance to McLeod Lake Indian Band:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
18.7 km east of KP 77	Lower Farrell Creek
Crosses at KP 93	Along Peace River
18.2 km east of KP 118	Lower Moberly Lake
33.6 km southeast of KP 97	Near Jackfish Lake
33.7 km southeast of KP 97	Near Halfmoon Lake
Crosses at KP 120.6	Along the Moberly River
40.3 km southeast of KP 137	Sukunka Forest Service Road
109 km south of KP 182	Swamp River along the Chuchinka Creek (wetland)
15.5 km south of KP 177	Pine Pass

EAO notes that two of the nine gathering areas identified by McLeod Lake Indian Band cross the proposed pipeline and would be impacted by the Project footprint. The other areas are located between 15 to 109 km away from the proposed pipeline route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in minor impacts on McLeod Lake Indian Band's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

McLeod Lake Indian Band raised a concern about the potential disturbance of habitation and gathering sites.

Culturally important areas are located through McLeod Lake Indian Band traditional territory. A culture camp is located at McIntyre Lake. An area near Davie Lake has culturally modified trees marking an ancient trail system. Sites described as being of sacred significance are also located throughout the traditional territory.

Section 11 (Table 11.6-1) of the Application identified the following important sites for McLeod Lake Indian Band:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places and Sites Described as being of Sacred Significance	
27.6 km southeast of KP 226	Parsnip River near Williston Lake (now flooded)
Trails and Travelways	
Crosses at KP 81.3	Portage Trail
Crosses at KP 94	Dawson Creek to the Peace River east of Eight Mile Creek, then extends east and west along the south shore of the Peace River
47.9 km southeast of KP 96	Trail that splits off to the west of Dawson Creek, extends to Sunset Prairie, Willow Valley, Favels Creek and ends west of the Pine River
Crosses at KP 120.6	Pine Pass Trail
Crosses at KP 93	Rocky Mountain Portage Trail
27.6 km southeast of KP 225	Parsnip River Winter Trail
Crosses at KP 93	Peace River Winter Trail
64.4 km south of KP 232	Carp Lake Trail
Habitation Sites	
25.3 km west of KP 57	Mouth of Dunlevy Creek
38 km east of KP 62	Mouth of Halfway River
73.5 east of KP 70	Vicinity of Fort St. John
46.1 east of KP 85	North of Monias Lake
41.7 km southeast of KP 224	Colbome Creek
19.6 south of KP 283	Near the mine of Mt. Milligan

In consideration of the information provided 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 report - the proposed Project is expected to result in negligible 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 16.8.

18.1.7 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. 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

- EAO’s initial assessment of project impacts concluded that the proposed Project was not expected to overlap the area understood to be the area of Prophet River First Nation traditional use, resulting in a duty to consult Prophet River First Nation at the low end of the *Haida* spectrum. Prophet River First Nation was listed on Schedule C of the Section 11 Order issued May 6, 2013.
- EAO subsequently received additional information from Prophet River First Nation regarding its historic and current use in the vicinity of the proposed Project area in letters dated March 10, 2014 and May 14, 2014.
- As a result, a Section 13 Order was issued May 29, 2014 moving Prophet River First Nation from Schedule C to Schedule B of the Section 11 Order, resulting in a deeper level of consultation with Prophet River First Nation on the proposed Project. Prophet River First Nation expressed further concerns that they were added to Schedule B later in the EA process which effected their ability to meaningfully participate in the process.
- The first compressor station for the project is located in the Cypress area, at K1 of the proposed route. This compressor station will require up to 35

ha of land. A temporary work camp would be located at this site in order to house workers.

- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Prophet River First Nation's area of traditional use.

Summary of Consultation

Prophet River First Nation was initially listed on Schedule C of the Section 11 Order. The Proponent was not initially directed to consult with Prophet River First Nation until the Application Review Stage. Prophet River First Nation was invited to attend the Advisory Working Group meetings held in July 2014 to consider the Application, but did not attend. Prophet River First Nation has not yet responded to EAO's request for more specific information on locations, types, frequency, and timing of traditional uses within the proposed project area to better understand the nature of potential impacts of the proposed Project on its Treaty rights.

Once directed to consult with Prophet River First Nation, the Proponent provided Prophet River First Nation with draft Aboriginal Consultation Reports #2 and #3 for review and comment, and delivered the EA Application to Prophet River First Nation on June 27, 2014. Prophet River First Nation and the Proponent have negotiated a Capacity Funding Agreement in support of consultation related to the Proposed Project. The Capacity Funding Agreement includes a TLU study, job readiness and independent technical reviews. Prophet River First Nation indicated an interest in summer fieldwork opportunities, and has decided to undertake a job readiness study rather than a socio-economic study. Prophet River First Nation, 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. The results of this technical review have not been received by EAO.

EAO provided Prophet River First Nation \$10,000 to help fund their participation in the EA process.

No information was available in the Application regarding the exercise of Prophet River First Nation Treaty 8 rights within the area of the proposed Project. At the time of writing, Prophet River First Nation had not submitted to the Proponent concerns related to the potential impacts of the proposed Project.

In letters to EAO dated March 10, 2014, May 14, 2014, and June 3, 2014, Prophet River First Nation described their current and past traditional uses in the vicinity of the proposed Project, which is included in the analysis of potential impacts to Prophet River First Nation treaty right and interests below. However, specific locations and

information on frequency of use or species hunted for the sites described in the Cypress area and the Hudson's Hope area are not available to EAO.

The Site C TLUS study referenced above considered areas used by Doig River, Halfway River, Prophet River and West Moberly First Nations, and did not specify which areas are used by Prophet River First Nation members. Information on the areas and sites identified specifically by Prophet River First Nation members on a map, the use values associated with these sites, and the timing of use values is not available to EAO.

In a meeting held with EAO June 12, 2014, Prophet River First Nation commented, in part, on the following regarding the proposed Project:

- Concerns regarding hunting and poaching along rights of way;
- Questions regarding pipeline integrity programs;
- Questions and concerns regarding pipeline impacts, and
- Importance of considering the benefits from gas activity (jobs and contracting).

Potential Impacts of the proposed Project on Prophet River First Nation's Treaty 8 rights and other Interests

Hunting

Prophet River First Nation indicated that its members have identified that the areas between Cypress Creek and Hudson's Hope are used for camping and hunting. Species hunted now or in the past include deer, moose, elk, geese, bear, lynx, and beaver, and Prophet River First Nation members have expressed particular concern regarding hunting and poaching along rights of way, and regarding the status of deer, which they report used to be more plentiful in the Hudson's Hope area in the 1980s and 1990s. More specific information on Prophet River First Nation's hunting in areas near the proposed Project, including specific sites and timing and frequency of use, was not available to EAO at the time of writing.

EAO understands that there is some overlap between the area of the proposed Project with areas of use by Prophet River First Nation in the areas between Cypress and Hudson's Hope.

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to result in negligible impacts to Prophet River First Nation's Treaty 8 right to hunt in the area of the proposed Project.

Trapping

Prophet River First Nation indicated that its members have trapped in the Hudson's Hope area, and identify it is a particularly good location for trapping. No specific information was available to EAO at the time of writing regarding current Prophet River First Nation trapping, including any traplines, specific sites, or timing and frequency of use.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use— as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts on Prophet River First Nation's Treaty 8 right to trap in the area of the proposed Project.

Gathering

One Prophet River First Nation member reported picking berries in the Hudson's Hope area, which Prophet River First Nation members consider as very good for berry picking in general. More specific information on Prophet River First Nation's gathering in areas near the proposed Project, including specific sites and timing and frequency of use, was not available to EAO at the time of writing.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in negligible impacts to Prophet River First Nation's gathering activities in the area of the proposed Project.

Fishing

Prophet River First Nation members noted that fishing occurs at sites ranging from Cypress Creek in the north to Hudson's Hope in the south. Cypress Creek is an important fishing destination for Prophet River First Nation members, who have noticed a significant decline in fish which they believe is due to oil and gas development in the area. One Prophet River First Nation member identified whitefish and trout as her preferred species. More specific information on Prophet River First Nation's fishing in areas near the proposed Project, including specific sites and timing and frequency of use, was not available to EAO at the time of writing.

The proposed Project corridor would cross approximately 52 major watercourses with indicated fish presence from KP 0 to KP 400.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to result in negligible impacts on Prophet River First Nation's Treaty 8 right to fish in the area of the proposed Project.

Culturally important sites, trails, and travelways

Prophet River First Nation identified traditional use sites spanning the distance from Cypress Creek in the north to Hudson's Hope in the south which include sites containing heritage resources, such as carved stones. Since 1995, approximately 10-25 Prophet River First Nation members, predominantly from the Wolf and Chipesia families, camp around Cypress (close to the Halfway River bridge), hunting in the area, fishing in Cypress Creek, preparing dry meat for the winter, and teaching traditional ways to their children. More specific information on Prophet River First Nation's culturally important sites near the proposed Project, including specific sites and timing and frequency of use, was not available to EAO at the time of writing.

In consideration of the information provided 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 report - the proposed Project is expected to result in negligible impacts to Prophet River First Nation's use of culturally important sites, trails and travelways in the area of the proposed Project.

Other matters of concern to Prophet River First Nation

During the EA process, Prophet River First Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.8.

18.1.8 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 Peace Moberly Tract (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.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to cross 72 km through the traditional territory of Saulteau First Nations.
- There are three compressor stations proposed to be located from KP 0 to KP 400 with seven preliminary construction camp locations (KP 19, 71, 184, 219, 257, 316 and 376).
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Saulteau First Nations area of traditional use.
- Saulteau First Nations is listed on Schedule B of the Section 11 Order based on EAO's assessment. Given the nature and location of the proposed Project and EAO's assessment of the potential impacts to Treaty 8 rights, as discussed below, EAO is of the view that the duty to consult Saulteau First Nations lies at the middle part of the *Haida* spectrum.
- Saulteau First Nations is a member of the Treaty 8 Tribal Association which is an administrative body that provides support and advice to 5 BC First Nations residing in and around the Peace River Valley area of northeastern BC. EAO consults directly with Treaty 8 Tribal Association member nations regarding the potential effects of the proposed Project on their treaty rights.

Summary of Consultation

Saulteau First Nations was invited to review and provide comments on the draft Application Information Requirements, 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 \$5,000 in capacity funding to Saulteau First Nations during the pre-Application phase and \$10,000 in capacity funding during the Application Review phase of the EA process to assist with costs associated with their participation in the environmental review. The Proponent entered into a Relationship Protocol with Saulteau First Nations April 2014. A Capacity Funding Agreement was signed May 2014, in support of ongoing consultation in meetings and other activities with the Proponent and regulatory agencies. An agreement for technical reviews was signed June 2014.

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 with potentially serious and long-term impacts on traditional resources. Saulteau First Nations, West Moberly First Nations, McLeod Lake Indian Band, Prophet River First Nation and Doig River First Nation, have indicated that they are collectively participating in an independent technical review. The results of this technical review have not been received by EAO.

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 to expand the current boundaries of Klin-Se-Za (Twin Sisters) Provincial Park.

Saulteau First Nations attended working group meetings on February 5-6, 2014. In addition, Saulteau First Nations participated in the Natural Gas Pipeline Workshop on February 4, 2014 and May 29-30, 2014.

Saulteau First Nations elected to conduct TLU studies. An interim TLU report was received by the Proponent March 2014, however the final TLU report was not provided within the designated timeframe and was not included in the EA Application. The final 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 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 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 LSA 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 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 Regional Study Area (RSA) differ from those used by EAO for wildlife (in sections 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 are 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.

Saulteau First Nations participated in the following fieldwork programs: Archaeology surveys from January 13 to 15, 2014 and winter wildlife surveys from January 30 to February 4, 2014. Saulteau First Nations was provided with the 2012/2013 Biophysical Results Review for the proposed Project.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Saulteau First Nations to discuss economic benefits, compressor stations and

investigative use permits. 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 proposed Project Aboriginal Consultation Reports #1, #2 and #3.

Potential Impacts from the proposed Project to Saulteau First Nations' Treaty 8 rights and other interests

Hunting, trapping and fishing remain integral to community members' lifestyles. Moberly Lake has been central to traditional resource use. The Pine River area, Moberly River, and Cameron and Boucher Lakes are used for hunting and gathering activities. The PMT has been described as a breadbasket for traditionally harvested game and plants.

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.

Hunting

Saulteau First Nations raised key concerns regarding wildlife, wildlife habitat and the treaty right to hunt including:

- Destruction of wildlife;
- Impacts to caribou and caribou habitat;
- Protection of moose and moose habitat;
- Effects to ungulates and habitat;
- Effects of construction on small furbearers;
- Noise disturbance;
- Disturbance of bird habitat during construction, including grouse habitat and woodpecker nesting sites;
- Loss of beaver dam/lodge;
- Disturbance of bear dens during construction;
- Loss of mineral lick during construction;
- Potential for construction activities to limit use of game trails, restricting wildlife movement; and
- Increased access for recreational harvesters to the area.

Saulteau First Nations members have historically hunted the lands south of the Peace River, and east of the Rocky Mountains, including the Murray and Sukunka River watersheds, as well as northward within the Kiskatinaw River watershed to the Peace River. The area north of the reserve, around the Moberly and Pine rivers and Cameron and Boucher lakes, is currently hunted by Saulteau First Nations members. The upper Moberly River and Cameron Lake is in closest proximity to the proposed Project.

Following are the hunting locations identified by Saulteau First Nations and described in the Application (section 11, Table 11.5-1).

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Hunting	
20.4 km east of KP 92	Boucher Lake
Crosses at KP 93	Peace River Valley
22.8 km east of KP 96	Moberly River
29.8 km east of KP 112	Saulteau First Nations
41.6 km east of KP 140	Sukunka River
49.1 km southeast of KP 145	Sukunka Valley
100 m southeast of KP 153.2	Pine River

The TLU indicates that Saulteau First Nation members use the proposed Project footprint intensively for hunting. Use is reported throughout the footprint, particularly in the area between Dinosaur Lake to the north and the Pine River to the south. The proposed footprint and LSA pass through significant areas including:

- The roads that run between Groundbirch Creek and Farrell Creek which Saulteau First Nations use for hunting moose, elk, deer, rabbits and grouse;
- The Beryl Prairie Road between Farrell Creek and the road between Hudson Hope and the WAC Bennett Dam which is used for hunting moose, elk and deer;
- The transmission line between the Johnson Creek Road and Pete Lake which is frequently used for hunting moose, elk, rabbits and bears; and
- Pete Lake and the surrounding area which is used for hunting moose, deer, rabbits, grouse and other species.

The TLU reports 212 habitation sites within the proposed Project footprint. Subsistence values include large game kill locations, fish catch sites and berry picking locations.

EAO notes that two hunting areas identified by Saulteau First Nations cross or are adjacent to the proposed route and the other 5 areas are located between 20 and 50 km away from the proposed route. There are also 212 habitation sites identified as being within the proposed Project footprint.

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to result in moderate impacts on Saulteau First Nations' Treaty 8 right to hunt in the area of the proposed Project.

Fishing

Saulteau First Nations raised key concerns regarding fish and fish habitat and fishing including:

- Crossing method at Peace River;
- Effects on fish;
- Effects on water quality;
- Disturbance of headwaters and spawning areas;
- Erosion and sedimentation from construction activities;
- Disruption of natural water cycles, flow, and drainage patterns and potential for flooding;
- Contamination of water from machinery during construction; and
- Reclamation and protection measures for watercourses.

Saulteau First Nations indicate that they are more dependent on fishing than their Dunne-Za neighbours. Species harvested from Moberly Lake include whitefish, pike, lake trout, grayling, ling cod (burbot) and suckers, although, use of the net fishery at that lake is declining due to pressures from the provincial government, as well as increased motor boat use on Moberly Lake. Rainbow trout, grayling, jackfish and Dolly Varden are also harvested. Lake trout in Moberly Lake are a species of concern for Saulteau First Nations, and special efforts have been taken to rehabilitate populations.

Section 11 (Table 11.5-1) of the Application identifies four important fishing locations for Saulteau First Nations:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
29.8 east of KP 112	East Moberly Lake IR 169
17.9 km east of KP 117	Moberly Lake
41.6 km east of KP 140	Sukunka River
48.4 km east of KP 140	Sukunka Falls

The TLU indicates that Saulteau First Nation members use the proposed Project footprint intensively for fishing. Use is reported throughout the footprint, particularly in the area between Dinosaur Lake to the north and the Pine River to the south and along the Peace River. The TLU reports 212 habitation sites within the proposed Project footprint. Subsistence values include large game kill locations, fish catch sites and berry picking locations. The proposed Project corridor would cross approximately 52 major watercourses with indicated fish presence from KP 0 to KP 400.

The Proponent indicates in the Application that Saulteau First Nations had no further concerns regarding the crossing method at Peace River when the Proponent provided as mitigation that the crossing would be made using HDD or micro tunneling.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to result in minor impacts on Saulteau First Nations' Treaty 8 right to fish in the area of the proposed Project.

Trapping

The TLU describes the importance of trapping as a form of income and as an integral part of their traditional livelihood. Saulteau First Nations raised key concerns regarding wildlife, wildlife habitat and the treaty right to trap.

The lands trapped by Saulteau First Nations include those lands south of the Peace River and east of the Rocky Mountains, including the Murray and Sukunka River watersheds, as well as northward within the Kiskatinaw River watershed to the Peace River. One registered trapline held by a Saulteau First Nations member is crossed by the proposed Project. Section 11 (Table 11.5-1) of the Application identifies the following trapping areas that are important to Saulteau First Nations:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
20.4 km east of KP 92	Boucher Lake
Crosses at KP 93	Peace River Valley
22.8 km east of KP 96	Moberly River
29.8 km east of KP 112	Saulteau First Nations
41.6 km east of KP 140	Sukunka River
49.1 km southeast of KP 145	Sukunka Valley

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
100 m southeast of KP 153.2	Pine River
Crosses from KP 91.8 to KP 98.8	Trapline 0731-T007
Crosses from KP 101.8 to KP 117.1	Trapline 0731-T007

EAO notes that four of the nine trapping areas identified by Saulteau First Nations cross or are adjacent to the proposed pipeline route and would be impacted by the Project footprint. Other areas are located between 20 to 49 km away from the proposed pipeline route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in minor impacts on Saulteau First Nations' Treaty 8 right to trap in the area of the proposed Project.

Gathering

The TLU indicates that Saulteau First Nation members use the proposed Project footprint intensively for gathering berries and other plant materials. Use is reported throughout the footprint, particularly in the area between Dinosaur Lake to the north and the Pine River to the south.

Saulteau First Nations raised key concerns about the potential adverse effects on plants harvested, including the disturbance and alternation of plant gathering sites and places, and disruption of subsistence plant gathering activities including:

- Effects on wetlands;
- Effects on mature growth forests;
- Replacement of natives species with non-native species during reclamation;
- Concern with herbicide spraying on right-of-way;
- Contamination or perceived contamination by traffic fumes along roads and access sites;
- Loss of berry patches; and
- Potential effects on traditionally harvested vegetation including medicinal plants.

Section 11 (Table 11.5-1) of the Application presents the following key plant gathering areas:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
Crosses at KP 93	Peace Moberly Tract
29.8 km east of KP 112	East Moberly Lake IR 169

The TLU reports 212 habitation sites within the proposed Project footprint. Subsistence values include large game kill locations, fish catch sites and berry picking locations.

EAO notes that one of the two gathering areas identified by Saulteau First Nations cross the proposed pipeline and would be impacted by the Project footprint. The other area is located 30 km from the proposed pipeline route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in minor impacts on Saulteau First Nations' gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Saulteau First Nations raised the following key concerns about the potential disturbance of sacred areas.

- Confidentiality of TLU and TEK information;
- Direct disturbance of land used for cultural activities or teaching areas; and
- Avoid all heritage resource sites.

In addition, Saulteau First Nations indicated that trails, travelways and habitation sites are important to the practice of Treaty rights. Section 11 (Table 11.5-1) of the Application identifies the following important sites for Saulteau First Nations:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places and Sites Described as being of Sacred Significance	
46.1 km east of KP 85	Monias Lake
5.3 km east of KP 88	Hudson's Hope
38 km east of KP 101	Big Lake
45.5 km east of KP 102	Graveyard Creek
29.8 km east of KP 112	East Moberly Lake IR No. 169
18.2 km east of KP 115	West Moberly Lake IR 168A

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
17.9 km east of KP 117	Moberly Lake
21.9 km west of KP 125	Twin Sisters Mountains
Trails and Travelways	
43 km east of KP 71	Boudreau Lake
46.1 km of KP 85	Monias Lake
20.4 km east of KP 92	Boucher Lake
Crosses at KP 93	Peace River
22.8 km east of KP 96	Moberly River
14.9 km east of KP 112	Cameron Lake
Habitation Sites	
29.8 east of KP 112	East Moberly Lake IR 169
30.8 km east of KP 116	East Moberly Lake
49.1 km southeast of KP 145	Sukunka Valley

The TLU reports 34 cultural/spiritual sites, 21 habitation sites and 51 transportation trails or water routes within the proposed Project footprint. Subsistence values include large game kill locations, fish catch sites and berry picking locations.

In consideration of the information provided 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 report - the proposed Project is expected to result in 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 16.8. Other concerns raised by Saulteau First Nations and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
The TLU identified a concern related to the potential impact to drinking water resulting from contaminants	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

Key Issue Raised	EAO Response
	<p>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.</p> <p>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.</p>

18.1.9 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 Sauteau 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.

Treaty Rights and EAO's Assessment of Project Impacts and Depth of Consultation

- The proposed Project is expected to cross 237 km of the area understood 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).
- West Moberly First Nations was listed in Schedule B of the Section 11 Order based on EAO's initial assessment. Given the nature and location of the proposed Project and EAO's assessment of the potential impact to Treaty 8 rights, as 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.
- There are three compressor stations proposed to be located within the Treaty 8 boundary with seven preliminary construction camp locations (KP 19, 71, 184, 219, 257, 316 and 376).
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in West Moberly First Nations area of traditional use.
- 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 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

West Moberly First Nations was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's First Nations 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 \$5,000 in capacity funding to West Moberly First Nations during the pre-Application phase and \$10,000 in capacity funding during the Application Review phase of the EA process to assist with costs associated with their participation in the environmental review. The Proponent provided capacity funding for West Moberly First Nations to engage in discussions regarding the proposed Project under a Capacity

Funding Agreement dated November 2013, and an agreement for a First Nation Independent technical review was signed June 2014.

West Moberly First Nations provided comments to EAO on alternatives to the proposed route during the EA. One alternative route to run parallel to the existing forest service road and other clearings in the area is being considered by the Proponent. Discussions between West Moberly First Nations and the Proponent are ongoing. West Moberly First Nations attended a Working Group meeting on February 5, 2014. In addition, West Moberly First Nations participated in the Natural Gas Pipeline Workshops on February 4, 2014 and May 29-30, 2014.

West Moberly First Nations elected to conduct TLU studies. An interim TLU report was received on March 2014, however the final TLU report was not provided within the designated timeframe and was not included in the EA Application. West Moberly First Nations participated in archaeology field studies/survey January 2014, as well participated in the avalanche awareness training and the winter wildlife studies/survey from January 3 to February 4, 2014. West Moberly First Nations was provided with the 2012/2013 Biophysical Results Review for the proposed Project. Sauteau First Nations, West Moberly First Nations, McLeod Lake Indian Band, Prophet River First Nation and Doig River First Nation, have indicated that they are collectively participating in an independent technical review of the proposed Project. The results of this technical review have not been received by EAO.

West Moberly First Nations elected to conduct a socio-economic study. However, the final socio-economic report was not provided within the designated timeframe and was not included in the EA Application.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with West Moberly First Nations to discuss economic benefits, compressor stations and investigative use permits. 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 proposed Project Aboriginal Consultation Report #1, #2 and #3.

Potential Impacts from the proposed Project to West Moberly First Nations' Treaty 8 rights and other interests

Hunting

West Moberly First Nations stated key concerns regarding wildlife, wildlife habitat and hunting including:

- Protection of caribou and caribou habitat;
- Protection of moose and moose habitat;
- Disturbance of bird habitat including grouse habitat and woodpecker nesting sites;
- Loss of beaver dam/lodge;
- 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;
- Effect on water quality and wildlife health;
- Loss or contamination of mineral lick; and
- Increased access for recreational harvesters.

Following are the hunting locations identified and described in the Application (section 11.4-1). Of the 8 locations and areas identified below, 4 would be directly impacted by the Project footprint.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Crosses at KP 92	Peace River Valley
Crosses at KP 93 to KP 109	Peace Moberly Tract
19.7 km east of KP 93.6	Boucher Lake
15.4 km southeast of KP 102.6	Moberly Lake
14.9 km east of KP 112	Cameron Lakes
Crosses at KP 120.6	Moberly River
100 m southeast of KP 153.2	Pine River
12.2 km north of KP 168.5	Upper Moberly watershed

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this 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 stated key concerns regarding fish and fish habitat and fishing including:

- Potential adverse effects on fish and fish habitat;

- Effects on water quality;
- Disturbance of headwaters and spawning areas;
- Erosion and sedimentation from construction activities;
- Change in species abundance;
- Change in fish behavior;
- Concern for change in water flow and water levels in the Peace River, Mackenzie River, Salt River and the Peace-Athabasca Delta;
- Disruption of natural water cycles, flow and drainage patterns and potential for flooding; and
- Contamination of water from machinery used during construction.

Lake trout are a species of concern in Moberly Lake and special efforts have been taken to rehabilitate populations. Interest in fishing in the Pine River ceased after an oil spill in 2000 and there are concerns expressed over reports of potential mercury contamination in Williston Reservoir Bull Trout, Lake Trout, and Rainbow Trout. The following important fishing locations to West Moberly First Nations were identified in section 11 of the Application (Table 11.4-1):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Crosses at KP 93 to KP 109	Peace Moberly Tract
19.7 km east of KP 93.6	Boucher Lake
15.4 km southeast of KP 102.6	Moberly Lake
14.9 km east of KP 112	Cameron Lakes
Crosses at KP 120.6	Moberly River
100 m southeast of KP 153.2	Pine River

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this 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 stated key concerns regarding wildlife, wildlife habitat and trapping including:

- Potential marten may leave the areas due to construction activities resulting in loss income; and

- Ensure trap lines are known and owners are consulted.

West Moberly First Nations has a community trap line in the Upper Moberly Watershed. Industrial development in the PMT has affected animals harvested by West Moberly First Nations. Section 11 of the Application identifies trapping areas which are important to West Moberly First Nations. Four of the identified areas may be crossed by the proposed Project alignment, although exact locations have not been identified. The following trapping locations were identified (Table 23-3):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping Areas	
Crosses at KP 92	Peace River Valley
Crosses at KP 93 to KP 109	Peace Moberly Tract
19.7 km east of KP 93.6	Boucher Lake
15.4 km southeast of KP 102.6	Moberly Lake
14.9 km east of KP 112	Cameron Lakes
Crosses at KP 120.6	Moberly River
100 m southeast of KP 153.2	Pine River
12.2 km north of KP 168.5	Upper Moberly watershed

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use— as discussed in section 17.2.3 of this report - the proposed Project is expected to result in minor impacts on West Moberly First Nations' Treaty 8 right to trap in the area of the proposed Project.

Gathering

West Moberly First Nations stated key concerns regarding vegetation and gathering including:

- Potential effects on traditionally harvested vegetation including medicinal plants;
- Potential effects on berry picking and harvesting sites, and reclamation of vegetation;
- Impacts to wetland vegetation;
- Use of pesticides; and
- Effects on existing vegetation.

Plant gathering areas identified in the Application for assessment of potential effects to current and traditional land use include (Table 11.4-1):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
51.7 km east of KP 61	Bear Flats
19.7 km east of KP 93.6	Boucher Lake
15.4 km southeast of KP 102.6	Moberly Lake
14.9 km east of KP 112	Cameron Lakes
Crosses at KP 120.6	Moberly River
100 m southeast of KP 153.2	Pine River

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in minor impacts to West Moberly First Nations' gathering activities in the area of the proposed Project.

Culturally Important Sites, trail and travelways

West Moberly First Nations raised the following key concerns about the potential disturbance of sacred areas:

- Avoid all heritage resource sites;
- Conduct further archaeological studies; and
- Disruption of archaeological sites or potential sites.

The Application (Section 11) identifies gathering places, sites described as being of sacred significance, trail and travelways of importance to West Moberly First Nations (Table 11.4-1):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places and Sites Described as being of Sacred Significance	
51.7 km east of KP 61	Bear Flats
39.4 km east of KP 65	Attachie
12.2 km north of KP 168.5	Upper Moberly watershed
21.9 km west of KP 125	Twin Sisters Mountain
Trails and Travelways	

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places and Sites Described as being of Sacred Significance	
51.7 km east of KP 61	Bear Flats
Crosses at KP 92 to KP 94	Peace River valley
Crosses at KP 93	Peace River

In consideration of the information provided 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 report - the proposed Project is expected to result in negligible impacts on 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 16.8. Other concerns raised by West Moberly First Nations and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Potential impacts to drinking water resulting from a loss of containment of drilling fluids during HDD	<p>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.</p> <p>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</p>

Key Issue Raised	EAO Response
	information to OGC during permitting which are reviewed for fish habitat, riparian issues and geotechnical information by qualified specialists.

18.1.10 Treaty 8 Tribal Association

The Treaty 8 Tribal Association is an administrative body that provides support and advice to 5 BC Treaty 8 First Nations residing in and around the Peace River Valley area of northeastern BC. These member First Nations 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. 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 provided Treaty 8 Tribal Association with the Aboriginal Consultation Reports #2 and #3 for review and comments. No comments were provided. The Proponent provided a proposed Project presentation on June 11, 2014 at the North Peace Cultural Centre. The Proponent continues to provide Treaty 8 Tribal Association with updates to the Proposed Project.

EAO has not received comments from Treaty 8 Tribal Association on the EA.

18.2 Carrier First Nations

In consideration of the historic and current context of the Carrier provided in section 13.2 of this 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; and
- EAO's evaluation of potential effects of the proposed Project to that Aboriginal Group's Aboriginal Interests.

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, Nak'azdli Band, Saik'uz First Nation, Stelat'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 First Nations, 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.

The Proponent offered Carrier Sekani Tribal Council one time funding to engage with the Proponent and to participate in the EA process.

Carrier Sekani Tribal Council submitted a letter to EAO and the Premier on January 27, 2014 with 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.

In addition to concerns provided by Carrier Sekani Tribal Council, Saik'uz First Nation (not listed in Schedule B or C of the Section 11 Order) also submitted a letter voicing concerns for the Aboriginal Groups that would be affected by the proposed Project, including:

- Meaningful opportunities for Aboriginal Groups to provide input;
- Implementation of regional land use planning;
- Complete a coordinated regional cumulative effects assessment;
- Carry out a strategic EA for the LNG industry;
- Issue a legally binding statement that the proposed Project would not be converted to an oil pipeline; and
- Make legally-binding commitments on benefits sharing.

EAO did not include Saik'uz First Nation in the Section 11 Order for the proposed Project, as Saik'uz First Nation's traditional territory is located over 100 km from the proposed Project. EAO provided Aboriginal Groups listed in Schedules B and C meaningful opportunities to provide input throughout the EA.

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 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 47 km of the northernmost extent of Lake Babine Nation's asserted territory. There is one camp proposed at KP 480 and one compressor station (K4) proposed at KP 487 within Lake Babine Nation territory. Lake Babine Nation is listed in Schedule B of the Section 11 Order.
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Lake Babine Nation's asserted territory.
- 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.
- EAO's consideration of the potential impacts of the proposed Project on specifically Lake Babine Nation's Aboriginal Interests is discussed below.
- Lake Babine Nation provided EAO with a map of their asserted area showing that the proposed Project falls outside of Lake Babine Nation's critical cultural zone.
- 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 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 no or weak information indicating sufficient or exclusive occupation that supports a *prima facie* claim of Aboriginal title by Lake Babine Nation within or near those portions of the proposed Project areas that overlap with the asserted traditional territory of the Lake Babine Nation. The area of the proposed Project overlapping Lake Babine Nation's asserted territory is distant to the main communities of Lake Babine at 1846, and within an area that overlaps with an area understood to have been used historically by the Gitksan. Although it is not clear the northern extent of the area ethnographers historically associated with the Lake Babine people, there is some information of historic use of areas by EAO is of the view that Lake Babine Nation has a moderate *prima facie* claim to Aboriginal rights to fish, gather, hunt and trap within or near the area of the proposed Project overlapping its asserted territory.

- Given the nature and location of the proposed Project at the northern periphery of Lake Babine Nation's asserted territory, EAO is of the view that the potential impacts to Lake Babine Nation's Aboriginal Interests are minor to moderate. EAO is of the view that the duty to consult Lake Babine Nation lies in the low to middle part of the *Haida* spectrum.

Summary of consultation

Lake Babine Nation was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening version of the Application and on the final 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 for the proposed project, and \$10,000 in capacity funding during the Application Review phase of the EA.

Lake Babine Nation became actively involved in the EAO-led Environmental Assessment review process in November of 2013 and prior to this did not provide feedback on the draft AIR or Section 11 Order. Lake Babine Nation provided input to the EA process through attending Working Group meetings and through comments on the Application, including during screening. In addition, Lake Babine Nation participated in the Natural Gas Pipeline First Nations Regional Meeting on November 26, 2013 and in the Natural Gas Pipeline Workshop on May 29-30, 2014. EAO made other offers to meet directly with Lake Babine Nation to discuss the impacts of the proposed Project. Lake Babine Nation indicated that work required for other projects stressed Lake Babine Nation's capacity to engage regarding the proposed Project.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Lake Babine Nation more than 20 times (2012-2014) to discuss issues and concerns regarding the proposed Project and to collect information about routing, geophysical surveys, compressor station sites, contracting and employment opportunities and economic benefits and pipeline safety and routing of the application corridor within the area understood to be their area of traditional territory. As well, Lake Babine Nation Chief and Council, along with hereditary chiefs, participated in a field visit in North-East BC to look at examples of existing ROWs, and to visit Spectra Energy Gas Control.

During the EA, Lake Babine Nation participated in biophysical studies in 2012 and 2013 and provided TEK. Capacity Funding in support of ongoing consultation, including a Traditional Land Use Study, has been offered to Lake Babine Nation by the Proponent.

To date, an agreement for funding has not been reached, other than a nominal amount for initial discussions.

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 as well as the Proponent's proposed mitigation to issues raised is provided in the Proponent's second and third Aboriginal Consultation Reports.

Lake Babine Nation Fisheries provided comments on the Proponent's Fish Habitat Offsetting Plan and on the watercourse crossing risk management framework. The Proponent provided additional detailed fisheries information for Lake Babine Nation's asserted territory in response to these requests and meeting feedback.

The Proponent has had preliminary discussion with one Lake Babine Hereditary Chief separately from direct discussion with Lake Babine Nation government.

EAO received Lake Babine Nation's comments on the draft Assessment Report on October 15, 2014 and considered them in the final version of this report. Lake Babine Nation disagreed with EAO's conclusions related to the proposed Project's likely impacts to fisheries and specifically does not believe that EAO has adequately considered impacts to Aboriginal food fisheries. Lake Babine Nation is not satisfied that offsetting will address their concerns regarding impacts to food fish.

Potential Impacts of the proposed Project on Lake Babine Nation's Aboriginal Interests

Aboriginal Title

During the EA process, Lake Babine Nation provided EAO with the following statement with respect to their rights and title:

"Lake Babine Nation has used and occupied their lands and waters since time immemorial. Lake Babine Nation are stewards of their land, water, and resources with this considered to be a responsibility as well as a right. They conserve and protect their traditional territories and resources to ensure that future generations of Lake Babine Nation members are able to live and benefit from all that their ancestral land provides. The Lake Babine Nation's special relationship to the land, water, and respective resources, provides grounds for and affirms their title. Lake Babine Nation's perspective includes protecting and maintaining Lake Babine Nation Aboriginal rights from potential infringement."

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 the strength of its Aboriginal rights and title claims, arguing that Lake Babine Nation has a strong *prima facie* claim supported by past traditional land use and cultural practices that continue into the present day.

EAO's consideration of impacts of the proposed Project on Aboriginal title claims generally is discussed in section 17.2.7 of this report. In EAO's opinion, the proposed pipeline project would not have an impact Lake Babine Nation's asserted Aboriginal title.

Hunting

Moose, bear, goat, grouse and ptarmigan are hunted by members of Lake Babine Nation. Lake Babine Nation raised general concerns regarding wildlife, wildlife habitat and the asserted right to hunt

The following hunting sites were identified by Lake Babine Nation community members through consultation and described in the Application:

Approximate Distance and Direction from Project	Site Description	Age
2.6 km southeast of KP 449	Moose hunting along forestry roads	Current
22.3 km southeast of KP 475	Hunters camp	Current
Crosses at KP 475.5	Moose sighting	Current
4 km southeast of KP 475.5	Hunting near Kotsine Mountains	Current
3 km northwest of KP 484	Bear den	Current
39 km southeast of KP 482	Hunting area near the fish fence	Historic

Of the identified hunting areas, one moose sighting was noted within the proposed Project footprint and three other areas were located within 5 km of the proposed Project alignment. It is acknowledged that Lake Babine Nation members may hunt throughout their traditional territory and not solely at the locations described in the above table and as such the proposed Project could impact other seasonally valuable hunting areas. Other hunting areas may be available within Lake Babine Nation Traditional Territory for the purposes of hunting during construction of the proposed Project.

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to have minor 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 in the winter as part of the traditional economy. The following trapping locations were identified by Lake Babine Nation community members through consultation and described in the Application:

Approximate Distance and Direction from Project	Site Description	Age
54 km southeast of KP 457	Trapline south of Morrison Lake	Current
50 km south of KP 466	Trapping in the fort Babine region	Current
52 km south of KP 466	Trapping in the Babine Lake Valley region	Current
19 km northwest of KP 474	Trapping near community member's cabin	Current
Crosses from KP 466.5 to KP 476.5	Community member's trapline	Current
39 km southeast of KP 482	Trapping area at the fish fence	Historic
20 km southeast of KP 482	Lynx and rabbit tracks	Current
418 m northeast of KP 501	Two marten and tracks at Gunanoot Lake	Current

The proposed Project crosses one community member's trapline between KP 466.5 and KP 476.5 which is not currently being used, but will be in the future. Two marten and tracks were identified during field observations at Gunanoot Lake less than half a kilometer northeast of KP 501 which could represent potential trapping areas.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts on Lake Babine Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Lake Babine Nation have strongly stated that the status of salmon and freshwater fish within the Babine watershed and within 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 to 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.

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. A technical discussion of fisheries related concerns is captured in section 5.6 of Part B of this report and the following is a high-level summary of the key concerns raised:

- Potential impacts to freshwater fish and particularly salmon (Sockeye, Coho and Chinook) from stream crossings and disturbance to riparian habitat;
- Concerns with upstream impacts to salmon spawning and rearing areas;
- Concern that an assessment of harm to Aboriginal fisheries has not been completed and that reversibility of these impacts should be considered;
- Requested consultation with Lake Babine Nation occur related to any proposed offsetting for adverse fisheries impacts;
- Inappropriate identification of timing windows for in-stream works, specifically noting that this will not be an effective mitigation during winter construction since fish inhabit those streams year-round;
- Concern that the Proponent's "self-assessment" resulted in only 8 streams that will require consideration of offsetting measures and consultation with DFO;
- Potential effects on water quality related to construction including: watercourse crossings, equipment maintenance and potential spills;
- Concern and request that Lake Babine Nation be appropriately notified of timing of watercourse crossings, and have access to review crossing plans and reports. Lake Babine Nation identified 30 days as reasonable notice, and 72 hours too short;
- Effective implementation of EMP and response plans, an ensuring that qualified environmental professionals are on-site with appropriate stop-work authority;
- Potential impacts from the LNG export facilities proposed for the mid and outer Skeena Estuary; and
- Cumulative effects to fish and fish habitat in Lake Babine Nation's traditional territory from forestry, fishing and mining developments on Lake Babine Nation traditional lands.

