Eagle Mountain – Woodfibre Gas Pipeline Project

Application to Amend Environmental Assessment Certificate No. E16-01

Amendment No.1

Revision 1

October 2020

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Eagle Mountain – Woodfibre Gas Pipeline Project

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Executive Summary

On January 9, 2015 FortisBC Energy Inc. (FortisBC) filed an Application for an Environmental Assessment Certificate (EAC) to the British Columbia (BC) Environmental Assessment Office (BC EAO) for the Eagle Mountain – Woodfibre Gas Pipeline Project (the Project). On August 9, 2016, FortisBC received EAC No. E16-01 for the Project. In addition to the EAC, the Squamish Nation conducted an independent environmental assessment (EA), establishing the Squamish Nation Environmental Assessment Agreement (Squamish Nation EAA) with FortisBC and Squamish Nation.

FortisBC is applying for an amendment to its EAC in accordance with Section 32 of the *Environmental Assessment Act*, S.B.C. 2018, c. 51 (the *2018 Act*) and an amendment to the Squamish Nation EAA. Amendments to the Certified Project have been identified through FortisBC's ongoing engagement, advancing Project planning and engineering design. This Application to Amend Environmental Assessment Certificate No. E16-01 (Amendment Application) is for the following changes to the Certified Project:

- **Stawamus Corridor Expansion** – An expansion to the Certified Pipeline Corridor by an average of 200 metres (m) for approximately 7 kilometres (km) between Kilometre Post (KP) 25.0 and KP 32.1 (from E 497079 N 5499357 to E 493623 N 5505016).
- **Coquitlam 3 km Pipeline Twinning (Coquitlam Twinning)** – The addition of 3 km of Nominal Pipe Size (NPS) 24 gas pipeline from the existing Eagle Mountain Compressor Station to a tie-in point located on the existing NPS 12 FortisBC pipeline.
- **Eagle Mountain Compressor Station** – Installation of two approximately 26,000 horsepower (hp) electric motor-driven compressor units within the existing Eagle Mountain Compressor Station, as an alternative to installing two 20,500 hp units in a 5 hectare (ha) expanded area adjacent to the existing Eagle Mountain Compressor Station.
- **Squamish Compressor Station** – An alternative location option for the Squamish Compressor Station at the northeast portion of the Woodfibre LNG Limited (WLNG) project site.

This Amendment Application will be reviewed through the BC EAO process. During the EAC Application development, at the request of Squamish Nation, FortisBC and Squamish Nation negotiated FortisBC's involvement in a parallel assessment process led by the Squamish Nation (the Squamish Nation Process). The Amendment Application will also be reviewed through the Squamish Nation Process. the *2018 Act* was enacted in December 2019 and Section 25 of the *2018 Act* includes additional assessment matters that were not previously included in the *Environmental Assessment Act*, S.B.C. 2002, c. 43 (the *2002 Act*) under which the Project was approved. This Amendment Application has been prepared in accordance with the Project Assessment Information Requirements, Section 25 of the *2018 Act,* and the Squamish Nation Process. A summary of the required assessment matters included in the *2018 Act* and where they are addressed in this Amendment Application is provided in Table 0-1: Concordance with Section 25 of the *2018 Act*.

FortisBC has conducted early engagement with Indigenous groups and key stakeholders in advance of filing this Amendment Application.

With the addition of the proposed amendments, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). Project benefits described in the EAC Application included Project expenditures, government revenues, employment and contracting opportunities, and on-the-job training. Many of the proposed amendments were developed to address concerns and feedback received through engagement with Indigenous groups and stakeholders. For instance, the Stawamus Corridor Expansion is a proposal resulting from consultation with Squamish Nation to reduce environmental and cultural effects, and the Squamish Compressor Station alternative location at the WLNG project site is the result of feedback from community members to consolidate construction and operational impacts (such as, noise).

The proposed amendments do not result in a material change to Project-related negative direct or indirect effects as described in Sections 4.0 to 15.0 of the EAC Application (Volume 1, Part B). A summary of Valued Component (VC) interactions for each proposed amendment is provided in Table 0-1: Concordance with Certified Project EAC Application including all addenda.

The proposed amendments, with the exception of the Eagle Mountain Compressor Station, result in an expansion of the Local Study Area and Regional Study Area for some of the VCs. The existing conditions for all VCs in these areas are comparable to the conditions identified in the EAC Application. No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application.

The western screech-owl nesting and foraging habitat within the Squamish Compressor Station siting area is considered a material change in existing conditions from the EAC Application. However, western screech-owl was previously identified as a key indicator and changes in habitat availability and effectiveness was assessed in the EAC Application. Existing mitigation developed in the EMP is considered suitable and therefore, the characterization of residual effects and conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same.

The Land and Resources Use VC proposes new mitigation measures and environmental monitoring relating to contaminated sites associated with the Squamish Compressor Station. The Environmental Management Plan (EMP) will be updated to reflect these changes and submitted to the BC EAO prior to construction.

Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (Table 3-2 in subsection 3.3). Overall, most of the previously mapped developments are now operating and therefore considered part of the existing disturbance. The search conducted for this Amendment Application has identified three new reasonably foreseeable developments that were not included in the EAC Application. These are the proposed Delta Grinding Facility, the Tilbury Phase 2 LNG Expansion, and the proposed Tilbury Pacific LNG Jetty. All three are located on Tilbury Island in the City of Delta. No new potential cumulative adverse effects have been identified for any of the VCs.

In addition to the assessment of potential adverse effects, the proposed amendments do not result in any materially changed effects of the environment on the Project. It is concluded that the effects of the environment on the Project identified in the EAC Application remain the same.

The potential risk of accidents or malfunctions was evaluated by examining the likelihood and consequence of an event that has the potential to adversely affect a VC. As a result of the proposed location of the Squamish Compressor Station site and its proximity to the WLNG facility (approximately 400 m), the potential for interactions between the WLNG facility and the Squamish Compressor Station was evaluated to better understand potential for accidents or malfunctions. A new potential interaction that was identified and not assessed in Section 16.0 of the EAC Application is the potential for a fire and explosion at WLNG as a result of an uncontrolled gas release. Additional mitigation measures have been proposed and Emergency Response Plan (ERP) will include additional measures related to this topic. Upon review, it was determined that the potential residual adverse effects of a fire and explosion at WLNG as a result of an uncontrolled gas release was assessed to be rare and of medium risk.

The *2018 Act* was enacted December 16, 2019 and Section 25.2 of the *2018 Act* includes additional assessment matters that were not previously included in the *2002 Act* under which the Project was approved. This Amendment Application assessed three additional Section 25 required assessment matters for the proposed amendments relative to the Certified Project:

- disproportionate effects on distinct human populations, including populations identified by gender
- effects on biophysical factors that support ecosystem function
- effects on current and future generations

The disproportionate effects on distinct human population assessment conducted for the proposed amendments identified a list of socio-economic factors and potential subgroups that may interact with the proposed amendments. The assessment reviewed the potential adverse effects, mitigation measures, and residual adverse effects of each proposed amendment on the identified distinct human populations. The assessment found no material change to effects assessment conclusions compared to general population assessed in the EAC Application.

An assessment of biophysical factors that support ecosystem function was conducted for the proposed amendments. The Ecosystem Function Scoping Tool was completed and focused on potential interactions between the proposed amendments and biophysical factors that support ecosystem function. The scoping exercise found that all the ten biophysical factors that support ecosystem function interacted with at least one of the proposed amendments. The proposed amendment for the Eagle Mountain Compressor Station did not interact with any of the ten biophysical factors that support ecosystem function as the newly proposed equipment will be accommodated within the existing facility. For all proposed amendments that interact with biophysical factors that support ecosystem function, the proposed amendment activities are not expected to have a negative effect on ecosystem function at the ecosystem scale.