The proposed Project corridor would cross approximately 12 major watercourses with indicated fish presence in Lake Babine Nation's asserted territory. There are two large crossings: Shelagyote River (KP 507), and the Nilkitkwa River (KP 483) which would be crossed using underground trenchless methods.

Specific water bodies of concern were identified by Lake Babine Nation as 'no-go' areas including Nilkitkwa Lake, Rainbow Alley, Babine River Corridor and Morrison Watershed. Nilkitkwa Lake, Rainbow Alley and Morrison Watershed are located greater than 40km south of the proposed Project. While there is no crossing of the Babine River corridor within Lake Babine Nation territory, the proposed Project corridor would cross the Babine River upstream of Lake Babine Nation territory.

The following fishing sites were identified by Lake Babine Nation members through consultation and described in the Application.

Approximate Distance and Direction from Project	Site Description	Age
50 km south of KP 469	Fishing in Rainbow Alley Provincial Park	Current
39 km southeast of KP 482	Salmon fishing and 2 smoke houses at the north end of Lake Babine	1981
50.7 km southeast of KP 485	Fishing at Babine Lake	Current
Crosses at KP 537.8	Fishing at Babine River	Current
41.9 km south of KP 475	Babine River Fence	Current

Stream crossings are largely upstream of areas identified to date as important Lake Babine Nation fishing locations and are therefore unlikely to be impacted in terms of direct access to fishing. EAO notes that the proposed Project does cross one identified fishing location at KP 537.8, at Babine River, however it is EAO's understanding that this is outside of Lake Babine Nation's asserted traditional territory. Potential impacts to fisheries would therefore be indirect in that these streams may provide important spawning habitat for salmon species and un-mitigated could result in adverse residual effects.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Lake Babine Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

The following plant gathering sites were identified by Lake Babine Nation members through consultation and described in the Application:

Approximate Distance and Direction from Project	Site Description	Age
Plant Gathering Sites		
50 km northwest of KPN 634 26 km northwest of KPK 680.42	Berry picking site.	Current
Crossed at KP 470.5	Medicinal plant harvesting and berry picking site	Current
Crosses at KP 465.5	Old man's hair	Current

Approximate Distance and Direction from Project	Site Description	Age
Plant Gathering Sites		
25 km southwest of KP 408	Untouched spruce forests	Current
28.5 km southwest of KP 410	Pine beetle damaged spruce forest	Current
20.6 km southwest of KP 415	Pine beetle damaged and dead trees on east side of Skeena Mountain range	Current
21.3 km southeast of KP 472	High bush blue berries	Current
Unknown location	Labrador tea in wetlands of Lake Babine Nation asserted traditional territory.	Current

Two of the identified plant gathering sites could be impacted by proposed Project activities including a medicinal and berry picking site at KP 470.5 and an old man's hair harvesting site at KP 465.5. It has been identified that Labrador tea is collected in wetland locations however no specific location has been identified. As Labrador tea has a broad distribution across the area, it is assumed there are many other locations for this harvest.

The Proponent will be undertaking pre-construction TUS studies during which time any particular plant communities could be identified and avoided if practicable.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this 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

Lake Babine Nation indicated that cultural heritage is important and raised the concern that archaeological baseline appears to have not been field checked frequently enough to enable an effective assessment. Lake Babine Nation raised concerns about the potential effects on CMTs, archaeological and culturally important sites as well as general concerns about increased access and traffic due to pipeline construction.

Habitation Sites

The following habitation sites were identified by Lake Babine Nation community members through consultation and described in the Application.

Approximate Distance and Direction from Project	Site Description	Age
44 km southwest of KP 413	Cabin on west side of Haul Lake	--
47 km southwest of KP 453	Cabin north of Tahlo Lake	--
54 km southeast of KP 457	Cabin on Morrison Lake	Historic
2.6 km southwest of KP 467	Outfitter cabin	Current
36 km southwest of KP 469	Cabin	Current
21.5 km south of KP 470	Trapping cabin and smoke house	Current
22.3 km southeast of KP 475	Hunters camp	Current
2.5 km northwest of KP 475.5	Campsite on east side of Kotsine Mountains	Historic
39 km southeast of KP 482	Seasonal dispersal campsite at fish fence	Historic
26.3 km southeast of KP 484	2 cabins and smokehouse (bindahthe)	Current
5 km northwest of KP 497	Campsite at Silver Hilton	Historic
4 km southeast of KP 499	Trapping cabin	Historic
52 km south of KP 466	Fort Babine	Historic

The majority of identified habitation sites are located 20 or more km from the proposed Project site. There were three historic habitation sites identified within five km of the proposed Project corridor located north and south of KP 499, 497 and 475.5. One current habitation site was identified 2.6 km southwest of KP 467. Given the distance from the proposed Project, it is possible that the proposed Project could indirectly impact this habitation site. It is anticipated that pre-construction TUS and consultation with Lake Babine Nation prior to construction would enable the avoidance of impacts to the habitation site, and recommended that the Proponent should identify the current users to notify them of the timing of works in this area.

Trails and Travelways

The following trails and travelways were identified by Lake Babine Nation community members through consultation with the Proponent and described in the Application:

Approximate Distance and Direction from Project	Site Description	Age
Trails and Travelways		
103 km southeast of KP 382	Omineca trail	Historic
3 km south of KP 455	Large network of trails	Historic
51.5 km southeast of KP 475	Ski doo travelway on the Shores of Lake Babine	Current
1.4 km northwest of KP 476	Trails around Kotsine Lake	Historic
Crosses at KP 478	Bear Lake grease trail	Historic
Crosses at KP 482	Northwest Territory trail	Historic

Approximate Distance and Direction from Project	Site Description	Age
Trails and Travelways		
39 km southeast of KP 482	Trails near the north end of Nilkitkwa River near the fish fence.	Historic
2.8 km northwest of KP 483	Blaze marks near confluence of west Nilkitkwa and Nilkitkwa Rivers	Historic
8 km south of KP 490	Trail on the east side of Nilkitkwa River	Historic
418 m northeast of KP 501	Blaze marks/CMTs near Gunanoot Lake	Historic
Crosses at KP 537.8	A network of grease trails on both sides of the Babine River leading to Skeena and Hazelton Mountains	Historic

While the proposed pipeline crosses two historic trails at KP 476, 482 and a network of historic grease trails leading to Skeena and Hazelton Mountains along either side of the Babine River at KP 537.8 where the proposed Project crosses the Babine River, EAO notes that these are historic trails and would cause limited impacts to current traditional use at these crossings. Blaze marks / CMTs near Gunanoot Lake were identified less than half a kilometer northeast of KP 501.

Given the potential impacts to CMTs which could have been used to mark historic trails, there could be impacts to heritage resources, and pre-construction TUS surveys would be required to accurately identify any additional cultural features and to enable the implementation of appropriate mitigation measures.

The Application identified one current gathering place 43 km southeast of KP 488 and one historic site described as being of sacred significance 36 km south of KP 489. Given the distance of the proposed Project from these sites, it is not anticipated that they would be directly or indirectly impacted during construction or operational activities.

In consideration of the information provided 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 report - the proposed Project is expected to have minor impacts to Lake Babine Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other issues raised by 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 16.8. Other concerns raised by Lake Babine Nation and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Concerns with dredging and aquatic environmental health at Ridley Island Landfall site	<p>Confirmation of the planned dredging methods and equipment would be provided once the marine pipeline construction contractor(s) is/are selected. The Proponent noted that currently the preferred method of handling non-contaminated dredge material is to side-cast it adjacent to the pipeline trench for subsequent backfill. Ocean disposal is a secondary or alternative option. The details for ocean disposal requirements would be determined during subsequent design, contracting and permitting processes.</p> <p>Consultation and notification to Aboriginal Groups would be part of the permit approval process. To support decisions with respect to handling dredge material at Ridley a more detailed HHRA was requested by EAO and submitted during the Application Review period.</p> <p>The dredging area and volumes at landfall sites vary from small to substantial at Ridley Island. The areal extent; however, represents a small proportion of the nearshore marine environment within the LSA and is predicted to recover within 5 years. Refer to Marine resources section (section 5.11) of Part B of the Assessment Report for additional information.</p>

18.2.3 Nak'azdli Band

Context

- Nak'azdli Band is made up of Dakelh-speaking members of the Carrier people. The Carrier Sekani have occupied a territory in north-central BC for an estimated 4,000 years.
- Clan territories (*keyohs*) are governed under Hereditary Chiefs in a matrilineal line of clan Elders. There are 42 *keyohs* within Nak'azdli Band, and the clan system is a strong part of the Nak'azdli community organization and identity. Chief and Council are elected to two- or three-year terms.
- Nak'azdli Band has 17 reserves. Nak'azdli (Necoslie) IR 1, Sowchea IR

3 and Williams Prairie Meadow IR 1A are currently occupied. Nak'azdli (Necoslíe) IR 1 is the administrative centre 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 114 km of the northern portion of Nak'azdli Band's asserted traditional territory. The proposed route would enter the east border of Nak'azdli Band's asserted territory near Mackenzie and west of Parsnip Reach, and would exit Nak'azdli Band's asserted territory east of Takla Landing near Nation Lakes Park.
- There would be one compressor station in Nak'azdli Band's traditional territory, near the Klawli River, south of Germansen Landing at KP 314.
- Two construction camps would be located within Nak'azdli Band's traditional territory at KP 257 and at KP 316.
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Nak'azdli Band's asserted territory.
- 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'aztli of southern Stuart Lake and Stuart River. It is also understood that fishing, hunting and gathering practices were an important part of Carrier culture, with fish having primary importance.
- As articulated in EAO's December 20, 2013 letter, although the area of the proposed Project is outside what is understood to be the traditional territory of the Necosilweten Carrier prior to contact, there is information indicating that this area may have been traversed as there was trade and intermarriage between the Carrier and the Sekani to the north. Travel by trails and water is known to have connected these communities. Considering this movement, and the need for subsistence during travel, it is possible that harvesting may have occurred which could support a moderate *prima facie* claim to Aboriginal rights to fishing, hunting, trapping and gathering in the area

of overlap between the proposed Project and asserted territory of the Nak'azdli Band.

- 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 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 the proposed Project route.
 - EAO provided a letter to Nak'azdli Band on December 20, 2013 discussing the 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. 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 requested that the evidence used and rational for the Crown's preliminary findings on strength of title claims be provided.
 - 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.
- Given the nature and location of the proposed Project corridor route and the potential impacts to Nak'azdli Band's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult lies in the low to 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 Application Information Requirements, 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.

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. Nak'azdli Band and the Proponent signed an

interim capacity agreement in May 2013 to support ongoing consultation in meetings and other activities with the Proponent and regulatory agencies related to the proposed Project, and to identify relevant effects of the proposed Project on Nak'azdli Band, and identify and consider relevant mitigation to address those effects.

Nak'azdli Band provided EAO with letters on February 28, 2013, September 17, 2013, January 10, 2014, April 11, 2014, June 17, 2014, August 12, 2014, and October 15, 2014, with extensive comments and concerns regarding EA documents and the EA process.

In January 2014, EAO and OGC met with the Nak'azdli Band and other Carrier Sekani Tribal Council Nations for a community meeting. 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.

Nak'azdli Band participated in Working Group meetings on February 5-6, 2014, and July 14-17, 2014. Nak'azdli Band also participated in the Natural Gas Pipeline Workshops on November 26, 2013, February 4, 2014 and May 29-30, 2014.

Key concerns raised by Nak'azdli Band in meetings and correspondence are included in the common issues section (section 16 above), potential effects section below, as well as the issues tracking tables (Appendix 2).

Nak'azdli Band participated in biophysical field studies for employment, and did not provide Traditional Ecological Knowledge. Nak'azdli Band provided their TUS to EAO on October 24, 2014, accompanying the CSTC separate submission to Ministers. EAO considered Nak'azdli Band's TUS in this report. Nak'azdli Band is also conducting a socioeconomic impacts assessment (SEIA), which has not been received by EAO.

The Proponent and Nak'azdli Band have had a series of meetings, including discussions on geophysical surveys, contracting and employment opportunities, economic benefits and routing of the proposed Project corridor through their asserted traditional territory. A community meeting was held with Nak'azdli Band community members, primarily consisting of affected *keyoh* holders, and the Proponent. Some Nak'azdli Band Council members participated in a fly-over of their traditional territory and a tour of natural gas facilities in Northeast BC with the Proponent.

Potential Impacts of the Proposed Project on Nak'azdli Band Aboriginal Interests

Nak'azdli Band expressed concerns regarding the potential effects of the proposed Project on the creeks, lakes and rivers in the Nation River watershed, as they view the watershed as the circulatory system of Nak'azdli Band's resource harvesting economy. Nak'azdli Band is concerned that proposed Project would result in limited access for Nak'azdli Band's traditional practices.

Hunting

Nak'azdli Band stated key concerns and information and regarding wildlife, wildlife habitat, and the asserted right to hunt including:

- Concern regarding impacts to wetlands that will in turn affect moose, caribou, beavers and other fur-bearers, and migratory birds;
- Potential effects on moose and concerns about moose declines within their asserted traditional territory;
- Potential effects on caribou:
 - Nak'azdli Band expressed the desire to increase caribou populations in their traditional territory to exercise their right to hunt in the future; and
 - Nak'azdli Band expressed concerns regarding caribou migration through the Porcupine Mountain area, and potential effects of the pipeline in that area;
- Potential effects on of the proposed Project and cumulative effects to the Scott and Wolverine herds of the Southern Mountain caribou - Nak'azdli Band supports recovery of this herd to support Nak'azdli Band's ongoing and future opportunity to hunt this species;
- Concern regarding an influx of recreational hunters into Nak'azdli Band's traditional territory; and
- Effects to beaver habitat including dams and lodges.

The Application included the following information on Nak'azdli Band's hunting practices:

- Concern that moose, caribou, elk and deer were far more plentiful in pre-contact times than the present;
- Concern regarding disruption of hunting activities and alteration of hunting sites; and
- Species of concern due to overhunting and trapping, as well as industrial, urban, and agricultural development include grizzly bear, wolverine, common nighthawk and rusty blackbird.

Wildlife species used by Nak'azdli Band community members include moose, beaver, muskrat, marmot, snowshoe hare, groundhog, porcupine, elk, red fox, marten, deer, otter, mountain goat, wolverine, caribou, fisher, black bear, lynx, grebe, geese, swan, water hen, ptarmigan, grouse, and duck.

The Proponent identified one hunting site within the traditional land and resource use RSA: the Tse loo Kaz Keyoh (Trapline TR0728-T005), which the proposed Project would cross from KP 256 to KP 289.

Nak'azdli Band members hunted close to where the proposed Project would intersect the Nation River. To the west of Nation River, *Keyoh* holders hunt rabbit, grouse, black bear and moose to the north and west of Finger Lake. Nak'azdli Band hunts moose on the shores of Fish Roe Lake. Grouse and rabbits are hunted along the Thutade Forest Road. Moose is hunted in the highland and forest areas to the north of Klawli River.

In consideration of the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use related to hunting – as discussed in section 17.2.1 of this 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

Nak'azdli Band stated key concerns and information and regarding wildlife, wildlife habitat, and the asserted right to hunt including:

- Concern regarding impacts to wetlands, that will in turn affect beavers and other fur-bearers; and
- Effects to beaver habitat including dams and lodges.

The Application included the following information on Nak'azdli Band's wildlife that could be trapped:

- Wildlife species used by Nak'azdli Band community members include beaver, muskrat, marmot, wolverine, fisher and lynx;
- Concern regarding disruption of subsistence trapping activities and alteration of trapping sites; and
- Concern regarding over trapping, as well as industrial, urban, and agricultural development on wolverine.

The Proponent identified one trapline within the traditional land and resource use RSA: the Tse Ioo Kaz Keyoh (Trapline TR0728-T005), which the proposed Project would cross from KP 256 to KP 289.

Nak'azdli Band members trapped close to where the proposed Project would intersect the Nation River. Trapping is carried out all along Thutade Forest Road.

In consideration of the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use related to trapping – as discussed in section 17.2.3 of this 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

Nak'azdli Band raised the following key concerns related to potential effects to fish and fish habitat:

- Kokanee salmon run through Nak'azdli Band and are important culturally and for sustenance;
- Important fish and salmon-bearing waterbodies include the Salmon River, Great Beaver Lake, Bugle Lake, Stuart Lake and the Stuart River;
- Potential effects of the spring that feeds Inzana Lake (approximately 45 km from the proposed pipeline route);
- Early Stuart River sockeye salmon runs are an important food source to community members;
- Nak'azdli Band raised concerns regarding the Proponent's plans, policies, and programs for monitoring and track abundance, distribution, timing and spawning success within watercourses crossed by the proposed Project;
- Species of concern due to overfishing, as well as industrial, urban and agricultural development include Dolly Varden and sturgeon;
- Concern regarding effects to watercourses and therefore fish and fish habitat as a result of mountain pine beetle and intensive logging;
- Concern regarding no net loss and fishery offsetting plans;
- Concern regarding an increase in suspended sediment causing increased fish mortality or injury; and
- Concern regarding cumulative effects on fish, noting Arctic grayling.

The Application included the following information on Nak'azdli Band's fishing concerns:

- Concern regarding disruption of subsistence trapping activities and alteration of fishing sites.

Species fished include ling cod, sockeye salmon, spring salmon, white sturgeon, kokanee, Dolly Varden trout, bull trout, carp, peamouth whitefish, suckers, char, prickly sculpin, arctic grayling, rainbow trout, and freshwater clams.

Fishing areas identified in the Application (Table 11.8-1) for assessment of potential effects to Nak'azdli Band current and traditional land use included the following sites in proximity to the proposed pipeline route:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
41 km south of KP 268	Salmon River
93 km south of KP 264	Great Beaver Lake
103 km south of KP 233	Bugle Lake
91 km south of KP 536	Stuart Lake
105 km south of KP 293	Stuart River

The proposed Project corridor would cross approximately 12 major watercourses with indicated fish presence in Nak'azdli Band's area of traditional use. The Nation River is a source of trout, char, and Dolly Varden. Nak'azdli Band fished for trout in the Klawli River.

In consideration of the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish and fish habitat, surface water, groundwater, and traditional land use activities related to fishing – as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Nak'azdli Band's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

The Application stated that aside from berries, plants do not play a major role in seasonal harvesting by Nak'azdli Band, likely due to a short growing season and availability or variety. However, the Application also listed disruption of subsistence plant gathering activities and alteration of plant gathering sites as issues identified by Nak'azdli Band.

Nak'azdli Band raised concerns regarding:

- Effects of dust contamination on human health;
- The use of herbicides to create or maintain the proposed Project's ROW, and

- potential damage to existing plants in adjacent areas;
- Decrease in plant abundance; and
- Increase in access of non-traditional users, which could result in an increase in introduced plants.

Species gathered include gooseberry, huckleberry, kinnikinnick, Saskatoon berry, sugarberry, soapberry, bilberry, high bush and low bush cranberry, loganberry, Eritrum mountain berry, salmonberry, wild strawberry, raspberry, blackberry, dandelion, cattail, wild rose, columbine, ferns, Labrador tea, mushrooms, and pine cambium.

Medicinal plants gathered include lodgepole pine, poplar, spruce, balsam fir, mountain ash, juniper, alder, kinnikinnick, soapberry, bearberry/twinberry, high bush cranberry, wild strawberry, raspberry, cow parsnip, stinging nettle, scouring rush, yarrow, wild rose, lamb's quarters, diaper moss, red-osier dogwood, plantain, devil's club, lady slippers, and black birch.

The Nation River area is a source of medicinal plants. There is a gathering place to the west of Thutade Forest Road. Berries are picked north of the proposed Project near Kwanika Creek, close to the western boundary of Nak'azdli Band's traditional territory. Nak'azdli Band identified 18 rare ecological communities requiring protection in their TUS, as well as three rare plants. Nak'azdli Band members gathered where the proposed Project would intersect the Nation River, close to the eastern boundary of Nak'azdli Band's traditional territory. The Tse loo Kaz Keyoh (Trapline TR0728-T005), which the proposed Project would cross from KP 256 to KP 289 is also a gathering area.

In consideration of the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on vegetation, current and traditional land use related to gathering – as discussed in section 17.2.4 of this report - the proposed Project is expected to have negligible impacts on Nak'azdli Band's asserted Aboriginal right to gather in the area of the proposed Project.

Impacts to culturally important sites

In their comments on Aboriginal Consultation Report 2, Nak'azdli Band raised that areas of cultural significance are a critical concern of Nak'azdli Band. Issues of concern raised in the Application regarding potential effects to culturally important sites include:

- Disruption of use of trails and travelways;
- Reduced use of habitation sites;
- Disturbance of gathering places; and

- Disturbance of sites described as being of sacred significance.

In the Application, the Proponent notes that there is a cabin 13.4 km south of KP 272.3, at the confluence of Rainbow Creek and Nation River.

Regarding sites described as being of sacred significance and gathering places, the Application states that it can be assumed that each *Keyoh* would have these areas within their familial territory, and probably kept their locations in confidence. In addition, a Nak'azdli Band community member told one researcher that the land is so sacred they are not supposed to talk about it.

Nak'azdli Band's TUS indicated that the area above the Second Bridge of the Nation River (near the eastern boundary of Nak'azdli Band's traditional territory), is an area of sacred significance and traditional gathering place.

Nak'azdli Band's TUS indicated that lean-tos have been constructed in the Klawli River area.

With regard to trails and travelways, the Application states that it can be assumed that each *Keyoh* would have trails and access points within their familial territory, likely in relation to their traplines. Nak'azdli Band's TUS shows that the proposed Project would cross the Old Baldy Trail, as well as approximately five other trails.

In consideration of 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 is expected to result in negligible impacts to Nak'azdli Band's culturally important sites, trails, and travelways in the area of the proposed Project.

Other Issues Raised by Nak'azdli Band

During the EA process, Nak'azdli Band raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.8 as well as the table below.

Key Issue Raised	EAO Response
Nak'azdli Band is dissatisfied with EAO's responses to their concerns	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 section, section 16.8 of this report, as well as in

Key Issue Raised	EAO Response
	correspondence for the proposed Project.
Lack of proper consideration of socio-economic effects, and consideration of Nak'azdli Band's SEIA	<p>The potential social effects of the proposed Project are discussed in section 7 of the Assessment Report.</p> <p>As of writing this report, Nak'azdli Band's SEIA has not been received by EAO.</p>
Not including the issues tracking table in the referral package	<p>The tracking table was posted to the EAO SharePoint site July 25, 2014 and was considered final at that time. The referral package contains the issues tracking table developed during Application review as an appendix to the assessment report, so Ministers will have the opportunity to review Nak'azdli Band's comments verbatim. Aboriginal Groups have the opportunity to provide Ministers with a separate submission to accompany EAO's referral material. The Ministers can consider any information they deem relevant in their decision whether to issue an EA Certificate for the proposed Project.</p>
Expansion of the proposed Project corridor to accommodate another pipeline, and an increase in production capacity.	<p>The potential for two pipelines was considered in the effects assessment during the EA. If an EA Certificate was issued for the proposed Project, the Proponent would be legally bound to the conditions and restrictions included in the EA Certificate, Table of Conditions and Certified Project Description.</p>
Nak'azdli Band recommends that additional TUS be studied in greater scope and depth than what Nak'azdli Band provided during the EA, as the timeframe for their proposed Project-related TUS was limited.	<p>This recommendation was directed to the Proponent. However, EAO proposes 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.</p>
Nak'azdli Band recommends that existing pipelines and pipeline corridors are considered as an alternative to the	<p>EAO notes Nak'azdli Band's recommendation. Section 2.4 of this report includes a discussion on alternative means of undertaking the proposed Project.</p>

Key Issue Raised	EAO Response
proposed Project	
<p>Nak'azdli Band recommends that the Proponent consult with Nak'azdli Band during:</p> <ul style="list-style-type: none"> • construction planning, including development of mitigation; • maintenance; • decommissioning and abandonment. 	<p>If an EA Certificate were issued by Ministers, Aboriginal consultation would continue as part of the permitting phase.</p> <p>EAO proposes 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.</p> <p>The reports must be provided to Aboriginal Groups, EAO and OGC.</p>
Nak'azdli Band recommends that an emergency response strategy be developed with Nak'azdli Band involvement and participation.	The Proponent's EMP would address emergency response. EAO proposes a condition that requires the Proponent to develop their EMP in consultation with Aboriginal Groups.

18.2.4 Takla Lake First Nation

Context

- Takla Lake First Nation's asserted traditional territory is located in north central BC, and is approximately 46,000 km² in size. Takla Lake First Nation has a total of 17 reserves. North Takla Lake Indian Reserve 7 is the main reserve. Takla Lake First Nation has a registered population of 741, with 392 living on reserve.
- Takla Lake First Nation is a member of the Carrier Sekani Tribal council.
- Takla Lake First Nation identifies its members to be descendants of Carrier and Sekani (Sasuchan and Yutuwichan) Aboriginal groups.
- Takla Lake First Nation uses a clan system to identify responsibility for use and protection of the asserted traditional territory. Each clan belongs to a *Keyoh*, or particular region.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project crosses approximately 275 km of Takla Lake First Nation's asserted traditional territory. Five proposed temporary work camps would fall within the asserted territory, located at KP 219, KP 257, KP 316, KP376 and KP 421 and two proposed compressor stations would fall within the asserted territory, located at K2 and K3.
- The Proponent estimates the proposed Project would involve construction of approximately 28 km of temporary access roads and no new permanent access roads in Takla Lake First Nation's asserted traditional territory.
- 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 as at 1846. Based on review of available ethnohistoric literature, and based on a consideration of Takla Lake claims based on asserted Sasuchan and Yutawichan ancestry, EAO is of the view that with respect to the proposed Project, Takla Lake First Nation likely has:
 - Strong *prima facie* claim to Sekani (Sauchan/Yutuwichan) Aboriginal rights to hunt/trap, fish and gather at Manson Lakes and the Omineca, and between Finlay Forks and Bear Lakes (north of the proposed WCGT pipeline);
 - Weak to moderate *prima facie* Sekani (Sasuchan) Aboriginal title claims in the area along the portions of the pipeline east of Takla Lake based on limited information suggesting a strong presence on the land. This area appeared to be a border between the Sasuchan and Yutuwichan Sekani divisions; and
 - Weak to moderate *prima facie* claim Sekani (Sasuchan) to Aboriginal title to areas along the pipeline adjacent to Takla Lake based on evidence of a strong presence but questions about exclusivity.
- 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 part of the *Haida* spectrum.
- Takla Lake First Nation is listed in Schedule B of the Section 11 Order.
- In their October 2014 letter to EAO, Takla Lake First Nation stated they assume that east of Takla Lake, as referenced in the fourth to last bullet point above, would be the area north of Tsayta Lake, and that Takla Lake First Nation has a long history in that area, including trails,

cabins, and hunting and trapping practices in the Kwanika Creek and Kwanika Range areas. Takla Lake First Nation also stated that they used the area adjacent to Takla Lake referenced in the second to last bullet point since well before 1846.

Summary of Consultation

Takla Lake First Nation was invited to review and provide comments on the draft Application Information Requirements, 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 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 Takla Lake First Nation to engage in discussions regarding the proposed Project capacity funding under a Letter of Understanding March 2013. A final Capacity Funding Agreement was signed and dated as of June 6, 2014, in support of ongoing consultation.

Takla Lake First Nation participated in a Working Group meeting on February 6, 2014, and participated in the Natural Gas Pipeline Workshops on February 4, 2014.

Takla Lake First Nation undertook preliminary TLU and socio-economic studies. Final versions of both studies were submitted to the Proponent on January 10, 2014, and incorporated in the EA Application. Updated versions of the studies were received by the Proponent February 12, 2014. The Proponent provided funding for additional studies that have not yet been completed. Takla Lake First Nation provided EAO with updated TLU information in October 2014.

Takla Lake First Nation members participated in biophysical field studies as observers and/or workers.

Issues raised by Takla Lake 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 Takla Lake First Nation as well as the Proponent's proposed mitigation to issues raised is provided in the proposed Project Aboriginal Consultation Reports #1, #2 and #3.

Potential impacts of the proposed Project to Takla Lake First Nation's Aboriginal Interests

Based on a review of the interim TLUS submitted by Takla Lake First Nation to the Proponent, the Application identified that fishing, hunting, trapping, and plant gathering both for subsistence and for economic reasons continue to be of central importance to Takla Lake First Nations culture and daily life, and the vitality of community members. The protection and preservation of existing resources, and continued access to those resources, is extremely important to community members.

TLU data was reported for five *keyohs* that fall within the LSA. *Keyohs*, their associated traplines, and the surrounding areas are used for trapping, hunting, fishing and berry picking and plant gathering, and sites of cultural and functional importance, including wildlife calving sites, medicinal plant sites, trails and campsites are found throughout the *Keyohs*. The concerns expressed varied among the *keyohs*. Concerns regarding Keyoh 1 related to road maintenance and cleanup of industrial activity. At Keyoh 1, concerns included the disturbance of calving areas along Driftwood River, disturbance of migration routes, disturbance of historical trails, and increased access. For Keyoh 3, concerns were regarding trapping practices including noise pollution, disturbance of calving grounds, and increased access. Members of Keyoh 4 identified concerns regarding trapping practices include disturbance of wildlife and vegetation.

Takla Lake First Nation notes that in many cases, the populations of fish and wildlife have been drastically reduced to a level in which Takla Lake First Nation can no longer maintain a meaningful subsistence economy and way of life. Takla Lake First Nation views any additional impacts to fish and wildlife populations and their habitat as significant. Takla Lake First Nation has adopted a no net loss policy to all cultural resources.

Hunting

Takla Lake First Nation raised the following key issues related to hunting:

- Concern with methodologies for wildlife, aquatic, and terrestrial vegetation assessments as well as monitoring;
 - Potential effects not adequately documented;
 - Inadequate cumulative effects assessment; effects of multiple projects in region; and
 - Concern that many of the proposed mitigations have not been proven to be effective.
- Impacts to wildlife and wildlife habitat during construction and operations:
 - Caribou: Scott, Wolverine, and Takla herds;

- Moose: concern that EA methods do not include an understanding of population and population dynamics;
- Mountain goat: loss of habitat;
- Disruption of migration routes and wildlife movement (limiting use of game trails), feeding areas, water sources and calving areas;
- Loss of carnivore habitat;
- Disruption of bear dens during construction and operations;
 - Increased access;
- Impacts on lines of sight;
- Sensory disturbance associated with noise and vibration;
- Effects of compressor station noise and emissions on wildlife detrimentally affect their movement and access to areas across Takla Lake First Nation's territory;
- Disturbance of bird habitat during construction, including grouse habitat and woodpecker nesting sites;
- Loss or contamination of mineral lick;
- Impacts to wildlife populations in the Kotsine and Driftwood watersheds; disturbance of calving areas along the Driftwood River;
- Travel of wolves and wildlife;
- Increased ungulate predation due to clearing;
- Increased access for recreational hunters; increasing pressure on wildlife resources; potential overhunting;
- Altered vegetation may also affect wildlife that rely on native plant species;
- Impacts on terrestrial species of concern due to increased road and air traffic (e.g. helicopter use);
- Contamination to wildlife relying on polluted lands or waters; and
- Impacts to predator-prey interactions and distribution, including human; and
- Cumulative effects of increased access, including an increase in ease of predation;
- Potential adverse effects to hunting practices resulting from adverse impacts to wildlife. Changes to the environment within Takla Lake First Nation asserted territory resulting from industrial development have already affected hunting practices;
 - Need to maintain traditional foods (e.g. berries, fish, and game); and
 - Increased access by non-Aboriginal hunters;
- Environmental monitoring by Aboriginal Groups;
- Increased access to territory that Takla Lake First Nation cannot control or monitor;
- ROW width;
- Effects on mature growth forests; and
- Concern regarding cumulative effects to ecosystem health: that ecosystem thresholds in the area surround the project have been reached or surpassed,

resulting in rapid decline in biodiversity and risking ecosystem productivity and resiliency:

- Mountain Pine Beetle salvage harvest and annual allowable cut should be addressed in EA.

The Scott and Wolverine caribou ranges fall within Takla Lake First Nation's asserted traditional territory. The Takla caribou range does not. However, Takla Lake First Nation has expressed concern regarding the loss of genetic migration for all herds as a result of their decreased populations. The proposed Project route crosses draft Specified Area (UWR u-7-026) in the Wolverine caribou range, causing approximately 198.3 ha of disturbance within this Specified Area, which is an increase in disturbance of less than 0.1% from existing conditions. In the Wolverine herd the pipeline bisects the herd range and separates an important calving area from the general winter range. Compressor station K2 is proposed within the Scott caribou range, and compressor station K3 is proposed within the Wolverine caribou range. The K3 compressor station is situated in close proximity to a known post-rut aggregation area. Takla Lake First Nation would like to see increased engagement with BC and the Proponent to resolve these concerns.

In consultation with Takla Lake First Nation, the proposed Project route west of the Nation River crossing was realigned to avoid portions of the Wolverine caribou herd's critical habitat. In addition, the proposed K4 compressor site, initially adjacent to the Driftwood River, was relocated west of the Nilkitkwa River due to Takla Lake First Nation's concerns about possible effects to local wildlife. Takla Lake First Nation would like to have discussions with BC to discuss no net loss for the wolverine herd and surrounding caribou herds.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to have 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:

- Concern with methodologies for wildlife, aquatic, and terrestrial vegetation assessments as well as monitoring;
 - Potential effects on TFLN not adequately documented;

- Inadequate cumulative effects assessment; effects of multiple projects in region; and
 - Concern that many of the proposed mitigations have not been proven to be effective;
- Potential impacts to small furbearers during construction and operations;
- Potential impacts to beaver, particularly where dams and lodge crossings exist;
- Potential adverse effects to TLFN trapping. Changes to the environment within Takla Lake First Nation asserted territory resulting from industrial development have already affected trapping practices;
 - Need to maintain traditional foods (e.g. berries, fish, and game);
- Potential impacts to wildlife trees;
- Impacts of construction and operations on wildlife habitat, including calving grounds, and lines of sight;
- Potential for construction activities and operations to limit use of game trails, restricting wildlife movement;
- Noise pollution;
- Impacts to the terrestrial ecosystem as a result of vibrations from compressor stations;
- Impacts on terrestrial species of concern due to increased road and air traffic (e.g. helicopter use);
- Impacts to wildlife populations in the Kotsine and Driftwood watersheds, as well as across the Takla Lake First Nation territory;
- Environmental monitoring by Aboriginal Groups;
- Increased access to territory that Takla Lake First Nation cannot control or monitor, including access for recreational harvesters, increasing pressure on wildlife and fish resources;
- Concerns related to right-of-way, including:
 - Travel of wolves and wildlife;
 - Increased access for recreational hunters; increased pressure on wildlife resources; potential overhunting; and
 - Right-of-way width;
- Altered vegetation may also affect wildlife that rely on native plant species;
- Effects on mature growth forests;
- Potential impacts to traplines (integrity needs to be protected); and
- Concern regarding cumulative effects to ecosystem health: that ecosystem thresholds in the area surround the project have been reached or surpassed, resulting in rapid decline in biodiversity and risking ecosystem productivity and resiliency:
 - Mountain Pine Beetle salvage harvest and annual allowable cut should be addressed in EA.

Takla Lake First Nation members trap throughout the asserted traditional territory. There are five traplines within the LSA registered to Takla Lake First Nation community members, and each trapline is associated with a specific Keyoh, as listed in the Application (Table 11.95-5):

- Crosses at KP 407.649 to KP 430.315 Keyoh 1: trapline number TR0727T006;
- Crosses at KP 444.179 to KP 474.864 Keyoh 2: trapline number TR0727T007;
- Crosses at 430.315 to KP 444.179 Keyoh 3: trapline number TR0727T013;
- 14.1 km south of KP 304.96 Keyoh 4: trapline number TR0728T010; and
- Location not provided Keyoh 5: trapline number not provided.

Species trapped include mink, beaver, marten, lynx, weasel, wolf, wolverine, muskrat, squirrel, fox, rabbit, fisher, and porcupine.

Takla Lake First Nation expressed concern regarding potential impacts to the Driftwood watershed. The proposed K4 compressor site, initially adjacent to the Driftwood River, was relocated west of the Nilkitwa River due to concerns expressed about possible effects to local wildlife.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife and wildlife habitat – as discussed in section 17.2.3 – the proposed Project is expected to result in minor 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:

- Concern with methodologies for wildlife, aquatic, and terrestrial vegetation assessments as well as monitoring:
 - Potential effects on Takla Lake First Nation are not adequately documented;
 - Inadequate cumulative effects assessment; effects of multiple projects in region; and
 - Concern that many of the proposed mitigations have not been proven to be effective;
- Waterway crossings (especially Driftwood River): impacts to fish and interference with natural processes, including natural erosion and riparian vegetation:
 - High water volumes during spring months need to be considered in assessing water crossings;

- Effects to water quality and quantity:
 - Disruption of natural water cycles, flow, and drainage patterns; potential for flooding as a result;
 - Erosion and sedimentation, including increased turbidity;
 - Effects on soils and terrain stability;
 - Contamination of water from machinery used during construction; and
 - 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;
- Stream diversions, streambed diversions, streambed disturbances, and contamination are of great concern;
- Effects on fish:
 - Disturbance of headwaters and spawning areas;
 - Impacts to any watershed that supports salmon or sturgeon;
 - Loss of fish and fish habitat;
 - Lack of robust healthy populations of fisheries resources (i.e. to historic levels) on which the community depends;
 - Effects of proposed Project-related vibrations underwater on fish health;
 - Effects to fish eggs and fry during the diversions of rivers and streams during construction;
 - Effects of contamination caused by waterway pollution as well as spread of invasive organisms on fish and fish habitat; and
 - Cumulative effects of metal concentration, turbidity, increased temperatures (in combination with climate change) on watershed that could potentially stress some valued fisheries resources to extirpation or reduce populations;
- Fish play an important role in the seasonal round of Takla Lake First Nation members. Main species harvested include Dolly Varden, kokanee, salmon, coho salmon, mountain whitefish, rainbow trout, lake trout, burbot, and arctic grayling. Impacts to the aquatic ecosystem as a result of vibrations from compressor stations;
- Potential adverse effects on Aboriginal rights:
 - Need to maintain traditional foods (e.g. berries, fish, and game);
- Impacts to watercourses:
 - Potentially inadequate baseline collection; and
 - Need for reclamation and protection measures;
- Potential adverse effects on soil and terrain stability;
- Impacts to water and fish in the Kotsine and Driftwood watersheds;
- Concern regarding impacts to the Nation Lakes sub basin;
- Environmental monitoring by Aboriginal Groups;

- Increased access to territory that Takla Lake First Nation cannot control or monitor, including access for recreational harvesters, increasing pressure on wildlife and fish resources;
- Effects on mature growth forests;
- Impacts to Aboriginal commercial fishing activities; and
- Concern regarding cumulative effects to ecosystem health: that ecosystem thresholds in the area surround the project have been reached or surpassed, resulting in rapid decline in biodiversity and risking ecosystem productivity and resiliency:
 - Mountain Pine Beetle salvage harvest and annual allowable cut should be addressed in EA.

Takla Lake First Nation fish throughout the waters of the asserted traditional territory for species including char, Dolly Varden, Pacific salmon including spring, sockeye, steelhead and coho, mountain whitefish, rainbow trout, lake trout, arctic grayling, lingcod, and freshwater shrimp. Many community members fish and rely on the catch for a portion of their diet. The Bear Lake region is one of the last valuable salmon harvesting sites in Takla Lake First Nation's asserted traditional territory, supporting runs of sockeye, pink, coho, Chinook, and steelhead. It is heavily used by Takla Lake First Nation members for fishing. Takla Lake First Nation members continue to depend on salmon runs in the Fraser River system, and would like to see that run return to historic numbers.

Key indicator fish species considered in the EA include most of the species known to be fished by Takla Lake First Nation members (e.g. all five species of Pacific salmon, rainbow trout, lake trout, brook trout, and arctic grayling).

The proposed Project corridor would cross approximately 32 major watercourses with indicated fish presence in Takla Lake First Nation's asserted traditional territory.

Takla Lake First Nation expressed concern regarding potential impacts to the Driftwood watershed. The proposed K4 compressor site, initially adjacent to the Driftwood River, was relocated west of the Nilkitwa River due to concerns expressed about possible effects to local wildlife.

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 report. In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use – as discussed in section 17.2.2 - the proposed Project is expected to result in negligible

impacts on Takla Lake First Nation's 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:

- Concern with methodologies for wildlife, aquatic, and terrestrial vegetation assessments as well as monitoring:
 - Potential effects on Takla Lake First Nation not adequately documented
 - Inadequate cumulative effects assessment; effects of multiple projects in region;
- Effects on existing vegetation, including mature growth forests;
- Loss of berry patches;
- Key food sources include pine tree cambium, a wide variety of berries, including blueberry, huckleberry, Saskatoon berry, soapberry, bearberry, and wild raspberry. Bark, roots, leaves, and the wood of trees were used as medicines and materials for housing, household utensils, clothing, weapons, and tools;
- Effects on harvested plants including medicinal plants:
 - Altered soil conditions from construction, including impacts to terrain stability, may threaten harvested plants and introduce invasive plant species;
- Contamination of plants by pesticides; Takla Lake First Nation does not support herbicide spraying on right-of-way;
- Potential adverse effects on Takla Lake First Nation gathering sites and gathering:
 - Need to maintain traditional foods (e.g. berries, fish, and game);
- Environmental monitoring by Aboriginal Groups;
- Increased access to territory that Takla Lake First Nation cannot control or monitor, including access for recreational harvesters, increasing pressure on wildlife and fish resources;
- Concerns related to right-of-way, including right-of-way width; and
- Concern regarding cumulative effects to ecosystem health: that ecosystem thresholds in the area surround the project have been reached or surpassed, resulting in rapid decline in biodiversity and risking ecosystem productivity and resiliency:
 - Mountain Pine Beetle salvage harvest and annual allowable cut should be addressed in EA.

Takla Lake First Nation members gather berries and plants for subsistence and medicinal purposes. Berries are harvested during the summer and fall, including soapberries, Saskatoon berries, raspberries, salmonberries, high bush blueberries, huckleberries, and cranberries. Red willow, devil's club, balsam bark, 'Indian' tea, cranberry buds, rock juniper, and Jackpine pitch are gathered for medicinal purposes.

Takla Lake First Nation members emphasized that access to certain medicinal and subsistence plant resources is crucial for their culture, health, and wellbeing, particularly for those families residing in remote areas. No specific Takla Lake First Nation gathering sites were identified in the Application, although Takla Lake First Nation members identified that cut blocks provide ideal conditions for berry gathering. No site-specific mitigation was requested for plant gathering sites by Takla Lake First Nation in the TUS. Takla Lake First Nation members do not want their gathering sites to be known. Takla Lake First Nation is willing to continue to work with the Proponent to identify gathering sites prior to construction to identify meaningful ways to mitigate impacts.

Access for Aboriginal Groups to the proposed Project area to gather 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 to a lesser extent over the medium term during the operation of the pipeline. Although clearing of the right-of-way may temporarily increase the total area of some types of vegetation (e.g. berries) that are used by Takla Lake First Nation members, concerns over perceived contamination may limit the use of these areas by Takla Lake First Nation members. Takla Lake First Nation members did not identify any specific gathering sites of concern crossed by the proposed Project corridor.

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 report. In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 - the proposed Project is expected to have minor effects on Takla Lake First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Takla Lake First Nation raised the following key issues related to culturally important sites:

- Concern that Driftwood River crossing has high potential for archaeological sites;
- Assessment of effects to heritage resources has not adequately documented potential effects on Takla Lake First Nation;
- Potential adverse effects on Aboriginal rights;
- Potential adverse effects on areas of cultural significance, including trail systems, and on First Nation habitation sites:
 - Avoid all heritage resource sites; and
 - Conduct further archaeological studies;

- First Nations environmental monitoring;
- Effects of multiple projects in region; and
- Increased access to territory that Takla Lake First Nation cannot control or monitor, including access for recreational harvesters.

Trails and travelways

In the past, trails and travelways were extensively used by Takla Lake First Nation members' ancestors, who were nomadic or semi-nomadic, travelling throughout the year in search of resources. Trails and travelways were also used as trade routes between Aboriginal groups.

Many of these trails are no longer in use, in many cases because they have been converted into access roads for development. However, Takla Lake First Nation members view these trails as culturally and historically important, with a high potential for archaeological sites along the trails.

Takla Lake First Nation identified 36 currently used trails/travelways, which are listed in the Application in Table 11.9-3. Of these, the following trails and travelways directly cross the proposed Project corridor:

- Gaffney Creek; Crosses at KP 281.156 to KP 281.158;
- Klawli River; Crosses at KP 332.918 to KP 332.9;
- Kwanika Creek; Crosses at KP 367.047 to KP 367.076;
- West Kwanika Creek; Crosses at KP 371.031 to KP 371.033;
- Bates Creek; Crosses at KP 440.143 to KP 440.145;
- Lion Creek; 0.075 km north of KP 449.53;
- Driftwood River; Crosses at KP 449.535 to KP 449.577; and
- Nilkitkwa River; Crosses at KP 482.7.

Takla Lake First Nation community members reported a high concentration of trails in the Takla Landing and Bulkley House regions on Takla Lake. Takla Lake First Nation did not identify any site-specific mitigations for trails and travelways. Takla Lake First Nation states that they will continue to work with the Proponent on mitigation measures for these sites. Takla Lake First Nation notes that for mitigation to work, BC and potentially other industrial proponents will need to find solutions to concerns raised regarding trails and travelways.

Takla Lake First Nation disagreed with EAO's conclusions regarding trails and travelways in the draft Assessment Report, as impacts to the use of historic trails and travelways is viewed as significant by Takla Lake First Nation. EAO considered Takla

Lake First Nation's comments on the draft Assessment Report and incorporated them into the final version of this report where appropriate.

Cabins and campsites

Although Takla Lake First Nation reserves and other habitation sites are found primarily in the area surrounding Takla Lake, cabins and campsites can be found through Takla Lake First Nation traditional territory. Many cabins are on established traplines. Takla Lake First Nation community members identified 23 features with concentrations of currently used cabins and campsites which are listed in Table 11.9-4 of the Application. Of these, a number cross or are within 2 km of the proposed pipeline corridor:

- Cabins at Kwanika Creek; crosses from 367.047 to KP 367.076;
- Cabins at Tsayta Lake; 1.7 km south of KP 388.15;
- Campsites at Lion Creek; 0.075 km north of KP 449.53;
- Campsites at Kotsine River; crosses at KP 473.128 to KP 473.130;
- Cabins and campsites at Sitlika Creek; crosses from KP 437.355 to KP 437.357; and
- Cabins and campsites at Driftwood River; crosses from KP 449.535 to KP 449.577.

No site-specific mitigation was requested by Takla Lake First Nation for these sites.

Gathering Places

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.

Sites Described as being of Sacred Significance

Takla Lake First Nation members identified sites described as being of sacred significance for Keyohs within the LSA, and that culturally modified trees (CMTs), sacred springs, ceremonial sites and other sites described as being of sacred significance are found throughout the RSA.

Table 11.9-6 of the application lists the *Keyohs* within the LSA associated with these sites described as being of sacred significance, and which types of site are found in each *Keyoh*: Keyoh 1: Death sites, burial sites, ceremonial sites, sacred springs, CMTs; crosses at KP 407.649 to KP 430.315

- Keyoh 2 Fossil Beds, cache pits, CMTs; crosses at KP 444.179 to KP 474.864;
- Keyoh 3: Sacred springs, CMTs, ceremonial sites; crosses at 430.315 to KP 444.179;

- Keyoh 4: Sacred springs, spiritual trail, CMTs; 14.1 km south of KP 304.96; and
- Keyoh 5: Cache pits, CMTs; Location not given.

In addition, Bear Mountain, approximately 26.2 km northeast of KP 442, was identified as a Takla Lake First Nation sacred site.

No site-specific mitigation was requested for sacred sites by Takla Lake First Nation in the TUS.

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. In consideration of the information provided 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 is expected to result in moderate impacts to Takla Lake First Nation's culturally important sites, trails, and travelways in the area of the proposed Project.

Other matters of concern to the Takla Lake First Nation

During the EA process, Take Lake 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 16.8. Other concerns raised by Takla Lake First Nation and responses from EAO, are outlined below.

Key Issue	EAO's response
Loss of amphibian habitat	<p>The following amphibian species were assessed:</p> <ul style="list-style-type: none"> • Pond-dwelling Amphibians • Western Toad • Northwestern Salamander • Coastal Tailed Frog <p>The magnitude of potential residual effects to amphibians is considered low because of the amount of habitat disturbance in the LSA and the mitigation proposed to minimize habitat disturbance and fragmentation is expected to reduce the potential residual adverse effects. Refer to Section 5.9 of Part B of the Assessment Report for more information</p>

Key Issue	EAO's response
	on potential impacts to amphibians.
Takla Lake First Nation requested that EAO note their preference of legislative options for ensuring that the natural gas pipelines are not converted to oil pipelines, instead of relying on the CPD and amendment process.	See section 16.3 of this report

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, and fishing for several species of salmon, white fish, trout and ling cod. 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 does not overlap Tl'azt'en Nation's asserted territory. The proposed corridor at its closest point is approximately 25 km north of Tl'azt'en Nation's asserted most northerly territorial boundary.
- Tl'azt'en Nation is listed in Schedule C of the Section 11 Order. Given the nature and location of the proposed Project and the asserted boundary of the Nation, EAO is of the view that the duty to consult lies in the low end of the *Haida* spectrum.

Summary of Consultation

The traditional territory of Tl'azt'en Nation lies outside of the proposed Project area. EAO provided Tl'azt'en Nation with notification of key milestones in the EA, including issuance of the Application Information Requirements, and acceptance of the Application to the Environmental Assessment Office for review. Tl'azt'en was also provided an opportunity to review and comment on the draft Assessment Report. No comments were received by EAO.

The Proponent was not directed to consult with Tl'azt'en Nation. However, the proponent offered one-time capacity funding to Tl'azt'en Nation under a letter of understanding dated 17 September 2013. During the EA, Tl'azt'en Nation was invited to participate in discussions regarding fieldwork and studies, and also had limited participation in a TEK/TLU study.

The proponent held between 5-10 meetings with community representatives. They provided Tl'azt'en Nation with the Proposed Project's Aboriginal Consultation Reports and requested review and comment. No comments were received. Issues raised by Tl'azt'en Nation on the application information requirements and the Proponent's responses are provided in the issues summary table of the Proponent's Aboriginal Consultation Reports #1, #2 and #3.

Potential Impacts of the proposed Project on Tl'azt'en Nation's Aboriginal Interests

Potential impacts of the proposed Project on Aboriginal Interests, including Aboriginal groups' Treaty rights or asserted rights to hunt, trap, gather, fish, and make use of culturally significant sites, are characterized in general terms in Section 17.2 of this report. Below, EAO outlines issues identified during the EA, provides additional background information specific to Tl'azt'en Nation's Aboriginal Interests, and lays out its considerations and conclusions on the seriousness of impacts to Tl'azt'en Nation's Aboriginal Interests.

Tl'azt'en Nation's asserted traditional territory lies outside of the LSA and RSA 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 LSAs are intended to capture the direct and indirect impacts from the proposed Project, while the RSAs 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 LSA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into Tl'azt'en Nation's asserted traditional territory. Taking into consideration the potential residual adverse effect from the proposed Project, and the distance of the proposed Project to Tl'azt'en Nation's asserted traditional territory, EAO concludes that the proposed Project is not expected to result in any adverse effects on Tl'azt'en Nation's Aboriginal Interests.

Other Issues Raised by 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 16.8.

18.2.6 Tsay Keh Dene Nation

Context

- Tsay Keh Dene Nation is made up of Sekani-speaking members of the Carrier people.
- Tsay Keh Dene 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 Nation has a registered population of 458, with 67 living on reserve.
- Tsay Keh Dene Nation has a Chief and four Councillors and uses a custom electoral system.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- EAO understands that the proposed Project overlaps 25 km of the most southern boundary of Tsay Keh Dene Nation's asserted traditional territory. Tsay Keh Dene Nation is listed in Schedule B of the Section 11 Order.
- There are no compressor stations proposed to be located within the Tsay Keh Dene Nation. There is one proposed preliminary construction camp location (KP 219).

- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Tsay Keh Dene Nation's area of traditional use.
- As articulated in a letter from EAO on December 20, 2013, EAO considered information related to the historical practices of the Sasuchan Sekani, to which Tsay Keh Dene Nation is understood to have an ancestral connection. EAO is of the view that the Tsay Keh Dene Nation has a strong *prima facie* claim to Aboriginal rights to fish, hunt, trap and gather in the area of the proposed Project overlapping with its asserted traditional territory.
- 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 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 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 areas, which overlap with the asserted traditional territory of Tsay Keh Dene Nation.
- Given the nature and location of the proposed Project, and EAO's consideration of the potential impacts to the Tsay Keh Dene Nation Aboriginal Interests as discussed, below, EAO is of the view that the duty to consult lies in the low to middle part of the *Haida* spectrum.

Summary of Consultation

Tsay Keh Dene Nation was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's First Nations Consultation Plan and Reports, the screening of the Application and on the Application. Tsay Keh Dene Nation was also provided with opportunities to attend working group meetings, workshops and to meet with EAO staff directly.

EAO provided Tsay Keh Dene 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 a Capacity Funding Agreement for Tsay Keh Dene Nation dated November 2013 in support of ongoing consultation in meetings and other activities.

Tsay Keh Dene Nation provided interim results of their TLU study on December 13, 2013 and final results were received by TERA Environmental on behalf of the Proponent on February 28, 2014. At the request of Tsay Keh Dene Nation to keep the

results of the TLU study confidential, the results were not incorporated in the Application. However, the final results of the study will form the basis for on-going dialogue between the Proponent and Tsay Keh Dene Nation to inform detailed planning for the proposed Project.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Tsay Keh Dene Nation several times to discuss geophysical surveys; contracting and employment opportunities; economic benefits; and routing of the proposed Project corridor through their asserted traditional territory. The Proponent has visited the Tsay Keh Dene Nation community four times to review the proposed Project with community members. Issues raised by Tsay Keh Dene Nation and the Proponent's responses are provided in the Issues Tracking Table (Appendix 2). A summary of the Proponent's engagement activities with Tsay Keh Dene Nation as well as the Proponent's proposed mitigation to issues raised is provided in the WCGT Aboriginal Consultation Report #3.

Potential impacts of the proposed Project to Tsay Keh Dene Nation's Aboriginal Interests

Hunting

The main stated concerns of the Tsay Keh Dene Nation are about wildlife, wildlife habitat and the asserted Aboriginal right to hunt, including:

- Disruption of hunting activities;
- Alteration of hunting sites;
- Loss of beaver dam/lodge;
- Construction limiting wildlife movement; and
- Increased access to recreational hunters adding pressure to wildlife resources.

Traditionally, Tsay Key Dene Nation hunted migrating birds, groundhog, sheep, moose, ptarmigan, goat and caribou. Oral histories suggest buffalo, elk and caribou were once abundant in the Akie River valley. Today Tsay Keh Dene Nation hunt moose, caribou, stone sheep, goats, and marmot.

The Application states that the Upper Ospika watershed and Akie Mountain region are considered important goat habitats and feature a number of mineral licks. Moose and deer are abundant and hunted in riparian areas along the Ospika River. Large and healthy grizzly and black bear populations are also present in the Lower Ospika, particularly in bottom lands. Caribou are present at lower elevations during winter, and caribou and stone sheep are present at higher elevations in summer in the Upper Ospika. Sheep also reside on high mountain ridges in the Akie area. Moose, elk, grizzly bears and deer habitat is of traditional value along Akie River bottom.

Based on the information collected to date and presented in Section 11.7.1.3 of the Application, known interactions of the proposed Project with Tsay Keh Dene Nation's Aboriginal Interests include crossing of a hunting site at KP 256.

In consideration of the information provided to EAO, Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.1 of this report – the proposed Project is expected to have minor impacts on Tsay Keh Dene Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Fishing

Tsay Keh Dene Nation raised the following key concerns related to potential effects on fish and fish habitat and the asserted Aboriginal right to fish, including:

- Disruption of subsistence fishing activities;
- Alteration of fishing sites;
- Effects on fish;
- Effects on water quality; and
- Reclamation and protection measures for watercourses.

Traditionally, Tsay Keh Dene Nation fished for salmon at Bear Lake. Fishing areas in Tsay Keh Dene Nation asserted traditional territory contain Dolly Varden, rainbow trout, grayling, ling cod, whitefish and suckers. Kokanee have been noted in the Upper Akie River area. Fishing areas used by Tsay Keh Dene members include the Upper Ospika, Wicked River, Ingenika Valley, Chowika Creek, Horn Creek, and Davis Creek. Thorne Lake is another important fishing lake. The Finlay River bottom was also a prime fishing area prior to flooding by the W.A.C. Bennett Dam.

Fishing areas identified by Tsay Keh Dene Nation in the Application (Table 11.7-1, Section 23) for assessment of potential effects to current and traditional land use include:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
79.2 km west of KP 5	Horn Creek (Davis/Collins)
27.7 km north of KP 476	Bear Lake

The proposed Project corridor would cross two major watercourses with indicated fish presence in Tsay Keh Dene Nation's asserted traditional territory.

Based on the information collected to date and presented in section 11.7.1.3 of the Application, known interactions of the proposed Project with Tsay Keh Dene Nation's Aboriginal Interests include a crossing of a fishing site at KP 256.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Tsay Keh Dene Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Trapping

Tsay Keh Dene Nation raised concerns regarding the asserted Aboriginal right to trap, including:

- Disruption of subsistence trapping activities; and
- Alteration of trapping sites.

Tsay Keh Dene Nation families traditionally focused their activity along trap lines. Each family had a number of camps or cabins throughout the Tsay Keh Dene Nation traditional territory covering their trap lines. Tsay Keh Dene Nation traditionally trap furbearing animals, including: fisher; lynx; marten; mink; wolf; wolverines; muskrat; beaver; otter; coyote; and foxes. Thutade Lake is another important area for trapping.

At this time, no known trapping sites are known to interact with the proposed Project route.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts on Tsay Keh Dene Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Gathering

Tsay Keh Dene Nation raised concerns regarding potential effects on vegetation and the asserted right to gather plants, including:

- Disruption of subsistence plant gathering activities;

- Alteration of plant gathering sites;
- Effects on wetlands; and
- Effects on existing vegetation.

Berries listed as important for traditional harvest and conservation under the Tsay Keh Dene Land and Resource Conservation and Management Plan include: strawberries, cranberries, buffalo berries (soapberry), lingonberries, gooseberries, huckleberries, saskatoon, trailing raspberries, wild cherry rosehips, kinnikinnick berries, black and red currants, strawberries and blueberries. Herbs used for medicine and sustenance include yarrow, balsam, poplar, alder, willow, black spruce, acorn, juniper, devil's club, kinnikinnick, Labrador tea, cattails, mountain ash, sage, raspberry leaves, red osier, cow parsnip, sweet vetch, dwarf cedar and strawberry vine for food and medicine. Many of these plants are harvested in the Swannell region, and the Police Meadows area, as well as the Finlay River Bottom Land and the Wicked River area prior to flooding as a result of the W.A.C. Bennett Dam.

Based on the information collected to date and presented in section 11.7.1.3, known interactions of the proposed Project with Tsay Keh Dene Nation's Aboriginal Interests include crossings of a plant gathering site at KP 256.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on vegetation, current and traditional land use related to gathering – as discussed in section 17.2.4 of this report the proposed Project is expected to result in minor impact on Tsay Keh Dene Nation's asserted Aboriginal right to gather in the area of the proposed Project.

Cultural sites and trails

Tsay Keh Dene Nation raised concerns about potential effects on culturally important sites, including:

- Disruption of use of trails and travelways, gathering places, sites described as being of sacred significance;
- Reduced use of habitation sites; and
- Need to conduct further archaeological studies.

Thutade Lake, located about 85 km west of the tip of Williston Lake, was historically an inter-tribal area for gatherings shared among the Carrier, Gitksan, and Sekani tribes. Trails existed to Carrier, Gitksan and Kaska Dene Territories, including the Bear Lake trail, Sustut trail, Telegraph Creek trail, Gah Duhduli Tsay (Red Rabbit Mountain), Babine River and Stikine trail. The area at the north end of Thutade Lake was a meeting

ground, where each year Aboriginal groups gathered for discussions and to recognize significant events that happened in the last year including naming ceremonies and deaths. These meetings would occur over many days during which groups would disperse throughout the area for hunting, fishing and trapping. Petroglyphs also occur around Thutade Lake.

At Fast Creek in the Swannell region, the initials of William Isaac, Leon Tomah, and Charlie Hunter are carved on a possible culturally modified tree that has been marked for protection. One of the main gathering sites was at Cascadero Falls, with another on the shores of Thutade Lake. There is another burial site at Thutade at the north end of the lake, on the eastern side just before the mouth of the Finlay River. The mountains around Thutade are an important area for obtaining medicine used for hunting.

Burial sites are considered sacred sites by the Tsay Keh Dene Nation. Thutade Lake is also known for its spiritual importance, as a place where dreams and spiritual powers can be acquired. There is a burial site at the north end of Thutade Lake on the eastern side of the lake just before the mouth of the Finlay River. Other burial sites may also be present around Thutade Lake. Amazay Lake was also an important location for the region's First Nations to gather, feast, share information and arrange marriages, and this lake is considered a sacred location where burial sites are present. The burial site of "Naatsəby", a great Tsay Keh Dene Nation medicine man and chief, occurs at the southwest end of Amazay Lake. There was also a grave site present at Pelly Creek. Ingenika Cone which is considered to hold high spiritual value by Tsay Keh Dene Nation, and is protected with limitations on development by the Tsay Keh Dene Land and Resource Conservation and Management Plan. The Ingenika Cone is located within the Swannell region, which also includes "Singing in the Mountain", an area in the mountains where spiritual singing is performed, and "Writing-on-the-Bedrock" Hill. The Swannell area was considered to be of high value as a gathering place.

Two major traditional trails are present around Thutade Lake. One trail heads from Thutade Lake south to Attichika Creek, continuing to Thorne Lake and Moose Valley. The other trail runs north from Thutade Lake to Toodoggone Creek, merging with the Caribou Hide trail. The Tsay Keh Dene Nation members say that gathering places occur where these trails intersect.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Habitation	
Crosses at KP 256	Nation River
53.8 km north of KP 368	Osilinka River

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Gathering Places	
115 km northeast of KP 350	Fort Graham
Sites described as being of Sacred Significance	
115 km northeast of KP 360	Fort Graham
Trails/Travelways	
79.2 km west of KP 5	Horn Creek (Davis/Collins)
26.5 km north of KP 26.5	Bear Lake (from Thutade Lake)
14.4 km west of KP 34	Graham River (Lower Ospika)
14.5 km west of KP 90	Peace River (Wicked River)
56.1 km northwest of KP 188	Nabesche River (Lower Ospika)
26.7 km northeast of KP 321	Manson Creek (Nation River)
KP 449	"Ingenika Thomas" (Takla Lake to Fort Graham)
66.6 km north of KP 516	Sustut (from Thutade Lake)

Based on the information collected to date and presented in Section 11.7.1.3 of the Application, known interactions of the proposed Project with Tsay Keh Dene Nation's Aboriginal Interests include a crossing of a trail at KP 449 and a habitation site at KP 256. At this time, no known gathering places or sites described as being of sacred significance are known to interact or be in proximity to within the proposed Project route.

In consideration of the information provided 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 report - the proposed Project is expected to have minor impacts to Tsay Keh Dene Nation's use of culturally important sites, trails, and travelways in the area of the proposed Project.

Other matters of concern to Tsay Keh Dene Nation

During the EA process, Tsay Keh Dene Nation raised a number of additional concerns with the proposed Project. These concerns and responses from EAO are provided in section 16.8.

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

- The proposed Project does not overlap with what the Province understands to be the traditional territory of Yekooche First Nation.
- Given the distance of the proposed Project from Yekooche First Nation's asserted traditional territory, EAO listed Yekooche First Nation on Schedule C of the Section 11 Order.
- As articulated in a letter dated December 20, 2013, EAO assessed the Yekooche First 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 Portage Band/Stuart Lake Carrier prior to contact with Europeans (understood to be around 1806). The area of the proposed Project does not overlap with the description of the traditional territory of the Stuart Lake people at around the time of contact, or that the Stuart Lake people made use of this area at that time or at 1846.
- On January 17, 2014, Yekooche expressed concern to EAO about the

Province's reliance on the Statement of Intent map, which they indicated was prepared solely for the purpose of treaty negotiations, and that EAO should be using a new asserted Yekooche Consultation Boundary map provided previously on April 30, 2013. After careful review and consideration of available information regarding any historic use of Stuart Lake people at time of contact or at 1846 in the area of the proposed Project, EAO concluded that no change to the previous assessment of strength of claim or scope of consultation with Yekooche First Nation was required.

- 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 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 no information indicating historic use of the area of the proposed Project by the Stuart Lake Carrier people that supports a *prima facie* claim of Aboriginal rights or title of Yekooche First Nation.
- EAO's consideration of potential impacts of the proposed Project on specifically Yekooche First Nation's Aboriginal Interests is discussed below.
- Given the nature and location of the proposed Project, EAO is of the view that the duty to consult Yekooche First Nation lies toward the low end of the *Haida* spectrum.

Summary of Consultation

Yekooche First Nation's asserted traditional territory lies outside of the proposed Project area. Yekooche First Nation was provided with notification of key milestones in the EA, including issuance of the Section 11 Order, Application Information Requirements, and the acceptance of the Application by EAO for review.

On March 21, 2014, the Proponent provided notification that the proposed Project's EA Application was submitted to the EAO. The notice provided information regarding the upcoming 30-day screening and 180-day Application Review regulatory process. The Proponent will continue to provide Yekooche First Nation with updates to the Proposed Project.

Yekooche First Nation expressed interest in attending Working Group meetings and was invited to attend a meeting in Prince George on February 5th, 2014, as observer given their Schedule C consultation designation. This meeting was attended by three representatives from Yekooche First Nation.

Yekooche First Nation participated in the Natural Gas Pipeline Workshops led by EAO on November 26, 2013, February 4, and May 29-30, 2014.

The Proponent provided Yekooche First Nation with draft Aboriginal Consultation Reports #2 and #3 for review and comment, to which Yekooche First Nation responded, questioning the level of consultation with Schedule C Aboriginal groups. The Proponent provided a response on February 11, 2014 offering Yekooche First Nation one time funding to engage in the EAO process as a Schedule C First Nation. The Proponent also offered to meet with Chief and Council to discuss the Proposed Project. No response has been received to date on either offer.

Potential impacts of the proposed Project on Yekooche First Nation's Aboriginal Interests

Yekooche First Nation's asserted traditional territory lies outside of the LSA and RSA 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 LSAs are intended to capture the direct and indirect impacts from the proposed Project, while the RSA 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 LSA, therefore, it is not expected that residual adverse effects on any of the above mentioned VCs would extend into Yekooche First Nation's asserted traditional territory. Cumulative effects resulting from the interactions of the proposed Project with other reasonably foreseeable projects for wetlands and aquatics are not expected to be significant.

Taking into consideration the potential residual adverse effect from the proposed Project, and the distance of the proposed Project to Yekooche First Nation's asserted traditional territory, EAO concludes that the proposed Project is not expected to result in any adverse effects on Yekooche First Nation's asserted Aboriginal interests.

18.3 Tsimshian

In consideration of the historic and current context of the Tsimshian provided in section 13.3 of this 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.

18.3.1 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 economic activities. Gitxaala First 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 people living at Kitkatla and elsewhere.
- Gitxaala Nation is governed by a Council with a Chief Councilor, Deputy Chief and five Councillors, 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 of British Columbia.
- The proposed Project marine pipeline route through Chatham Sound to Ridley Island would cross through approximately 20-30 km of the Gitxaala Nation's asserted traditional territory.
- The proposed Project would not cross directly through the portion of Gitxaala Nation's asserted traditional territory near Red Bluff on the north side of Nass

Bay, although the Nasoga Route option would cross approximately 3 km south of that area along the south side of Nass Bay.

- 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 teach and pass on these 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 the 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:
 - 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
 - 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 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 the strength of *prima facie* claim to Gitxaala Nation's asserted Aboriginal rights to fish and gather, and activities incidental to those rights, in this area is weak to moderate. 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 required the permission of the Nine Allied Tsimshian Tribes. Gitxaala Nation provided several letters expressing concerns and disagreement with EAO's strength of claim assessment, including:
 - Disagreement with views relating to the northern limit of Gitxaala Nation territory and villages, as well as requiring permission and 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

- 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 six memoranda 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 likely made use of these areas with permission of 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 at the permission of the nine Allied 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 the Nisga’a at this site.
- Given the nature and location of the proposed Project, EAO is of the 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 were consulted at the deeper consultation level.

Summary of Consultation

Gitxaala Nation was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's Aboriginal Consultation Plan and Reports, the screening of the Application and on 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 has been provided by the Proponent. The intent of funding is to support completion of a socio-economic and TLU study; and to support ongoing consultation in meetings and other activities with the Proponent and regulatory agencies, related to the proposed Project. An Agreement with Gitxaala for funding was signed July 15, 2014, and funding provided for capacity, TLU and socio-economic studies.

Gitxaala Nation elected to conduct a socio-economic and TLU study, however the final reports were not provided within the designated timeframe and were not included in the Application due to challenges in the negotiation of study-related funding between Gitxaala Nation and the project Proponent. The final reports were provided to EAO on September 25, 2014 and have been considered as supplemental information in EAO's assessment of potential impacts of the proposed Project on Gitxaala's Aboriginal Interests.

The Proponent's Aboriginal Consultation Report noted that final results of the socio-economic report and TLU study will form the basis for ongoing dialogue between the Proponent and Gitxaala Nation to inform detailed planning and ongoing discussion of mitigation measures during all phases of the proposed Project.

Initially, Gitxaala Nation elected not to participate in biophysical field studies in 2013 but increased engagement in 2014. Gitxaala Nation participated in the May 27, 2014 nearshore seine net baseline fish sampling program.

The Proponent provided Gitxaala Nation with shapefiles of routing through their asserted traditional territory on April 2, 2014. 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 representatives attended the following meetings:

- Marine Technical Working Group Meetings on May 15-16, 2013; February 12, 2014; and July 21-22, 2014 in Prince Rupert;
- Regional First Nations Workshop - Northern Pipelines on February 4, 2014 in Prince George;
- Meeting with EAO and BC OGC on June 17, 2014 in Prince Rupert; and
- Meeting with EAO and several First Nations including Gitxaala Nation on July 25, 2014 in Prince Rupert.

Gitxaala Nation provided extensive review comments on the Application (see tracking table in Appendix 2 for further details).

Gitxaala Nation provided several letters to EAO and the Proponent with extensive comments and concerns during Pre-Application and Application Review, including:

- Concerns regarding EAO's initial strength of claim assessment letter and ongoing disagreement regarding BC's strength of claim analysis;
- Concerns regarding the Application Information Requirements;
- Concerns regarding potential impacts to Gitxaala Nation's aboriginal rights and ongoing concerns with the review of the proposed Project and insufficient consultation;
- Information regarding Gitxaala Nation's asserted traditional territory, occupation and use supporting claims to Gitxaala aboriginal rights and title in the proposed Project area;
- Application Review comments (see tracking table in Appendix 2 or details);
- Concerns with EAO and OGC, including:
 - Lack of coordination between LNG-related applications;
 - Lack of a credible approach to assessing potential cumulative effects on Gitxaala's rights and culture; and
 - Lack of clarity around the consideration of Gitxaala Nation's TLU information.

Gitxaala Nation provided a letter to the Proponent and EAO (dated Aug 14, 2014) expressing concerns relating to the draft Aboriginal Consultation Report #3 including:

- Gitxaala Nation has completed TLU and socio-economic studies in relation to the proposed Project, which were finalized in July 2014. However, the final studies

were delayed from being released due to ongoing negotiations between Gitxaala and the Proponent to finalize the capacity funding agreement; and

- The Proponent's Aboriginal Consultation Report #3 does not include a plan to submit a supplement to the Application to incorporate an assessment of the TLU and socio-economic information once the reports are received.

In response to Gitxaala Nation's comments on the draft Aboriginal Consultation Report #3, the Proponent provided a letter to Gitxaala Nation (dated August 19, 2014) acknowledging Gitxaala Nation's concerns and expressing willingness to consider and discuss specific potential impacts and mitigation measures in connection with the TLU and socio-economic study in ongoing discussions with Gitxaala Nation.

Gitxaala Nation provided a letter to EAO (dated September 19, 2014) in follow up to their letter dated June 7, 2014 expressing concerns, including:

- Inaccurate and misleading information contained in the Application and inappropriate use of Gitxaala Nation TLU information in assessing potential impacts of the proposed Project on Gitxaala Nation's Aboriginal Interests; and
- In a letter to Gitxaala Nation dated August 18, 2014, the Proponent confirmed the Application (pg. 11-372) contained the following inaccurate statement relating to consultation activities with Gitxaala Nation:

"WCGT has consulted with participating Gitxaala Nation members who have historically used or currently use the Current Use of Lands and Resources for Traditional Purposes VC RSA to identify potential resource use issues, features and activities which may be disturbed by construction and cleanup activities of the proposed Project". This statement was made in error. Neither Spectra Energy nor their contractors have engaged with any Gitxaala Nation members directly on this or any other matter relating to the use of lands. EAO committed to include this statement in this Report.

On September 24, 2014 Gitxaala Nation provided EAO with the following:

- Final TLU report titled "Gitxaala Use Study" (Calliou Group, July 2014);
- "Gitxaala Nation Socio-Economic Report" (Calliou Group, August 2014) prepared for Port Edward Area LNG Projects, including:
 - PR LNG
 - PNW LNG
 - PRGT
 - WCGT
- Gitxaala Valued Components (VC) Report prepared for the WCGT Project (Calliou Group, July 2014)

These final reports were provided following EAO's initial completion of the draft Assessment Report. However, EAO has reviewed and considered these reports as supplemental information to the Application in EAO's assessment of potential impacts of the proposed Project on Gitxaala Nation's Aboriginal Interests.

Gitxaala Nation's final TLU report and VC report (2014) provide 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, with a specific study area near Port Edward and Prince Rupert Harbour.

The Gitxaala Nation VC report (2014) 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.

Four other VCs with potential indirect effects and interactions of the proposed Project on Gitxaala Nation's Aboriginal Interests were identified, however were excluded from further consideration in the Gitxaala Nation VC report assessment included: Spirituality, Language, Economy and Teaching/Transmission.

Other concerns raised by Gitxaala Nation during Application Review included:

- 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's Aboriginal rights including harvesting marine resources and marine navigation;
- The Proponent's Application misuse and misrepresentation of traditional use information previously provided by Gitxaala for other regulatory processes or projects (e.g., Northern Gateway Pipeline Project);
- In a letter dated June 7, 2014, Gitxaala raised a number of concerns with information in the Application. Specifically, Gitxaala was concerned by the information in Table 11.17-2 of the Application entitled "Potential effects to Aboriginal Interests Identified by Gitxaala First Nation":
 - This table misrepresents information provided by Gitxaala, and was based on information prepared by Gitxaala for the review of the Northern Gateway Project (NGP). The TLU information was specific to the study area for the NGP and was limited "to the geographical area between

Porcher Island (and surrounding islands) and the south ends of Banks and Pitt Islands”; and

- There is no overlap between the NGP study area and the study area for the proposed Project. Therefore, the Application does not accurately describe or assess potential effects on Gitxaala Nation’s current and traditional use marine use areas within their asserted traditional territory, particularly in areas north of Porcher Island (i.e., Skeena River estuary, Prince Rupert Harbour, Chatham Sound and Nass Bay) within the proposed WCGT Project Area.
- Gitxaala Nation considers the Application incomplete and requested assessment of cumulative effects on the four additional VCs included in their VC Report and listed above. With reference to the number of proposed projects Gitxaala Nation is being consulted on, they would like regional and qualitative cumulative effects assessment on the four VCs identified above.

As will be discussed below, the information provided in Gitxaala Nation VC report (2014) that identified potential direct effects and interactions of the proposed Project on Gitxaala Nation’s Aboriginal Interests on Governance, Cultural Identity, Harvesting Rights and Sacred Places, was considered in EAO’s assessment of potential impacts of the proposed Project on Gitxaala Nation’s Aboriginal Interests, included 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 assesment was done in consideration of potential effects to Gitxaala Nation’s Cultural Identity, Harvesting Rights and Sacred Places VCs. EAO considered Gitxaala Nation’s comments on the draft Assessment Report received on October 16, 2014 (dated October 15, 2014) and incorporated them into the final version of the report where appropriate.

In a meeting 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’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 statutory declarations derives from attestations of a Gitxaala 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 (like Gitga'at 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 a 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 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 Tribes and not also to Gitxaala. 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 October 28, 2014 memoranda provided to Gitxaala in advance of the meeting, which built on information previously shared by EAO in March, 2014.

EAO appreciates that confusion has been created by use of the term "Coast Tsimshian" 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 prior to contact. EAO understands that the Coast Tsimshian term has been used by different linguists and ethnohistorians in different way 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 will be revised.

Although Gitxaala were provided consultation opportunities at a deeper level by having been listed on Schedule B, Gitxaala 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 raised was regarding the potential social and economic effects that Gitxaala members could experience. EAO can confirm that the proposed SEEMP condition requires the Proponent to engage with all affected Aboriginal Groups, which includes Gitxaala. This plan must be developed and approved in accordance with defined timelines outlined in the draft condition. Note 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. EAO also understands that BC had an initial discussion with Gitxaala regarding benefits to Gitxaala related to LNG. BC does not direct Proponents in relation

to benefit negotiations, and has shared the preliminary strength of claim summary information to inform delegated aspects of consultation.

Gitxaala emphasized its concerns regarding the timeline and requested a suspension of time limits pursuant to section 24(4) to allow for more consultation to address or reconcile Gitxaala'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 on Gitxaala Nation's 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 is not overlapped by the route of the proposed Project which 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.

The Application (Aboriginal Consultation Section 11.17) included general information regarding Gitxaala Nation's current and traditional land use activities including hunting, gathering, fishing and trapping.