An assessment of effects on current and future generations was conducted for the proposed amendments. Most potential residual effects were assessed to have immediate- or short-term durations and therefore could impact the current generation. The potential residual effects that were assessed to have a duration that extends into the “long-term” were considered in the assessment of effects to the future generation. Four VCs (that is, Atmospheric Environment, Water, Land and Resources Use, and Human Health) had residual effects with long-term durations which therefore could impact future generations and were carried forward into this assessment. For all four VCs, the conditions for the proposed amendments are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendments do not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the VCs during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations. The Project, including the proposed amendments will provide positive benefits by means of employment, government revenues, and economic development and diversification for the Region and Local communities. FortisBC understands that the benefits of the Certified Project to future generations would be sustained for the life of the Project and that these economic benefits were accurately assessed in the EAC Application. Therefore, social and economic benefits will not be carried forward into the effects on future generations.

Tables of Concordance

Table 0-1 summarizes the Section 25 required assessment matters included in the *2018 Act* and where they are addressed in this Amendment Application.

Table 0-1. Concordance with Section 25 of the British Columbia *Environmental Assessment 2018 Act*

Section 25 of the *2018 Act* Required Assessment Matter	Included in Project AIR?	Included in Amendment Application?	Amendment Application Section	Rationale
(1) The effects of a project on Indigenous groups and rights recognized and affirmed by Section 35 of the *Constitution Act*, 1982 must be assessed in every assessment	Y	Y[a]	18	Requirement of the *2018 Act*.
2(a) Positive and negative direct and indirect effects of the reviewable project, including environmental, economic, social, cultural and health effects and adverse cumulative effects	Y	Y	4 to 18 and 20-22	Sections 4 to 18 of this Amendment Application includes effects assessment conclusions for each VC. To avoid repetition, effects of the Project are not repeated in this Amendment Application and cross references to the EAC Application are provided instead. Project benefits (includes positive direct and indirect effects) were assessed in Section 1.6 of the EAC Application (Volume 1, Part A). Adverse effects (includes negative direct and indirect effects) were assessed in Sections 4 to 20 in the EAC Application (Volume 1, Part A). Spatial boundaries for the Project were developed to identify potential direct and indirect effect pathways within the zones of influence for the proposed amendments and reasonably foreseeable developments. A summary of how positive and negative direct and indirect effects were considered with respect to the proposed amendments for each VC can be found in sections 4 to 18 of this Amendment Application.
2(b) Risks and uncertainties associated with those effects, including the results of any interaction between effects	Y	Y	N/A (see Rationale)	Subsection 3.8 of the AIR indicates that additional risk analysis may be required to fully characterize the potential risk associated with uncertain outcomes, where there is a high degree of uncertainty with the possibility of a significant adverse effect, and follow-up programs are not considered sufficient to manage the potential risk. In the assessment of potential adverse effects of the proposed Project, including proposed amendments, no situations like this arose (Volume 1, Part B, Sections 4.0 to 15.0 of the EAC Application). Therefore, the assessments do not contain additional information on risk. As described in Section 3.0 (Assessment Method) of the EAC Application (Volume 1, Part A), the probability of occurrence was included in the characterization residual effects.
2(c) Risks of malfunctions or accidents	Y	Y[a]	16	Requirement of the *2018 Act*.
2(d) Disproportionate effects on distinct human populations, including populations identified by gender	N	Y[a]	21	New required assessment matter not included under the *2002 Act*.
2(e) Effects on biophysical factors that support ecosystem function	N	Y[a]	22	New required assessment matter not included under the *2002 Act*.

Table 0-1. Concordance with Section 25 of the British Columbia *Environmental Assessment 2018 Act*

Section 25 of the *2018 Act* Required Assessment Matter	Included in Project AIR?	Included in Amendment Application?	Amendment Application Section	Rationale
2(f) Effects on current and future generations	N	Y[a]	23	New required assessment matter not included under the *2002 Act*.
2(g) Consistency with any land use plan of the government or an Indigenous group if the plan is relevant to the assessment and to any assessment conducted under Section 35 or 73	Y	Y[a]	13	Requirement of the *2018 Act*.
2(h) greenhouse gas emissions, including the potential effects on the province being able to meet its targets under the *Greenhouse Gas Reduction Targets Act*	Y	Y[a]	5	An assessment of GHG was previously required under the AIR. An assessment of the potential effects on the Province's ability to meet its targets under the *Greenhouse Gas Reduction Targets Act* is a new requirement since the AIR was developed and is included in Section 5.
2(i) alternative means of carrying out the project that are technically and economically feasible, including through the use of the best available technologies, and the potential effects, risks, and uncertainties of those alternatives	Y	Y[a]	2	Requirement of the *2018 Act*.
2(j) potential changes to the reviewable project that may be caused by the environment	Y	Y[a]	17	The proposed amendment does not result in the addition of any new potential effects of the environment on the Project that have not been identified and assessed in the EAC Application.
2(k) other prescribed matters	N	N	N	There were no other prescribed matters in the Project AIR.

Notes:

AIR = Application Information Requirement
GHG = greenhouse gas

a - Through consultation with the BC EAO it is understood that the Amendment Application is only required to address these matters as they apply to the proposed amendments and not the Certified Project

Table 0-2 summarizes the changes to the FortisBC Application for an EAC for the Project.

Table 0-2. Concordance with Certified Project EAC Application Including All Addenda

Section in EAC Application/ Valued Component	EAC Application Section (Volume 1 Effects Assessment)	Interaction with Proposed Amendment				Included in Amendment Application	Amendment Application Section	Rationale
		Stawamus Corridor Expansion	Coquitlam Twinning	Eagle Mountain Compressor Station	Squamish Compressor Station			
Proposed Project Overview	1.0	✓	✓	✓	✓	Yes	1 and 2	The proposed amendments result in a change to the Certified Project Description and updated discussion of alternative means is provided. There are no changes to the proponent, applicable authorizations, or Project benefits discussed in Section 1.0 of the EAC Application.
Environmental Assessment Process	2.0	--	--	--	--	No	--	It is assumed that this Amendment Application will follow the EA Process consistent with the *2018 Act*.
Assessment Methodology	3.0	--	--	--	--	Yes	3	The effects assessment methodology is mostly the same as in EAC Application and a summary is provided in this Amendment Application. In accordance with the *2018 Act*, this Amendment Application does not include significance determinations.
Soil Capability	4.0	✓	✓	×	✓	Yes	4	There is a change to existing conditions for the identified proposed amendments.
Terrain Integrity	4.0	✓	✓	×	✓	Yes	4	There is a change to existing conditions for the identified proposed amendments.
Acid Rock Drainage	4.0	✓	×	×	×	Yes	4	There is a change to existing conditions for the identified proposed amendments.
Acoustic Environment	5.0	✓	✓	✓	✓	Yes	5	There is a change to existing conditions for the identified proposed amendments.
Air Quality	5.0	✓	✓	✓	✓	Yes	5	There is a change to existing conditions for the identified proposed amendments.
GHG Emissions	5.0	✓	✓	✓	✓	Yes	5	There is a change to existing conditions for the identified proposed amendments.
Surface Water	6.0	✓	✓	×	✓	Yes	6	There is a change to existing conditions for the identified proposed amendments.

Table 0-2. Concordance with Certified Project EAC Application Including All Addenda

Section in EAC Application/ Valued Component	EAC Application Section (Volume 1 Effects Assessment)	Interaction with Proposed Amendment				Included in Amendment Application	Amendment Application Section	Rationale
		Stawamus Corridor Expansion	Coquitlam Twinning	Eagle Mountain Compressor Station	Squamish Compressor Station			
Groundwater	6.0	✓	✓	×	✓	Yes	6	There is a change to existing conditions for the identified proposed amendments.
Fish and Fish Habitat	7.0	✓	✓	×	✓	Yes	7	There is a change to existing conditions for the identified proposed amendments.
Vegetation	8.0	✓	✓	×	✓	Yes	8	There is a change to existing conditions for the identified proposed amendments.
Wetland Function	9.0	✓	✓	×	✓	Yes	9	There is a change to existing conditions for the identified proposed amendments.
Wildlife and Wildlife Habitat	10.0	✓	✓	✓	✓	Yes	10	There is a change to existing conditions for the identified proposed amendments.
Economic	11.0	✓	✓	✓	✓	Yes	11	There is a change to existing conditions for the identified proposed amendments.
Employment and Labour Force	11.0	✓	✓	✓	✓	Yes	11	There is a change to existing conditions for the identified proposed amendments.
Community Utilities and Services	12.0	✓	✓	✓	✓	Yes	12	There is a change to existing conditions for the identified proposed amendments.
Transportation Infrastructure	12.0	✓	✓	✓	✓	Yes	12	There is a change to existing conditions for the identified proposed amendments.
Community	12.0	✓	✓	✓	✓	Yes	12	There is a change to existing conditions for the identified proposed amendments.
Land and Resources Use	13.0	✓	✓	✓	✓	Yes	13	There is a change to existing conditions for the identified proposed amendments.
Heritage Resources	14.0	✓	✓	✓	✓	Yes	14	There is a change to existing conditions for the identified proposed amendments.
Human Health	15.0	✓	✓	✓	✓	Yes	15	There is a change to existing conditions for the identified proposed amendments.
Ecological Health	15.0	✓	✓	✓	✓	Yes	15	There is a change to existing conditions for the identified proposed amendments.