As noted above, and in Gitxaala Nation's comments on the draft Assessment Report, Gitxaala Nation expressed concerns regarding misleading information in the Application and the Proponent's misuse and misrepresentation of traditional use information provided by Gitxaala Nation for other regulatory processes. The Application only included TLU information provided by Gitxaala Nation specifically for the Northern Gateway Project which had a different study area. The Application did not identify Gitxaala Nation's TLU sites and activities within the proposed Project area, including:

important marine resource harvesting areas, culturally important sites and marine travelways within the Prince Rupert Harbour area, Skeena River estuary and Nass River estuary. As a result, the Application did not accurately assess potential impacts on Gitxaala Nation's Aboriginal Interests within the proposed Project area.

The final Gitxaala Use Study (TLU report), Gitxaala Nation Socio-Economic Report and Gitxaala VC Report (Calliou Group, 2014) provided by Gitxaala to EAO on September 24, 2014 have been reviewed and considered in EAO's assessment on Gitxaala Nation's Aboriginal Interests summarized below.

Hunting

Throughout the 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 Nation Use Study and VC Reports identified Gitxaala Nation hunting areas 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, and seabird eggs.

Key areas for hunting terrestrial wildlife identified in Gitxaala Nation Use Study (2014) include: Ridley Island, Lelu, Smith Island and other surrounding areas within 2 km of the proposed Project's landfall on Ridley Island.

Marine mammals hunted by Gitxaala Nation include seals and sea lions. Key hunting areas for seals, identified in the Gitxaala Nation Use Study (2014) include: Ridley Island, Smith Island, Kinahan Islands and Lucy Islands - located within 2 km of the proposed Project's marine corridor; and Stephens Island - located approximately 18km southwest of the proposed marine corridor. Other 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; the Tree Nob Group; Genn Islands; Gull Rocks; the north coast of Porcher Island; and Hunt Point.

The Gitxaala Nation Use Study Report also identified harvesting areas for sea bird eggs which were not included in the Application. Areas within the vicinity of the proposed Project route include around Smith Island including to Lelu Island, and Holland Rocks.

Other important hunting areas include the Gitxaala Nil Luutiksm / Kitkatla Conservancy which is located approximately 22.5 km southwest of the proposed Project marine route landfall on Ridley Island. The Gitxaala Nil Luutiksm / Kitkatla Conservancy is an important area for marine and terrestrial wildlife and was designated as a protected area in 2006 following recommendations from the North Coast LRMP. The conservancy area includes: Porcher Peninsula and several islands and waters surrounding Kitkatla Inlet and Kitkatla Channel southwest of Porcher Island. This conservancy is not within the Marine Environment RSA. Wildlife, wildlife habitat and hunting areas within this conservancy, and other conservancy islands within the RSA, are not expected to be affected by the proposed Project.

The Gitxaala Nation Use Study identified additional hunting areas associated with important bear habitat, including at Ridley Island and duck habitat off Lima Point 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;
- Alteration of hunting sites during construction and operation;
- Potential adverse effects on terrestrial and marine wildlife species and wildlife habitat, including:
 - Change to species abundance;
 - Change in wildlife behaviour;
 - Change in wildlife health, including project-related accidents;
 - marine pipe lay areas and shoreline entry and exit points;
 - Impacts to culturally critical species, such as grizzly bear foraging, security and bedding locales;
 - project-related air and noise pollution decreasing quality of habitat for continued reproduction of species; and
 - permanent alteration on culturally critical marine species;
- Effects on species availability for harvest or trade, and food types available at cultural gatherings; and
- Contamination of wildlife species resulting in decreased food safety/quality; and
- Potential effects on the navigability of watercourses and travel routes in the marine environment and the ability to exercise Gitxaala right to hunt.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EAC issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat, marine ecosystems, current and traditional land use— as discussed in section 17.2.1 and 17.2.6 of this report - the proposed Project is not expected to result in long-term, permanent or irreversible adverse effects on Gitxaala Nation's hunting. The proposed Project is expected to have negligible impacts on Gitxaala First 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 and various types of teas. Marine plants harvested include: kelp, sea prunes and seaweed.

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:
 - during construction, due to pipe laying vessels and support vessels;
 - seaweed, harvested primarily from rocky shorelines, due to industrial development; and
 - reduced harvest efficiency;
- Potential adverse effect on vegetation and plant communities;
- Changes in habitat for culturally critical species including:
 - species harvested for trade; and
 - Air and noise disturbances reducing quality of habitat for continued reproduction of species and loss or avoidance of preferred locations;
- Potential effects on existing traditionally harvested vegetation including ceremonial, medicinal and food source plants, including loss of traditionally harvested native and medicinal plants and berries during construction;
- Potential loss of wetland habitat, function and water quality also affecting wildlife and vegetation during construction of the proposed Project;
- Introduction or spread of invasive plant species;
- Adverse cultural effects related to plant gathering including:
 - change in food type available at cultural gatherings;
 - change in level of feasting;
 - reduction in trade and/or trade network; and

- permanent alteration of cultural components of harvesting;
- 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
- Potential adverse effects on harvested plants.

Specific plant gathering areas were not identified in the Application. The Application identifies potential effects and proposed mitigation for the disruption of subsistence plant gathering activities; and alteration of plant gathering sites.

The Gitxaala Nation Use Study (2014) identifies key medical plant and berry gathering areas within 2 km of the proposed Project's marine pipeline corridor and landfall on Ridley Island including: Ridley Island, Lelu Island, Kinahan Islands and the north shorelines of Inverness Passage. Areas further than approximately 5 km include 2 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 approximately 18-20 km southwest of the proposed Project landfall on Ridley Island.

Seaweed is primarily harvest in areas surrounding Lelu Island and Lucy Islands within 2km of the proposed Project landfall on Ridley Island; and Stephens Island located approximately 18-20 km southwest of the proposed Project landfall on Ridley Island.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EAC issued, and EAO's analysis of potential residual and cumulative effects to vegetation, and current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to have negligible impacts on Gitxaala Nation's asserted Aboriginal right to gather in the area of the proposed Project.

Fishing

Gitxaala Nation have a 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.

Gitxaala Nation members have developed a system of seasonal fish harvesting within their traditional territory that provide resources that are the primary contributor to the Gitxaala marine economy and an important part of Gitxaala Nation's culture.

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, sea cucumber, seals, sea lions 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.

Key areas for fishing identified in Gitxaala Nation Use Study (2014) include: the Skeena River estuary and surrounding areas within 2 km of the proposed landfall near Ridley Island; and several areas throughout Chatham Sound including areas within 2km of the proposed marine pipeline corridor.

Eulachon are also an important fish species harvested by Gitxaala Nation for food, social and ceremonial purposes. Gitxaala Nation currently and traditionally harvest 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 Nasoga Route crosses on land along the south side of the Nass River valley approximately 3km 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 River.

Potential effects on fish and fish habitat in the marine environment with potential effects to traditional fishing practices, including:

- Potential effects to salmon and critical juvenile salmon habitat in the Skeena estuary associated with proposed dredging at the Ridley Island landfall;
- Potential effects to water quality and marine life from:
 - Dredging and re-suspension of historically contaminated sediment around Ridley Island; and
 - Effects on the underwater acoustic environment;

- Potential effects to Dungeness crab and other crab species due to migration barrier effects from the proposed marine pipelines on the seabed in Chatham Sound;
- Potential effects, including cumulative effects, on fish and fish habitat impacts to Aboriginal food fisheries and fish stocks and the livelihood of Gitxaala Nation members;
- Increased construction vessel traffic and shipping traffic in areas where Gitxaala has fishing rights;
- Barriers to access for harvesting, including:
 - Potential disruption of marine travel navigability, interruption of marine travelways and anchorages, and access to fishing areas;
 - Changes to the ability to harvest traditional foods in Work Channel; and
 - Changes in ability to harvest shellfish and intertidal/marine resources;
 - Avoidance of marine areas during dredging;
- Accidents and malfunctions, including risks of fuel spills during construction, at pipeline coatings, shipping accidents, and underwater pipeline ruptures which may have adverse effects on fish health and fish populations harvested within Gitxaala's asserted traditional territory;
- Loss or damage to fishing gear;
- Impacts to 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, including:

- 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.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EAC issued, and EAO's analysis of potential residual and cumulative effects on freshwater and marine fish and fish habitat, navigation, and traditional land use activities related to fishing – as discussed in section 17.2.2 and 17.2.6 of this 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.

Traditionally, Gitxaala Nation members engage in trapping throughout the year, with the exception of certain times to allow fur-bearer reproduction to occur.

Potential effects of the proposed Project related to trapping include:

- 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.

Specific trapping areas within the proposed Project area were not specified in the Gitxaala Use Study (2014). However, trapping activities are assumed to occur in similar areas described in the hunting section above.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in 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 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 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.

Gitxaala Nation raised concerns about the preservation of heritage resources in the area of Ridley Island including:

- Culturally modified trees;
- A settlement site;
- A sacred site; and
- Two hereditary territories including: House territories of Txa Gyet (Porpoise Harbour, Watson Island, Lelu Island and Ridley) and La Ooy (Tugwell Island).

Important Sites including Areas identified as Sacred

Specific locations of Gitxaala Nation's culturally important sites, current and traditional travelways and marine transportation routes in proximity to the proposed Project were identified in the final Gitxaala Use Study (2014) and Gitxaala VC Report (2014) prepared for the proposed Project. The Gitxaala Use Study identified locations of sacred places but did not disclose the specific type of sacred place, which the Gitxaala consider confidential.

The Gitxaala VC report (2014) identifies the following sites described as being of sacred significance:

- 2 sacred places within 1km of the proposed landfall on Ridley Island;
- 1 sacred place on the northwest side of Smith Island and surrounding waters; and
- 1 sacred place near Lelu Island within 2km of the landfall on Ridley Island.

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; around Stapledon Island and the east coast of Lelu Island; Casey Point; the west coast of Kaien Island; Sourdough Bay; and Tsum Tsudai Inlet.

The Gitxaala Nation Use Study (2014) identifies 5 historic sites and settlements within 2 km of the proposed Project marine corridor and landfall on Ridley Island, including:

- 1 village site on Ridley Island;
- 1 village site on the North side of Smith Island;
- 1 camping site on Kitson Island; and
- 2 past settlement sites in Inverness Passage near Lelu Island.

Cultural areas in the vicinity of the proposed Project include: Veitch Point; and through the Telegraph and Inverness Passages.

Places identified in the 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 relating to disruption to sites described as sacred, including:

- Access to sacred areas due to Project-related activities;
- changes to viewpoints and acoustic effects;
- effects on cultural heritage resource values due to inappropriate behavioural practices around or in sacred areas due to increased recreational access by non-Gitxaala users;
- traffic volumes through identified sacred places and changes in existing conditions leading to avoidance; and
- Disruption to sense of place, impacting Gitxaala connection to territory.

Travelways

Gitxaala Nation's VC report indicated that potential Project effects on transportation and access could adversely impact all 4 Gitxaala Nation-identified VCs, including sacred places, cultural identity, governance and harvesting.

Based on Gitxaala Nation's final TLU report 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.

There are many preferred marine travel routes extending from the village of Kitkatla on Dolphin Island to the Prince Rupert Harbour Area, alternate bad weather routes, and anchorage points in use and in the vicinity of the proposed Project. There are several marine travel routes to fishing areas around Ridley Island, Lelu Island, Flora Bank,

Smith Island and Inverness Passage in the Skeena River estuary located within 2km of the proposed Project marine corridor and landfall at Ridley Island.

Other marine travel routes include routes from the village of Kitkatla to resource harvesting areas in Chatham Sound, Portland Inlet, Observatory Inlet, Nass Bay and the Nass River estuary to Gitxaala's traditional fishing camp at Red Bluff on the north side of the Nass River, located within 3 km of the proposed Project's Nasoga Gulf route. 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.

There are specific marine routes in different locations throughout the year which have been selected based on traditional knowledge of safe passage routes, tides, currents, depths, weather, as well as timing of fisheries (e.g. Skeena River salmon, Nass River eulachon spawning migration) and other marine resource harvesting activities.

Gitxaala Nation raised the following key concerns relating to disruption to the use of trails and travelways, including:

- change in marine or terrestrial access and change to haul-outs, anchorages, or travel routes;
- Impediments to travel between places, transport goods and harvest preferred foods;
- safer marine travel routes due to presence of ships and interference from lights at night, and due to increased wind from logging activities;
- from terminals and infrastructure on Ridley Island, the marine pipeline, safety exclusion zones, dredging, and increase in marine traffic; and
- Reduction in access to sacred places related to daily traffic volumes.

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. 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; 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 has potential to be affected by project activities or physical works.

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 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 the Inverness Passage, and the cannery on Hazel Point, on Smith Island. Several traditional land use sites associated with gathering areas were identified within the vicinity of the proposed Project including historic trading places, fishing camps, canneries, and general meeting areas.

Gitxaala Nation raised the following key concerns relating to disruption to gathering areas:

- Potential changes to teaching areas or areas used for teaching, including due to contamination, loss or disruption of resources.

In consideration of the information provided 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 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 issues raised by 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 16.7.

Other concerns raised by Gitxaala Nation, are outlined below.

- Potential adverse effects in the marine environment, including potential effects to fish and fish habitat, marine mammals, water quality and sediment quality;

- Potential impact from marine pipelines causing a barrier to crab migration;
- Potential effects of the proposed Project construction and operations on subsistence resources, access to resources and marine travel routes;
- Navigability of watercourses for exercise of Gitxaala rights and culture;
- Requested additional information on mitigation and monitoring plans for dredging and a plan for the disposal of dredged material to be included in the Application;
- The effectiveness of mitigation measures for sediment dispersion associated with dredging needs to be evaluated in assessing significance of potential impacts of dredging contaminated marine sediments on fish and fish habitat;
- Spatial and temporal boundaries used in the assessment should be defined by range and availability of the resources;
- How will the Proponent and EAO incorporate Gitxaala's final TLU report and socio-economic report into the assessment of potential impacts on Gitxaala's Aboriginal Interests;
- The Labour Force RSA used in the Application does not include Dolphin Island and the village of Kitkatla; and
- Potential effects on marine transportation and access. None of the RSAs for the Transportation and Access, Communities Infrastructure and Services and the Lands and Resources VCs include Dolphin Island despite some of these VCs referring to information pertaining to Gitxaala.

Gitxaala Nation submitted a letter to EAO (dated September 23, 2014) with comments on the Proponent's final responses to the Information Requests and Gitxaala Nation's views relating to the adequacy of information and mitigation measures in the Application, noting concerns of similar information missing from the proposed PNW LNG Project required to assess potential impacts of the proposed Project on Aboriginal Interests. EAO responded to these concerns in a letter to Gitxaala Nation dated October 7, 2014.

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. Gitxaala Nation noted that the preferred means of exercising Aboriginal rights should be considered when determining the seriousness of

potential impacts of the proposed Projects. It also cannot be assumed that alternate areas are always available for the exercise of Aboriginal rights.

EAO's assessment of potential impacts on Aboriginal Interests considered several factors, as described in Section 17.2 of this report, including any specific TLU sites and activities in proximity to the proposed Project as identified in TLU studies; the duration and spatial scale of potential effects and interactions of the proposed Project on Aboriginal Interests.

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 previously noted above, EAO's assessment of potential impacts of the proposed Project on Gitxaala Nation's Aboriginal Interests included consideration of Gitxaala Nation's final TLU, VC and Socio-Economic reports provided to EAO on September 24, 2014.

Issues and concerns in the Gitxaala Nation's VC Report 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 (e.g. dredging);
- Change in level of feasting, and in food type available at cultural gatherings (e.g. contaminants, accidents, malfunctions);
- 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.

EAO's assessment of potential impacts on Gitxaala Nation's Aboriginal Interests associated with hunting, trapping, gathering and fishing is described in detail in the above sections. EAO's assessment of VCs in Part B of this report, including the Marine Environment, Human Health, and Transportation VCs included the assessment of potential effects of the proposed Project from dredging, contaminants, construction activities and accidents and malfunctions.

Gitxaala Nation also indicated the methodology used by EAO to characterize the effects to 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.

Section 17.2 of Part C of the Assessment Report describes the methodology and factors considered with respect to assessing 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 proposes several specific 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 report.

18.3.2 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

- The proposed Project is currently assessing two possible route options within the Kitselas First Nation's asserted harvesting area. Both options would pass through approximately 100 km of the Kitselas First Nation's asserted harvesting area, but neither would cross through the Kitselas First Nation's asserted traditional territory. The closest point would be near the terminus of the proposed Project – located approximately 2 km from Smith Island (i.e. the western edge of the Kitselas' asserted traditional territory). There are no compressor stations or work camps for the project that would fall within Kitselas First Nation's asserted traditional territory or coastal harvesting area.
- The Proponent estimates the proposed Project would not involve construction of temporary access roads nor new permanent access roads in Kitselas First Nation asserted territory.

- Kitselas First Nation is listed in Schedule B of the Section 11 Order.
- EAO is of the understanding that there is no indication that the proposed Project would overlap what was considered the traditional territory of Kitselas First Nation at the time of contact, and that Kitselas First Nation's *prima facie* claim to Aboriginal rights is weak to moderate at the mouth of the Skeena and in the Prince Rupert Harbour area in the vicinity of the proposed Project. However, Kitselas First Nation disagree with this assessment, assert a stronger claim to these areas, arguing that Kitselas had a significant pre-contact and historical presence on the coast, and made a regular practice of harvesting resources there.
- 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 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 no information indicating sufficient or exclusive occupation that supports a *prima facie* claim of Aboriginal title by Kitselas First Nation within or near those portions of the proposed Project areas that overlap with the asserted traditional territory of the Kitselas First Nation.
- Given the nature and location of the proposed Project and the potential impacts of Kitselas First Nation's Aboriginal Interests as discussed below, EAO is of the view that the duty to consult Kitselas First Nation lies at the low end of the *Haida* spectrum.

Summary of Consultation

Kitselas First Nation was invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, the Proponent's First Nations 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 under an interim Capacity Funding Agreement dated September 2013.

A Memorandum of Understanding which includes additional capacity funding and funding for a Traditional Knowledge/socio-economic study was signed between Kitselas First Nation and the Proponent in July of 2014. Kitselas First Nation participated in biophysical field studies for the proposed Project.

Kitselas First Nation participated in Working Group meetings on February 5-6 and 12, 2014, and July 14-17, 21-22, 2014. Kitselas First Nation also participated in the Natural Gas Pipeline Workshops on November 28, 2013, 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 WCGT Aboriginal Consultation Report #1, #2 and #3.

Potential Impacts from the proposed Project to Kitselas First Nation's Aboriginal Interests

Hunting

Kitselas First Nation raised a general concern regarding project effects on wildlife, but did not provide any specific comments to EAO with respect to the impact of the project on wildlife, wildlife habitat, or Kitselas hunting.

Kitselas First Nation members hunt moose, deer, black and grizzly bear, snowshoe hare, red squirrel, ptarmigan, grouse, geese, and ducks in a number of locations far from the proposed pipeline route. Hunting of ungulates occurs in the Upper Kitimat and its tributaries. Hunting for mountain goat is limited to certain areas. Bears are harvested in the spring months and then in September to November, while game birds are usually harvested from September to the end of November. Upland birds are usually taken along road rights of way and migratory bird harvesting occurs in the same areas frequented by water animals. The Application listed a single hunting location at 77 km southeast of KP 665, in the Kitselas Canyon.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat – as discussed in section 17.2.1 of this report – the proposed Project is expected to have negligible impacts on Kitselas First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Gathering

Kitselas First Nation raised general concerns regarding the effects of the proposed project on harvested plants, including medicinal plants, but did not raise any specific concerns with respect to the impact of the proposed Project on terrestrial vegetation, wetlands, or Kitselas First Nation plant gathering.

Kitselas First Nation members harvest a range of medicinal plants and berries (see Application p. 11-326 for a comprehensive list). Gathering of forest plants and berries normally runs from June to October in the Upper Kitimat River and tributary valleys, in lower elevations adjacent to wetted areas. The Application listed a single plant gathering location at 77 km southeast of KP 665, in the Kitselas Canyon.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this report – the proposed Project is expected to result in negligible impacts on Kitselas First Nation's gathering activities in the area of the proposed Project.

Fishing and other marine uses

Kitselas First Nation raised the following key concerns related to potential effects to fish, fish habitat, and Kitselas First Nation fishing and marine uses:

- Contamination from suspended sediment:
 - Dioxin/ furan bioaccumulation;
 - Ridley Island Landfall site is very close to the Skeena Estuary; dredging could lead to re-suspension of contaminants with significant effects to the estuarine food chain;
 - Harbour Porpoise are already of COSEWIC 'Special Concern' and would be hurt by contaminants in their food chain; and
 - Increased toxicity and bioavailability of contaminants due to landfall trenching and sidecast is a significant residual effect;
- Scour around the pipeline on the seabed following dredging;
- Effects on soil and terrain stability;
- Effects on fish;
- Effects on water quality;
- Effects on watercourses; reclamation and protection measures for watercourses
- Impacts to First Nation commercial fishing activities; and
- Kitselas Marine Harvest area includes the Marine exit location and the area from the Skeena Estuary through Chatham Sound to Portland Inlet.

Kitselas First Nation members harvest salmon particularly from the Skeena Watershed downstream of Lorne Creek to the mouth of the Skeena River. Species harvested include all species of Pacific salmon, steelhead, cutthroat trout, Dolly Varden, lamprey, other finfish, shellfish and crustaceans.

The Application listed two fishing areas:

- 82.2 km south of KPN 751, Skeena River; and
- 14 km south of KPM 102.5 (Ridley Island), Mouth of the Skeena River.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Kitselas First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Trapping

Kitselas First Nation raised a general concern regarding project effects on wildlife, but did not provide any specific comments to EAO with respect to the impact of the proposed Project on wildlife, wildlife habitat, or Kitselas First Nation trapping.

Many of Kitselas First Nation's trap lines have been lost as a result of provincial licensing requirements. Currently several Kitselas First Nation members trap in the upper Kitsumkalum River; near the Skeena substation; and at the Kitimat River and tributaries. Kitselas First Nations members own four active traplines in the upper Kitimat watershed. There are trapping cabins in the valleys of Chist Creek, Bolton Creek, North Kitimat River to Hunter Creek, upper Kitimat River, and at the Kitselas Band trapline. Most of the harvest for fur-bearing animals takes place within 50 metres of roads, in treed areas bordering rivers and streams. The Application notes that trapping occurs at 77 km southeast of KP 665, in the Kitselas Canyon.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts on 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 did not raise any specific concerns with respect to the impact of the proposed Project on culturally important sites, trails, or travelways.

The Application lists two trails/travelways:

- Crosses at KPK 9.9 km, Nass River; and
- 130 km southeast of KPN 750.98/166 km southeast of KPK 672.9, Kitimat.

One trading area/gathering place is listed, crossing at KP 544 on the Skeena River. A habitation area and site described as being of sacred significance is listed in the Kitselas Canyon, 77 km southeast of KP 665.

In consideration of the information provided 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 is expected to result in minor 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. Concerns that were common across Aboriginal Groups, and responses to those concerns from EAO, are provided in section 16.8.

18.3.3 Kitsumkalum First Nation

Context

- Kitsumkalum First Nation is located just west of the city of Terrace, east of the junction of the Kitsumkalum River and the Skeena River. Kitsumkalum has four registered reserves with an area of 597 ha. Current demographic data are not available for Kitsumkalum First Nation, but there were 290 in 2006, according to the census for that year.
- 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 Proponent for the proposed Project is currently assessing two possible route options within the Kitsumkalum First Nation's asserted traditional territory. These corridors would pass through approximately 100 km of marine areas in the Kitsumkalum First Nation's asserted territory.
- The KSA compressor station would fall within the northernmost edge of Kitsumkalum First Nation's asserted territory. There is one temporary work camp that would fall within the asserted territory. The Proponent estimates the proposed Project would involve construction of

approximately 1 km of temporary access roads and 1.5 km of new permanent access roads in Kitsumkalum First Nation's asserted territory.

- 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 submitted to the Province a "Declaration of the Kitsumkalum Indian Band 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 is weak to moderate in the coastal areas crossed by the proposed Project as Kitsumkalum First Nation use of this area at the time of contact and 1846 would have likely required the permission of the nine Allied Tsimshian Tribes. Ethnographic sources characterize Kitsumkalum First Nation as one of the 12 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 disagrees with EAO's assessment and assert strong claims of Aboriginal rights and title to this area. Numerous meetings and 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 May 9, 2014 and September 29, 2014.
- 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 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 no information indicating sufficient or exclusive occupation that supports a *prima facie* claim of Aboriginal title by Kitsumkalum First Nation within or near those portions of the proposed Project areas that overlap with the asserted traditional territory of the Kitsumkalum First Nation.
- 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 members 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 of 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 low 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 Application Information Requirements, 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.

Kitsumkalum First Nation provided comments on the draft section 11 Order, the draft Application Information Requirements, the proposed Project Screening process, and the Application (see tracking table, Appendix 2, for further details). Kitsumkalum First Nation attended a workshop on LNG facilities and natural gas pipelines organized by the Province on November 28, 2013, and met with the Proponent to discuss marine routing and other topics related to the marine component of the pipeline.

Kitsumkalum First Nation participated in biophysical field studies through the provision of Marine Mammal Observers during the Proponent's Marine Autonomous Underwater Vehicle (AUV) survey, conducted in April 2014. Kitsumkalum First Nation conducted a socio-economic study, with an interim report completed in May 2014, and a final version expected in fall or winter of 2014. Although Kitsumkalum First Nation plans to conduct a TLU study for the Proposed Project, a contract for the TLU is still under discussion with the Proponent, and Kitsumkalum First Nation's TEK was not included in the EA Application. EAO provided \$5,000 in capacity funding to Kitsumkalum First Nation during the Pre-Application Stage of the EA, and \$10,000 during the Application Review phase, to assist with the costs associated with their participation in the EA. The Proponent also offered funding to Kitsumkalum First Nation through an interim Capacity Funding agreement signed in 2013 in support of ongoing consultation, including identification on relevant project effects and potential mitigations. As of September 30, 2014, discussions were ongoing to finalize a Capacity Funding Agreement to provide additional funds.

Potential Impacts from the proposed Project on Kitsumkalum First Nation's Aboriginal Interests

Hunting

Kitsumkalum First Nation stated key concerns regarding wildlife, wildlife habitat and hunting including:

- Changes to animal behavior due to habitat change, human presence, noise, and light, resulting in impacts to hunting;
- Recreational hunting by project personnel;
- Questions or concerns raised regarding assessment methods for particular species, including;
 - Marbled murrelet;
 - Sea otter (should be considered in relation to the National Recovery Strategy and potential range expansion/historic range);
 - Great blue heron;
 - Peregrine falcon; and
 - Steller sea lion;
- Perceived contamination of country foods from a spill;
- A Kitsumkalum Traditional Use Study is needed to inform the assessment of impacts to land and resources and use;
- Any residual effects to land and resources should be considered significant; and
- Duration of effects is potentially the full length of the construction phase, 10 years, which could have significant effects to culture and way of life.

Settlement, government policies, and industrial development have resulted in significant alterations to Kitsumkalum First Nation's pre-contact hunting patterns. 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. The information available to EAO does not clarify which of these species are currently hunted by Kitsumkalum members. At the time of European contact, Kitsumkalum First Nation hunting occurred mainly in upriver areas as part of the seasonal round rather than in coastal areas. Sea otters were not considered in the Application because although the range of sea otters is expanding, it is unlikely that sea otters will be present within the RSA during project construction, which is the project phase with a potential for interactions with sea otters.

The Application reports a single Kitsumkalum First Nation hunting/trapping location, crossed by the proposed Project at KP 544 on the Skeena River. This location does not fall within Kitsumkalum First Nation's asserted traditional territory.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat – as discussed in section 17.2.1 of this report - the proposed Project is expected to have negligible impacts on Kitsumkalum First Nation's asserted Aboriginal right to hunt in the area of the proposed Project.

Gathering

Concerns raised by the Kitsumkalum First Nation related to vegetation, wetlands, and gathering included:

- Effects on wetlands and vegetation;
- Effects on harvested plants, including medicinal plants;
- Perceived contamination of country foods from a spill;
- A Kitsumkalum Traditional Use Study is needed to inform the assessment of impacts to land and resources and use;
- Any residual effects to land and resources should be considered significant;
- Duration of effects is potentially the full length of the construction phase, 10 years, which could have significant effects to culture and way of life; and
- Concerns regarding herbicides/pesticides, including contamination of plants.

Berry picking is an important component of everyday life of Kitsumkalum First Nation members. Although current information on Kitsumkalum First Nation plant gathering is not available to EAO, Kitsumkalum First Nation members harvest a range of plant species, including the cambium of various species of trees, the inner bark of the red cedar, crab-apples, hazelnuts, soapberries, high-bush cranberries, huckleberries, high-bush blueberries, devil's club, Indian hellebore, Labrador tea, and hazelnuts. Hazelnuts were an important trade community for the Robin town community.

The Application reports a single plant gathering area at 71 km south of KPN 723, at Robin town, well outside the project corridor.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this 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.

Fishing

Kitsumkalum First Nation raised the following key concerns related to potential effects to fish, fish habitat, and the marine environment:

- Impacts to marine mammals, including sea otters;
 - Vessel traffic: injury/mortality, displacement;
 - Noise propagation in water resulting from blasting in the nearshore;
- Impacts to kelp and eel grass and to sponge reefs;
- Impacts to eulachon;
 - Eulachon outmigration from Nass should be considered in timing windows;
- Effects to Nass estuary and Skeena estuary and species that use them; RSA should include both in full;
- Impacts to fish and invertebrates:
 - Fish habitat offsetting plan should be included in the EA Application and discussed and reviewed with Kitsumkalum First Nation;
 - 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;
 - Noise propagation in water resulting from blasting in the nearshore;
 - Direct effects of construction on nearshore fish and invertebrates at landfall sites; and
 - Displacement of mobile invertebrate species due to habitat fragmentation;
 - recreational fishing by project personnel;
- Impacts to Aboriginal Groups' fishing activities:
 - Disruption of Aboriginal Groups' fishing due to construction; and
 - Perceived contamination of country foods from a spill;
- Disruption of marine navigability during construction;
- Dredging and sedimentation during process of marine pipe laying:
 - Effects on water quality;
 - Contamination of seafood;
 - Avoidance of areas by fish, marine mammals, and birds;
 - Concerns with methodology of Application analysis of sedimentation (dispersion modeling and significance evaluation);
 - Dredge plan and monitoring plan should be included in Application; and
 - Concerns with content, consultation, and methodology of future monitoring;
 - Mitigations require clarification;

- Marine cumulative effects assessment:
 - Concerns with methodology (e.g. should consider multiple project activities occurring concurrently); and
 - Disagree with assessment of duration and magnitude of effects;
- Effects on watercourses; reclamation and protection measures for watercourses;
- A Kitsumkalum TUS is needed to inform this section;
- Any residual effect to land and resources should be considered significant;
- Effects are listed as short-term and not significant during construction phase, but construction phase is a 10-year time frame which could significantly impact the entire culture and way of life of the Kitsumkalum First Nation; and
- Consultation with Kitsumkalum First Nation on marine environmental management plans prior to construction; permits/approvals prior to submission for approval; and post-construction monitoring plans (PCMPs) prior to start of project related activities. PCMPs related to second pipeline requires clarification.

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 pass and the Hecate Straits) throughout the winter, and all freshwater, saltwater, and anadromous species in the Kitsumkalum and Skeena Rivers. Skeena salmon are particularly valued.

Historically, the Kitsumkalum First Nation participated in the eulachon fishery on the Nass River, alongside members of other Tsimshian tribes and the Nisga'a.

Currently Kitsumkalum First Nation has two commercial fishing vessels.

The following fishing areas were identified in the Application:

- Crosses at KPK 9.9 km Nass River;
- 68.7 km southwest of KPN 750.98;
- 143 km southwest of KPK 672.85;
- Prince Rupert Port;
- Crosses at KP 544 Skeena River;
- 948 m southeast of Chatham Sound; and
- 42.4 km southeast of Grenville Channel.

The proposed Project corridor would cross approximately 2 major watercourses with indicated fish presence in Kitsumkalum First Nation's asserted traditional territory. Of the fishing areas crossed by the proposed Project route(s), both appear to be outside the asserted traditional territory of Kitsumkalum First Nation. One noted location is close to the route, less than a km southeast of in Chatham Sound.

The proposed Project routing and design were intended to mitigate some of the potential marine impacts of concern to Kitsumkalum First Nation. For example, the Proponent noted that:

- The pipeline corridor through the area of sponge reef complexes in Chatham Sound has been adjusted to maximize the distance between the pipe and known sponge reefs;
- The landfall at Ridley Island was adjusted to avoid impacts to valued habitats in the small cove to the north of the current landfall location; and
- The landfall at Nasoga Gulf was moved as far as practical from head areas of Nasoga Gulf where intertidal clam beds, eelgrass and archeological sites are located.

With respect to some of Kitsumkalum First Nation's concerns regarding impacts to their Aboriginal rights, it should be noted that although a complete, site-specific offset plan was not included in the Application, a conceptual offsetting plan was included in EA. With respect to the duration of construction, pipeline construction will occur over several months spread over 1 to 2 years for the first pipeline. If and when a second pipeline is constructed the same time frame for construction will apply.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have negligible impacts on Kitsumkalum First Nation's asserted Aboriginal right to fish in the area of the proposed Project.

Trapping

Kitsumkalum First Nation raised the following key concerns related to potential effects to wildlife, wildlife habitat, and trapping:

- A Kitsumkalum TUS is needed to inform this section;
- Any residual effect to land and resources should be considered significant;
- Effects are listed as short-term and not significant during construction phase, but construction phase is a 10-year time frame which could significantly impact the entire culture and way of life of the Kitsumkalum First Nation;
- Perceived contamination of country foods from a spill; and
- Loss of beaver dam/lodge.

A number of furbearers have been recorded as being trapped by Kitsumkalum First Nation members, including fox, beaver, marten, lynx, muskrat, river otter, squirrel, weasel, mink, hare, porcupine, and wolf.

Kitsumkalum First Nation trapping has been in decline since the 1950s. Forestry has affected access to traplines as well as habitat for a number of furbearing species, and provincial licensing requirements interfered with the matrilineal system of inheritance. Many of Kitsumkalum First Nation's traplines have been abandoned.

There is no information available to EAO regarding more recent trapping by Kitsumkalum First Nation members in the area of the proposed Project. The Application lists a single Kitsumkalum First Nation hunting/trapping site which crosses at KP 544 on the Skeena River, outside Kitsumkalum First Nation's asserted traditional territory.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use – as discussed in section 17.2.3 of this report - the proposed Project is expected to result in negligible impacts on Kitsumkalum First Nation's asserted Aboriginal right to trap in the area of the proposed Project.

Impacts to culturally important sites

Kitsumkalum First Nation raised the following concerns related to potential effects to culturally important sites:

- Effects are listed as short-term and not significant during construction phase, but construction phase is a 10-year time frame which could significantly impact the entire culture and way of life of the Kitsumkalum First Nation;
- Information from Kitsumkalum is not included in the baseline heritage setting or in the section on Aboriginal traditional knowledge, which instead relies on industry reports;
- Mitigation for previously unidentified archaeological sites should not place recovery of archeological materials second to the construction schedule;
- Cumulative effects assessment should consider during operations as well as construction;
- All heritage resource sites should be avoided; conduct further archaeological studies; and
- Kitsumkalum First Nation should be involved in the curation of any discovered artifacts/discovered artifacts should be sent to the University of Northern BC (UNBC).

The historical site of Robin Town was connected through a web of trails to fishing stations on the Skeena and Kitsumkalum River, which also served as overland trade routes. Many of these trails may have been linked into the regional Grease Trail running from Tseax Creek to the Skeena River. The Kitsumkalum Trading Road is believed to have run from Robin Town along the east site of the Kalum River, crossing to the west side of the Cedar River to the lava fields, and splitting into two roads ending at the Nass River, where the Kitsumkalum First Nation had eulachon fishing stations. This trail would be crossed by the pipeline route in some locations, and run parallel to it in others. Kitsumkalum First Nation camped across from Red Cliffs of the Nass River for the purposes of eulachon fishing and grease-making.

The Application lists the following sites of cultural importance to Kitsumkalum First Nation:

Habitation Areas

- Robin Town: 71 km south of KPN 723

Trails and Travelways

- Tseax River, 3.6 km northwest of KPN 666
- Nass River. Crosses at KPK 9.9 km
- Cedar River: 25.3 km southeast of KPN 667m and 49.2 km southeast of KPK 651.5
- Nisga'a Memorial Lava Bed Provincial Park: crosses at KP 666.8
- Skeena River: Crosses at KP 544

Sites described as being of Sacred Significance

- Nass River. Crosses at KPK 9.9 km

Gathering Places

- Red Cliff – Nass River, 2.3 km north of KPN 723

In consideration of the information provided 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 is expected to result in minor impacts to 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 16.8.

Other concerns raised by Kitsumkalum First Nation and responses from EAO, are outlined below.

Key Issue	EAO response
Post construction monitoring (PCM) should <ul style="list-style-type: none"> - consider layout of second pipeline - consider buried sections of pipeline (designed to mitigate fragmentation of habitat, e.g. for crab) 	EAO proposes a condition to require the Proponent to develop and implement an EMP prior to construction in accordance with Section 14 of the Application and engage with relevant regulatory authorities and Aboriginal Groups in the development of this and other management plans. The Proponent would also have to conduct a Post-Construction Monitoring Program in accordance with Section 14.2.1 of the Application.

18.3.4 Lax Kw'alaams Band

Context

- Lax Kw'alaams Band and Metlakatla First Nation are made up of people from ten former Tsimshian tribes; of those ten, nine continue to exist (the “nine Allied Tsimshian Tribes”). By the time of contact, the surviving nine Allied Tsimshian Tribes had relocated their winter villages from the lower Skeena River to the Prince Rupert area, and were eventually based 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. The village of Lax Kw'alaams (also referred to as Port Simpson) is located on the Tsimpsean 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 Councillors.
- As stated in the Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams (Interim Land Use Plan), over

2,000 traditional sites have been identified by the 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.

- The proposed Project would cross a total of approximately 150 km within Lax Kw'alaams Band's asserted traditional territory. The proposed Project pipeline corridor within Lax Kw'alaams Band territory is primarily in the marine environment, and includes two marine route options within Lax Kw'alaams Band territory:
 - The proposed 103 km Nasoga Route, with approximately 50 km on land along the south side of the Nass River valley to the Nasoga Gulf landfall; and 103 km of marine corridor from Nasoga Gulf to Ridley Island; or
 - The proposed Kitsault Route through Alice Arm and Observatory Inlet enters Lax Kw'alaams Band traditional territory in the vicinity of Portland Inlet, Nass Bay and Observatory Inlet and continues from Nasoga Gulf to Ridley Island.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- Lax Kw'alaams Band is listed on Schedule B of the Section 11 Order.
- One compressor station and one temporary work camp are proposed to be in Lax Kw'alaams Band's asserted territory. The Proponent estimates the proposed Project would involve construction of approximately 1 km of temporary access roads and no new permanent access roads in Lax Kw'alaams Band's asserted territory.
- As articulated in its letter to Lax Kw'alaams Band on December 20, 2013, EAO initially assessed the strength of Lax Kw'alaams Band and Metlakatla First Nation's *prima facie* claim of Aboriginal rights to fish, gather, hunt and trap marine and terrestrial resources, in the vicinity of the proposed Project, to be strong.
- 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 and Metlakatla First Nation have a strong *prima facie* 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. Although 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 permissions of the nine Allied Tsimshian Tribes, however, EAO continues to be of the view that permission was likely required.