Table 0-2. Concordance with Certified Project EAC Application Including All Addenda

Section in EAC Application/ Valued Component	EAC Application Section (Volume 1 Effects Assessment)	Interaction with Proposed Amendment				Included in Amendment Application	Amendment Application Section	Rationale
		Stawamus Corridor Expansion	Coquitlam Twinning	Eagle Mountain Compressor Station	Squamish Compressor Station			
Accidents and Malfunctions	16.0	✓	✓	✓	✓	Yes	16	Most of the proposed amendments do not result in the addition of any new potential accidents or malfunctions that have not already been identified and assessed in the EAC Application. A new potential interaction that was identified and not assessed in Section 16.0 of the EAC Application is the potential for a fire and explosion at WLNG as a result of an uncontrolled gas release. This new interaction is assessed in Section 16.0 of this Amendment Application.
Effects of the Environment on the Project	17.0	✓	✓	✓	✓	Yes	17	The proposed amendments do not result in the addition of any new potential effects on the environment that have not been identified and assessed in the EAC Application.
Background and Consultation	18.0 to 21.0	✓	✓	✓	✓	Yes	18	This section summarizes the engagement activities and outcomes to date with Indigenous groups including Indigenous Interests regarding the proposed amendments.
Indigenous Interests								
Other Matters of Concern to Indigenous Groups								
Summary of Indigenous Interests								
Public Consultation	22.0	✓	✓	✓	✓	Yes	19	Section summarizes the engagement activities and outcomes with stakeholder groups and public to date regarding the proposed amendment.
Environmental Management Plan	23.0	✓	✓	✓	✓	Yes	20	Section discusses changes to the EMP as presented in Volume 3, Appendix 3A of the EAC Application.
Follow-up Programs	24.0	✓	✓	✓	✓	Yes	20	Section discusses changes to planned environmental monitoring during construction, post-construction monitoring, and compliance reporting.

Table 0-2. Concordance with Certified Project EAC Application Including All Addenda

Section in EAC Application/ Valued Component	EAC Application Section (Volume 1 Effects Assessment)	Interaction with Proposed Amendment				Included in Amendment Application	Amendment Application Section	Rationale
		Stawamus Corridor Expansion	Coquitlam Twinning	Eagle Mountain Compressor Station	Squamish Compressor Station			
Disproportionate Effects on Distinct Human Populations	N/A	✓	✓	✓	✓	Yes	21	New required assessment matter not included under the *2002 Act*. The BC EAO confirmed that the Amendment Application is only required to address these matters as they apply to the proposed amendments and not the Certified Project.
Biophysical Factors that Support Ecosystem Function	N/A	✓	✓	✓	✓	Yes	22	New required assessment matter not included under the *2002 Act*. The BC EAO confirmed that the Amendment Application is only required to address these matters as they apply to the proposed amendments and not the Certified Project.
Effects on Current and Future Generations	N/A	✓	✓	✓	✓	Yes	23	New required assessment matter not included under the *2002 Act*. The BC EAO confirmed that the Amendment Application is only required to address these matters as they apply to the proposed amendments and not the Certified Project.
Conclusions	25.0	✓	✓	✓	✓	Yes	24	Section summarizes the conclusions of this Amendment Application.

[a] In the EAC Application the term 'Aboriginal' was used to describe these communities however, since 2015 'Indigenous' is used for consistency with the United Nations Declaration on the Rights of Indigenous Peoples.

EMP = Environmental Management Plan

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Appendixes

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Acronyms and Abbreviations

2002 Act	*Environmental Assessment Act,* S.B.C. 2002, c. 43
2018 Act	*Environmental Assessment Act*, S.B.C. 2018, c. 51
µg/m^3	micrograms(s) per cubic metre
µm	micrometre(s)
Aboriginal Consultation Plan	Eagle Mountain – Woodfibre Gas Pipeline Project Aboriginal Consultation Plan
AEC	Area of Environmental Concern
AIA	Archaeological Impact Assessment
AIR	Application Information Requirement
ALR	Agricultural Land Reserve
Amendment Application	Application to Amend Environmental Assessment Certificate No. E16-01
AOA	Archaeology Overview Assessment
AQO	Air Quality Objectives (BC)
ARD	acid rock drainage
ARU	autonomous recording unit
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BC EAO	British Columbia Environmental Assessment Office
BC ENV	British Columbia Ministry of Environment and Climate Change Strategy
BC *HCA*	British Columbia *Heritage Conservation Act*
BC MAH	British Columbia Ministry of Municipal Affairs and Housing
BC MFLNRORD	British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development
BC MoTI	British Columbia Ministry of Transportation and Infrastructure
BC OGC	British Columbia Oil and Gas Commission
BGC	biogeoclimatic
CAAQS	Canadian Ambient Air Quality Standard
CAC	criteria air contaminant
CCP	Comprehensive Community Plan
CEAA	Canadian Environmental Assessment Agency
CEMP	Construction Environmental Management Plan
Certified Project	Approved Project described in Environmental Assessment Certificate No. E16-01
Certified Pipeline Corridor	Approved area specified in Environmental Assessment Certificate No. E16-01 within which the pipeline and associated components can be constructed
CH_4	methane
cm	centimetre(s)
CMP	Condition Management Plan
CO	carbon monoxide

CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COC	Contaminant of Concern
Coquitlam Twinning	Coquitlam 3 km Pipeline Twinning
CofC	Certificate of Compliance
COPC	contaminant of potential concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COVID-19	novel coronavirus disease 2019
CWHdm	Coastal Western Hemlock
dBA	A-weighted decibel(s)
DFO	Fisheries and Oceans Canada
DSI	Detailed Site Investigation
EA	environmental assessment
EAC	Environmental Assessment Certificate
EMD	electric motor-driven
EMP	Environmental Management Plan
ERP	Emergency Response Plan
FortisBC	FortisBC Energy Inc.
FSE	FortisBC-Squamish Nation Environmental Working Group
GBPU	Grizzly Bear Population Unit
GHG	greenhouse gas
Golder	Golder Associates Ltd.
GWh/yr	gigawatt hour(s) per year
ha	hectare(s)
HDD	horizontal directional drill
HHERA	human health and ecological risk assessment
hp	horsepower
IBA	Important Bird Area
IGTK	Inter-Generational Transfer of Knowledge
Keystone	Keystone Environmental Ltd.
KI	key indicator
km	kilometre(s)
km^2	square kilometre(s)
KP	Kilometre Post
kt	kiloton(s)
kV	kilovolt(s)
LSA	Local Study Area
m	metre(s)
m^2	square metre(s)
masl	metre(s) above sea level

ML	metal leaching
MLA	Member of Legislative Assembly
MP	Member of Parliament
MPMO	Major Projects Management Office
MVA	mega volt amp
MW	megawatt(s)
NCD	Non-Classified Drainage
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NPS	Nominal Pipe Size
NTFP	non-timber forest product
OCP	Official Community Plan
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 µm
PM_{10}	particulate matter less than 10 µm
PPE	personal protective equipment
Project	Eagle Mountain – Woodfibre Gas Pipeline Project
PSI	Preliminary Site Investigation
PSL	permissible sound level
PVP	Performance Verification Plan
RGS	Regional Growth Strategy
RMOW	Resort Municipality of Whistler
RSA	Regional Study Area
SARA	*Species at Risk Act*
SLRD	Squamish-Lillooet Regional District
SO_2	sulphur dioxide
SSI	Supplemental Site Investigation
SSISC	Sea to Sky Invasive Species Council
Squamish Nation EA	Squamish Nation Environmental Assessment
Squamish Nation EAA	Squamish Nation Environmental Assessment Agreement
Squamish Nation Process	Parallel assessment process led by the Squamish Nation
t CO_2e/year	metric tonnes of carbon dioxide equivalent
t/y	metric tonnes per year
TDR	Technical Data Report
TEU	twenty-foot equivalent units
the Project	Eagle Mountain – Woodfibre Gas Pipeline Project
TLU	Traditional Land Use
TWS	temporary workspace
VC	Valued Component

VLI	Visual Landscape Inventory
VOC	volatile organic compound
VQO	Visual Quality Objective
WAZ	Work Avoidance Zone
WHA	Wildlife Habitat Area
WLNG	Woodfibre LNG Limited
ZOI	zone of influence

1. Introduction

On January 9, 2015 FortisBC Energy Inc. (FortisBC) submitted an Application for an Environmental Assessment Certificate (EAC) to the British Columbia (BC) Environmental Assessment Office (BC EAO) for the Eagle Mountain – Woodfibre Gas Pipeline Project (the Project). On August 9, 2016, FortisBC received EAC No. E16-01 for the Project. In addition to the EAC, the Squamish Nation conducted an independent environmental assessment (EA), establishing the Squamish Nation Environmental Assessment Agreement (Squamish Nation EAA) with FortisBC and the Squamish Nation.

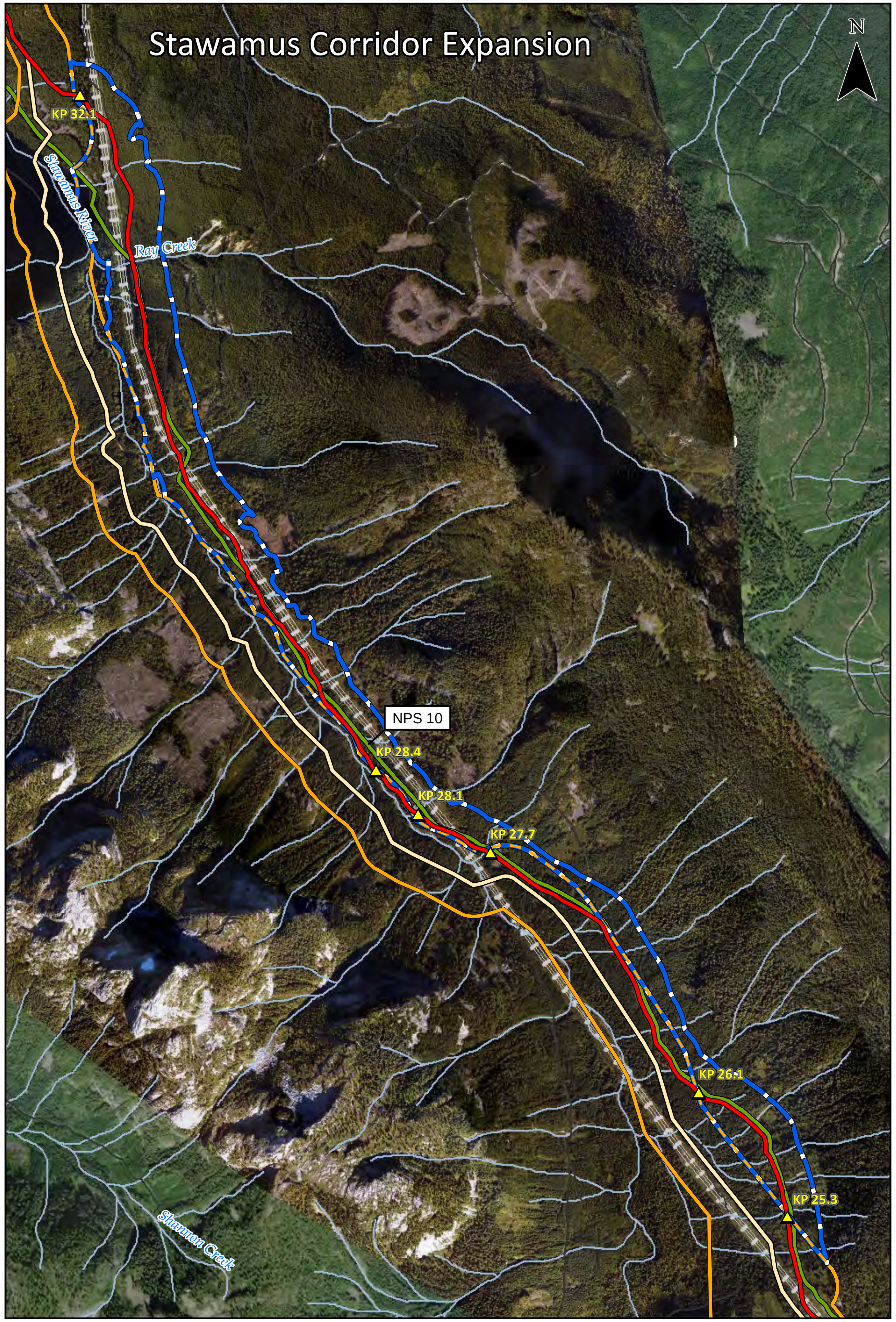
The Certified Project is described in EAC No. E16-01, Schedule A. The Certified Project Description involves the construction and operation of an approximately 47.7-kilometre (km) long, Nominal Pipe Size (NPS) 24 diameter sweet natural gas pipeline generally paralleling (or looping) a portion of FortisBC's existing pipeline from the area north of the Coquitlam Conservation Reserve in Metro Vancouver to the Woodfibre LNG Limited (WLNG) project facility, southwest of Squamish, BC. The Certified Project also includes the installation of a new electric drive compressor station adjacent to the existing compressor station located at Eagle Mountain in the City of Coquitlam, a new electrical substation and high-voltage electrical transmission lines to support the Eagle Mountain Compressor Station, and a new gas turbine-powered compressor station outside the District of Squamish, near Mount Mulligan. Construction logistics, including temporary workspace (TWS), a construction camp, use of existing barge landing sites, and the use of barges to transport people and materials is included in the Certified Project.