- EAO has determined that the duty to consult Lax Kw'alaams Band lies toward the deeper end of the *Haida* spectrum.

Summary of Consultation

Lax Kw'alaams Band was invited to review and provide comments on the draft Application Information Requirements, 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 capacity funding to Lax Kw'alaams Band to facilitate their participation in the EA review process and to conduct TLU and socio-economic studies for the proposed Project. Discussions are currently ongoing between the Proponent and Lax Kw'alaams Band to finalize a Capacity Funding Agreement.

Lax Kw'alaams Band elected to conduct a TLU and socio-economic study for the proposed Project, but these have not been provided. The studies could inform detailed planning and ongoing discussion between the Proponent and Lax Kw'alaams Band of mitigation during all subsequent phases of the proposed Project, if completed and provided.

The Proponent provided Lax Kw'alaams Band with draft Aboriginal Consultation Reports 2 and 3 for review and comment. The Application was delivered to Lax Kw'alaams Band on May 1, 2014.

The Proponent met with Lax Kw'alaams Band and held discussions, including: review of the proposed Project corridor; contracting and employment opportunities; economic benefits; marine technical routing including marine construction; and biophysical baseline studies. Lax Kw'alaams Band participated in the AUV survey.

In response to a community meeting offered to Lax Kw'alaams Band by the Proponent, Lax Kw'alaams Band advised that they would identify prospective dates for September 2014.

The Proponent has continued to share updated information on the proposed Project, including: information regarding the marine sampling program; investigative use permit applications; and information with respect to the regulatory process.

Lax Kw'alaams Band was invited by EAO to participate in all Advisory Working Group meetings and information sessions, and attended the following meetings:

- Marine Technical Working Group Meetings on May 15-16, 2013; February 12, 2014; and July 21-22, 2014;
- Project Overview Working Group Meeting on February 5, 2014;
- Fish and Water Technical Working Group Meetings on February 6 and July 16, 2014;
- Heritage and Archaeology Working Group Meeting July 14, 2014;
- Wildlife and Vegetation Technical Working Group Meetings on July 15, 2014;
- Socio-economic and Health Working Group Meeting July 17, 2014; and
- Lax Kw'alaams Band attended the Regional First Nations Workshop on northern pipelines held in Prince George on February 4, 2014;

Lax Kw'alaams Band was invited by EAO, but did not attend, a Regional First Nations Workshop on LNG Facilities and Natural Gas Pipelines on November 28, 2013 in Terrace and a meeting with Coastal First Nations on July 25, 2014 in Prince Rupert.

In addition, there was ongoing discussion and written correspondence with EAO and the Proponent (see tracking table in Appendix 2 for further details). Lax Kw'alaams Band provided several letters to EAO and the Proponent with extensive comments and concerns during Pre-Application and Application Review, including:

- Potential effects of the proposed Project on Lax Kw'alaams' 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' comments;
- Lack of meaningful consultation regarding the proposed route alternatives; Application Evaluation/Screening comments expressing concerns including: 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 on the draft AIR;
- Application Review concerns including insufficient assessment of potential cumulative effects and impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests. Lax Kw'alaams Band detailed Application Review comment are included in the Tracking Table (Appendix 2);
- Concerns with the Conceptual Marine and Freshwater Habitat Offsetting Plan, including the timing of this report leading to insufficient time to review and provide comments;
- Concerns with respect to cumulative effects assessment and the level of development existing and proposed for the Prince Rupert Harbour area;
- Inadequate consideration of the residual and cumulative impacts of LNG development proposed in Lax Kw'alaams Band asserted territory; and
- Insufficient time for reviewing the Application and providing comments.

A project-specific TLU report was not provided by Lax Kw'alaams Band and was not included in the Application or EAO's assessment below on potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests.

The Interim Land and Marine Resources Plan (LMRP) of the Allied Tsimshian Tribes of Lax Kw'alaams (ATTL 2004) identifies areas of importance within Lax Kw'alaams Band's asserted traditional territory. In the absence of project-specific TLU report, EAO has reviewed the Interim LMRP (ATTL 2004) for additional information on Lax Band current and traditional land use within the proposed Project area.

Potential impacts of the proposed Project on Lax Kw'alaams Band's Aboriginal Interests

Aboriginal Title

EAO has attempted to address potential impacts to Lax Kw'alaams Band's Aboriginal title claim by ensuring that Lax Kw'alaams Band is 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 16.6. 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.

Further to the discussion in section 17.2.7 of this report regarding the potential impacts of the proposed Project on Aboriginal title claims, 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.

The ATTL 2004 identifies several hunting areas within Lax Kw'alaams Band's asserted traditional territory. Detailed information on hunting sites and the approximate distances away from the proposed Project is not available.

There are several Lax Kw'alaams Band hunting sites within 5-10 km of the proposed Project area including: Prince Rupert Harbour, Dundas Island, Melville Island, the lower Skeena River, Portland Inlet and the Nass River area.

Several islands (e.g., Ridley Island, Dundas Island, Melville Island) are used by the nine Allied Tsimshian Tribes for hunting various marine wildlife species. Ridley Island has important hunting areas for hunting deer, waterfowl, seal, mink and otter within 2 km of the proposed Project 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 km west of the proposed marine pipeline route in Chatham Sound.

Key issues raised by Lax Kw'alaams Band regarding wildlife and hunting included:

- 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;
- Proposed mitigation measures including construction timing to mitigate potential effects to marine and terrestrial wildlife species;
- Construction timing and mitigation measures must be developed in consultation with Lax Kw'alaams Band;
- Potential access related effects during construction of the proposed Project, 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 blasting activities with potential injury, mortality and behavioural disturbance marine mammals (e.g., harbour seals, sea lions, humpback whales, northern resident killer whales, harbour porpoise);
- Disruption to hunting activities during construction and operation; and
- Alteration of hunting sites during construction and operation.

The Lax Kwaxl/Dundas and Melville Islands Conservancy located approximately 20 km west of the village of Lax Kw'alaams Band is an important ecological area, and current and traditional harvesting area, for wildlife including marine mammals (e.g. seals, sea lions), birds and other wildlife hunted by Lax Kw'alaams Band. The conservancy area is located immediately adjacent (west) of the RSA for the Marine Environment VC and Current and Traditional Land Use VC. The proposed Project marine pipeline corridor in Chatham Sound is located approximately 8-10 km east of the conservancy boundary and is not expected to result in any adverse effects to marine wildlife habitat or species within the conservancy.

Other conservancy areas within Lax Kw'alaams Band's asserted traditional territory with important wildlife habitat, and current and traditional land use activities related to hunting include: Ksgaxi/Stephens Island Group, Lucy Islands, Rachael Islands, Kinahan Islands, Ksi X'Anmas and Khutzeymateen Inlet.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.1 of this 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

Lax Kw'alaams Band raised the following key concerns related to potential effects to wildlife, wildlife habitat, and trapping:

- 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.

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 identified in the Application include:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
Ridley Island within 0-2km of the proposed Ridley Island landfall	Trapping area for mink and otter.
Dundas Island and Melville Island approximately 10km west of proposed Project marine pipeline in Chatham Sound	Trapping area for various wildlife

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in section 17.2.3 of this 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.

Lax Kw'alaams Band 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 activities including construction effects on marine travel routes and access to fishing areas.

Key issues raised by Lax Kw'alaams Band regarding fishing include:

- Potential effects to fish, fish habitat and fish populations in the marine environment from marine pipeline construction and seabed modifications, resulting in disruption to subsistence fishing activities during construction and operation;
- Potential injury or mortality to fish and effects to critical habitat for juvenile salmon in the Skeena estuary during dredging for construction of the pipeline landfall on Ridley Island;
- Potential effects on marine navigation for fishing vessels and effects on fishing activities during construction, particularly around Ridley Island, Prince Rupert and Port Edward for Skeena River salmon fisheries;
- Uncertainty in the assessment of potential effects depending on construction timing for dredging at Ridley Island landfall, fisheries timing windows, potential effects to critical juvenile salmon habitat and potential cumulative effects associated with multiple proposed LNG projects, as well as existing and future industrial developments in the Prince Rupert area;
- Concerns of potential contamination to fish and crab from proposed dredging at the Ridley Island landfall and historically contaminated marine sediment from the historic Skeena Cellulose Pulp Mill effluent discharges;
- Modelling results and dredging mitigation plans for sediment re-suspension, dredge material disposal plans and uncertainty regarding the effectiveness of proposed mitigation;
- Potential human health risks, including perceived risks, associated with potential contamination and consumption of fish, crab and other seafood harvested in areas around Ridley Island and potential impacts on the Aboriginal right to fish;
- Potential underwater noise effects from construction vessels and blasting activities with potential injury, mortality and behavioural disturbance to fish;

- Potential crab migration barrier effects from proposed marine pipelines to be laid directly on the seafloor in important crab harvesting areas in Chatham Sound;
- Potential effects to fish, fish habitat and fish populations including Skeena River salmon and Nass River eulachon from construction of watercourse crossings;
- Request for additional information on construction and post-construction environmental monitoring, including cumulative effects monitoring to ensure effectiveness of proposed mitigation and validation of the predicted effects in the Application;
- Alteration of fishing sites during construction and operation; and
- Potential effects to marine and terrestrial wildlife and wildlife habitat.

Section 11 (Table 11.14-1) of the Application identifies several fishing areas within Lax Kw'alaams Band's Traditional Territory in proximity to the proposed Project, including:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
Crosses at KP 544	Skeena River
Crosses Kitsault alternate (9.9 km)	Nass River
3 km north of KPN 717.5	Fishery Bay- Nass River eulachon fishing areas
63.2 km southwest of KP 750.9	Dundas Island Group
Within 2 km of Ridley Island pipeline terminal KP 102	Skeena River estuary salmon fishing areas

Key areas for salmon harvesting include: the lower Skeena River and its tributaries, the Skeena estuary, Dundas Island, Stephens Island, Chatham Sound and several other areas throughout Lax Kw'alaams Band's traditional territory.

The primary site for eulachon harvesting is the Nass River estuary near Red Bluff and Fishery Bay. The proposed Nasoga Route option crosses on land along the south side of the Nass River Valley approximately 3 km south of Red Bluff.

Fishing for halibut occurs throughout Chatham Sound, primarily near Dundas Island which is located approximately 10-12 km west of the proposed Project marine corridor. Dungeness crab and other species are harvested throughout Chatham Sound including areas within 2 km of the proposed Project corridor.

The proposed Project pipeline route within Lax Kw'alaams Band's asserted traditional territory is primarily within the marine environment. The proposed Project corridor would cross approximately 25 major watercourses with indicated fish presence in Lax Kw'alaams Band's area of traditional use. These are located within a small portion of

the proposed Nasoga Corridor near Iceberg Bay and Nasoga Gulf; and the Kitsault Corridor (tributaries to the Illiance River) near the head of Alice Arm.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish and fish habitat, current and traditional land use – as discussed in section 17.2.2 of this 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 through Lax Kw'alaams Band's traditional territory.

The ATTL 2004 identifies several plant gathering areas within Lax Kw'alaams Band's asserted traditional territory. However, detailed information on plant gathering sites and the approximate distances away from the proposed Project is not available.

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.

Seasonal berry picking, medicinal plant gathering and cedar and hemlock bark collecting are activities that are still practiced by Lax Kw'alaams Band members.

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, Hudson Bay tea, hemlock bark, jackpine sap and needles, fireweed, cow parsnip and devil's club.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, and current and traditional land use – as discussed in section 17.2.4 - of this 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

Section 11 of the Application identifies several culturally important sites, trails and travelways for Lax Kw'alaams Band within the vicinity of the proposed Project and the Current Use of Lands and Resources for Traditional Purposes RSA.

Known Lax Kw'alaams Band's gathering places occur at Lakelse Lake, Dundas Island and at Stephens Island.

Information regarding sites described as being of sacred significance in the Current Use of Lands and Resources for Traditional Purposes RSA for Lax Kw'alaams Band was not available during compilation of the Application.

There are several current and traditional marine transportation routes that provide access to culturally important areas, fishing, hunting and trapping and other resource harvesting areas in the waters and lands around Lax Kw'alaams Band, Prince Rupert Harbour, Ridley Island, Dundas Island, Melville Island, Chatham Sound and Portland Inlet.

Marine transportation corridors, overland trail systems and water routes provide access to important resource harvesting areas including hunting, trapping, fishing and other resource harvesting activities along the these routes.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Culturally important sites	
Habitation	
77.4 km southwest of KPN 714	Lakelse River ancient city
Gathering Places	
91 km southeast of KPN 696	Lakelse Lake
54.3 km southwest of KPN 751	Dundas Island
87.9 km southwest of KPN 751	Stephens Island
Red Bluff (2.4 km south of KPN 721/54.8 km southwest of KPK 672) on the Nass River	Campsite at Red Bluff on the north shore of the Nass River associated with the Nass River eulachon fishery
Trails and travelways	
55.6 km southwest of KPN 751	Skeena Trail
59 km north of KPK 654	Work Channel Trail
Marine travel routes within 5 km of the proposed marine pipeline corridor in Chatham Sound.	Marine travel routes to resource harvesting areas throughout Chatham Sound, including Dundas Island, Stephens Island, Ridley Island and Skeena River estuary.
Marine travel routes within 2 km of the proposed pipeline Ridley Island landfall.	Marine travel routes associated with Skeena River salmon fisheries around Ridley Island and Skeena River estuary.
Marine travel routes to the Nass River and Red Bluff (2.4 km south of KPN 721)	Marine travel route from Lax Kw'alaams north to Portland Inlet, the Nass River estuary and campsites at Red Bluff associated with Nass River eulachon fishery.

In consideration of the information provided 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 report - the proposed Project is expected to have minor 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 16.8. Other concerns raised by Lax Kw'alaams Band and responses from EAO, are outlined below.

Key Issue Raised	EAO Response
Effects to the Eulachon fishery – timing windows are crucial. Request for information regarding studies conducted with respect to Eulachon and disturbance around Ridley Island and deep sea.	The Proponent recognizes that Eulachon fishery is important to Lax Kw'alaams Band and would like to continue discussions with them. The Proponent will avoid activities during sensitive timing windows for wildlife and fish. Where identified and appropriate, the Proponent will look to conduct work in areas of critical importance to identify species during time periods when fish are absent (instream work windows or cultural/sport/commercial fishing seasons), avoiding sensitive habitat and life cycles (i.e., avoidance of instream work at sensitive locations or times), locating rights of way away from riparian areas, managing water quality and quantity and avoiding or reducing erosion and potential sediment entry into streams.
Interest in participating in field studies - Crab Migration study	Participation in the Proposed Project's field studies to help inform mitigation measures is encouraged. The Proponent will facilitate a meeting between Lax Kw'alaams Band and its contractors who are leading the crab migration study.

18.3.5 Metlakatla First Nation

Context

- Metlakatla First Nation and Lax Kw'alaams Band are made up of people from ten former Tsimshian tribes; of those ten, nine continue to exist (the "nine Allied Tsimshian Tribes"). By the time of contact, the surviving nine Allied Tsimshian Tribes had relocated their winter villages from the lower Skeena River to the Prince Rupert area, and were eventually based around the Fort Simpson Hudson's Bay Company trading post to take advantage of trade opportunities with European fur traders.
- The First Nation community of Metlakatla is located about 7 km northwest of Prince Rupert, BC on the Tsimshian 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. 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 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 RSA.

Aboriginal Interests and EAO's Strength of Claim Assessment and Depth of Consultation

- The proposed Project would cross through 100 to 200 km of Metlakatla First Nation's asserted territory, depending on the proposed marine route option.
- Metlakatla First Nation is listed in Schedule B of the Section 11 Order.
- Two compressor stations and one temporary work camp are proposed to be in Metlakatla First Nation's asserted territory. The Proponent estimates the proposed Project would involve construction of approximately 5 km of temporary access roads and 5 km of new permanent access roads in Metlakatla First Nation's asserted territory
- The proposed Project routes within Metlakatla First Nation's asserted territory are located primarily in the marine environment, however also include small portions on land near the Nasoga Route and Kitsault Route landfalls.
- The total length of the proposed marine routes include: Nasoga Gulf to Ridley Island (103 km); and Kitsault to Ridley Island (183 km) including Alice Arm, Observatory Inlet and Chatham Sound to the proposed pipeline terminal on Ridley Island near Prince Rupert Harbour.
- The proposed marine pipeline corridor 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 and Lax Kw'alaams Band'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 and Lax Kw'alaams Band have 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 (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 permission was likely required.

- 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 duty to consult the Metlakatla First Nation lies in the middle to deep part of the *Haida* spectrum.

Summary of Consultation

Metlakatla First Nation was invited to review and provide comments on the draft Application Information Requirements, 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 capacity funding for Metlakatla First Nation to engage in review of the proposed Project with a Capacity Funding Agreement signed in August 2013. Capacity funding was provided to support completion of a socio-economic and traditional land use (TLU) study; and to support ongoing consultation in meetings and other activities with the Proponent and regulatory agencies.

Metlakatla First Nation provided an interim Socio-Economic Impact Assessment Report to the Proponent in December 2013, and an interim TLU report in March 2014, however the final reports were not provided within the designated timeframe and were not included in the EA Application. Metlakatla First Nation provided a final TLU Report and Socio-Economic Impact Assessment Report to the Proponent and EAO on June 23, 2014. The Proponent noted these final reports will form the basis for on-going dialogue between the Proponent and Metlakatla First Nation and inform detailed planning of the proposed Project. The final reports have also been considered by EAO in this Assessment Report.

The Proponent held a community meeting for Metlakatla First Nation in 2013 and met with Metlakatla First Nation in four face-to-face meetings from January 1, 2014 to June 30, 2014.

The Proponent has continued to share updated information on the proposed Project, including information regarding the marine sampling program, investigative use permit applications, and information with respect to the regulatory process.

On January 29, 2014, the Proponent provided a technical marine routing review including marine pipeline construction methodology. The purpose of this meeting was to provide an update on the proposed marine route options, marine baseline studies, construction methods and mitigation measures and gather input and concerns from Metlakatla First Nation in respect of the proposed Project.

The Proponent also provided Metlakatla First Nation with shapefiles of the proposed route and continues to be available to meet to discuss routing through Metlakatla First Nation's traditional territory.

Metlakatla First Nation participated in the following meetings and regional workshops:

- Marine Technical Working Group Meetings on May 15-16, 2013; February 12, 2014; and July 21-22, 2014 in Prince Rupert;
- Fish and Wildlife Technical Working Group Meeting February 6, 2014
- Socio-economic and Health Working Group Meeting July 17, 2014
- Regional First Nations Workshop – Natural Gas Pipelines and LNG Facilities on November 28, 2013 in Terrace;
- Regional First Nations Workshop - Northern Pipelines on February 4, 2014 in Prince George; and
- Meeting with EAO and several Aboriginal Groups including Metlakatla First Nation on July 25, 2014 in Prince Rupert.

In addition, there was ongoing discussion and written correspondence with EAO and the Proponent (see tracking table in Appendix 2).

Metlakatla First Nation (Metlakatla Stewardship Office) provided several letters to EAO and the Proponent with extensive comments and concerns with the proposed Project, including:

- Pre-Application comments on the draft Application Information Requirements and Application Evaluation/Screening;
- Application Review comments and concerns. A total of 102 comments were submitted and are included in the Application Review Tracking Table (Appendix 2); and
- July 2, 2014 letter to the Minister of Environment expressing concerns regarding the EA process, timeline constraints with multiple proposed LNG projects within Metlakatla First Nation's traditional territory, insufficient assessment of

cumulative effects, and the Crown's duty to consult. Metlakatla First Nation requested extensions to the EA timeline to address their concerns raised and allow meaningful consultation.

Key concerns raised by Metlakatla First Nation during Application Review included, but are not limited to:

- The Application (Section 11) has very limited baseline TLU information on Metlakatla First Nation's use and occupancy in their traditional territory and 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 TLU and Socio-Economic Study (provided June 23, 2014) in the baseline information and redo the analysis in Section 11 for assessment of potential impacts on Metlakatla First Nation's Aboriginal Interests;
- Potential effects in the marine environment, particularly associated with dredging and construction of the marine pipeline landfall at Ridley Island; and
- Inadequate assessment of potential cumulative effects and potential impacts on Metlakatla First Nation's Aboriginal Interests.

On July 25, 2014 in a meeting with EAO and several Aboriginal Groups in Prince Rupert, 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 by Metlakatla First Nation on June 23, 2014 in the final TLU Report and Socio-Economic Study for assessing potential impacts on Metlakatla First Nation's Aboriginal Interests.

EAO has considered the final TLU Report and Socio-Economic Study (2014) as supplemental information in its assessment of potential impacts on Metlakatla First Nation's Aboriginal Interests summarized below.

EAO considered Metlakatla First Nation's comments on the draft Assessment Report received on October 14, 2014, and incorporated them into the final version of the report where appropriate. These included concerns relating to consultation:

- All meetings with the EAO on this proposed 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 with Metlakatla First Nation and noted outstanding consultation obligations remain. No meaningful engagement between the Proponent and Metlakatla First Nation has

occurred since submission of the final TLU and Socio Economic reports by Metlakatla First Nation in June 2014; and

- Metlakatla First Nation expressed concerns regarding EA timelines, consultation requirements and capacity constraints in reviewing multiple projects.

Potential impacts of the proposed Project on Metlakatla First Nation's Aboriginal Interests

Aboriginal Title

EAO has attempted to address potential impacts to Metlakatla First Nation's Aboriginal title claim by ensuring that Metlakatla First Nation is meaningfully consulted and accommodated around the potential effects of the proposed Project. The Province and the Proponent have approached Metlakatla First Nation 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 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.

Further to the discussion in section 17.2.7 of this report regarding the potential impacts of the proposed Project on Aboriginal title claims, 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 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 (DMCS and Metlakatla First Nation 2014).

- Key issues raised by Metlakatla First Nation related to potential impacts of the proposed Project on wildlife, wildlife habitat and hunting activities include: 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;
- Request for mitigation measures including construction timing and avoidance of critical wildlife species timing windows;

- Construction timing should be developed in concert with Metlakatla First Nation to ensure inclusion of TEK and TLU information and ensure timelines are appropriate to local conditions;
- Potential effects of blasting on marine wildlife, especially along the pipeline route approaching Ridley Island; and
- Potential access related effects to use of traditional hunting grounds and increased hunting pressure on wildlife from altering access in the area for Aboriginal and non-Aboriginal hunters.

The Application did not identify specific hunting areas used by Metlakatla First Nation near the proposed Project area. The final TLU Report provided by Metlakatla (DCMS and Metlakatla First Nation 2014) included additional hunting areas and marine transportation routes to hunting areas within 2 km of the proposed Project marine pipeline corridor.

Several islands (e.g., Ridley Island, Dundas Island, Melville Island) are used by Metlakatla for hunting various marine wildlife species. Ridley Island is an important terrestrial and intertidal hunting area for deer, waterfowl, and seal, trapping area for mink and otter, and berry picking, medicinal and food plant collecting 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 which located approximately 10 km west of the proposed marine pipeline route in Chatham Sound.

As noted in the final TLU Report (2014), there are several marine and terrestrial hunting areas for killer whale, bear, mountain goat, and a variety of birds throughout Portland and Observatory Inlets within 2 km of the proposed Project marine pipeline corridor.

The Lax Kwaxl/Dundas and Melville Islands Conservancy located approximately 20km west of the village of Metlakatla is an important ecological area, and current and traditional harvesting area, for wildlife including marine mammals (e.g. seals, sea lions), birds and other wildlife hunted by Metlakatla First Nation. The conservancy area is not included within the Application's RSA spatial boundary for the Marine Environment VC, however is located immediately west of the RSA. The proposed Project marine pipeline corridor in Chatham Sound is located approximately 10 km east of the conservancy boundary and is not expected to result in any adverse effects to marine wildlife or wildlife habitat within the conservancy.

Other conservancy areas with important current and traditional land use activities related to hunting within Metlakatla First Nation's asserted traditional territory include: Ksgaxi/Stephens Island Group, Lucy Island, Rachael Islands, Kinahan Islands, Ksi

X'Anmas, Khutzeymateen Inlet and Inlet West, and Ksi Xts'At'Kw/Stagoo in Observatory Inlet.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat and current and traditional land use – as discussed in 17.2.1 of this 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.

Key issues raised by Metlakatla First Nation related to potential impacts of the proposed Project on wildlife, wildlife habitat and trapping activities include:

- Potential adverse effects to wildlife and wildlife habitat;
- Disruption to trapping activities during construction and operation; and
- Alteration of trapping sites during construction and operation.

Section 11 (Table 11.14-1) of the Application and Metlakatla First Nation's final TLU Report (2014) identifies important trapping areas in proximity to the proposed Project, including:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
13.1 km west	Dundas Island trapping area for beaver, mink and river otter.
Within 1 km from pipeline terminal on Ridley Island	Ridley Island trapping area for mink and otter

Other areas within Metlakatla First Nation's asserted traditional territory as described in the hunting section above, and noted in Metlakatla First Nation's final TLU report (2014), may also be utilized for trapping. Ridley Island has important trapping areas for mink and otter within 1km of the proposed Project pipeline terminal.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on wildlife, wildlife habitat and

current and traditional land use – as discussed in section 17.2.3 of this 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 Metlakatla First Nation 2014). Marine and freshwater fish are harvested throughout their traditional territory for food, social, spiritual 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 and its members participate in commercial and aboriginal fisheries including the Skeena River and Nass River salmon and eulachon fisheries, as well as groundfish, crab, geoduck, herring and herring spawn-on-kelp fisheries.

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, 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 Nine Allied Tsimshian Tribes' annual cycle, lasting from June through October (DMCS and Metlakatla First Nation 2014).

Ridley Island is identified as an important fishing area. The marine waters near Ridley Island, between Lelu and Stapledon Islands, over Flora Bank, and through Inverness Passage are some of the main Sockeye salmon fishing areas (DCMS and Metlakatla First Nation 2014).

Metlakatla First Nation participated in the May 27, 2014 near shore marine fish sampling program. Metlakatla First Nation also noted interest in participating in a crab tagging program to determine key areas of crab migration along the marine pipeline corridor and mitigate potential crab migration barrier effect. Metlakatla First Nation provided Marine Mammal Observers during the Proponent's Marine AUV survey with respect to the Proposed Project in April 2014.

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 activities.

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 Ridley 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 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 Ridley Island;
- Potential cumulative effects on marine navigation and access to fishing areas during construction, particularly around Ridley Island, Lelu Island, Flora Bank, Porpoise Channel and Port Edward;
- The Application suggests that approximately 280,000m³ of dredged marine sediment from the Ridley Island landfall site may need to be disposed at sea, however, the dredging and potential disposal at sea is not included further in the assessment of Marine Environment VCs, Current Uses of Lands and Resources, or potential impacts to Metlakatla First Nation Aboriginal Interests;
- Potential effects to marine sediment, water quality, marine life, seafood harvesting areas and human health concerns associated with dredging historically contaminated marine sediment at the Ridley Island landfall and the Kitsault landfall in Alice Arm;
- 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 dredge material disposal plans, effectiveness of proposed mitigation and 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); and

- Potential effects to fish and fish habitat from construction of pipeline watercourse crossings.

Section 11 (Table 11.14-1) of the Application identifies several fishing areas important for Metlakatla First Nation in proximity to the proposed Project corridor, including:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
25.6 km southeast	Eulachon harvest on Ecstall River
14 km northwest	Eulachon harvest in Pearse Canal
Crosses at KP 638.7	Eulachon harvest on Nass River
In shipping lane	Eulachon harvest in Observatory inlet
81.9 km southeast of KP 689	Eulachon harvest on Zymoetz River
16.9 km southwest	Abalone harvesting around Stephens Island
8.1 km northeast	Abalone harvesting in Metlakatla Pass
19 km southwest	Herring Roe-on-Kelp harvested around Tree Nob Islands
16.9 km southwest	Herring Roe-on-Kelp harvested around Stephens Island
13 km south	Herring Roe-on-Kelp harvested around Porcher Island
13.1 km west	Dundas Island

Additional fishing areas within 2 km of the proposed Project marine pipeline corridor were identified in the final TLU report (DMCS and Metlakatla First Nation 2014), however were not included in the Application. Key fishing areas near the proposed Project identified in the final TLU report (2014) are summarized below and have been considered in EAO's assessment.

The marine waters near Ridley Island, between Lelu and Stapledon Islands, over Flora Bank, and through Inverness Passage are some of the main Sockeye salmon drifts and salmon fishing areas. These locations are approximately 1 km to 5 km from the proposed Project marine pipeline corridor and terminal at Ridley Island.

The primary sites for eulachon harvesting include Observatory Inlet, Nass Bay and the Nass River and Skeena River estuaries. These fishing sites are located within 5 km of the proposed Project corridor.

Fishing for halibut primarily occurs in Chatham Sound near Dundas Island within 10km of the proposed Project corridor. Abalone was traditionally harvested around Stephens Island located approximately 20 km west of the proposed Project corridor.

Dungeness crab, prawn and other species are harvested throughout Chatham Sound including areas within 2 km of the proposed Project corridor. Crab harvesting overlaps with the proposed pipeline corridor approach to the Ridley Island landfall.

The west side of Ridley Island near Coast Island, within 1 km of the proposed Project, is an important fishing area actively utilized by Metlakatla First Nation members for harvesting various salmon species and crab. Importantly, the intertidal zones and coastal beaches of Ridley Island, and the islands throughout Chatham Sound and Portland Inlet provide a rich variety of shellfish, fish and other food resources harvested (DMCS and Metlakatla First Nation 2014).

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 has a proposed future aquaculture facility located west of Digby Island located within 2 km of the proposed pipeline corridor in Chatham Sound.

The proposed Project corridor within Metlakatla First Nation's asserted traditional territory is primarily within the marine environment. The proposed Project corridor would cross approximately 10 major watercourses with indicated fish presence in Metlakatla First Nation's asserted territory. These watercourse crossings are limited within a small portion of the proposed Nasoga Route near Iceberg Bay and Nasoga Gulf and the Kitsault Route within the Illiance River watershed near Alice Arm.

As noted in the final TLU Report (2014), the close proximity of the proposed Project footprint to the Metlakatla First Nation's fishing grounds on the Skeena River is of concern to Metlakatla First Nation Elders, as hydrocarbon leaks or spills and impacts on rearing habitat may compromise the fisheries permanently.

In review of the draft Assessment Report, Metlakatla First Nation expressed additional concerns regarding potential adverse effects to fisheries, cumulative impacts on the Aboriginal right to fish from multiple proposed projects and cumulative reduction in access to fisheries. Metlakatla First Nation's final socio-economic assessment report shows that both traditional and commercial Metlakatla fishers are close to operating at a threshold of sustainability. Any adverse impact to the fisheries would therefore be significant.

Metlakatla First Nation expressed concern regarding potential effects to juvenile salmon near Ridley Island, and noted it is unclear how the Marine Environmental Management Plan (EMP) will address potential effects to fisheries and marine

navigation. Metlakatla First Nation requested a condition for further characterization of the impacts and mitigation plans to avoid impact on Aboriginal fisheries needs to be developed with First Nations and DFO to address potential impacts to salmon, eulachon, herring, crab and prawn (all accessed commercially and traditionally by Metlakatla First Nation). EAO's response to this concern includes the following:

- EAO proposes a Condition requiring the Proponent to develop an EMP prior to construction and in accordance with Section 14 of the Application, which includes a Marine EMP. The Marine EMP, outlined in Section 14 and described in Appendix 3B of the Application, includes development of site-specific least risk timing windows, in consultation with DFO and Aboriginal Groups, in order to avoid and minimize potential effects to fish and fish habitat from dredging and construction of the Ridley Island and other landfall sites. Development of the final EMP with construction timing windows and detailed mitigation plans required for permitting applications, would include consideration of fish species presence and life cycle timing at each landfall (i.e., to avoid potential effects to salmon, eulachon, herring, crab and other species). The Marine EMP also includes a Marine Traffic Management Plan for minimizing potential effects to marine uses including commercial and Aboriginal fisheries.
- The Marine EMP also includes: a Marine Species and Ecological Communities of Concern Contingency Plan; Marine Navigation Safety Plan; Marine Waste Management Plan; Emergency Response Plan; Seabed Sediment and Water Quality Monitoring Plan; as well as Pre-Construction Monitoring, Construction Monitoring and Post-Construction Monitoring Programs for dredging activities at Ridley Island and Alice Arm.
- EAO proposes a specific Condition requiring the Proponent to develop and implement a Marine Access Traffic Management Plan to specify mitigation measures to reduce disruption to marine use including Aboriginal Group use, fishing areas for commercial, recreational and Aboriginal fisheries; and specify actions to inform affected Aboriginal Groups.
- EAO proposes several other specific Conditions requiring the Proponent to develop and implement a Fisheries Interaction Plan; Marine Mammal Monitoring Plan; Crab Movement Mitigation and Monitoring Plan; Marine Sediment Management Plan; and Marine Sediment and Water Quality Monitoring Plan.
- In addition, EAO proposes a specific Condition requiring the Proponent to consult with Aboriginal Groups in the development of the EMP and various plans and permitting applications. The Proponent would be required to consult with Aboriginal Groups in developing a final Marine EMP and

permitting applications to DFO to confirm *Fisheries Act* Authorization requirements and offsetting plans potentially required by DFO for serious harm to fish that are part of, or support, a commercial, recreational or Aboriginal fishery.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on freshwater and marine fish and fish habitat, navigation and traditional land use activities related to fishing – as discussed in section 17.2.2 and 17.2.6 of this 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 the Metlakatla. Cedar wood and bark is used for making canoes, totem poles and for weaving.

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's traditional territory including Tugwell Island, Big Bay and throughout Chatham Sound within 5 km of the proposed Project corridor. As a substrate for herring roe-on-kelp, both bull and giant kelp are important marine plants gathered throughout Chatham Sound. Seaweed and kelp is also harvested near Dundas Island located approximately 10-13 km west of the proposed Project corridor in Chatham Sound.

Section 11 (Table 11.14-1) of the Application identifies plant gathering areas important for Metlakatla First Nation in proximity to the proposed Project, including:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
13.1 km west	Dundas Island plant gathering area

As noted in Metlakatla First Nation's final TLU Report (2014), Ridley Island is an important berry picking, medicinal and food plant collecting area with a high density of TLU sites. These plant gathering sites are located within 1 km of the proposed Project pipeline terminal on Ridley Island.

Given the nature and type of gathering required for marine plants, Metlakatla First Nation expressed concern that potential impacts from the proposed Project will be similar to those predicted in the fishing section. Metlakatla First Nation indicated construction timing windows may help to reduce impacts to marine plant harvesting, but these mitigation measures need to be developed and assessed before conclusions can be finalized.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, and current and traditional land use – as discussed in section 17.2.4 of this report - the proposed Project is expected to result in negligible impacts on Metlakatla First Nation's gathering activities in the area of the proposed Project.

Culturally important sites, trails and travelways

Section 11 of the Application identifies culturally important sites, trails and travelways for Metlakatla First Nation within the vicinity of the proposed Project and the Current Use of Lands and Resources for Traditional Purposes RSA.

Information regarding sites described as being of sacred significance in the Current Use of Lands and Resources for Traditional Purposes RSA for Metlakatla First Nation was not available during compilation of the Application.

Section 11 (Table 11.14-1) of the Application identifies Metlakatla First Nation's culturally important sites, trails and travelways in proximity to the proposed Project, including:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Culturally important sites	
Habitation Areas	
13.1 km west	Dundas Island campsites and harvest areas
Archaeology sites	
19 km southwest	Archaeological sites on Tree Nob Islands
16.9 km southwest	Archaeological sites on Stephens Island
20.8 km west	Archaeological sites on Triple Islands
17.9 km southwest	Ancient Nine Allied Tsimshian Tribes Village of Lax Gota

Metlakatla First Nation's final TLU report (DMCS and Metlakatla First Nation 2014) identified additional culturally important sites within the 2 km buffer of the proposed Project corridor which were not included in the Application.

There a total of 46 archaeology sites within the 2 km buffer of the proposed Project corridor, and a total of 266 archaeology sites within the proposed Project RSA. Areas of high archaeological site densities correlate with areas of high TLU site densities on Ridley Island, Lelu Island, Digby Island and Nass Bay (DMCS and Metlakatla First Nation 2014).

The final TLU report noted that Ridley Island, the terminal point of the proposed pipeline Project, is an area of cultural and spiritual significance to the Metlakatla First Nation. Ridley Island has a high density of culturally important sites including: 21 archaeology sites comprised of CMTs and pre-contact cultural materials; habitation areas; and important hunting, fishing, trapping and plant gathering areas (DCMS and Metlakatla First Nation 2014).

Within 2 km of the proposed Project's Nasoga Route on land within Metlakatla's traditional territory along the south side of Nass Bay, there are 4 archaeological sites between the 105.1N km marker and the 115.1N km marker at Nass Bay.

In comments on the draft Assessment Report, Metlakatla First Nation noted that the total of 46 archaeology sites identified within the 2 km buffer of the proposed Project does not include the results of the Proponent's Archaeological Impact Assessment (AIA) which has not been completed. Metlakatla First Nation expects there will be a much higher number of archaeology sites identified following completion of the Proponent's AIA report.

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 sites, residual effects and cumulative effects. Other concerns raised by Metlakatla First Nation included:

- The AIA report must be completed before the final decision is made on the Application. The full extent of impacts to archaeological sites will not be known until the AIA is submitted and reviewed by Metlakatla First Nation; and
- Any impacted heritage sites would have direct impacts on Metlakatla First Nation's rights and title. Any removal of archaeological sites should be planned directly with Metlakatla First Nation, not through discussion after alteration decisions have been made.

Metlakatla First Nation is not satisfied with the suggested informed discussions when it comes to archaeological and heritage sites. Metlakatla First Nation indicated it requires shared decision making, as the Archaeology Branch and the government cannot and should not make decisions on the importance of archaeological and heritage sites in Metlakatla First Nation's traditional territory. A discussion of the potential impacts of the proposed Project on Aboriginal Groups archaeological 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 archaeological sites are identified within the proposed Project footprint in the final AIA report, or during pre-construction, 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*.

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 about effects on marine transportation routes during construction of the proposed Project marine pipeline which may prevent access to important resource harvesting areas on surrounding islands and marine waters (DMCS and Metlakatla First Nation 2014).

There are several marine transportation routes that provide access to fishing and other resource harvesting areas in the waters around Nass Bay, Metlakatla, Prince Rupert Harbour, Dundas Island, Melville Island and Tugwell Island. An important 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 and crosses perpendicular to the 2km buffer zone of the proposed Project marine pipeline route 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. This transportation corridor encompasses an area from the 20 km marker of the proposed Project, near Tugwell Island, and continuing northwards to Portland Inlet at the 105.1K marker. A historical and current marine route for eulachon harvesting was identified in the north end of Steamer Passage (DMCS and Metlakatla First Nation 2014).

Metlakatla First Nation raised concerns during the VC selection, Application Screening, and Application Review that navigation patterns may change as a result of the Project and cumulative effects from multiple projects. Specifically, Metlakatla First Nation is concerned that marine traffic will increase and be diverted to Metlakatla Pass resulting in adverse effects on harvesting activities and quality of life in and around Metlakatla village. Metlakatla expressed concern that these effects have not been meaningfully assessed or addressed.