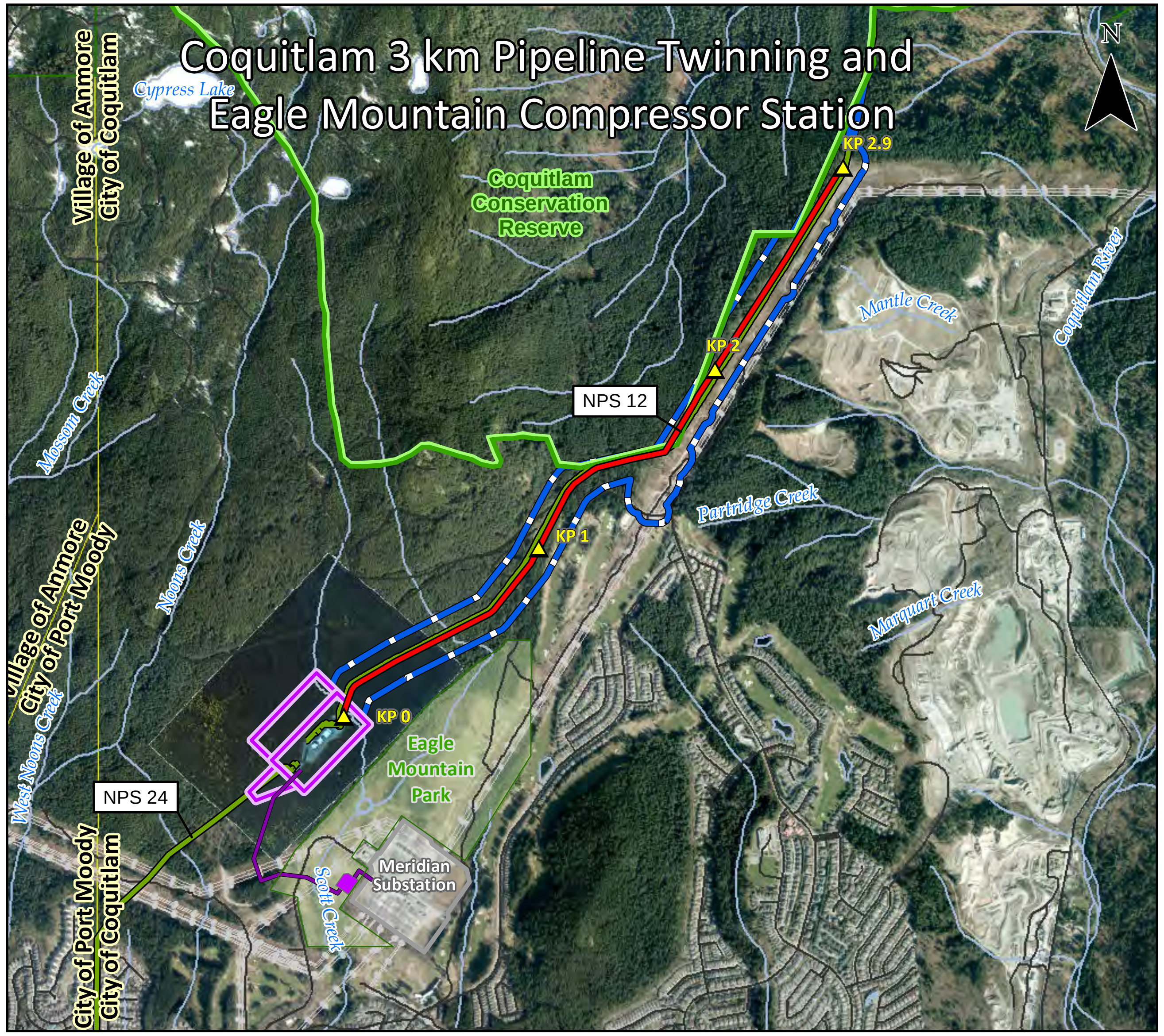
The EAC for the Project is located on the BC EAO website at:
https://projects.eao.gov.bc.ca/p/588511ddaaecd9001b826f0d/project-details;currentPage=1;pageSize=10;sortBy=-dateAdded;ms=1566516152658

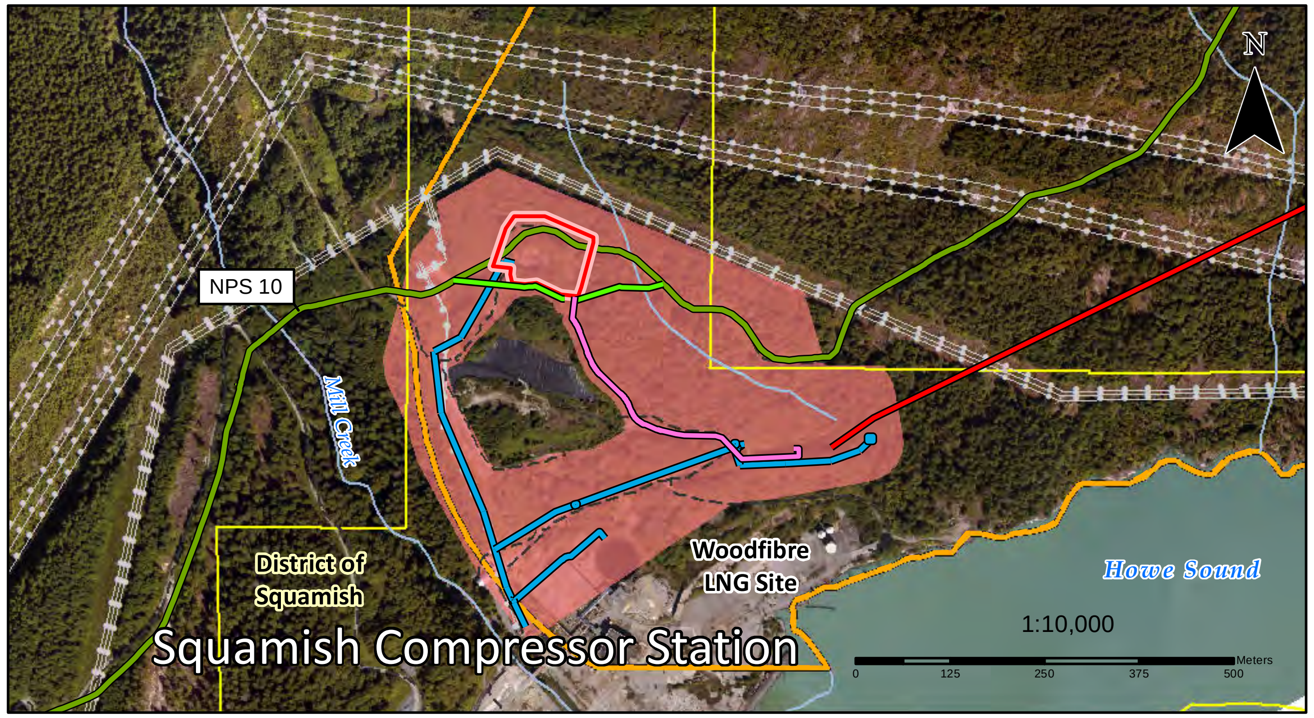
As a result of FortisBC's ongoing engagement and advancing Project planning and engineering design, the need for an amendment to the EAC has been identified. FortisBC is requesting an amendment to its EAC in accordance with Section 32 of the *Environmental Assessment Act*, S.B.C. 2018, c. 51 (the *2018 Act*). This Application to Amend Environmental Assessment Certificate No. E16-01 (Amendment Application) is for the following changes to the Certified Project (Figure 1-1):

- **Stawamus Corridor Expansion** – This proposed amendment involves expanding the existing Certified Pipeline Corridor by an average of approximately 200 metres (m) for approximately 7 km between Kilometre Post (KP) 25 and KP 32.1 (from E 497079 N 5499357 to E 493623 N 5505016). This expansion is being proposed to accommodate additional routing options outside the currently approved corridor and to facilitate a potential reroute in the Stawamus River Valley. The Stawamus Corridor Expansion is located on the east side of the Certified Pipeline Corridor. The new proposed pipeline alignment within the Stawamus Corridor Expansion parallels existing linear disturbances for 6.3 km (92 percent of its total length of 6.8 km). All other technical details of the Project, such as the NPS 24 pipeline size, operating pressure, and product would remain unchanged.
- **Coquitlam 3 km Pipeline Twinning (Coquitlam Twinning)** – The addition of approximately 3 km of NPS 24 gas pipeline from the existing Eagle Mountain Compressor Station to a tie-in point located on the existing NPS 12 FortisBC pipeline. The Coquitlam Twinning is needed to increase reliability of the service provided to WLNG and FortisBC's existing customers throughout the year through increased system capacity. The Coquitlam Twinning will parallel the existing FortisBC NPS 12 gas pipeline for its entire length and will require an extension of the Certified Pipeline Corridor.
- **Eagle Mountain Compressor Station** – The Certified Project includes installation of up to two 20,500 horsepower (hp) electric motor-driven (EMD) compressor units in a 5 hectare (ha) expanded area adjacent to the existing Eagle Mountain Compressor Station. As a result of further engineering and design, FortisBC is proposing to install two approximately 26,000-hp EMD compressor units within the existing Eagle Mountain Compressor Station.

- **Squamish Compressor Station** – The Certified Project includes a compressor station, called the Squamish Compressor Station, to be located at Mount Mulligan on the existing NPS 10 gas pipeline and includes up to three 4,700 hp natural gas turbine compressor units. FortisBC has re-evaluated the suitability of locating this compressor station to the WLNG project site as an alternative to the Mount Mulligan compressor station site. The amended design for the Squamish Compressor Station at the WLNG project site includes two approximately 6,300 hp gas turbine compressor units in place of the three 4,700 hp units proposed for the Mount Mulligan compressor station. The total planned compression capacity for the Squamish Compressor Station is within the total approved in the Certified Project Description. The new compressor station site will be approximately 113-m-wide by 87-m-long (1.0 ha) within the approximately 21.8 ha Squamish Compressor Station siting area.