EAO proposes 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. The Marine Access Traffic Management Plan must also identify existing and traditional navigational routes, fishing areas, habitat areas, harvesting areas and any associated timing windows within the Certified Pipeline Corridor; and specify mitigation to reduce disruption to marine use including Aboriginal Group use, fishing areas, recreational use, commercial shipping activities, tourism and marine-based transportation; and specify actions to inform affected stakeholders, NLG and Aboriginal Groups.

In consideration of the information provided 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 is expected to have minor 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 16.8.

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:
 - EAO Response: Section 16 of this 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. Additional baseline studies will be required for permitting applications and development of environmental management plans. In addition, Section 17 of this 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 also 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. Furthermore, no work has been done to address the cumulative impacts to Aboriginal rights and title as a result of past, present and reasonably foreseeable projects:
 - EAO Response: Section 16.5 of this 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 report

- provides information regarding the factors considered in EAO's assessment of potential impacts on specific Aboriginal Interests, including consideration of cumulative effects on each VC assessed in Part B.
- 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.
 - 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.
 - 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 info 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, as required by the EAO, must consider the findings of Metlakatla First Nation's final socio-economic assessment report, as well as obstacles to benefits-accrue ment by Aboriginal Groups, work for this inclusion has not occurred, therefore this section of the assessment cannot be considered complete.
 - EAO Response: EAO proposed a Condition for the Proponent to develop a Socio-Economic Effects Management Plan 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 Project.

18.4 Gitxsan Nation

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. Eulachan 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 travelways²⁵ 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 (McDonald 1989).

²⁵ Travelways typically refer to a watercourse that is used to access traditional land use areas, where a trail is used for land-based access to traditional land use areas.

Aboriginal Interests and EAO's strength of claim assessment and depth of consultation

The proposed Project would consist of approximately 130 km of pipeline passing through Gitxsan asserted traditional territory. There is one compressor station (K4) proposed within Gitxsan asserted traditional territory in Wilp Miluulak. Three camp locations are proposed within Gitxsan asserted traditional territory at KP 480, 529 and 575. The Proponent estimates the proposed Project would involve construction of approximately 7.9 km of temporary access roads and no new permanent access roads in Gitxsan asserted traditional territory.

The proposed pipeline is expected to cross the Skeena River at approximately KP 544 and pass approximately 2.8 km east of the confluence of the Nass and Cranberry Rivers, an important fishing and cultural area. The Proponent has explored two options (north and south) for crossing the Skeena River in the EA and requested feedback from Gitxsan regarding which of the options would be preferred by the Nation. At the time of this report, Gitxsan have not provided a preference for routing with respect to the Skeena River crossing.

EAO's review of ethnohistoric information points to several home sites located within approximately 2 km of the proposed Project in the following areas:

- The Kisgegas village complex, located in the Kisgegas canyon on the Babine River;
- Lower Babine River between the confluence of the Skeena and Babine Rivers and Kisgegas village;
- 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.

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, apart from the area of the proposed Project approximately east of the Kotsine Pass and south of the lower end of Bear Lake, which is assessed as having a weak *prima facie* claim to Aboriginal rights (Gitxsan use of this area is understood to have increased post-contact).

EAO met with several *Simgiigyet* on April 17, 2014 to discuss the initial assessment of 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 discussed with *Wilp* Mauus by phone and responded to the letter from *Wilp* Wii Gyet recently.

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 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 supporting a strong *prima facie* claim of Aboriginal title within or near those portions of the proposed Project areas that overlap with the asserted traditional territory of Gitxsan, including the vicinity of the Babine, Skeena and Kispiox rivers, areas in proximity to the major village complex on Babine river (Kisgegas), and primary trail networks accessing house territories and resource harvesting areas.

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 *huwilp* (houses) 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 *Simgiigyets* whose *wilp* territories could be directly impacted by the proposed Project. As such, 11 *huwilp* were identified and were consulted at the deeper end of the *Haida* spectrum (see section 13 above for listing of *huwilp* consulted). EAO consulted with any *Simgiigyets* whose *wilp* territories are located up to 30 km away from the proposed Project area at the lower end of the *Haida* spectrum by notifying them of key milestones in the EA and meeting if requested. EAO also consulted any other *Simgiigyets* who requested it, by notification. EAO's assessment of potential impacts of the proposed Project on Gitxsan's asserted Aboriginal rights and title considers information obtained from individual *wilp*, but applies to the Gitxsan Nation as a whole.

EAO copied the Gitxsan Development Corporation (GDC) and the Gitxsan watershed facilitators on communications to the *Simgiigyets* 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 *Simgiigyet*, 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 *Simgiigyet* did not use email. On several occasions, documents mailed to *Simgiigyet* 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 *Simgiigyet*, 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 *Simgiigyet* 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 *Simgiigyet* 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 Gitwanga 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 Highways 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 projects, the EA process, and the draft Application Information Requirements 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 preliminary 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.

On June 22, 2014, Gitxsan issued an eviction notice to 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 First Nation and Kitsumkalum First Nation 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.

Gitxsan were invited to review and provide comments on the draft Application Information Requirements, Section 11 Order, First Nations Consultation Plan and Reports, the screening of the Application and on the Application. Gitxsan was 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 to each of the 11 *Huwilp* during the Pre-Application Stage of review and \$2,000 during the Application Review phase of the EA process to assist with costs associated with participation in the EA review.

The Proponent provided capacity funding for Gitxsan to engage in discussions regarding the proposed Project through a capacity funding agreement signed in November 2013 with Gitxsan (GDC and Schedule B Hereditary Chiefs, with the exception of *Wilp* Haiwaas). The capacity funding agreement is administered by the Gitxsan Development Corp on behalf of the *Simgiigyet*, and included funding of staff to assist with coordinating communications with the *Simgiigyet*. The Proponent is continuing to attempt to engage with *Wilp* Haiwaas regarding capacity funding and to discuss the proposed Project.

Gitxsan elected to participate in biophysical field studies and to conduct TLU and socio-economic studies for the proposed Project. The final TLU report was received on January 16, 2014 and was incorporated in the EA Application, with the exception of some information that Gitxsan chose to keep confidential. The results of the TLU study will form the basis for on-going dialogue between the Proponent and Gitxsan to inform detailed planning for the proposed Project.

Gitxsan did not provide any written comments to the Proponent on the draft Aboriginal Consultation Plan or Aboriginal Reports #1, #2 or #3.

The Proponent held five meetings with the majority of *Simgiigyet* on Schedule B of the Section 11 Order. Discussions included: review of proposed route; 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 reported holding an additional 27 individual meetings and 50 telephone calls with *Simgiigyet* on Schedule B of the Section 11 Order. The Proponent held two

Community meetings, open to all Gitxsan community members, to present information about the proposed Project. The Proponent also held open houses at the request of several of the Gitxsan village councils.

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.

Ten out of the eleven *Simgiigyets* elected to work together for coordination purposes and identified representatives to attend Working Group meetings and report back to the larger group. *Wilp* Haiwaas chose to engage independently and participated on one Working Group Teleconference on January 28, 2014 as well as participated in separate meetings with EAO and OGC. Gitxsan provided written comments on the Application Information Requirements and 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 EA 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; 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 *Simgiigyets* attended.

Potential impacts of the proposed Project to Gitxsan's Aboriginal Interests

Aboriginal Title

EAO has attempted to address potential impacts to Gitxsan's Aboriginal title claim by ensuring that Gitxsan's are meaningfully consulted and accommodated around the potential effects of this proposed Project. The Province and the Proponent have approached Gitxsan's 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 proposed Project are being discussed amongst other accommodations, including those arising on potential Aboriginal title lands, and Gitxsan's has a role in considering the proposed use for those lands.

Further to the discussion in section 17.2.7 of this report regarding the potential impacts of the proposed Project on Aboriginal title claims, in EAO's opinion, the proposed Project is expected to have minor 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's 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 included:

- Increased access could impact traditional activities such as hunting by opening up areas to hunters and therefore increasing wildlife mortality;
- Effects on wildlife and wildlife habitat;
- Potential impacts on moose and moose habitat and specifically, disruption of moose during calving season (in particular in the vicinity of the Kispiox River crossing);
- 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; 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 is less commonly hunted for sustenance. Birds, including blue grouse, grouse, goose, duck, ptarmigan, swan and on occasion, seagull are all traditionally harvested.

Gitxsan expressed concerns about the cumulative effects of other activities and the proposed Project on hunting. Due to the development of new roads from forestry activity in the region, increased access to many previously remote locations have caused a reported increase in trapping and hunting. Gitxsan concerns that pipeline development will cause a reduction in moose habitat and that elk herds may abandon their home ranges if excessively disturbed.

Gitxsan requested that the Proponent avoid construction during May through June to avoid disturbing calving moose; preserve mineral licks where possible by avoiding the disturbance of drainage patterns and groundwater; and ensure continued access for black bears to waterways and salmon-rich streams. Routing discussions with the Proponent included participation in wildlife studies, avoidance of mineral licks, and routing north to avoid Grizzly Drop in the Babine River Corridor.

The Application listed the following areas, identified by Gitxsan in the TLU, of high value wildlife habitat used for hunting in the vicinity of the proposed Project (Table 11.11-7):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Hunting	
2 km south of KP 572.2 to KP 573.8 1.1 km south of KP 574.7 to KP 575.4 0.5 km south of KP 575 to KP 576 1.2 km south of KP 577.3 to KP 578.3 1.5 km south of KP 577.3 to KP 577.9 Crosses at KP 577.7 to KP 578.3 2 km south of KP 578.2 to KP 579	Deer habitat
2 to 3 km south of KP 482 to KP 484 Crosses at KP 544.8 to KP 546.2 Crosses at KP 540 to KP 542 Crosses at KP 545 to KP 551.5 Crosses at KP 551.6 to KP 556.5 Crosses at KP 554.2 to KP 567 Crosses at KP 571.5 to KP 576.8 Crosses at KP 577.7 to KP 578.3 Crosses at KP 578.1 to KP 578.5 1 to 2 km north of KP 579.5 to KP 583.8	Bear habitat
1 km south of KP 474.7 to KP 475.6 from 0.5 km north to 5.5 km southeast of KP 505.1 to KP 506.3 1 km south of KP 508.4 to KP 509.9 0.2 km south of KP 522.5 1 km north of KP 524 to KP 526.8 2 km north of KP 529 to KP 534.2 Crosses at KP 534.2 to KP 537.8 Crosses at KP 538.1 to KP 541.5 less than 0.5 km north of KP 547.3 less than 0.5 km north of KP 548 less than 0.5 km north of KP 548.2 0.25 km north of KP 556.1 less than 0.25 km north of KP 556.9 to KP 567.2 less than 0.25 km south of KP 566.9 to KP 567.2 KP 567.1 to KP 567.3 less than 0.1 km north of KP 568.7 to KP 569 less than 0.1 km south of KP 569.5 to KP 570 0.2 to 1.5 km north of KP 573.4 to KP 574.2 Crosses at KP 574.4 to KP 575 0.5 km north of KP 575.2 to KP 576.1 1.5 km north of KP 580 to KP 581.6 Crosses at KP 580.1 to KP 580.8 Crosses at KP 581 to KP 583 less than 1 km north of KP 583.1 to KP 584 less than 0.25 km south of KP 584.2 to KP 585.1	Moose habitat
Crosses at KP 474 to KP 480 1 km south of KP 484.7 to KP 486.2	Mountain Goat habitat

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
1 km north of KP 553.6 to KP 556.1 between 2.5 and 3 km south of KP 582.5 to KP 585 0.5 to 1.5 km south of KP 586 to KP 588	
Crosses at KP 529 to KP 534.2	Wildlife habitat

The list of areas identified in the table above, represents sites and areas identified by Gitxsan through the TLU of hunting sites and high value wildlife habitat in the asserted traditional territory, within the vicinity of the project. Gitxsan expressed most concern about the potential effects to moose and grizzly bear.

One deer hunting area, 8 bear hunting areas, 5 moose hunting areas, 1 mountain goat hunting area, and 1 'other' wildlife area would be crossed by the proposed Project. Several other areas would be within about 3 km of the proposed Project.

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.

The Proponent identified a commitment to work with Gitxsan to develop a training/ education program for potential Gitxsan wildlife monitors. Other mitigation measures related to wildlife are provided in section 17 of this report.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.1 of this 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;
- 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 from KP 574.1 to KP 576.1.

The Application listed the following trapping areas in the vicinity of the project:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trapping	
KP 574.1 to KP 576.1	Crossing of mink and marten trapping sites near the Kispiox River and Skunsnat Creek

While only the one trapping area was specifically raised by Gitxsan, EAO understands that trails and travelways were used for access to traplines. It is possible, given the number of trails that have been identified that additional trapping areas and traplines may be affected that are currently unknown to EAO.

The proposed Project may affect Gitxsan's ability to access the proposed Project area to exercise the right to trap. However, the proposed pipeline corridor is narrow enough that the disruption to each trapline should not prevent a trapline holder from trapping in other parts of that territory, and should therefore have a relatively small effect on overall access to trapping. Mitigation measures have been designed to reduce the disruption of trapping activities.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use - as discussed in section 17.2.3 of this 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 the key concern related to the proposed Project;
- 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;
- Cumulative effects on fish, particularly salmon from the mouth of the Skeena;
- 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 that downstream effects on fish habitat;
- Avoid laying pipe too close to rivers and lakes (Spectra responded that they are trying to stay away and on benches and height of land;
- Proximity to Cranberry River;
- Crossing of Sustet and Clifford – heavily used by coho and steelhead etc. in the spring;
- 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;
- Concern about the methods for river crossings ; and
- Concerns about impacts to fish habitat from vibrations of drilling during Horizontal Directional Drilling.

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.

Gitxsan expressed concerns that fish stocks are low, and fewer fish are returning each year. Other concerns regarding fishing include construction disturbance along waterways, water and water quality, erosion along the Shelagyote River bank, and disturbance to the Babine/Skeena confluence spawning area.

Gitxsan requested that the Project avoid all water and high value spawning areas; environmental monitors be employed to ensure integrity of habitats and water quality; construction should avoid following watercourses; damage to water crossings should be avoided or reduced as much as possible; construction be kept at least 100 m from marshlands and waterways; and moving the line slightly to reduce contact with watercourses. Gitxsan also requested that the felling of trees along the waterways or marshes be prohibited because riparian vegetation cools the water for its inhabitants in the summer and provides shelter and warmth in winter. The Proponent has addressed these requests largely through their standard construction techniques and in mitigations associated with the effects assessment in Part B.

The Proponent has been refining the crossing design and routing in proximity to the Babine, Skeena and Kispiox Rivers in consultation with the Gitxsan Hereditary Chiefs to minimize potential impacts to traditional activities and resources. There are discussions on-going about avoiding high value fish habitat by using underground trenchless crossings to cross the Skeena, Babine, and Kispiox Rivers. The Proponent consulted Gitxsan on two crossing options for the Skeena River, but has not received a response regarding Gitxsan's preference of a crossing location at this time.

The Application listed the following waterways used by Gitxsan for fishing in the vicinity of the project (Table 11.11-8):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Fishing	
50 km south of KP 568	Babine River
Crosses at KP 537.8	Babine River crossing
Crosses at KP 576.6	Clifford Creek crossing
Crosses at KP 582	Beaver Lodge Creek crossing - supports salmon spawning
Crosses at KP 583.2	Brown Paint Creek crossing
Crosses at KP 571.2	Corral Creek crossing
Crosses at KP 561	Cullen Creek crossing
Crosses at KP 556.2	Carrigan Creek crossing
5.1 km south of KP 563	Elizabeth Lake
Crosses at KP 495.9	Hanawald Creek crossing - salmon and trout spawning areas
Crosses at KP 567.3	Ironside Creek crossing
Crosses at KP 578.1	Kispiox River crossing
28 km south of KP 571	Kitwancool Lake

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Location unknown	Klen'sun
5.5 km south of KP 559	Kline Lake
Location unknown	Little Fish Lake
Location unknown	Lukdeduk
6.8 km south of KP 568	Mitten Lake
Location unknown	Naadaxteet Gillian Lagit
0.1 km northwest of KP 537.8	Sam Green Creek
23 km south of KP 520	Shegunia (Salmon) River
Crosses at KP 507	Shelagyote River crossing
Crosses at KP 544.5	Skeena River crossing
0.2 km south of KP 574.5 to KP 576	Skunsnat Creek
0.5 km south of KP 574	Skunsnat Lake
21 km south of KP 532	Sterritt Creek
13 km north of KP 600	Stevens Lake
Crosses at KP 579.8	Steep Canyon Creek crossing
12.5 km northwest of KP 600	Swan Lake
2.4 km north of KP 580	Sweetin River
Location unknown	Twin Lakes

The proposed Project corridor would cross approximately 20 major watercourses with indicated fish presence in Gitxsan's area of traditional use. The proposed Project would cross approximately 13 watercourses within Gitxsan's asserted traditional territory that Gitxsan identified as used for fishing.

The proposed Project would likely have a temporary effect on Gitxsan members' ability to access several key fishing sites during project construction. Key areas of concern raised by Gitxsan are the crossings of the Skeena, Kispiox, Clifford, and the Babine/Skeena confluence spawning area. Thirteen of the fishing locations documented in the Application are directly on the Project route and thus could be affected by the proposed Project. The type of crossing proposed at each watercourse will have implications on the level of potential impact. The final selection for the type of crossing will occur once final engineering and permitting occurs. Use of underground trenchless crossings would retain riparian vegetation and allow access to the fishing sites during construction. There are expected to be minimal impacts to access to fishing sites during operations. Fishing sites located further away from the pipeline corridor are not expected to be affected by the proposed Project given existing mitigations to prevent downstream effects. Mitigation measures, including certificate conditions requiring

further consultation with Gitxsan prior to construction, have been designed to address access management and minimize any impacts to Gitxsan members' access to fishing sites. Additional mitigation measures related to fish and fish habitat are provided in section 17 of this report.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential 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 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;
- Reclamation of the pipeline ROW after construction is completed; and
- Continued access to harvesting areas.

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. A huckleberry patch was identified at Burnt Ridge.

Gitxsan expressed concern about disruption of gathering activities 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 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 identified two gathering places. While information was collected in the Gitxsan TUS, Gitxsan chose not to share all information with the Proponent. Gitxsan (through the GDC) provided some limited additional TUS information related to gathering directly to EAO to consider in the assessment of potential impacts. While pine mushrooms were identified as important, this information was not provided by Gitxsan.

The Application listed the following plant gathering places in the vicinity of the project (Table 11.11-6):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Plant Gathering	
1.8 to 2 km south of KP 529.7 to KP 532.5 Crosses from KP 535 to KP 536.7	Berry patches

One site was identified by Gitxsan that would be directly impacted by the project corridor. Specific information on frequency and timing of the use of this site is not available to EAO; however, it is expected that some access to this particular site will be affected during construction, and portions of it may be unavailable during operations where it is directly affected by the right of way. Vegetation management on the right of way, including possible use of herbicides or pesticides could make this site less desirable to harvesters.

In general, the proposed Project is not expected to limit Gitxsan members' ability to access other gathering sites, as the zone of project impacts to vegetation is relatively narrow. The Project may increase access to some sites for Gitxsan members as well as other gatherers. The Project may also disrupt the existence of or access to gathering sites used by Gitxsan members but not identified in the Application. During operations, gathering sites located adjacent to the project right of way may be abandoned due to concerns related to the use of herbicides or pesticides.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, current and traditional land use – as discussed in section 17.2.4 of this 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 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 un the Heritage Conservation Act;
- Impacts to trails (e.g. trail to Kitsegas);
- Concern about potential impacts to cultural sites/ trails and cabins;
- Avoidance of heritage resource sites, specifically burial sites; and
- Impacts to Aboriginal rights and title.

Trails and Travelways:

Through the TUS, many trails, some several centuries old, were identified as being used to access communities, fishing sites, traplines, berry harvesting locations and other culturally important locations. 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.

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.

The Application listed the following trails and travelways in the vicinity of the project (Table 11.11-4):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trails	
Crosses at KP 482.6 to KP 483: along east and west banks of the Nilkitwa River Crosses at KP 496.3 Crosses at KP 501.9 Crosses at KP 506.8 and KP 507.2: along east and west banks of the Shelagyote River Crosses at KP 511.1 Crosses at KP 514.2 Crosses at KP 516 Crosses at KP 518	Trail Crossings

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Crosses at KP 519.8 Crosses at KP 522.1 Crosses at KP 525.2 Crosses at KP 529.1 Crosses at KP 531 Crosses at KP 533.5 Crosses at KP 533.9 Crosses at KP 537.5 Crosses at KP 545.5 Crosses at KP 551.8 Crosses at KP 552.3 Crosses at KP 555.4 Crosses at KP 560.8 Crosses at KP 567 Crosses at KP 529.1 Crosses at KP 531 Crosses at KP 533.5 Crosses at KP 533.9 Crosses at KP 537.5 Crosses at KP 545.5 Crosses at KP 551.8 Crosses at KP 552.3 Crosses at KP 555.4 Crosses at KP 560.8 Crosses at KP 567 Crosses at KP 571.2 Crosses at KP 574.8 Crosses at KP 576.3 Crosses at KP 577.8 Crosses at KP 578.3 Crosses at KP 579.7 Crosses at KP 580.7 Crosses at KP 582 Crosses at KP 583.2 Crosses at KP 583.8	
0.2 km south of KP 534.4 0.4 km north of KP 583.2 to KP 583.8	Trail Junction
Parallels from KP 551.8 to KP 552.3 Parallels from KP 578.3 to KP 579.7	Trail overlaps the proposed pipeline corridor

Habitation and Cultural Sites:

The Application identifies that campsites are used for hunting and trapping, often providing central access to numerous traplines. Campsites are also used as places to dress game and set up smokehouses to prepare fish.

The Application listed the following habitation and cultural sites in the vicinity of the project (Table 11.11-5):

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Habitation Sites	
2.5 km south of KP 529.4 2 km south of KP 531.7, 2.2 km south of KP 532.2	Abandoned Habitation Site
0.8 km south of KP 526.3 1 km north of KP 528.3 1.7 km south of KP 530.7 Crosses at KP 531.1 1 km south of KP 531.5 Crosses at KP 532.1 Crosses at KP 532.6 1.1 km south of KP 533.2 2 km north of KP 535.4 0.5 km south of KP 535.9 Crosses at KP 537.2 0.1 km south of KP 537.3 0.3 km north of KP 538.1	Archaeological Site
1 km south of KP 530.8 Crosses at KP 531.2 1.1 km south of KP 533.3 1 km south of KP 533.6 1 km south of KP 533.9 0.5 km southeast of KP 535 5 km south of KP 573.2 1.2 km south of KP 573.8 1 km south of KP 575.9 0.8 km south of KP 575.9	Cabins
0.6 km east of KP 537	Gisgega's traditional village site
The lands bordering Ironside Creek, from KP 567 through to KP 571	Site of cultural importance

EAO's review of ethnohistoric information points to several home sites located within approximately 2 km of the proposed Project in the following areas:

- The Kisgegas village complex, located in the Kisgegas canyon on the Babine River;
- Lower Babine River between the confluence of the Skeena and Babine Rivers and Kisgegas village;
- 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.

The Application identifies 4 archaeological sites that would be crossed by the proposed Project. One cabin site would be crossed and the lands bordering Ironside Creek, from KP 567 through to KP 571, an important cultural/ sacred site would be directly impacted. The Application identified 43 trails that would be crossed by the proposed Project. Other sites and trails are identified between 0.1 km and 5 km from the proposed Project.

The ancestral village of Gisgega'as is important to Gitxsan. Gitxsan requested that care be taken not to disturb the village and expressed concerns about possible increased access to the ancestral village of Gisgega'as due to Project construction, the destruction of cultural artifacts in surrounding areas, and possible illegal removal of cultural artifacts. Community members indicate that the village was an occupation site for thousands of years, and that the surrounding regions are rich in archaeological sites and signs of early occupation. The Gisgega'as traditional village site is 0.6 km east of KP 537.

In consideration of the Proponent's proposed mitigations and proposed conditions of any EAC issued, EAO's characterization of potential effects to Archaeology and Cultural Heritage Interests – as discussed in section 17.2.5 of this report - and the distance between the area of the proposed Project and culturally important sites, trails and travelways locations identified by Gitxsan, 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

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 16.8. 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 proposes 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 14.2.1 of the Application.

18.5 Gitanyow

Context

- 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. 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:
- The Gitanyow Hereditary Chief's Office (GHCO) advised EAO that it represents the Gitanyow *Huwilp*, and described them 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:
 - "Provide a foundation for a respectful Government-to-Government relationship within which the Parties can collaborate in the implementation and monitoring of this Reconciliation Agreement;
 - Create increased certainty in regard to land and resource management and economic benefits for both Parties;
 - Establish a clear, reliable and efficient framework for Shared Decision-Making, Land and Resource Decisions; and
 - 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:
 - “Implementing the results of Government to Government land use discussions in a spirit of collaboration; and
 - 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 environmental assessment 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 environmental assessments.
- While these discussions have been ongoing, EAO did require the Proponent to consider management directions set out in the Gitanyow Lax'yip Land Use Plan (GLLUP) and how that Plan may inform, for example, route selection and mitigation approaches and efforts relating to the proposed Project.
- EAO's analysis of the potential impacts from the proposed Project on the March 2012 GLLUP are found in Table 18-1.
- 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 continues west to the Nass River, following the Nass River towards its confluence with the Cranberry River. Two route options diverge from this point, one to the northwest and one to the southwest, exiting Gitanyow territory. EAO acknowledges that the proposed Project may impact areas of strong 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 are no work camps or compressor stations proposed within Gitanyow's asserted territory. The Proponent estimates the proposed Project would involve construction of approximately 15 km of temporary access roads and no new permanent access roads in Gitanyow's asserted territory.
- Gitanyow is listed in Schedule B of the Section 11 Order; on February 21, 2014, EAO amended the Section 11 Order to list the individual huwlp. Wilp Gamlakyeltxw, Wilp Malii, Wilp Gwaas Hla'am and

Wilp Watakhayetsxw were represented by the Gitanyow Hereditary Chiefs office; Wilp Luux Hon was consulted separately.

- 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 Application Information Requirements, the Proponent's First Nations 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 also provided Wilp Luux Hon with \$3,000 in capacity funding to assist with their participation in the EA for the proposed Project. The Proponent provided capacity funding for Gitanyow to engage in discussions regarding the proposed Project under a Capacity Funding agreement dated March 2013. The Proponent also signed a Capacity Funding Agreement with Wilp Luux Hon in August 2013.

Gitanyow Hereditary Chiefs submitted comments on the draft Section 11 order and the draft AIR as well as several letters to EAO (June 3, 2013) and 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.

Gitanyow elected to participate in biophysical field studies through the Gitanyow Fisheries Authority and to conduct a Lax'yip Cultural Impact study, (which replaced their TLU studies) and was received in time to be considered as part of the Application. Gitanyow also conducted a socio-economic study, which was not completed at the time the Proponent's Application was submitted. The proponent indicated in their Application that the information from this study would inform future discussions with Gitanyow.

In addition to EAO-led consultation activities throughout the EA process, the Proponent met with Gitanyow on May 2, 2014 to discuss pipeline routing. Several meetings were also held to discuss employment and business opportunities.

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 Wilp 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.

Potential impacts of the proposed Project on Gitanyow's Aboriginal Interests

Requests for Route Changes

The majority of the Proponent's engagement with Gitanyow has been regarding Gitanyow's interest in working with the Proponent to create a pipeline route that is in compliance with the Gitanyow Lax'yip Land Use Plan. The Gitanyow Preferred Route (GPR) was identified by Gitanyow as the route that would have the least impact to the Gitanyow Lax'yip Land Use Plan, compared to alternatives. The Gitanyow Lax'yip Cultural Impact Field Study was completed based on the GPR, and identified cultural resources and sites within or near that route.

The Cultural Impact Field Study identifies overarching concerns regarding Wilp sustainability along the GPR which in Gitanyow's view could not necessarily be mitigated or avoided by the GPR, including:

- Impacts to water, and concerns that there is a diminishing supply of clean stable water on the land base, and that there are cumulative effects to water from climate change;
- Declining moose population and habitat;
- Displacement and alienation of old growth dependent furbearers;
- Reductions in pine mushroom habitat;
- Impacts to high-quality huckleberry areas;
- Increase of road networks creating linear disturbances; and
- Impacts to culturally modified trees.

These concerns, as well as the sites identified in the Cultural Impact Field Study are identified in the following sections in relation to impacts on wildlife, hunting and trapping, fish and fishing, vegetation and plant gathering and culturally important sites.

Gitanyow and the Proponent have been working on a route selection agreement regarding the Gitanyow preferred route. Gitanyow has made amendments to the GPR to allow for constructability; the Proponent has made amendments to their initial proposed route to reduce the impact to Gitanyow traditional activities and resources. The Application states that the revisions resulting from consultation with Gitanyow are reflected in the current route proposed and includes routing of approximately 40 km of the initially proposed route, away from the Cranberry River watershed to a route further north through the Nass River watershed that follows the Borden Mainline FSR; accommodating the trenchless crossing location on the Cranberry River; and minimizing clearing in Gitanyow ecological connectivity corridors. The Proponent noted this reroute is subject to additional geotechnical investigations and further discussions with Aboriginal Groups. The Proponent will continue to consult with Gitanyow to refine site-specific mitigation measures to reduce effects to Gitanyow's Aboriginal Interests.

With respect to Gitanyow's concerns about potential impacts on its Aboriginal Interests, Gitanyow specifically requested that the proposed route avoid wetlands near the Nass River crossing on the Kitsault route and avoid proposed treaty lands on the Nass River crossing. The Proponent responded that it appears the wetland area can be avoided, but the proposed treaty lands could not as it straddles the proposed Project route. The Proponent committed to ongoing discussions regarding routing.

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 section 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:

- Concern about the ecological connectivity corridors defined in their Land Use Plan and how they will be impacted by the proposed right-of-way;
- Effects to grizzly bears from increased road access, since they already have low reproduction and may be displaced with increased access;
- Reopening old forestry roads to cut blocks, displacing and disorienting animals that use the cut blocks as well as increasing access that could increase hunting and may lead to a decline in already shrinking animal populations in the region;
- Concern that the route opens up their territory for access they cannot control or monitor (request that pipelines to be limited to common corridors);
- Loss of carnivore and amphibian habitat;
- Protection of moose and moose habitat;
- Effects to ungulates and habitat;
- Disturbance of bear dens during construction;
- Potential for construction activities to limit use of game trails, restricting wildlife movement;
- ROW concerns (e.g., travel of wolves and wildlife on right-of-way; increased access for recreational harvesters to the area, right-of-way width);
- As a result of new roads, potential for increased access for recreational harvesters to the area, increased pressure on wildlife and fish resources; and
- Need to maintain traditional foods (e.g., berries, fish and game).

According to the Proponent's Application, Gitanyow hunting sites include Meziadin Lake and extend north to Surveyors Creek and the Bell-Irving River (59 km north of KP 661.6). 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, important hunting species for Gitanyow members include moose, goat, black bear, grizzly bear, deer, waterfowl, marmots and grouse. Community members report that they only hunt bear when other protein resources are low. Moose, goat, grizzly bear and water birds were included as Valued Components in the assessment.

Two access roads to access traditional hunting areas are identified near the proposed route:

- 642.7 m southeast of KP 596; and
- 2.1 km south of KP 597.5.

A number of sites were identified in the Gitanyow Lax'yip Cultural Impact Field Study which are considered cultural resources within a Lax'yip. These are primarily wildlife signs and habitat and not specific use sites, and are presented here in relation to the Proponent's proposed route.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Crosses at KP 588.2 Crosses from KP 592.4 to 618.3 42.4 m south of KP 594.4 50.5 m north of KP 594.9 443.9 m north of KP 626.9 354.7 m north of KP 627.2 Crosses from KP 634.3 to KP 636.1 285.1 m northwest of KP 621.1	Ungulate/Moose signs/habitat
0.7 m southeast of KP 592.4 697.3 m south of KP 597.7	Bear signs (scat, evidence of feeding)
24 m south of KP 594.3 40 m south of KP 594.3 172 m south of KP 596 1.29 km south of KP 597.1 1.53 km south of KP 598.4 1.98 km south of KP 598.4 1.83 km south of KP 598.4 1.71 km south of KP 598.4 1.34 km south of KP 598.6 111 m north of KP 605.3 105 m north of KP 605.3 8 m north of KP 605.6 18 m south of KP 606 1.67 km south of KP 610.3 814 m south of KP 610.3 1.55 km east of KP 615.3 1.45 km east of KPN 634.1 1.79 km east of KPN 635.2 1.86 km east of KPN 635.4 2.16 km east of KPN 636.2	Grouse signs/habitat

EAO does not have information on specific use sites near the proposed Project area (apart from the access roads mentioned above), the frequency of hunting, what times of year different species are hunted, or the proportion of Gitanyow members involved in hunting.

According to Gitanyow community members, moose populations in their asserted traditional territories are in decline and have decreased within their asserted traditional territory by 68% in the last 10 years. Gitanyow recommended assessing and determining if KP 604.3 and KP 614.3 are critical moose winter areas, and following recommendations of the GLLUP.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to wildlife, wildlife habitat, current and traditional land use as discussed in section 17.2.1 of this report - the proposed Project is expected to result in minor to moderate impacts on Gitanyow's asserted Aboriginal right to hunt in the area of the proposed Project.

Trapping

Gitanyow raised key concerns regarding wildlife, wildlife habitat and the Aboriginal right to trap including:

- Effects of construction and operations on small furbearers (concern shared with other First Nations), in particular the displacement and alienation of old growth dependent furbearers.

Since 1930, the Gitanyow has owned a trapline that covers all of their traditional territory. The trapline is used for trapping mink, marten, beaver and fox and, according to the Proponent's Application, is most commonly used after a snowfall and following feasts, usually in January. Ermine is an important resource to community members. Ermine fur is used to decorate the Chief's headdress.

Furbearers were included as a key indicator in the assessment of the Wildlife and Wildlife Habitat VC in the Application.

A number of sites were identified in the Gitanyow Lax'yip Cultural Impact Field Study which are considered cultural resources within a Lax'yip. These are primarily wildlife signs and habitat and not specific use sites, and are presented here in relation to the Proponent's proposed route.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
1.05 km southeast of KP 595.9 32.1 m northwest of KP 605.1 72.2 m northwest of KP 605.9 757 m south of KP 606.8 827.6 m southeast of KP 630.5 1.68 km east of KP 635	Beaver signs (tracks, dams, water source, feeding ground)
14.4 m southeast of KP 590 83 m southeast of KP 590.6 10.6 m northwest of KP 592.1 5.5 m northwest of KP 592.1 184.9 m south of KP 596.9 197.5 m south of KP 598.5 321.4 m southeast of KP 602.6 1.43 km south of KP 608.3 1.57 km south of KP 608.6 36.7 m northwest of KP 619.3 165 m west of KP 620 943.6 m east of KP 631.4 1.53 km east of KPN 634.2 1.46 km east of KPN 633.3 1.53 km east of KPN 633.4	Marten, fisher and ermine signs/habitat
29.4 m south of KP 593.9 37.3 m northwest of KP 604.3 82.7 m north of KP 605.5 494.6 m south of KP 606.5 1.85 km east of KP 614.9 1.9 km east of KPN 635.4 2.19 km east of KPN 636.3	Rabbit signs (droppings)
27.6 m northwest of KP 593.2	Unidentified rodent den

Section 17.2.3 of this report characterizes the potential impacts of the proposed Project on Aboriginal Group's trapping activities. EAO does not have information on specific trapping sites in the area of the proposed Project.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential and cumulative effects to wildlife, wildlife habitat, current and traditional land use— as discussed in section 17.2.3 of this report - the proposed Project is expected to have minor impacts on asserted Aboriginal right to trap in the area of the proposed Project.

Fishing

Gitanyow raised key concerns regarding fish, fish habitat and the Aboriginal right to fish including:

- Routing at Cranberry River, including concerns about the impacts to the river during construction, access to the ROW adjacent to the Cranberry and preference for a trenchless crossing;
- Water quality concerns including:
 - Increased sedimentation;
 - Erosion during stream crossing construction; and
 - Pipeline breaks and ruptures during construction;
- Effects on fish;
- Effects on water quality;
- Disturbance of headwaters and spawning areas;
- Erosion and sedimentation from construction activities;
- Disruption of natural water cycles, flow, and drainage patterns; and potential for flooding due to this disruption;
- Reclamation and protection measures for watercourses;
- Effects on watercourses;
- Effects on marine environments (includes multiple ocean and river run fish species, crabs, clams, eelgrass, etc.);
- Impacts to First Nation commercial fishing activities; and
- Need to maintain traditional foods (e.g., berries, fish and game).

According to the Proponent's Application, sockeye is the fish of choice for the Gitanyow, and they 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.

The Application states that salmon are primarily caught in late summer and that Gitanyow Lake and the rivers around the village are popular fishing grounds.

The proposed Project corridor would cross approximately 5 major watercourses with indicated fish presence in Gitanyow's area of traditional use. The Proponent's Application lists the following fishing sites located in proximity to the proposed Project:

- 21.3 km northwest of KP 611;
- 1.8km west of KP 622;
- 1km west of KP 625; and
- 7 m northwest of KP 605.

EAO notes the proposed Project would cross one fishing site and be within 2 km of two other identified fishing sites.

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures, proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects on fish, fish habitat, current and traditional land use - as discussed in section 17.2.2 of this report - the proposed Project is expected to have minor impacts on Gitanyow's asserted Aboriginal right to fish in the area of the proposed Project.

Gathering

Gitanyow First Nation raised key concerns regarding plants and the Aboriginal right to gather including:

- Reductions in pine mushroom habitat;
- Huckleberry management;
- Effects on existing vegetation;
- Contamination of plants by pesticides;
- Effects on harvested plants including medicinal plants; and
- Need to maintain traditional foods (e.g., berries, fish and game).

Gitanyow members harvest devil's club, water lily roots, hellebore, Labrador tea, nettles, soapberries, balsam bark, red alder bark and wild mint, in addition to other plants; they are used both medicinally and for food. Gitanyow members pick berries seasonally. Berries harvested include blueberries, huckleberries, wild cranberries and soapberries. Pine mushroom harvesting is an important source of income in Gitanyow traditional territories. Gitanyow requested the *Gitanyow Vegetation Management Plan* should be referred to when mushrooms are identified. Western cedar is used extensively in Gitanyow culture.

Huckleberries are an important resource for Gitanyow community members. The berries are typically found and harvested in cut blocks. However, the forest canopy is closing over some older cut blocks, preventing sunlight from reaching the huckleberry plants,

therefore inhibiting the plants' ability to bear fruit. Productive huckleberry plants are said to be rare in the region. Community members are concerned about the few remaining productive huckleberry patches along the application Corridor and effects to the remaining plants due to pipeline construction.

The proposed Project would cross several sites for plant gathering including:

- berry patches at KP 592.4, KP 593.5, KP 588.4, KP 588.3, KP 594.1, KP 594.7, KP 595.7 and KP 618;
- mushroom harvest sites at KP 628.2 and KPN 633.3; and
- medicinal plants at KP 593.3, KP 595.9 and KP 596.5.

A number of plant harvesting sites and habitat for culturally valued vegetation were identified in the Gitanyow Lax'yip Cultural Impact Field Study which are considered cultural resources within a Lax'yip, and are presented here in relation to the Proponent's proposed route.