FORTIS BC

October 2020

FIGURE 1-1

PROJECT OVERVIEW

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Waterbody
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:25,000
0 200 400 600 800 metres
(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor: CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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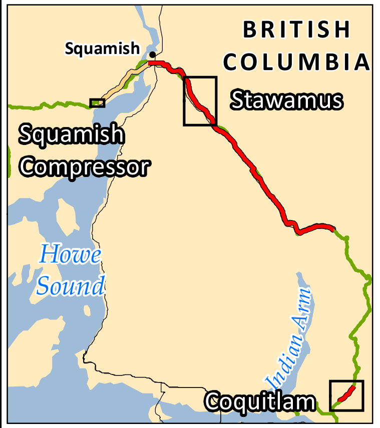


1.1 Amendment Descriptions

A description of each of the proposed amendments is provided as follows. The description includes a comparison with the Certified Project Description, the purpose of each proposed amendment, the location, and preliminary design details.

1.1.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion involves an extension of the existing Certified Pipeline Corridor for approximately 7 km in the Stawamus River Valley. The Stawamus Corridor Expansion is being proposed to provide flexibility to address potential construction challenges associated with the Certified Pipeline Corridor (such as, two crossings of the Stawamus River), to reduce impacts, and to realize operational efficiencies as it is located adjacent to the existing FortisBC NPS 10 gas pipeline.

The Stawamus Corridor Expansion is located on the east side of the Certified Pipeline Corridor between KP 25.0 and KP 32.1 (from E 497079 N 5499357 to E 493623 N 5505016). The Stawamus Corridor Expansion is located east of the District of Squamish, outside of the District planning boundaries (Figure 1-1).

The Stawamus Corridor Expansion originates on the west side of the existing NPS 10 pipeline at KP 25.0 and heads north on an expanded right-of-way. The new proposed pipeline alignment rejoins the Certified Pipeline Corridor on the east side of the existing NPS 10 pipeline, at KP 32.1. The new proposed pipeline alignment parallels the existing linear disturbance, including the existing FortisBC NPS 10 gas pipeline, roads, and electrical transmission lines, for 6.3 km (92 percent of its total length of 6.8 km) and crosses the existing FortisBC NPS 10 at five points. The approximate locations of these crossings are KP 28.9, KP 29.3, KP 29.6, KP 30.2, and KP 31.2. All other technical details of the pipeline (such as, the NPS 24 pipeline size, operating pressure, and product) remain unchanged.

The Stawamus Corridor Expansion will require an extension of the Certified Pipeline Corridor, which ranges from 32-m-wide to 420-m-wide and has an average width of 200 m.

The proposed amendment footprint is the physical area within the proposed Amendment Pipeline Corridor that will be directly disturbed by construction activities for the proposed Stawamus Corridor Expansion, including associated physical works and activities. The proposed amendment footprint will be approximately 38-m-wide. The location of the proposed amendment footprint within the Amendment Pipeline Corridor will be determined during detailed design.

Where TWS is necessary, the width of the proposed amendment footprint may extend more than 60 m and may be as narrow as 35 m in some locations. These will be localized and will be within the EAC Application Corridor for the Project. TWS would be used for construction within the Stawamus Corridor Expansion and may include temporary storage and work areas (such as, staging and stockpile sites, laydown areas, and Contractor yards).

Existing public roads, forest service roads, and other resource roads will be used to access the Stawamus Corridor Expansion, where practical. Some of these roads may require reactivation, upgrades, and clearing to accommodate construction traffic. The location of new temporary access roads will be identified during detailed engineering design.

Associated activities for pipeline construction remain the same as outlined in the EAC Application and include: engineering and design, construction survey, clearing, topsoil salvage, grading, stringing, and welding, trenching, lowering-in, backfilling, testing, and clean-up and reclamation. Watercourse crossing methods will be based on engineering, geotechnical, and environmental considerations. Crossing methods typically used during watercourse construction include trenched methods such as open-cut isolation (for example, dam and pump, flumes) and trenchless methods (such as, boring, and horizontal directional drilling [HDD]).

1.1.2 Coquitlam Twinning

This proposed amendment involves installation of a 3 km gas pipeline adjacent to FortisBC's existing NPS 12 gas pipeline in the City of Coquitlam, BC. The Coquitlam Twinning is proposed to increase capacity and reliability to WLNG and FortisBC's existing customers during peak periods when demand is at its highest. The existing NPS 12 pipeline currently experiences reduced efficiency and increased pressure loss due to a bottleneck created upstream of the twinned system. By twinning the section of NPS 12 pipeline that is mostly outside the Coquitlam Conservation Reserve, the additional volume of natural gas supply will provide reliable service to our existing customers on the Sunshine Coast and Vancouver Island as well as WLNG during those peak periods when demand is at its highest.

The Coquitlam Twinning is located north of the Westwood Plateau neighbourhood within the City of Coquitlam (from E 513808 N 5462502 to E 515686 N 5464613). The Coquitlam Twinning will originate at the Eagle Mountain Compressor Station and head northeast on an expanded right-of-way immediately south of the FortisBC NPS 12 pipeline. At approximately KP 1.6, the new pipeline will cross the existing NPS 12 pipeline and continue on the north side of the existing right-of-way until its terminus at the mainline block valve (MLD 1-1 NPS 12) on the existing pipeline. A portion of the Pipeline Twinning is proposed to be adjacent to the Westwood Plateau Golf and Country Club course and would be approximately 300 m from residential areas. The last 1.3 km of the pipe will be located parallel and adjacent to a BC Hydro 500 kV transmission line. The centreline will overlap with the Coquitlam Conservation Reserve between KP 1.7 and KP 1.8 for approximately 160 m. At the pipeline terminus, the mainline block valve site will need to be expanded to accommodate the terminus of the new NPS 24 pipeline. Metro Vancouver indicated to FortisBC that the Coquitlam Conservation Reserve boundary aligns with the Crown Land Tenure boundary. The location of the proposed amendment is shown on Figure 1-1.

The Coquitlam Twinning will require an extension of the Certified Pipeline Corridor. The extension will have an average width of approximately 150 m.

The proposed amendment footprint is the physical area within the proposed Amendment Pipeline Corridor that will be directly disturbed by the proposed amendment construction activities, including associated physical works and activities. The proposed amendment footprint will be approximately 28-m-wide from KP 0 to KP 1.6 and will be approximately 35-m-wide from KP 1.6 to KP 2.9. The location of the proposed amendment footprint within the proposed Amendment Pipeline Corridor will be determined during detailed design.

Where TWS is necessary, the width of the proposed amendment footprint may extend to more than 53 m; however, these wider locations will be localized and will be within the EAC Application Corridor for the Project. In some locations, the width may narrow to 10 m. TWS would be used for the construction of the Coquitlam Twinning and may include temporary storage and work areas (such as, staging and stockpile sites, laydown areas, and Contractor yards).

Existing public roads, resource roads, and established routes will be used to access the Coquitlam Twinning. Associated activities for the construction of the proposed amendment include: engineering and design, construction survey, clearing, topsoil salvage, grading, stringing, and welding, trenching, lowering-in, backfilling, testing, and clean-up and reclamation.

Watercourse crossing methods will be based on engineering, geotechnical, and environmental considerations. Crossing methods typically used during watercourse construction include trenched methods such as open-cut isolation (for example, dam and pump, flumes) and trenchless methods (such as, boring and HDD).

1.1.3 Eagle Mountain Compressor Station

The existing Eagle Mountain Compressor Station is in the northwest of the City of Coquitlam on the south slope of Eagle Mountain (E 513719, N 5462443) (Figure 1-1).

This proposed amendment involves the installation of two approximately 26,000 hp electric motor-driven compressor units within the existing Eagle Mountain Compressor Station, as an alternative to installing two 20,500 hp units in a 5 hectare (ha) expanded area adjacent to the existing Eagle Mountain Compressor Station. The compressor station upgrade will include additional discharge gas cooling, vent stack, and other auxiliary equipment, including high pressure yard piping, isolation valves, electrical, control, and gas systems.