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
4 m northwest of KP 592.6 10 m south of KP 597.0 1.4 km south of KP 607.7 1.4 km south of KP 608.4 1.8 km south of KP 610.3 2.3 km southeast of KP 612.8 2.4 km southeast of KP 612.9 2.3 km southeast of KP 613.5 680 m southeast of KP 615.9 203 m southeast of KP 617.2 114 m southeast of KP 617.5 88 m southeast of KP 617.6 291 m northwest of KP 621 292 m northwest of KP 621.3 292 m northwest of KP 621.3 280 m northwest of KP 621.8 746 m west of KP 623.0 589 m west of KP 623.2 617 m west of KP 623.3 627 m west of KP 623.4 1.4 km northwest of KP 624.9 1.4 km northwest of KP 625.2 1.3 km north of KP 626.3 1.3 km north of KP 626.4 939 m north of KP 626.5 751 m north of KP 626.6 704 m north of KP 626.7 184 m north of KP 627.7	Chanterelle and pine mushrooms

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
273 m north of KP 627.4 136 m north of KP 627.8 98 m north of KP 627.9 97 m north of KP 628 13 m northwest of KP 628.7 Crossed at KP 628.2 350 m southeast of KP 629.8 395 m southeast of KP 630.0 489 m southeast of KP 630.1 854 m southeast of KP 630.6 129 m north of KPE 0.4 22 m north of KPE 0.6 1.4 km south of KPE 1.1 273 m south of KPE 1.1 636 m south of KPE 1.1 129 m north of KPE 0.4 14 m south of KPE 0.7 273 m south of KPE 1.1 636 m south of KPE 1.1 413 m south of KPE 1.1 941 m east of KPN 631.2 969 m east of KPN 631.3 941 m east of KPN 631.5 962 m east of KPN 631.6 971 m east of KPN 631.7 Crosses at KPN 633.3 1 km east of KPN 632 to KPN 634.8	
173 m southwest of KP 589.4 152 m southwest of KP 589.4 205 m southwest of KP 589.5 20 m south of KP 588.3 3 m south of KP 588.4 1 m southeast of KP 592.4 57 m northwest of KP 593.5 41 m south of KP 594.1 42 m south of KP 594.7 46 m south of KP 595.7 806 m south of KP 597.9 881 m south of KP 598 868 m south of KP 598.4 887 m south of KP 598.5 991 m south of KP 598.6 1.9 km southeast of KP 612.2 27 m southeast of KP 618 610 m southeast of KP 616 292 m northwest of KP 621.3 209 m southeast of KP 629.4 962 m east of KPN 631.6	Huckleberry, coastal huckleberry, high bush blueberry, cranberry, false azalea, thimbleberry

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
2.3 km east of KPN 636.3 1.7 km east of KPN 634.8 2.2 km east of KPN 636.3 2.3 km east of KPN 636.4	
1.7 km east of KP 615.1	Labrador Tea
1.7 km east of KP 615	Siberian crab apple
100 m southeast of KP 590.5 214 m southeast of KP 590 48 m northwest of KP 593.3 60 m southeast of KP 595.9 71 m southeast of KP 596.5 1.5 km south of KP 608.5 1.6 km south of KP 608.6	Wuu'uums (Devil's Club)

In consideration of the information provided to EAO, the Proponent's proposed mitigation measures and proposed conditions of any EA Certificate issued, and EAO's analysis of potential residual and cumulative effects to vegetation, and current and traditional land use – as discussed in section 17.2.4 of this report - the proposed Project is expected to have minor impacts on Gitanyow's asserted Aboriginal right to gather in the area of the proposed Project.

Culturally important sites, trails and travelways

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 the Proponent's 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 622. As described in the Proponent's Application, there is also a known sacred site 1.8 km west of KP 622 consisting of a series of petroglyphs near the Cranberry River.

Known sites described as being of sacred significance also include sites at Kitwancool Lake near Moonlit Creek and at Kitwancool Lake Island, approximately 30 km from the proposed project.

The Proponent reports in the Application that several fishing camps and habitation sites were identified by Gitanyow community members whose locations remain confidential.

Gitanyow raised key concerns regarding culturally important sites including:

- Effects on areas of cultural importance;

- Protection of Culturally Modified Trees (CMT) site located in their asserted territory. CMTs are an important historical connection to the land and Gitanyow's culture. When CMTs are found within the Gitanyow *Lax'yip* the *Gitanyow Cultural Heritage Management Policy* should be referred to for requested mitigation policies; and
- Luux Hon raised concerns about a historic village site near Nass camp and the original Luux Hon pit house that are in the vicinity of the proposed Project, but not directly impacted. No further details were provided as to the proximity of these sites to the proposed Project.

There are five known sites described as being of sacred significance and three known trails within 2 km of the project corridor.

Gitanyow culturally important sites identified in the Application (Section 11, Tables 11.12-1 and 11.12-6) included the following sites:

Approximate Distance and Direction from the Proposed Project	Activity/Site Description
Trails/Travelways:	
1.8 km west of KP 622	Kitwancool Trail/"Grease Trail" (Gitwangak to Kitwancool Lake to Cranberry River at Nass River to aiyansh)
81 m southeast of KP 590.6	Trail cleared with chains unused for 20 years
111 m northwest of KP 603.2	Trail made before 1950, now wildlife trail.
Sites described as being of Sacred significance:	
1.8 km west of KP 622	Petroglyphs near Cranberry River
1.3 km south of KPE 1.1	CMT birch bark strip
5.5 km south of KP 567.8 740 m south of KP 597.7 806 m south of KP 597.9	Cultural area (non-specified)
15 m south of KP 588.0 6 m south of KP 588.0 122 m south of KP 588.9	CMT Western hemlock cambium Harvest
2.9 km southeast of KP 601.5	The "Hoodoo" cultural area

In consideration of the information provided 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 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 the 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 16.8.

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 from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
Water Resources				
<p>Protect and maintain surface and groundwater to:</p> <ul style="list-style-type: none"> • Provide a safe and sufficient drinking water supply that supports healthy communities; and • 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). 	<ul style="list-style-type: none"> • 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; and • Maintain the watershed of Ten Link Creek as a community watershed to provide domestic water supply to Gitanyow village (Cranberry Planning Unit). 	<ul style="list-style-type: none"> • See section 5.7 of the Assessment Report for a detailed analysis of potential effects on aquatic environment (including surface water and groundwater); • See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wetlands; • The proposed Project does not overlap with the watershed of Ten Line creek; and • The maximum disturbance* to the ECAs based on a project footprint width of 55 m is: <ul style="list-style-type: none"> • Borden - 11.8 ha (0.49%) (Nasoga route only); • Aluk - 33.2 ha (0.37%); • Derrick - 48.8 ha (0.47%); • Extra - 95.5-102.49 ha (2-2.1%); • Kinskuck River - 38.5 ha (0.27%); and • Nass River tributary 1 - 29.7ha (0.8%) (Kitsault route only); • Upper Kispiox – 24.6 (0.54%) (Nasoga route only). <p>* actual new disturbance may be less where the corridor is following</p>	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.7 of the Assessment Report for a detailed list of mitigation measures for potential effects on aquatic environment (including surface water and groundwater); and • See section 5.8 of the Assessment Report for a detailed list of mitigation measures for potential effects on wetlands. <p>Proponent mitigation includes:</p> <ul style="list-style-type: none"> • Equivalent Clearcut Area (ECA), as identified in the GLLUP, will be considered through ongoing consultation with the Gitanyow First Nation. If it is determined that the proposed Project could exceed ECA targets prior to construction, an independent watershed assessment will be undertaken by a qualified professional prior to construction. <p><u>EA Certificate Conditions:</u></p> <ul style="list-style-type: none"> • Refer to Water Quality Monitoring Plan condition. 	<p><i>Consistent with GLLUP</i></p>

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
		previously disturbed areas.		
Biodiversity Resources – GLLUP Layers: Ecosystem Network, Ecosystem Network Buffer; Old Growth Management Area				
<ul style="list-style-type: none"> • 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 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 	<ul style="list-style-type: none"> • Maintain a landscape pattern of patchiness that, over the long term, reflects the natural disturbance pattern; • Maintain or recruit 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 	<ul style="list-style-type: none"> • See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wetlands; • See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife habitat; • See section 5.10 of the Assessment Report for a detailed analysis of potential effects on terrestrial vegetation, including: • The most affected vegetation community would have alteration of up to approximately 6.4% within the Terrestrial vegetation RSA; • The proposed Project footprint²⁶ crosses approximately 15 to 17 ha of Ecosystem Network and 15 to 20 ha of Ecosystem Network 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.8 of the Assessment Report for a detailed list of mitigation measures for potential effects on wetlands; • See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife habitat; and • See section 5.10 of the Assessment Report for a detailed list of mitigation measures for potential effects on terrestrial vegetation. <p>Proponent mitigation includes:</p> <ul style="list-style-type: none"> • Development and implementation of a Plant Species or Ecological Communities of Concern Contingency Plan, Rare Plant and Ecological Communities Management Plan. <p><u>EA Certificate Conditions:</u></p> <ul style="list-style-type: none"> • Refer to vegetation habitat assessment survey condition; and 	<p><i>Consistent with GLLUP- the proposed Project is not expected to have significant effects to vegetation, wetlands or wildlife that occurs in Gitanyow territory.</i></p>

²⁶ estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
<p>help a variety of organisms re-colonize their historic range;</p> <ul style="list-style-type: none"> • Protect and maintain effectiveness of riparian habitats; all riparian habitats have disproportionately high biodiversity values relative to their proportional occupancy of the landscape; and • Preserve Gitanyow traditional use sites and maintain opportunities for traditional use of the land. 	<p>seral stages by BEC variant, within each landscape unit, that reflects the natural disturbance regime; and</p> <ul style="list-style-type: none"> • Maintain structured connectivity in the Ecosystem Network identified in Schedule A, Maps 1-10. 	<p>Buffer area;</p> <ul style="list-style-type: none"> • The proposed Project corridor²⁷ intersects approximately 109 to 136 ha of Ecosystem Network and 123 to 146 ha of Ecosystem Network Buffer area; • The proposed Project footprint²⁸ crosses approximately 2 ha of legal OGMA and 11-15 ha of non-legal OGMA; and • The proposed Project corridor²⁹ intersects approximately 34 ha of legal OGMA and 83 to 109 ha of non-legal OGMA. 	<ul style="list-style-type: none"> • Refer to OGMA condition. 	
<i>Pine Mushroom Resources - GLLUP Layers: Old Growth Management Area</i>				
Maintain pine mushroom resources and provide opportunities for a sustainable harvest.	Maintain productive pine mushroom sites across the plan area.	<ul style="list-style-type: none"> • See section 5.10 of the Assessment Report for a detailed analysis of potential effects on vegetation, including pine mushroom; and • The Application estimated that, 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.10.2 of the Assessment Report for a detailed list of mitigation measures for potential effects on vegetation, including pine mushroom, including: 	<i>Consistent with the GLLUP – with mitigation proposed, the proposed Project is not expected to have significant adverse effects on vegetation, including</i>

²⁷ estimates of Project Corridor intersection with GLLUP layers were made with a 400 m wide corridor (the Proponent's Application Corridor) and consider direct and indirect effects of the proposed Project on Gitanyow LLUP values; ranges represent differences between the two route options (Kitsault vs Nasoga).

²⁸ estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga).

²⁹ estimates of Project Corridor intersection with GLLUP layers were made with a 400 m wide corridor (the Proponent's Application Corridor) and consider direct and indirect effects of the proposed Project on Gitanyow LLUP values; ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
		based on a 70 m wide corridor for the ROW and temporary workspace, the entire route (including area outside Gitanyow territory) crosses approximately 163 to 210 ha of pine mushroom habitat.	<ul style="list-style-type: none"> In pine mushroom areas, reduce grubbing to allow the root system to remain intact; and In identified old growth and pine mushroom areas, narrow the work area to retain patches of natural species including trees, shrubs, herbs and groundcover species, where practical. 	<i>pine mushrooms.</i>
<i>Moose Resources - GLLUP Layers: Moose Winter Range</i>				
<ul style="list-style-type: none"> Manage moose winter range to help ensure a healthy moose population; and Minimize pressure on the moose population from legal and illegal harvest through human access management. 	<ul style="list-style-type: none"> Maintain, enhance or restore moose winter range habitats identified on Schedule A Maps 1-10; and Through access management, minimize mortality and disturbance to moose within and adjacent to the moose winter ranges identified on Schedule A, Maps 1-10. 	<ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including moose); The proposed project traverses two proposed UWRs for moose within Gitanyow territory (one on Kitsault route option and one on Nasoga route option); and The proposed Project footprint³⁰ crosses approximately 65 to 79 ha of moose winter range; and The proposed Project corridor³¹ intersects 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife and wildlife habitat (including moose), including: <ul style="list-style-type: none"> Avoiding the creation of new access within moose winter range, and where this is not feasible deactivating and reclaiming any temporary roads that are no longer needed with native vegetation. The proponent also commitments to implementing measures to reduce access (human and predator) along these temporary roads. 	<i>Consistent with GLUUP</i>

³⁰ estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga).

³¹ estimates of Project Corridor intersection with GLLUP layers were made with a 400 m wide corridor (the Proponent's Application Corridor) and consider direct and indirect effects of the proposed Project on Gitanyow LLUP values, ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
		approximately 462 to 580 ha of moose winter range.	<u>EA Certificate Conditions:</u> <ul style="list-style-type: none"> Refer to access management condition; and Refer to Nass Wildlife Area moose condition. 	
Mountain Goat Resources GLLUP Layers: Mountain Goat Winter Range; Mountain Goat 500m Buffer; Canyon Dwelling Mountain Goat				
<ul style="list-style-type: none"> Manage mountain goat winter range to help ensure a healthy mountain goat population; Avoid disturbance and displacement of mountain goats during vulnerable periods; and Minimize pressure on the mountain goat population from legal and illegal harvest through human access management. 	<ul style="list-style-type: none"> 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; and Minimize adverse disturbance to mountain goat winter range from helicopter logging activities. 	<ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including mountain goat); and The proposed Project does not cross any Mountain Goat Winter Range, Mountain Goat 500m Buffer, or Canyon Dwelling Mountain Goat areas. 	<u>Mitigations:</u> <ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife and wildlife habitat (including mountain goat). <u>EA Certificate Conditions:</u> <ul style="list-style-type: none"> Refer to UWR condition. 	<i>Consistent with GLLUP</i>
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.	<ul style="list-style-type: none"> Preserve the highest value grizzly bear habitat, identified in Schedule A, Maps 1-10 as either: <ul style="list-style-type: none"> a) Grizzly Bear Habitat Complex: <ul style="list-style-type: none"> Class 1: Very High - provincially significant 	<ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat, including grizzly bears; The proposed project crosses a 200m portion of the proposed Grizzly Bear Nass TSA WHA (6-282) for grizzly 	<u>Mitigations:</u> <ul style="list-style-type: none"> See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife and wildlife habitat (including grizzly bears), including: <ul style="list-style-type: none"> Develop and implement a Human-Wildlife Conflict Management Plan 	<i>The proposed Project would overlap the proposed Grizzly Bear Nass TSA WHA. With mitigation, effects to grizzly bear are not expected to be significant.</i>

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
	value; and ○ Class 2: High Value (Cranberry, Kispiox and Kalum Planning Units). or b) Grizzly Bear Specified Areas (Nass South Planning Unit). <ul style="list-style-type: none"> • Maintain the quality and effectiveness of grizzly bear foraging habitat; • Minimize human-bear conflicts; and • Minimize long-term displacement of grizzly bears from industrial access development. 	bear; <ul style="list-style-type: none"> • The proposed Project footprint³² crosses approximately 29 ha of Grizzly Bear Identified Watersheds (on the Nasoga route only), and 2 to 3 ha of Grizzly Bear Wildlife Habitat Area; and • The proposed Project corridor³³ intersects approximately 270 ha of Grizzly Bear Identified Watersheds (on the Nasoga route only), and 42 ha of Grizzly Bear Wildlife Habitat Area. 	that would include measures to prevent any direct bear mortalities associated with the construction and operations of the Project. <u>EA Certificate Conditions:</u> <ul style="list-style-type: none"> • Refer to grizzly bear condition 	
<i>Fur-bearers</i>				
Maintain high-value habitat for identified fur-bearer species to help ensure a healthy population of fur-bearers.	Minimize impact to known high-value fisher and wolverine habitat.	<ul style="list-style-type: none"> • See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including furbearers); • Proposed project would affect 2.9-3.1% of high-value fisher natal denning habitat within the 	<u>Mitigations:</u> <ul style="list-style-type: none"> • See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife and wildlife habitat (including furbearers), including: <ul style="list-style-type: none"> • Redistributing large-diameter slash over select locations on the ROW is 	<i>Consistent with GLLUP</i>

³² estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga);

³³ estimates of Project Corridor intersection with GLLUP layers were made with a 400 m wide corridor (the Proponent's Application Corridor) and consider direct and indirect effects of the proposed Project on Gitanyow LLUP values; ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
		total LSA of the project.	expected to reduce the potential adverse effects from the proposed Project by providing cover and facilitating the movement of furbearers.	
Goshawk – GLLUP Layers: Goshawk Habitat/Nests				
Maintain a viable population of northern goshawk within the plan area.	<ul style="list-style-type: none"> • Maintain nesting and post-fledgling habitat at known goshawk nest areas to support continued use and reproduction in those areas; and • Maintain foraging habitat around known goshawk nest and post-fledgling areas. 	<ul style="list-style-type: none"> • See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife and wildlife habitat (including goshawk); • The proposed Project footprint³⁴ crosses 9 to 12 ha of high value and 26 to 27 ha of moderate value goshawk habitat in the Cranberry; and on the Kitsault route only, 20 ha high value, 27 ha moderate value and 12 ha low value habitat in the Nass South; • The proposed Project corridor³⁵ intersects 82 to 101 ha of high value and 187 to 196 ha of moderate value goshawk habitat in the Cranberry; and on the Kitsault route only, 138 ha high value, 188 ha moderate value and 95 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on northern goshawk, including: <ul style="list-style-type: none"> ○ Conducting pre-construction wildlife surveys to identify habitat features that warrant mitigation. 	<i>Consistent with GLLUP</i>

³⁴ estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga);

³⁵ estimates of Project Corridor intersection with GLLUP layers were made with a 400 m wide corridor (the Proponent's Application Corridor) and consider direct and indirect effects of the proposed Project on Gitanyow LLUP values; ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
		ha low value habitat in the Nass South; and <ul style="list-style-type: none"> The proposed Project does not intersect any goshawk nest areas. 		
General Wildlife Resources – GLLUP Layers: Special Habitat for General Wildlife				
Protect special habitats for general wildlife.	<ul style="list-style-type: none"> Maintain effectiveness of riparian habitats adjacent to wetlands in polygons identified on Schedule A, Maps 1-10 as Special Habitats for General Wildlife; and Maintain effectiveness of alder brush and aspen patch habitats in polygons identified on Schedule A, Maps 1-10 as Special Habitats for General Wildlife (Cranberry and Kalum Planning Units). 	<ul style="list-style-type: none"> See section 5.10 of the Assessment Report for a detailed analysis of potential effects on terrestrial vegetation; See section 5.9 of the Assessment Report for a detailed analysis of potential effects on wildlife habitat; The proposed Project footprint³⁶ crosses 5 to 7 ha of high value patch habitat and no riparian reserves; and The proposed Project corridor³⁷ intersects 39 to 49 ha of high value patch habitat and no riparian reserves. 	<u>Mitigations:</u> <ul style="list-style-type: none"> See section 5.10 of the Assessment Report for a detailed list of mitigation measures for potential effects on terrestrial vegetation; and See section 5.9 of the Assessment Report for a detailed list of mitigation measures for potential effects on wildlife habitat. 	<i>Consistent with GLLUP</i>
Fisheries Resources– GLLUP Layers: Ecosystem Network, Ecosystem Network Buffer				
Protect fish populations by preserving, maintaining and restoring fish habitat.	<ul style="list-style-type: none"> Maintain habitat for indigenous fish populations; and Restore habitat for 	<ul style="list-style-type: none"> See section 5.6 of the Assessment Report for a detailed analysis of potential effects on fish and fish habitat. 	<u>Mitigations:</u> <ul style="list-style-type: none"> See section 5.6 of the Assessment Report for a detailed list of mitigation measures for potential effects on fish 	<i>Consistent with GLLUP</i>

³⁶estimates of Project Footprint intersection with GLLUP layers were made with a 55 m wide corridor on the route centerline; ranges represent differences between the two route options (Kitsault vs Nasoga).

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
	indigenous fish populations.		and fish habitat, including: <ul style="list-style-type: none"> o Develop a detailed site-specific watercourse crossing plans that includes mitigation measures to avoid harm to fish and aquatic habitat, water quality monitoring, and riparian and instream habitat restoration plans. 	
Cultural Heritage Resources				
Recognize and respect Gitanyow traditional areas, values, and activities so that they may exercise their aboriginal rights on the landscape.	<ul style="list-style-type: none"> • 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; and • Reserve land surrounding Gitanyow Lake for Gitanyow management of cultural heritage resources. 	<ul style="list-style-type: none"> • See section 8.1 of the Assessment Report for a detailed analysis of potential effects heritage resources; • See section 5.10 of the Assessment Report for a detailed analysis of potential effects terrestrial vegetation; and • The proposed Project does not intersect any Lake Reserves or Cedar Stand Reserves. 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 8.1 of the Assessment Report for a detailed list of mitigation measures for potential effects on archaeological and heritage resources; and • See section 5.10 of the Assessment Report for a detailed list of mitigation measures terrestrial vegetation. <p>Proponent's mitigations include:</p> <ul style="list-style-type: none"> • Developing a Heritage Resources Discovery Contingency Plan, in the event of discovery of heritage sites during the impact assessment; and • Suspending work in proximity to archaeological or historic sites discovered during construction. No work at that particular location shall continue until permission is granted by the appropriate regulatory authority. Follow the contingency measures identified in the Heritage Resources 	<i>Consistent with GLLUP</i>

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
			Discovery Contingency Plan.	
Timber Resources				
<ul style="list-style-type: none"> • Promote full utilization of productive sites while providing stable or increased harvest levels; and • Develop a sustainable and economically viable forest industry that contributes to the local community over the short and long terms, while respecting Gitanyow interests. 	<ul style="list-style-type: none"> • 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; and • Develop long-term plans that recognize and respect Gitanyow interests in the forest resource. 	<ul style="list-style-type: none"> • See section 5.10 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; and • The proposed project crosses proposed treaty settlement land at the Nass River crossing on the Kitsault route. 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.10 of the Assessment Report for a detailed list of mitigation measures for potential effects on vegetation; and • See section 7.3 of the Assessment Report for a detailed list of mitigation measures for potential effects on land and resource use. <p><u>EA Certificate Conditions:</u></p> <ul style="list-style-type: none"> • Refer to Timber utilization conditions. 	<p><i>Timber harvesting may occur in proposed treaty settlement land that overlaps with the Application Corridor near the Nass River crossing on the Kitsault route.</i></p>
Water Management Resources - GLLUP Layers: Water Management Units;				
Manage surface water and groundwater to maintain water quality and peak and low flows within the range of	Ensure proper hydrological functioning of streams, lakes, and wetlands within water management units identified in	<ul style="list-style-type: none"> • See section 5.7 of the Assessment Report for a detailed analysis of potential effects on water quality and 	<p><u>Mitigations:</u></p> <ul style="list-style-type: none"> • See section 5.7 of the Assessment Report for a detailed list of mitigation measures for potential effects on water 	Consistent with GLLUP

Plan Goals:	Objectives:	Potential Effects from the Proposed Project:	Mitigations/Accommodations/Conditions:	Preliminary Conclusion:
natural variability, and protect the hydrologic integrity of the watersheds.	Schedule A, Maps 1-10.	quantity (including groundwater and surface water); <ul style="list-style-type: none"> See section 5.8 of the Assessment Report for a detailed analysis of potential effects on wetlands; and The proposed Project does not route through any Watershed Management Units. 	quality and quantity (including groundwater and surface water); and <ul style="list-style-type: none"> See section 5.8 of the Assessment Report for a detailed list of mitigation measures for potential effects on wetlands. 	
Upper Kispiox Special Management Zone				
<ul style="list-style-type: none"> Primary goal is to maintain key resource values such as wildlife habitat, water quality, fish habitat, and cultural heritage resources; and Secondary goal is to allow identified economic opportunities to prevail. 	<ul style="list-style-type: none"> Ensure proper hydrological functioning of all streams, lakes and wetlands within the Upper Kispiox Special Management Zone, as identified on Schedule A, Map 8; and Minimize long-term displacement of grizzly bears from industrial access development. 	<ul style="list-style-type: none"> The proposed Project does not route through the Upper Kispiox Special Management Zone. 		<i>Consistent with GLLUP</i>
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.	<ul style="list-style-type: none"> Maintain conservation, recreation, and cultural heritage values and features within the area to be protected identified as the Hanna-Tintina Area to be protected in Schedule A, map 1. 	<ul style="list-style-type: none"> The proposed Project does not route through Hanna Tintina Area. 		<i>Consistent with GLLUP</i>

19 Weighing Impacts on Aboriginal Interests with Other Interests

The Crown has a duty 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.

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 important 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 substantial 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 Project. These opportunities include:

- Building Aboriginal business capacity through the use of directed procurement activities prior to and during the EA of the 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 would continue to maximize Aboriginal opportunities through designated services to qualified Aboriginal businesses and individuals. The Proponent would 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. The Proponent requests information about activities related to

Aboriginal participation as part of the prime contractor procurement package. This information would form 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;
- 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 would be affected by the 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. The Proponent has offered to meet with all Aboriginal Groups to discuss a business and employment process to maximize the opportunities available to Aboriginal businesses and community members. The Proponent has initiated these discussions with all but three Aboriginal communities. Additionally, the Proponent has distributed negotiation principles and objectives for economic benefits agreements with Aboriginal communities and has been meeting with Aboriginal communities to gain alignment on the negotiation principles and objectives and to work toward completing economic benefits agreements.

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 Nass Wildlife Area 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 Assessment 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 Environmental Assessment) 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 4 of Part D 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 Assessment 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 Assessment 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.

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, para. 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 British Columbia 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 BC 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 (para. 23).

22.1.2 Potential Effects and Proposed Mitigation

The proposed Project would traverse the Nass Area, the NWA and, in respect of the Nasoga route, 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 Cypress to Cranberry Route would enter the Nass Area and NWA boundaries on its western end. From there, the Kitsault Route would traverse northwest from Cranberry Junction, across the Nass River to Kitsault at the head of Alice Arm, continuing offshore into the Pacific Ocean through Alice Arm, Observatory Inlet, Portland Inlet and Chatham Sound. The Kitsault Route, including the beginning of the marine route and Kitsault Compressor Station, would be entirely within the NWA. The Kitsault Alternate Route would also pass through Nisga'a Lands and the Grease Trail near its eastern end. The Kitsault Alternate Route within Nisga'a Lands would not share a common border or cross any existing linear rights-of-way.

The Nasoga Route would traverse southwest from Cranberry Junction along the Nass River, paralleling its south bank in Nisga'a Lands, and then bearing southwest to Echo Cove. The route would extend offshore through Iceberg Bay, onshore south of the

Chambers Creek estuary, then west to vegetated land at the head of Nasoga Gulf. From there, it would extend offshore into the Pacific Ocean through Nasoga Gulf, Portland Inlet and Chatham Sound. The Nasoga route would also traverse the Tseax and Nass Bottomlands. The Nasoga Route would traverse Nisga'a Lands, the NWA and the Nass Area.

The Nisga'a Memorial Lava Bed Park (Anhuluut'ukwsim Laxmihl Angwinga'Asanskwhl Nisga'a, or "the Park") would be crossed by the proposed Project's Nasoga Route. Development of a pipeline alignment across the Park would require a Park Boundary Amendment, which would require several different reviews and approvals, including from the Minister of Environment and amendments to legislation and the NFA by the BC Government and the *Wilp* Si'ayuukhl Nisga'a (the Nisga'a legislature). If the Nasoga route is constructed, the Proponent currently proposes to drill through the rock underneath the lava to construct the pipeline, subject to additional geotechnical investigation.

The beginning of the Nasoga marine route and the K5A Compressor Station at Nasoga Gulf would be located within the NWA. The Nasoga Route would cross existing power lines and all-season public highway rights-of-way for 24.7 km, 25.6% of the total corridor length.

Alternate routes (shown in light blue in Figure 20-1) are proposed along the Nasoga Route in the Lower Nass River sub-basin, including:

- Gitlaxt'aamiks Alternate route (KPN 662.9 0 to KPN 664.8), which would border or cross existing power lines right-of-way for 1.05 km or 36.7% of its total length;
- Nisga'a Highway Alternate route (KPN 681.4 to KPN 684.7), which would border or cross existing all-season public highway rights-of-way for 2.5 km or 77.3% of its total length;
- Ksi Mat'in Alternate route (KPN 696.7 to KPN 698.5), which would border or cross existing all-season public highway rights-of-way for 0.7 km or 30.4% of its total length; and
- Nass Bay Tunnel Alternate route (KPN 727.1 to KPN 734.4), which would not border or cross existing rights-of-way.

Land Interests

As the proposed Project would pass through Nisga'a Lands, it 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 (Category A and B Lands) outside of Nisga'a Lands. The Proponent discusses these interactions in sections 1.0 and 12.3.3 of the Application. The Nasoga route would cross within approximately 2 km of Nisga'a Fee Simple Lands at Gits'ooohl and potential adverse effects related to Nisga'a Land interests could include infringement on Old Growth Management Areas (OGMAs) in Nisga'a Lands.

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 Nisga'a Nation, developed mitigation strategies which include avoiding OGMAs where practical, minimizing impacts to OGMAs where avoidance is not possible, and identifying replacement areas.

EAO proposes an EA Certificate 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 and Gingeitl Creek Ecological Reserve could be impacted by the proposed Project, including impacts arising from changes in the Park's geological, vegetation and heritage resources. The Application assesses these impacts and Nisga'a interests related to: commercial recreation tenure issued to Nisga'a Nation pursuant to Chapter 3, paragraph 90, Appendix E; traplines pursuant to Chapter 9, Schedule B; angling guide licences pursuant to Chapter 9, Schedule D and guide outfitter's certificates and licences issued to Nisga'a Nation pursuant to Chapter 9 paragraph 81. Other Nisga'a Land-related interests which could interact with the proposed Project include sites outside of Nisga'a Lands designated as provincial heritage sites as outlined in Chapter 3, paragraph 95 and Chapter 17, paragraph 37.

There is potential for Nisga'a rights related to outfitting, trapping, tourism, recreational and treaty rights to certain subsistence activities to be adversely affected. While no commercial recreation tenures are located near the proposed Project, 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. Potential effects of the proposed Project include disruption to commercial freshwater, land-based and marine tourism activities.

Disruption of trapping activities could also occur. Traplines fall within the area studied by the Proponent, but do not overlap with proposed infrastructure. Nisga'a citizens have identified Nisga'a Nation hunting and fishing cabins close to the proposed Project. Issuance of hunting licences by the NLG in the NWA varies annually.

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 Assessment Report. As requested by EAO, during Application Review the Proponent provided additional information from field studies on watercourses in Nisga'a Lands.

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 Assessment Report.

The pipeline ROW would cross near Genim Sgeenix (Grease Trail), which is designated as a provincial heritage site under the NFA, near Nisga'a habitation sites (Old Aiyansh village site, Wii LaxKap, Gitwinksihlkw, Laxgalts'ap, Gingolx, Gitlaxt'aamiks and Gitlaxksiip), and near the important stretch of coastline used for the eulachon fishery between Red Bluff and Fishery Bay at the mouth of the Nass River. Other areas identified by the Nisga'a as being of sacred value include but are not limited to the Nass River and Lake, Volcano (Tseax Cone) and Lava Beds, Vetter Peak, Mount Hinkley, Treaty Creek and Kelskiist Creek.

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:

- Rerouting from KP 665.9 to KP 668.8 in Nisga'a Memorial Lava Bed Park to provide an underground trenchless crossing, subject to geotechnical investigations and discussions with Nisga'a Nation and BC Parks;
- Obtaining a Park Boundary Amendment from Nisga'a Nation and BC for the Nisga'a Memorial Lava Bed Park;

- Reaching agreements for demonstrated economic losses related to proposed Project construction;
- Minimizing helicopter overflights in areas of importance for guiding activities;
- Communicating the Project construction schedule and routing with licensee holders and guide outfitters, trapline holders, and tourism operators;
- Adhering to various plans, including the Access Management Plan, Restoration Plan, and Marine Management Plan (see Table 12-24 of the Application);
- Restricting construction activities during peak tourism seasons; and
- Other specific mitigation measures, as provided in the Project Environmental Management Plan (EMP).

Nisga'a Access to Other Lands

The Application indicated there would not be potential interaction between the proposed Project and Nisga'a interests pertaining to access to other lands. Nisga'a Nation does not operate agricultural range tenures near the proposed Project.

Potential adverse effects include disrupted access to outdoor recreational activities in the Nass Area, as well as impacts on wilderness character due to access as well as clearing and helicopter overflights. There is the potential for disturbance to residences, cabins, and other occupied areas outside of communities within the Nass Area. Effects may also include disruption of activities and sites related to hunting, trapping, and plant gathering in the Nass Area. Hunting, trapping, and plant gathering occur within the NWA. The Application indicated no sites are known to be crossed by the proposed Project route, although NLG noted to EAO that the entirety of the route from Cranberry to Nasoga Gulf is within a trapline (correspondence September 26, 2014). While the Application stated that no known plant harvesting areas occur within the proposed footprint, NLG indicated that is incorrect and that not all plant harvesting areas used by Nisga'a citizens are catalogued.

Disruption of activities and sites related to fishing in marine areas and at watercourse crossings is another potential adverse effect, as Nisga'a have treaty rights to harvest fish and aquatic plants in accordance with the NFA.

Gathering places exist throughout the NWA. Sites identified by the Nisga'a as being of sacred value exist throughout the NWA, including the previously mentioned lava beds that would be crossed by the Project footprint. Meetings between the Proponent and NLG to discuss routing and mitigation measures regarding the lava bed crossing are

ongoing. Disruption of use of trails and travelways could also occur, including but not limited to Nisga'a roads, public roads and Highway 37. This may include trails and travelways around Nisga'a Category B lands at Gits'oohl and Nasoga Gulf, and around the intertidal bivalve harvest zone at Nasoga Gulf, which are adjacent to proposed landfall along the proposed Kitsault and Nasoga Gulf routes.

In response to adverse potential effects of the proposed Project on Nisga'a access to other lands, the Proponent has put forward additional mitigation strategies including:

- Following Access Management, Soil Handling Conservation, Restoration, Traffic Management, Environmental Management, Waste Management, TLU Sites Discovery Contingency and Heritage Resources Discovery Contingency Plans;
- Constructing trail crossings at right angles to trails where practical;
- Restricting construction to off-seasons or periods of low use, using existing access roads, using existing clearings and access where practical, and reducing duration of construction activities and effects;
- Communicating the proposed Project construction schedule;
- Minimizing right-of-way near inhabited areas;
- Notifying representatives of Nisga'a Nation and registered trappers of work locations and construction schedules a minimum of 14 days prior to commencement of construction;
- Pre-construction discussions with Nisga'a Nation to identify hunting sites that warrant mitigation;
- Prohibiting vandalism or theft of trapper equipment or animals by workers;
- Prohibiting hunting by construction personnel near the proposed Project site during working hours or while in Project-funded accommodation. No firearms permitted on work sites except for protection from wildlife;
- Prohibiting recreational fishing and hunting by personnel near Project construction; and
- Ensuring construction equipment is clean and free of soil or vegetative debris prior to arrival on the construction site to reduce weed introduction.

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 Access) 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 may result in some changes to the visual, geological, vegetation, and heritage resources, but these would be managed by Nisga'a Nation in accordance with rights conveyed under the NFA for the section of the Project located on Nisga'a Lands.

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 permitting or the Right of Way Agreement would also be expected to be important in mitigating potential adverse effects. Following consultation with Nisga'a Nation and other members of the Working Group, 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 identified in Chapter 10, paragraph 8(e) 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:

- Oolichan (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 focusses on the potential impacts to fish and plants in the freshwater environment.

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 fish. EAO’s

Assessment Report includes an assessment of freshwater fish and fish habitat and water in sections 5.6 and 5.7.

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 oolichan within the Nass Area and freshwater plants.

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 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 fish and fish habitat downstream of the construction footprint.

According to the Proponent, the proposed Project's Nasoga route would cross 206 watercourses (147 fish-bearing) within the Nass River and North Coast Rivers watersheds, while the Kitsault route would cross 194 watercourses (122 fish-bearing) (Table 5-4 of this Report). Along the Nasoga route 26 of these watercourses are identified as medium risk, and two are high risk, while along the Kitsault route 3 are medium risk and two are high risk (Table 5-6 of this Report).

The Application indicated that fish and fish habitat field investigations were conducted in 2012 and 2013 on approximately 85% of the potential watercourses crossed by the proposed Project. The Application also indicated that due to access restrictions during the field program and refinement of the Application Corridor, many of watercourse crossings in the Nass River watershed on Nisga'a Lands for the proposed Nasoga Route were not investigated during the 2012 and 2013 baseline studies and were not included in the Application. However, NLG disagrees that there were access restrictions at this time. At the time of accepting the Application, EAO, following consultation with Nisga'a Lisims Government, established a requirement for additional fieldwork to be conducted on the missed watercourses, and for the results to be submitted during Application Review. The Proponent submitted their supplemental report, "Nisga'a Lands Freshwater Fish and Fish Habitat Technical Data Report," in August 2014.

The Application identified a number of potential effects of the proposed Project which may affect the ability of Nisga'a citizens to harvest freshwater fish, and proposed mitigation measures, discussed below.

EAO also proposes EA Certificate Conditions to:

- Give opportunities for Aboriginal Groups and Nisga'a Lisims Government to provide environmental monitors during construction;
- Require, at the request of one or more Aboriginal Groups including Nisga'a Lisims Government, the Proponent to provide plans for offsets on aquatic, riparian, or in-stream values prior to submission to Relevant Regulatory Authorities;
- Require the Certificate Holder to develop a Restoration Plan if the proposed Project construction overlaps with existing aquatic or riparian restoration or compensation sites; and
- Require implementation of a No-Hunting, No-Trapping, No-Fishing and No-Plant Gathering Policy for employees and contractors during work hours.

Alteration or loss of riparian habitat function

Alteration or loss of riparian habitat function at watercourse crossings during construction activities and during operations could impact fish and fish habitat within the proposed Project footprint. The Nasoga route would disturb 204 ha of riparian area (0.1% of the Nass River RSA; 0.17% of the North Coast Rivers RSA), while the Kitsault route would disturb 133 ha of riparian area (0.06% of the Nass River RSA; 0.77% of the North Coast Rivers RSA). Existing riparian disturbance to each of these watersheds is relatively low (in the RSA).

Mitigation measures related to riparian disturbance include:

- Constructing temporary and permanent facilities at least 30 m away from watercourses;
- Leaving as much riparian vegetation left intact during construction as practical;
- Implementing efforts to control sedimentation and erosion in disturbed areas;
- Reducing alteration of riparian vegetation during frozen ground conditions;

- Re-establishing disturbed bank areas and seeding riparian areas following construction activities with appropriate native seed mix and quick establishing cover crop;
- Planting riparian shrubs and trees in temporary workspaces in riparian zones;
- Including re-vegetation plans and associated mitigation in the EMP; and
- Applying other appropriate mitigation and offsetting measures.