The new equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility and will involve an expansion to one of the existing compressor buildings. A new warehouse and electrical building will be built to house auxiliary equipment. TWS located outside the current facility footprint may be required during construction. The site preparation activities for TWS may involve tree clearing, salvage and storage of topsoil, excavation, blasting of rock, grading, site drainage, and compaction of gravel surface on work areas. TWS for construction was considered in the original EAC Application.

1.1.4 Squamish Compressor Station

This proposed amendment involves a potential alternative location and a different compressor configuration from the approved Squamish Compressor Station. The Certified Project includes a new compressor station, called the Squamish Compressor Station, with up to three 4,700-hp, natural gas turbine compressor units located at the base of Mount Mulligan. After further Project optimization studies, it was determined that locating this compressor station to the WLNG project site is also a suitable option. If approved, only one Squamish Compressor Station would be built at either the approved Mount Mulligan location or the potential WLNG location. The amended design for the Squamish Compressor Station at the WLNG project site includes two approximately 6,300-hp gas turbine compressor units. The total planned compression capacity is within the total approved in the Certified Project Description.

The Squamish Compressor Station will be located on the northeast portion of the WLNGproperty within the Squamish Compressor Station siting area shown on Figure 1-1. The Squamish Compressor Station siting area will be approximately 21.8 ha. The construction site, including anticipated earth works, will be approximately 113-m-wide by 87-m-long (approximately 1 ha) and the permanent flat facility site will be approximately 60-m-wide by 83-m-long (approximately 0.5 ha).

The WLNG project site overlaps the ancestral Squamish Nation Village of Swĺyat and is approximately 7 km southwest of the Squamish Nation reserve of Stawamus 24. However, there are no permanent residents in proximity of the site as the nearest occupied location is 5.5 km east, directly across Howe Sound at Darrell Bay, and downtown Squamish is over 7.2 km to the northeast. The Squamish Compressor Station siting area overlaps with the WLNG project site.

The compressor station design will incorporate numerous autonomous safety monitoring devices that will automatically shut-down the station and isolate itself from the pipeline in abnormal conditions (refer to Table 16-3 for Squamish Compressor Station mitigation measures). The site will also be equipped with discharge gas cooling and other auxiliary equipment, including high pressure yard piping, isolation valves, electrical, control and gas systems, storage facilities, and offices.

The existing NPS 10 pipeline located in the north portion of the Squamish Compressor Station siting area will be rerouted to accommodate the new compressor station site. The length of the NPS 10 pipeline to be rerouted is approximately 270 m.

A new approximately 430-m-long NPS 10 pipeline lateral will be constructed to connect the rerouted section to the Custody Transfer Station. The route for this new NPS 10 pipeline will be entirely within a previously disturbed area along the southwest border of the Squamish Compressor Station siting area.

In addition, the Squamish Compressor Station will be serviced by a 750 kilo-volt-ampere power supply, through approximately 700 m of new electrical powerline, originating from the electrical substation being proposed as part of the WLNG project. The alternative means for this proposed amendment is to construct within the Certified Pipeline Corridor. Routing options within the Certified Pipeline Corridor remain viable for construction but present geotechnical risks and construction challenges associated with crossing the Stawamus River. By rerouting the pipeline to parallel existing disturbances such as the FortisBC right-of-way, roads, and the existing BC Hydro transmission right-of-way, potential impacts can be minimized.

2. Alternative Means of Undertaking the Project

Alternative means are the various technically and economically feasible ways to carry out the Project, and these were considered through the route and site selection process throughout the planning of the Project. FortisBC's approach to identifying and reviewing alternative facility siting options is described in subsection 1.5 of the EAC Application (Volume 1, Part A).

FortisBC has continued planning and design of the Project since receiving the EAC and has also continued to engage with Indigenous groups, stakeholders, and regulatory agencies. Throughout this planning process, FortisBC has identified four proposed amendments to the Certified Project. FortisBC evaluated the proposed amendments and associated alternatives based on a number of factors including safety, the environment, Indigenous group feedback, community feedback, socio-economic factors, Municipal requirements, and engineering and operations.

The alternative options to the proposed amendments that were considered by FortisBC are discussed in the following subsections.

2.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is being proposed to provide flexibility to address potential construction challenges associated with the Certified Pipeline Corridor (such as, two crossings of the Stawamus River), to minimize impacts, and to realize operational efficiencies as it is located adjacent to the existing FortisBC NPS 10 pipeline. This proposed amendment also responds to feedback from Squamish Nation, who have asked FortisBC to reduce the visual impacts of the Project and minimize impacts on the Stawamus River. By rerouting this segment of the pipeline parallel to the existing NPS 10 pipeline, roads, and electrical transmission lines for the majority of its length, visual impacts can be reduced. Squamish Nation has informed FortisBC that they have not completed their internal review of this proposed amendment.

The alternative means for this proposed amendment is to construct within the Certified Pipeline Corridor. Routing options within the Certified Pipeline Corridor remain viable for construction but present geotechnical risks and construction challenges associated with crossing the Stawamus River. By rerouting the pipeline to parallel existing disturbances such as the FortisBC right-of-way, roads, and the existing BC Hydro transmission right-of-way, potential impacts can be minimized.

2.2 Coquitlam Twinning

The Certified Project is planned to operate in parallel to (that is, loop) the existing FortisBC pipeline that is part of the natural gas transmission system that services Squamish, the Resort Municipality of Whistler (RMOW), the Sunshine Coast, and Vancouver Island. The purpose of the Certified Project is to provide natural gas transportation service to a new liquified natural gas facility being proposed by WLNG. The expanded system is intended to meet the requirements of the new WLNG facility and enable FortisBC to continue to provide reliable service to existing customers.

Downstream of the Eagle Mountain Compressor Station, the existing NPS 12 pipeline runs through the Coquitlam Conservation Reserve in Metro Vancouver where it can experience low flow efficiency and pressure loss. Looping (or paralleling) sections of pipeline increases flow efficiencies and decreases pressure loss within the system.

The Coquitlam Twinning is considered a suitable location to loop the existing NPS 12 FortisBC pipeline due its location being mostly outside of the Coquitlam Conservation Reserve, the availability of existing access, and proximity to the Eagle Mountain Compressor Station. The proposed amendment location was considered most suitable to loop as other sections of the existing NPS 12 pipeline are located within the Coquitlam Conservation Reserve where there are development limitations and greater potential environmental impacts.

No other pipeline routes for the Coquitlam Twinning were considered during preliminary design as it is a routing principle and FortisBC's preference to parallel the existing NPS 12 pipeline. Paralleling the existing pipeline route reduces the permanent right-of-way width requirements resulting in less tree clearing and physical disturbance.

As an alternative to the Coquitlam Twinning, FortisBC considered expanding the Certified Pipeline diameter along the length of the approved 47.7 km route in order to meet the capacity and reliability objectives. FortisBC conducted a hydraulic analysis for the NPS 24 pipeline (approved in the EAC) and other alternative pipeline diameters including NPS 30 and NPS 36. The hydraulic analysis found that the NPS 30 and NPS 36 options would provide only a slightly higher capacity output compared to the NPS 24 option. Additionally, these alternatives were not considered suitable because, compared to the Certified NPS 24 pipeline, they would result in greater environmental impacts (such as, additional land clearing and air emissions), longer construction times, increased construction materials, and higher overall Project costs.

2.3 Eagle Mountain Compressor Station

In response to the FortisBC Request for Proposal for the supply of two EMD compressor units for the Eagle Mountain Compressor Station, vendors submitted proposals that included compressor units with upwards of 26,000-hp. Additional hydraulic information and feedback from the compressor unit manufacturers suggests that the increase of horsepower is due to manufacturers moving away from highly-customized EMD compressor unit designs. They are, instead, offering standardized EMD compressor unit packages as a result of market growth for EMD compressor units.

FortisBC's site selection criteria considers many factors including potential environmental effects, and FortisBC understands that spatially efficient design can reduce Project effects on Environmental and Socio-economic Valued Components (VCs). During the Project optimization phase, FortisBC reviewed the equipment and workspace requirements for the Eagle Mountain Compressor Station. This review determined that the additional compression equipment required for the Eagle Mountain Compressor Station could be accommodated within the existing facility rather than within the approved expansion area. The Certified Project includes a 5-ha expansion to the north of the Eagle Mountain Compressor Station and up to 20,500-hp of additional electric drive compression. The current design accommodates the additional compression requirement within the existing facility statutory right-of-way. Although FortisBC can likely accommodate the additional compression equipment within the existing facility statutory right-of-way, FortisBC is not applying for a reduction to the Certified Compressor Station Area. The Certified Compressor Station Area may still be required for TWS.