Alteration or loss of instream habitat

Alteration or loss of instream habitat within the zone of influence at trenched crossings, during construction of vehicle crossings, and within the zone of influence during operations at watercourse crossings could impact fish and fish habitat within the proposed footprint. The Nasoga route would disturb 4 ha of instream area (0.02% of the Nass River RSA; <0.01% of the North Coast Rivers RSA), while the Kitsault route would disturb 21 ha of riparian area (0.08% of the Nass River RSA; <0.01% of the North Coast Rivers RSA). Existing instream disturbance to each of these watersheds is relatively low (in the RSA).

Related mitigation measures include:

- Considering sensitivity of watercourses, including habitat characteristics, fish species present and instream work windows, in addition to construction schedule and technically and economically feasible mitigation at crossings;
- Bank stabilization through application of native seed mixes with quick-germinating cover mixtures, and enhanced re-vegetation efforts including geotextiles or biostabilization; and
- Applying other appropriate mitigation and offsetting measures discussed in section 5.6 of this report.

Increased suspended sediment concentrations in the water column

Increased suspended sediment concentrations in the water column at watercourse crossings could impact fish and fish habitat within the LSA. Some mitigation measures and offsetting requirements would be confirmed during the permitting stage through discussions with appropriate regulatory agencies and stakeholder consultations. Identified mitigation measures include water quality monitoring to monitor for turbidity, TSS and dissolved oxygen content during instream activities at selected, isolated, fish-

bearing crossings to monitor for levels in excess of CCME guidelines and BC Approved Water Quality Guidelines. Excess levels would require a mitigation strategy.

Fish mortality and injury

Fish mortality and injury at watercourse crossings could impact fish and fish habitat within the LSA. The loss of fish as a result of the proposed Project is expected to be negligible and concentrated in the construction phase.

Access to fish and fish habitat

Increased access to fish and fish habitat at watercourse crossings within the LSA could have adverse effects. This could arise due to increased off-road vehicle access and legal and illegal harvest of fish as well as angler overharvest, with top level predators in the NWA including salmon, trout and char being particularly vulnerable. Decreased access by Nisga'a to fishing areas may also occur during construction of the right-of-way. Mitigation measures include:

- Prohibiting pipeline construction staff from angling while on, or travelling to and from, the construction site;
- Planting trees and shrubs as part of the re-vegetation program at water crossings to discourage increased access; and
- Other mitigation measures outlined in the Access Management Plan.

NLG has expressed that the mitigation measure listed above regarding limiting fishing by construction staff should not have a geographic limitation.

Blockage of fish movements

Blockage of fish movements at watercourse crossings could impact fish and fish habitat within the LSA. Appropriate mitigation measures would be applied as well as offsetting measures, if required, under the *Fisheries Act*.

Effects on fish species of conservation concern

Potential adverse effects within the LSA on fish species of conservation concern at watercourse crossings may occur due to the proposed Project. Several COSEWIC and provincially-listed species occur in the NWA and within watercourses crossed by the proposed pipeline corridor, including coastal cutthroat trout, bull trout and oolichan.

Mitigation includes selection of vehicle and pipeline crossing methods to reduce potential Project-specific effects during construction, operations and decommissioning on fish species of conservation concern.

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 and the CPD (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 on either fish and fish habitat or water.

Conditions established under permitting or the ROW Agreement would also be expected to be important in mitigating potential adverse effects. Following consultation with Nisga'a Nation and other members of the Working Group, 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 3.2.1 of Part D outlines Nisga'a right to fish as well as fish harvest allocation entitlements as outlined by Chapter 8 of the NFA.

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.

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 the marine environment. EAO's Assessment Report includes an assessment of marine resources in section 5.11.

22.3.2 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 marine fish and plants (Chapter 8), including specific allocations. As discussed in section 5.11 (Marine Resources), the proposed Project corridor within the marine environment includes two marine route options to the proposed terminal at Ridley Island in Prince Rupert Harbour:

- Nasoga Route, including: Iceberg Bay, Nasoga Gulf, Portland Inlet, Chatham Sound to Ridley Island with a total length of approximately 105 km; or
- Kitsault Route, including: Alice Arm, Observatory Inlet, Portland Inlet and Chatham Sound to Ridley Island with a total length of approximately 182 km.

The Proponent identified the following potential adverse marine effects of the proposed Project:

- Alteration or loss of marine and foreshore vegetation due to construction activities within the nearshore and offshore proposed Project footprint, and alteration or loss of marine and foreshore vegetation due to sedimentation within the nearshore and offshore LSA;
- Displacement, injury, mortality and loss of habitat for intertidal bivalves, Dungeness crab, tanner crab, king crab and fish due to construction within the nearshore and offshore proposed Project footprint;
- Disturbance from construction noise and underwater blasting nearshore and offshore could impact marine life in the nearshore and offshore RSA;
- Increased toxicity and bioavailability of contaminants due to landfall trenching and sidecast, and habitat fragmentation within the nearshore and offshore Project footprint, particularly at the Kitsault landfill site;
- Displacement, injury or mortality due to sedimentation nearshore and offshore could impact fish in the nearshore and offshore RSA;
- Disturbance of marine mammals due to construction noise within the nearshore and offshore RSA;
- Loss of access to fishing and harvesting areas during construction; and
- Damage or loss of fishing gear during construction and operations.

The results of a human health risk assessment (Appendix 2-P of the Application)

indicates that any increase in contaminant levels in biota including bivalves and Dungeness crab as a result of landfall construction activity at Kitsault would be negligible relative to existing baseline levels.

The assessment of impacts to Marine Resources is discussed in section 5.11 of this Assessment Report, while impacts to Human Health are discussed in section 9.1 and impacts to marine activities are discussed under Land and Resource Use in section 7.3.

The Nasoga route would require shoreline modification at three areas (Nasoga Gulf, Echo Cove and Iceberg Bay), and no offshore seabed modification. There is the potential that the pipelay across Iceberg Bay could create a barrier for crab movement, but the Proponent has committed to ensuring that it is submerged to a depth that mitigates this potential effect. EAO proposes a Condition of the EA Certificate for mitigation and monitoring to ensure that it does not present a barrier within one year after construction.

The Kitsault route would require shoreline modification at the marine entry at Kitsault, as well as seabed modification at four areas along Alice Arm (Alice Rock, Pearson Point, Brooke Shoal and Liddle Channel). The Application included studies regarding the potential impacts of the re-suspension of contaminated sediments at Kitsault as a result of dredging activities, and impact that seabed modification of Alice Rock could have on the mobilization of contaminated sediments.

Key mitigation measures are discussed in Part B of this Assessment Report. 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;
- Ensuring opportunities for Aboriginal Groups and Nisga'a Lisims Government to provide environmental monitors during construction;
- Requiring, upon the request of one or more Aboriginal Groups including Nisga'a Lisims Government, the Proponent provide plans for offsets on aquatic, riparian, or in-stream values prior to submission to Relevant Regulatory Authorities; and
- Submit to NLG detailed construction plans of construction activities occurring in marine waters of the Nass Area or foreshore areas of the Nass Area, and provide a Marine and Foreshore Habitat Offsetting Plan, for NLG review.

22.3.3 Conclusions

Part B of this Assessment 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 and the CPD (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 Nisga'a Nation and other members of the Working Group, 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 Nisga'a wildlife allocations for initial designated species of moose, grizzly bears, and mountain goats. There is also a process for the designation of other 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.

Spatial information for permanent access roads associated with the proposed compressor stations is available and was included in the proposed Project footprint, although locations of roads required to access the right-of-way during construction and operations have yet to be determined. Therefore, such roads were considered qualitatively in assessment of wildlife.

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.

The proposed Project footprint would overlap with Nisga'a hunting areas in the NWA. Pipeline and facility construction and operation directly and indirectly affect wildlife and wildlife habitat through alteration of vegetation, terrain and drainage, and sensory disturbance which cause changes in habitat, movement and mortality risk. Key potential adverse effects to grizzly bear, moose and mountain goat and mitigation measures are discussed below and in more detail in section 5.9 of this Assessment Report.

EAO also proposes the following EA Certificate 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 a policy restricting employees from possessing or storing firearms, bows and crossbows in camps or work vehicles unless at request of the Certificate holder.

Grizzly Bear

Grizzly bear are a COSEWIC and blue-listed species of conservation concern, largely

due to extensive range and population reductions from development and habitat fragmentation, and human related conflicts and mortality. Within the NWA, the proposed Project would overlap with the Cranberry, Stewart and Khutzeymateen Grizzly Bear Population Units (GBPUs), all three of which are considered to have viable grizzly populations.

The potential adverse effects of the proposed Project on grizzly bear in the NWA include to habitat, movement and mortality risk. The proposed Project footprint would reduce cover and temporarily reduce forage availability, although the ROW would likely be used for foraging and travel. Noise and traffic may reduce habitat effectiveness during construction. Rights-of-way could potentially increase mortality rates through hunting pressures by increasing access.

The Application Corridor would traverse a proposed Grizzly Bear Wildlife Habitat Area (WHA) for 0.5 km along the Kitsault Route in the NWA. Within the NWA the Corridor crosses Grizzly Bear Class 1 habitat designated under the Central and North Coast Order, for approximately 100 m along the Kitsault Route and 100 m along the Nasoga Route. It would cross Class 2 habitat under the Order for 200 m along the Kitsault Route. These areas' objectives include targets for maintaining high value grizzly habitat. Habitat model results indicate predicted change in effective spring grizzly bear habitat is 5% or less of modeled habitat currently available in the Wildlife LSA. Linear corridor densities in all three GBPUs are below 0.6 km/km², and would remain under this threshold if the proposed Project is built.

General Wildlife Measures, objectives, conditions and recommendations associated with the proposed WHA and Central and North Coast Order, and information collected through consultation and Working Groups were incorporated into development of the Proponent's proposed mitigation.

Mitigation to reduce potential adverse effects from the proposed Project on mammal movement includes:

- Limiting access to reduce the proposed Project's effects on grizzly bear mortality risk, including through an Access Management Plan;
- Developing and implementing a Human-Wildlife Conflict Management Plan;
- Avoiding locating temporary facilities and roads in key grizzly bear habitat;
- Scheduling clearing and construction activities within identified high value grizzly habitat outside of periods of high seasonal use;
- Reducing potential indirect effects of the proposed Project on grizzly habitat; and

- Minimizing impacts to mammal movement during construction and operations by limiting the length of open trench, maintaining breaks in soil, slash, snow and pipe, and aligning breaks with wildlife trails.

EAO proposes EA Certificate 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.

The proposed Project has the potential to affect moose habitat, movement and mortality risk in the NWA. Area clearing for the proposed Project footprint would reduce availability of cover and temporarily reduce forage, although forage availability would increase once regeneration to grasses and shrubs occurs. This change may alter moose movement patterns by attracting them to the ROW.

Sensory disturbances can displace moose to less suitable habitats. Noise and light would be continuous throughout operations at the compressor and meter stations including those in the NWA on proposed Nasoga and Kitsault routes. Linear features such as secondary roads or seismic lines are not expected to impede moose movement.

Rights-of-way could increase mortality rates through increasing access for hunters and predators such as wolves. Predation was identified as a factor in the recent Nass moose population declines, of concern in the region. Routing meetings with NLG and the Proponent are ongoing regarding impacts on moose range. Habitat models predict change in effective moose winter feeding and winter security/thermal habitat to be relatively small at less than 3% of habitat currently available in the Wildlife LSA. 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 Nisga'a for traditional harvest.

The proposed Project would traverse two Ungulate Winter Ranges (UWRs) for moose in

the NWA: the Nasoga Route would cross primary winter range for 1.3 km and secondary winter range for 3.3 km, and the Kitsault Route crosses u-6-018 (for approximately 2 km). Draft General Wildlife Measures for the latter focus on retaining thermal and security cover for moose and minimizing roads within 500 m of the UWR.

Mitigation to reduce potential adverse effects from the proposed Project on mammal movement during construction and operations is described in the Application, and in section 5.9 of this Assessment Report. Proposed mitigation efforts include:

- Scheduling clearing and construction activities within the UWRs to avoid November 1 – May 1;
- Reducing potential indirect effects of the proposed Project on moose habitat and adverse effects on mammal movement;
- Limiting barriers to moose movement during construction by limiting the length of open trenches, maintaining breaks in soil, slash, snow and pipe, and aligning breaks with wildlife trails;
- Limiting access to the area, including by using existing access wherever feasible;
- Developing an Access Management Plan; and
- Further discussions with Nisga'a to consider additional potential mitigation measures specific to moose in the Nass Area, potentially Nass moose programs or studies referenced in conditions 20 and 21 of the EA Certificate for Kitsault Mine Project.

EAO notes that many of the issues relating to the regional decline in moose population are complicated and stem from a number of issues, including 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 EA Certificate 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 would like to see integration of ROW maintenance with moose habitat management. EAO notes that such measures would be included in the Nass Moose Monitoring Plan.

Mountain Goat

There is one Mountain Goat UWR along the proposed route in the NWA that would be avoided by the Nasoga Route through the tunnel proposed. General Wildlife Measures for the UWR are intended to maintain forest and vegetation cover and reduce

displacement and sensory disturbance to mountain goat.

Mitigation to reduce potential adverse effects from the proposed Project on mammal movement during construction and operations is described in the Application, and in Section 5.9 of this Assessment Report. Proposed mitigation efforts include avoiding overflights and maintaining a 2 km horizontal distance and 400 m vertical distance from mountain goat winter range.

22.4.3 Conclusions

Part B, section 5.9 of this Assessment Report identified a number of residual effects related to wildlife. Considering the analysis and having regard to the Conditions identified in the TOC and the CPD (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 OGC and NLG permitting would also be expected to be important in mitigating potential adverse effects.

Following consultation with Nisga'a Nation and other members of the Working Group, 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.

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.

22.5.2 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 5.9 of this Assessment Report.

The proposed Project would not traverse migratory bird WHAs, migratory bird sanctuaries, western hemisphere shorebird reserves, Ramsar wetlands or biosphere reserves. The head of the Nass River and the area near Prince Rupert have been identified as important staging areas for migrating white-winged and black scoters. Marine waterfowl often winter in coastal estuaries and other coastal waters, and shorebirds are associated with coastal estuarine and mud flat habitats. Large numbers of moulting scoters have been observed in the southern portion of Observatory Inlet.

Most potential effects to migratory bird habitat would occur primarily in the short-term during construction activities, although much of the regeneration of forest vegetation in the proposed footprint will take decades, particularly forest habitat. Habitat models indicate that the proposed Project would reduce effective nesting habitat in the NWA, although for some species including common nighthawk and grassland/shrubland birds, construction may increase habitat. Migratory bird habitat would experience some direct habitat loss, fragmentation, edge effects and sensory disturbance, particularly along the right-of-way. Migratory birds may experience adverse effects related to changes in movement due to forest gaps, wider corridor widths, and parallel forest openings.

The Project would potentially increase bird mortality, related to nest disturbance during construction, and increased risk of nest predation, particularly for ground nesters.

Proposed mitigation measures in the Application include:

- Reducing grubbing near watercourses, wetlands and other wet areas to facilitate reclamation of deciduous tree and shrub communities;
- Avoiding vegetation control along right-of-way edges;

- Scheduling clearing and construction activities outside the migratory bird nesting period (May 1-July 31), or conducting migratory bird nest sweeps; and
- Reducing the Project footprint and fragmentation.

EAO proposes the following EA Certificate 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.

22.5.3 Conclusions

Part B, section 5.9 of this Assessment Report identified residual effects related to birds. Considering the analysis and having regard to the Conditions identified in the TOC and the CPD (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 birds. Mitigation implemented as part of OGC and NLG permitting would also be expected to be important in mitigating potential adverse effects.

Following consultation with Nisga'a Nation and other members of the Working Group, 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 in Chapter 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.

Spatial and temporal boundaries for Section 8(e), Chapter 10 of the NFA assessment are consistent with those for VCs for vegetation.

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 RSA within the NWA. The Application indicated that the proposed Project does not cross any designated mushroom harvesting areas, although it may result in loss or alteration of habitat and consequent change in Nisga'a ability to harvest pine mushroom, red cedar and yellow-cedar, and other non-timber forest resources including but not limited to huckleberry, soopolallie, devil's club and Labrador tea. A summary of the potential adverse environmental effects on cultural plants is described below, and a more detailed assessment of impacts to terrestrial vegetation is provided in section 5.10 of this Assessment Report. The harvest of non-timber forest products is discussed in section 7.3 (Land and Resource Use).

Effects of the proposed Project on non-timber forest resources habitat is expected to be primarily in the short-term due to ROW clearing, with some impediment to access to harvest areas during construction. Loss or alteration of pine mushroom habitat, included as one of the management objectives by the Land Use Plan for Nisga'a Lands, could occur at pipeline access roads, construction camps, temporary facilities and permanent facilities within the Project footprint to LSA. Within the NWA, approximately 43.36 ha and 11.09 ha of potential pine mushroom habitat overlaps with the Cypress to Cranberry/Kitsault Route and Cypress to Cranberry/Nasoga Route footprints, respectively 20.7% and 6.8% of total potential mushroom habitat. Related mitigation efforts include:

- In site-specific pine mushroom habitat, avoidance to the extent practical;
- Narrowing work areas to retain patches of natural species including trees, shrubs, herbs and groundcover species;
- Limiting compaction and reducing grubbing to allow the root system to remain;
- Allowing harvesting of pine mushrooms prior to construction; and

- Monitoring following completion of construction to identify any locations where remedial work on surface drainage patterns or re-vegetation is to be conducted.

An estimated 60.3 ha of potential western red cedar and yellow-cedar-dominated communities would be traversed by the Cypress to Cranberry/ Kitsault Route footprint within the NWA, 36.8% of the total 164 ha of potential western red cedar and yellow-cedar-dominated communities traversed. An estimated 281.24 ha of potential red cedar and yellow-cedar-dominated communities are traversed by the Cypress to Cranberry/Nasoga Route footprint within the NWA, 89.9% of the total 320 ha of the potential communities traversed. Loss or alteration of red or yellow-cedar dominated habitat could occur at access roads, construction camps, and temporary and permanent facilities within the vegetation Project footprint to LSA.

Related mitigation efforts include:

- Avoidance, including facilities, stockpile sites, staging areas, work camps, ancillary facilities and access roads;
- Limiting temporary workspace in western red and yellow-cedar-dominated communities;
- Narrowing the area of disturbance in communities;
- Giving consideration to planting western red cedar and yellow-cedar on temporary workspace where ecologically suitable;
- Implementing industry-standard mitigation to minimize indirect affects to cedar habitat adjacent to the right-of-way; and
- Monitoring post-construction to identify locations on the Project footprint where remedial work on surface drainage patterns or re-vegetation could be conducted.

EAO proposes EA Certificate Condition 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.

22.6.3 Conclusions

Part B, section 5.9 and 7.3 of this Assessment 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 and the CPD (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 Nisga'a Nation and other members of the Working Group, 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:
 - Nisga'a citizens' employment and income;
 - Nisga'a citizens' business activities;
 - Natural resource activities and related earnings or values;
 - Future Nisga'a citizens' economic opportunities and economic development;
 - 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:
 - Migration and population effects in the Nisga'a Nation communities;
 - Infrastructure and services in the Nisga'a Nation communities;
 - Occupational and non-occupational health risks;
 - Occupational and non-occupational accident risks;
 - Crime;
 - Family and community well-being;

- Cultural interests:
 - Effects of environmental impacts (including those resulting from accidents and malfunctions) 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.

The spatial boundary used for the 8(f) assessment is the Nass Area.

23.1 Economic Well-Being

23.1.1 Background

Nisga'a employment and income

The Proponent provided background information on Nisga'a labour force characteristics, including available labour supply, potential barriers to employment and unemployment rates, as well as labour force requirements for construction and operations of the proposed Project and Nisga'a Nation training programs.

Statistics Canada data indicate the available labour force ranged from 71.8% in Gingolx to 77.1% in Gitwinksihlkw, with unemployment rate ranging from 26.1% in Gitwinksihlkw to 49.6% in Gitlaxt'aamiks. However, according to Skeena Native Development Society (SNDS), Laxgalts'ap had the highest unemployment rate of 73.3% and Gitwinksihlkw the lowest at 40.9%. NLG representatives communicated to the Proponent that unemployment is 80-85% across Nisga'a communities.

In northwest BC (North Coast-Nechako Region) there is a labour force of 47,400, participation rate of 71.1%, employment rate of 64.9%, and 8.5-11.6% unemployment. Based on labour demand projections, total regional jobs are expected to grow within the next decade as existing and planned projects are constructed and operated in hydro/power generation, distribution and transmission, mining, independent power projects, port and industrial development, and pipelines. Development scenarios from 2011 projected 4,000-12,000 new direct and indirect jobs up to 2021 in northwest BC, with the gap between labour supply and demand expected to peak from 2016-2019.

The Application discussed the importance of training programs to develop skilled technical workers in the region to increase Nisga'a benefits from the proposed Project and to reduce employment barriers. These include training programs such as the *Wilp* Wilxo'oskwhl Nisga'a Institute's technical and training program which has increased industry employment for Nisga'a citizens.

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 include Nisga'a Fisheries Ltd., Lisims Forest Resources LLP, Lisims Backcountry Adventures Inc., and enTel Communications Inc.

The NCG provides labour market contracts for major projects in the area and maintains a database of around 100 Nisga'a members, including information on individuals' skill sets. NCG can provide services including environmental monitors, clearance crews along hydroelectric lines, bear monitors/wildlife monitors, marine and freshwater fisheries monitors, medical staff and vehicles, surveying assistants, fallers and slashers, general labourers, fire management, camp management, water supply services and internet services.

Nass Area Enterprises (NAE) manages Nass Camp, and is employed in construction on the NTL Project. Nass Camp is 10 km east of Gitlaxt'aamiks; it was purchased in 2010, can accommodate 150 individuals and is largely self-contained.

A business survey indicated that about 20% of Nisga'a businesses work in the mining, construction and forestry sectors. A 2012 survey cited by the Proponent indicated the majority of Nisga'a businesses operate in the tourism, accommodation, and food services sector. 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.

Nisga'a natural resource activity and related earnings or values

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.

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 150,000 m³. No Nisga'a Nation forestry tenures have been identified in or near the right-of-way.

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.

Future Economic Opportunities and Economic Development

The Proponent's Application notes that NLG have expressed interest in development of 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. Project benefits are discussed in section 2.5.

Nisga'a employment and income

A labour force would be required for construction of the initial pipeline and compressor stations, and a smaller workforce for construction of a second pipeline, if constructed. Marine construction would require a substantial number of highly skilled and specialized workers, although less specialized vessels, equipment and crews may be obtained from northwest BC communities. Some additional opportunities would be available during construction, such as deckhands and shore workers. A second pipeline would yield similar benefits and opportunities.

During operations, about 44 staff would be needed to operate the proposed Project's pipeline system, plus Supervisory Control and Data Acquisition staff at the Proponent's facilities in other regions of the province. Workers would be required for periodic vegetation management (every 5-10 years) in the Project footprint, typically contracted. As a result, labour demand is expected to increase. The Proponent did not estimate the number of Nisga'a citizens to be employed during construction or operations.

The Application identified increased employment, business and contracting opportunities and future economic development in the Nass Area as potential effects of the proposed Project. Related mitigation would include Project-specific skills training, developing Aboriginal engagement and contracting and employment strategies. The Proponent intends to communicate and provide the construction schedule publicly, communicate with local Economic Development Officers and adhere to the Local and Aboriginal Business and Employment Strategy. Other mitigation measures to increase business and contracting opportunities include a procurement strategy and communicating contracting requirements. Education and training would be important factors in determining the level of employment of Nisga'a citizens related to the proposed Project and other major projects.

Potential adverse economic effects identified in the Nass Area include workforce

requirements of the proposed Project exceeding supply, displacement of local workers and distortion of wage rates, barriers to obtaining employment for the local workforce, disruption of the local labour force due to the temporary nature of the project, and barriers for local businesses to obtain contracts. Mitigation strategies to address adverse potential effects include:

- Measures to ensure alternative sources of skilled workers are in place to avoid disruption of the local employment market;
- Collaboration between the Proponent, training and employment agencies and trade unions;
- Considering local circumstances in development of training initiatives;
- Development of an employment strategy;
- Ensuring training initiatives do not solely focus on Project employment, by encouraging people to create transferrable skills;
- Explaining the temporary nature of the proposed Project to local hires; and
- Discussing with communities the need to train other workers to replace those skilled workers that may leave the community to work on the proposed Project.

No mitigation strategies were identified to address local worker displacement and distortion of local wage rates.

Nisga'a business activity, earnings, and investment activity

Business opportunities are expected to increase as a result of the proposed Project. However, the Application cited similar obstacles for Nisga'a businesses as were experienced around mine projects in 2012, including limited business opportunities, inflation of local prices or wages and shortage of qualified workers. Nisga'a business contractors indicated project proponents could assist businesses obtain contracts by providing direct awards instead of competitive bids, early payment arrangements and smaller contracts to benefit local businesses in securing contracts. The Application did not quantify the potential revenue to Nisga'a businesses during construction and operation.

The Proponent's Application identified barriers for local businesses to obtain contracts in the Nass Area. Mitigation measures include a procurement strategy, and communicating construction schedules, construction activities and contract requirements.

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. Changes to these activities could result from socio-economic changes from environmental impacts of the proposed Project as well as from changes in employment patterns.

Full details on the potential impacts to environmental VCs can be found in Part B of the Assessment Report, and a discussion of adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands and Nisga'a interests set out in the NFA (assessment required under Chapter 10, paragraph 8(e)) can be found in Section 3 of this Chapter.

The Application indicated that no seafood processing facilities were identified that could be adversely affected by the proposed Project. However, on September 23, 2014, an NLG representative indicated that the Nisga'a fish processing plant at Gingolx could be impacted. The Kshadin Peak Wind Energy Tenure, to the north of Nisga'a Lands but within the NWA, and held by a private, non-Nisga'a company, would be crossed by the proposed Project.

Nisga'a Nation hydroelectric projects could potentially be impacted by the proposed Project but effects would be limited.

The NTL Project alignment would also intersected the proposed Project at 4 locations along the corridor from KP 609-661. The Application identified potential adverse economic effects related to Nisga'a natural resource activity including:

- Disruption of commercial fishing activities and fishing gear loss in marine areas;
- Disruption of timber harvesting and silviculture activities, and impacts on volume of merchantable timber available for harvesting;
- Disruption of NTFP harvesting in areas of high productivity;
- Disruption of mining and mineral exploration in mines and mineral tenure areas;
- Increased spread of weeds in the Nass Area;
- Effects on future farming activities;
- Disruption to hydropower, wind power and oil and gas tenures; and
- Barrier effect on Dungeness crab.

In response to adverse potential economic effects of the proposed Project related to Nisga'a natural resource activity, additional mitigation strategies include:

- Communicating the Project construction schedule to residents, relevant government agencies, commercial organizations and tenure holders, and coordinating construction timing in relation to natural resource activities;
- Establishing a gear loss or damage compensation policy;
- Updating Canadian Hydrographic Service nautical charts;
- Adhering to existing Traffic and Access Management Plans and developing access agreements;
- Minimizing volume of merchantable timber harvested along the right-of-way, and providing what is harvested on Nisga'a Lands to the NLG;
- Compensating tenure holders;
- Avoiding areas of high NTFP productivity and accommodating NTFP harvest along the right-of-way prior to construction;
- Returning existing access routes to former conditions;
- Considering minimum setbacks from mining-related blasting;
- Limiting public vehicles access to right-of-ways , cleaning weed seeds from public vehicles, and implementing an Invasive Plant Species Management Plan; and
- Identifying options to facilitate Dungeness crab movement.

Nisga'a Government revenues and expenditures

The proposed Project is expected to change NLG revenues and expenditures. As outlined in the *Nisga'a Goods and Service Tax Act*, NLG has the right to impose Nisga'a GST and other amounts as imposed in the Act.

The Application did not estimate impacts to other components of NLG revenue or expenses, including reviewing and monitoring costs, indirect costs to community infrastructure and services, or revenue from resource sharing.

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.

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. At present, to EAO's knowledge, the Proponent and Nisga'a Nation have not entered into a benefits agreement or similar agreement. However, if such an agreement is entered into, it may contain additional measures to mitigate potential adverse economic, social and cultural effects, and measures to enhance benefits.

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. Nisga'a Nation would be engaged in the development of the SEEMP.

Following consultation with Nisga'a Nation and other members of the Working Group, 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 Application noted 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 is complete. An exception is mining projects, which require long-term workers after construction. The Proponent did not provide analysis for potential migration to Nisga'a communities or for community or regional

population growth.

Impacts on infrastructure and services

The Application reviewed the existing housing stock and current capacity of infrastructure and services, including water, sewage, electricity and recreation facilities.

Available housing in Nisga'a Villages is low based on 2012 data, with overcrowding an issue in Gitlaxt'aamiks, Gitwinksihlkw and Gingolx, which have established waiting lists for new housing. Statistics Canada reports that in 2011 there were 690 private dwellings in the Villages, with 590 occupied; about 40% of the dwellings were constructed prior to 1986, 23% of which needed major repair. The Application indicated that until additional housing is constructed and repairs made, Nisga'a Villages will likely continue to experience overcrowding and inadequate accommodations. Total capacity of temporary accommodation in Gitlaxt'aamiks and Gitwinksihlkw is approximately 272 units based on 2012 data; EAO notes this data was compiled for a previously proposed mine that has since been approved and data may have changed.

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. All of the water systems in Nisga'a Villages have been or are in the process of being upgraded. 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 highway rights-of-way. 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.

The Proponent's preliminary site investigation identified contaminated features within the Nass Area along the proposed Nasoga route. At KP 693.2 is a possible former mining site not in the BC Site Registry, Federal Contaminated Site Inventory or in Abacus Datagraphics Ltd. Databases. In addition, Kitsault molybdenum mine, operated from 1981-1982, deposited approximately 4 million tons of mine tailings into Alice Arm from a submerged outfall at a depth of 50 m.

Family and community well-being

The Application characterized existing social conditions in Nisga'a communities using available socio-economic indicators reported by BC Stats, including children at risk, youth at risk, economic hardship, crime, health, and education. For most indicators, the rates in Nisga'a communities were shown to be double or triple above 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

The proposed Project would require a large workforce for the construction period, with temporary construction camps occupied for 1-2 years in various areas, to be demobilized following construction. Construction would last from 4-11 years depending on whether the second pipeline is constructed. Fewer workers might be required for periodic maintenance such as brushing during operations, but not for long enough duration to expect in-migration.

The Proponent's Application identified alteration of social condition of communities due to demographic and population changes in Nisga'a Villages as a potential social effect, further discussed in the Application's Social Effects Assessment (section 6.1). Mitigation strategies include ensuring workers are trained in and adhere to the code of conduct, and communicating construction schedules to community representatives.

Impacts on infrastructure and services

Ongoing challenges related to overcrowding and inadequate accommodations would likely be exacerbated if the proposed Project triggered an influx of people into Nisga'a Villages. The Proponent indicates that while communities outside the Nass Area and work camps would account for most of the construction-related accommodation needs for the proposed Project, temporary accommodation in Nisga'a Villages would likely be required to some degree during construction and, infrequently, during operations.

The large workforce required for the construction phase is expected to increase pressure on health care services in some northern BC communities, including walk-in clinics, hospitals and pharmacies. The Application indicated it is unlikely that workers would increase pressure on the Nisga'a Valley Health Authority as most would go to Terrace.

There may 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 may adversely affect the mental health of workers, and some may require mental health practitioners, drug and alcohol treatment, or counselling services. Potentially negative social effects resulting from demographic changes accompanying development were identified as a concern of representatives from Gitwinksihlkw, Gitlaxt'aamiks and Lisims-Nass Valley RCMP.

Scenic areas which may be affected by the proposed Project include the recreation sites at Dragon Lake and the Tseax visually sensitive area identified in the Nisga'a Nation Land Use Plan.

The NLG has expressed concerns about potential Project effects on the community water supply. Construction of NTL increased sedimentation in the Gitzyon Community Watershed upstream of the domestic water supply intake for Gitlaxt'aamiks.

The proposed Project is not expected to strain the capacity of education facilities in Nisga'a Villages or increase student enrolment. However, some post-secondary students may leave their programs to work on the proposed Project, which the Proponent indicates may be considered a beneficial effect by the students, even if they leave school prior to completion of their program. School enrollment may increase should more people remain in Nisga'a communities due to perceived improvement in economic opportunities. No effects on social services are anticipated during operation.

The Application identified potential adverse social effects related to Nisga'a infrastructure and services, further discussed in the Application's Potential Social Effects Assessment (section 6.1), including:

- Impacts on availability of temporary accommodation, rent levels and permanent housing costs in Nisga'a Villages;
- Increased demand on emergency services in Nisga'a Villages;
- Increased demand on existing health care and social services in Nisga'a Villages;
- Altered campgrounds, recreation sites, trails and boat launches in the Nass Area

and impacted access to community recreation facilities in Nisga'a Villages;

- Altered telephone and internet services in the Nass Area;
- Increased demand on potable water in communities and altered surface water infrastructure in the Gitzyon Community Watershed;
- Altered groundwater structure in groundwater wells;
- Increased pressure on local and regional government staff and resources in NLG and Village government offices;
- Increased demand on municipal and regional solid and liquid waste infrastructure;
- Disruption of marine and freshwater navigability;
- Impacts on quality of road surfaces; and
- Increased traffic volumes on roads and highways.

In response to adverse potential social effects of the proposed Project related to Nisga'a infrastructure and services, mitigation strategies include:

- Providing temporary construction camp accommodation for workers;
- Communicating the construction schedules to interested parties and service providers;
- With community representatives, assessing rental and permanent housing availability;
- Adhering to the Emergency Response Plan, WorkSafe BC standards, and ensuring safety and medical personnel, including those trained in mental health and substance abuse, are present in work camps and construction sites;
- Providing contact numbers and access maps to emergency service providers;
- Providing satellite phones where warranted;
- Installing groundwater wells for domestic water in work camps and providing water if surface water sources or infrastructure are affected;
- Using a trenchless crossing methods, if feasible, at Gitzyon Creek and Ksi Sii Aks (Tseax River), which supply the Gitzyon Community Watershed;
- Providing groundwater wells replacement or otherwise supplying water where infrastructure is affected;
- Adhering to the Waste Management Plan, Traffic Management Plan, Access

Management Plan and Restoration Plan;

- Installing signs notifying road users of construction activities; and
- Further mitigation measures are outlined in the Project EMP.

Occupational and non-occupational health risks

Construction activities in the intertidal and subtidal zones at the head of Alice Arm may disturb sediments and release contaminants, which could result in bioavailability of dissolved metals and transfer to and contamination of bivalves and other shellfish. The Proponent expects the proposed Project would dredge 186,000 m³ and sidecast at the Kitsault landfill site.

The Application considered the impacts from right-of-way clearing, petroleum product spills during construction or by application of herbicides on country foods. Right-of-ways can increase harvesting activities by humans by improving access, although they also increase predation pressure on wildlife. Further potential effects include perceptions of harvested food quality, particularly due to maintenance activities and vegetation management.

As most of the proposed Project would be in remote, unpopulated areas, few residents are expected to be adversely affected by construction noise, although Gitlaxt'aamiks is near the proposed Nasoga route.

The Proponent identified potential adverse social effects, further discussed in the Application's Potential Social Effects and Potential Health Effects Assessments (section 6.1 and 8.1), including:

- Transportation of dangerous goods on roads and highways;
- Disturbance of contaminated soil in the Nass Area and potentially contaminated marine sediments in Alice Arm;
- Impacts on quality of harvested foods due to herbicide application during operations or to petroleum leaks and spills;
- Altered quality of productive harvesting sites;
- Impacts to availability of wildlife for consumption;
- Increased noise levels;
- Impacts on respiratory health during construction in the Nass Area, and during operation at the K5 compressor station;

- Impacts to drinking water quality in Gitlaxt'aamiks; and
- Impacts to recreational water quality in the Nass River and other water bodies.

In response to adverse potential social effects of the proposed Project related to health, additional mitigation strategies include:

- Training workers and transporters in accordance with regulators and manufacturer recommendations;
- Identifying if contaminants are present and reducing disturbance of potentially contaminated soils and sediments, including in the Project footprint;
- Prohibiting herbicide use where edible plants are known to be harvested and using signage where edible vegetation has been affected by spills or herbicides;
- Completely containing any spills and remediating affected sites;
- Implementing a Soil Handling and Conservation Management Plan, Sediment and Erosion Control Plan, and Restoration Plan Framework;
- Narrowing widths of clearings at site-specific features;
- Strictly controlling possession of firearms or hunting by Project work crews;
- Restricting construction activities to daytime hours, use noise control methods;
- Communicating construction and compressor station schedules;
- Adhering to EHS policies, BC OGC *Noise Control Best Practice Guidelines*;
- Taking measures to minimize vehicle emissions, apply dust suppressants, reduce non-merchantable timber burning, adhere to the *Open Burning Smoke Control Regulations*, and monitor and communicate ambient air quality;
- Monitoring surface and groundwater during construction, treating to remove chemicals or solids where warranted;
- Providing well replacement or potable water if quality and quantity is altered;
- Monitoring water crossings using a turbidity meter; and
- Disposing of water used for hydrostatic testing in its originating watershed.

Family and community well-being

The proposed Project may impact well-being of families and communities due to social changes from demographic and population changes. Work camps are proposed near

Nisga'a communities for construction activities, which would result in sudden increases to local population size and alter the demographic structure of communities. Higher rates of crime, drug and alcohol abuse, unplanned pregnancies and communicable diseases may potentially accompany sudden demographic and population changes.

Pipeline project work camps would be occupied for 1-2 years during construction. As workers' schedules allow skilled workers from external workforces and communities to travel home during off-time periods, the Proponent expects minimal effects, particularly as work camps are demobilized following restoration. However, Nisga'a communities have indicated concerns about these potential effects on Nisga'a Villages.

Concerns about adverse social effects due to development-related demographic changes were a concern during discussions with representatives from the Northern Health Authority, Gitwinksihlkw and Gitlaxt'aamiks. Specifically regarding the proposed Project, NLG expressed concern that existing issues such as substance abuse may be exacerbated. Work camps are not expected to increase capacity issues for the Lisims-Nass Valley RCMP according to its Commander.

The Proponent's Application identified altered public safety due to a sudden increase in population in the Nass Area as potentially adversely impacting on family and community well-being. Mitigation includes reinforcing the code of conduct and importance of respectful conduct while in communities to staff, and communicating proposed construction schedules to RCMP and community representatives.

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. At present, to EAO's knowledge, the Proponent and Nisga'a Nation have not entered into a benefits agreement or similar agreement. However, if such an agreement is entered into, it may contain additional measures to mitigate potential adverse economic, social and cultural effects, and measures to enhance benefits.

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. Nisga'a Nation would be engaged in the development of the SEEMP.

Following consultation with Nisga'a Nation and other members of the Working Group, 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 may be simultaneous positive and negative impacts on Nisga'a cultural activities and practices. 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.

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. Proposed mitigation strategies include pre-construction discussions with Nisga'a Nation to identify language impacts that warrant specific mitigation. These may include implementing Nisga'a place names on proposed Project material, using bilingual signs on Nisga'a Lands and including Nisga'a place names, site-specific mitigation strategies recommended by NLG. Further measures would be developed through community discussions.

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. At present, to EAO's knowledge, the Proponent and Nisga'a Nation have not entered into a benefits agreement or similar agreement. However, if such an agreement is entered into, it may contain additional measures to mitigate potential adverse economic, social and cultural effects, and measures to enhance benefits.

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. Nisga'a Nation would be engaged in the development of the SEEMP.

Following consultation with Nisga'a Nation and other members of the Working Group, 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