2.4 Squamish Compressor Station

FortisBC has considered the following five areas as possible locations for the Squamish Compressor Station. FortisBC initially looked at several possible locations for compressor stations in or near Squamish, but concerns were raised by Indigenous groups, the public, and Municipal representatives (such as, noise levels, proximity to reserves and populated areas, potential environmental impacts, and zoning restrictions). The five locations and a brief history of rationale for inclusion or exclusion is provided as follows.

2.4.1 Sabre Site and Pioneer Way Site

The Sabre site was the preferred option described in the EAC Application and the Pioneer Way site was described as the second compatible option in the EAC Application. Both sites are located in the industrial area of Squamish. Concerns regarding the location of the compressor station in the industrial park within the District of Squamish were raised about these sites. Concerns included potential conflicts with businesses and recreational opportunities for the land, proximity of the compressor station to residents, visual aesthetics, and noise. As a result of concerns raised about these sites, FortisBC filed Addendum 3 to the EAC Application in September 2015, which proposed alternative locations for the Squamish Compressor Station.

2.4.2 BC Rail Yard Site

The BC Rail yard site was described in Addendum 3 of the EAC Application as an alternative location for the Squamish Compressor Station. The BC Rail yard site is located in the District of Squamish east of the Sabre site. This site offered existing access and close proximity to the proposed pipeline route; however, a location in the BC Rail yard would present similar issues in regard to proximity of the compressor station to residents, visual aesthetics, and noise. As a result, it was deemed that the BC Rail yard site did not address concerns raised by Municipal representatives, Indigenous groups, and the public regarding the location of the Squamish Compressor Station. In addition, BC Rail yard lands would require rezoning to accommodate the compressor station.

2.4.3 Mount Mulligan Site

The Mount Mulligan site is described in Addendum 3 to the EAC Application and is the approved compressor station site near Squamish in the Certified Project Description.

As described in Addendum 3, the Mount Mulligan site is considered suitable because it provides existing forestry road access with potential for road upgrades, site security, distance from residences, and location outside the *Siiyamin ta Sḵwx̱wú7mesh* (Squamish Nation Cultural Site) adjacent to the Stawamus River. The site is also considered suitable due to its discrete distance from the nearby community, the Sea to Sky gondola viewing area, and the summit of the Stawamus Chief Mountain.

The Mount Mulligan site remains a suitable location for a compressor station. In the time since the EAC was issued, FortisBC has received feedback from the District of Squamish and the Squamish community about potential issues at this location, such as noise, air quality, and visual impacts. As a result, FortisBC has re-evaluated other site options.

2.4.4 Woodfibre LNG Limited Site

The WLNG project site was originally described in the EAC Application as an alternative; however, the site was initially discounted as it did not meet the minimum separation requirement between compressor stations. During the Project optimization phase, it was determined that the separation distance between the existing Port Mellon compressor station and the WLNG project site is a manageable constraint.

Based on improved hydraulic data, it was determined that there is little difference hydraulically between Mount Mulligan and the WLNG project site. The WLNG project site is approximately 5.5 km from the nearest residence (Darrell Bay) and is located on a previously disturbed site currently zoned for industrial uses. As such, the WLNG project site is expected to alleviate some concerns expressed by the community related to noise, air quality, and visual aesthetics. Further coordination with WLNG including discussions regarding access, site location, safe operation, and shared construction logistics led to the consideration of this site as a suitable option.

Several site options were evaluated on the WLNG project site and the present option was considered most suitable based on environmental constraints, engineering feasibility studies and feedback from WLNG.

2.4.4.1 Equipment Selection for the Squamish Compressor Station at Woodfibre LNG Limited Site

The WLNG project site has a substantial number of siting constraints due to safety considerations (that is, proximity to WLNG facilities and BC Hydro right-of-way), topography, environmental sensitivities, and historical contamination. FortisBC considered numerous potential locations on the WLNG project site before proposing the current Squamish Compressor Station siting area. FortisBC considered both gas-driven and EMD compressor units for the Squamish Compressor Station. FortisBC evaluated the following criteria related to gas and electric drive options:

- Plot plan feasibility (that is, spatial requirements)
- Electric substation details
- Reliability of gas drive versus electric drive
- Environmental impacts during construction and from ongoing operations

The electric drive compressor station plot plan would require substantially more area than the gas drive plot plan. The electric drive compressor requires more equipment than the gas drive options including electrical switchgear and two variable frequency drives per compressor. An electric drive compressor station option would also require the addition of a dedicated electrical substation to step down available electrical voltage from the nearby BC Hydro high-voltage electric transmission line to a distribution voltage. Ideally, the substation would be located between the proposed BC Hydro switching station and the Squamish Compressor Station; however, this area presented substantial constraints including challenging terrain, unsafe proximity to existing infrastructure, and environmental sensitivities.

FortisBC also considered the reliability of gas and electric driven compressor units and determined that gas-driven compressors are preferred because they do not rely on interruptible service from BC Hydro in order to operate. This is an essential consideration because the Squamish Compressor Station needs to operate reliably in order to provide uninterrupted service to FortisBC's existing customers downstream of WLNG, on Sunshine Coast and Vancouver Island. FortisBC considered the electric drive option with gas powered back up generators, but it is not practical for the emergency generator to power the compressors in the event of loss of electrical power. In addition, there would be insufficient space to accommodate this size of an electric generator. From an environmental impact perspective, the electric drive compressor requires more land clearing due to its larger size. The gas drive compressor has higher emissions of criteria air contaminants (CACs) and greenhouse gases (GHGs) than an electric drive compressor; however, the gas drive configuration will be within applicable emission regulations (Section 5).

FortisBC determined that there are no safe and practicable locations on the WLNG property to site an electric drive compressor station. FortisBC has determined that the electric drive option is not feasible, and the gas drive option is preferred.

3. Effects Assessment Methods

The effects assessment in this Amendment Application, similar to the effects assessment contained in the EAC Application, considers the five interconnected and interdependent pillars identified by the BC EAO: environment, economy, social, heritage, and health.

The effects assessment methodology described in the EAC Application (Section 3.0, Volume 1, Part B) was utilized for this Amendment Application. Positive effects (includes direct and indirect effects) of the Project are assessed in Section 1.6 of the EAC Application (Volume 1, Part A). The assessment of adverse effects (includes negative direct and indirect effects) and cumulative effects on VCs is provided in Sections 4 to 20 of the EAC Application (Volume 1, Part B).

Sections 4 to 18 of this Amendment Application provide a description of the existing conditions for the proposed amendments and includes an assessment of VCs as identified in the EAC Application Information Requirements (AIRs) for the Project (revised version issued November 10, 2014 by the BC EAO). Sections 4 to 18 of this Amendment Application includes the effects assessment conclusions for each VC. To avoid repetition, previously identified effects of the Project are not repeated in this Amendment Application and cross references to the EAC Application are provided instead. The effects assessment in this Amendment Application examines whether new potential effects, not identified in the EAC Application are present. Potential effects that are unchanged from the EAC Application for the Project are not re-assessed in this Amendment Application.

3.1 Spatial Boundaries

General information on spatial boundaries is provided in subsection 3.2 of the EAC Application (Volume 1, Part B). This Amendment Application applies the same VC-specific methods for identifying the Local Study Areas (LSAs) and Regional Study Areas (RSAs) as described for each VC in Sections 4.0 to 15.0 (Volume 1, Part B) of the EAC Application.

Where the LSAs and RSAs previously used in the EAC Application could not be applied (for example, if the proposed amendment footprint did not fall within a previously defined VC spatial boundary), extensions to existing spatial boundaries were identified and are provided, where applicable, in the effects assessment subsections of this Amendment Application.

The proposed amendment footprint is the physical area within the proposed Amendment Pipeline Corridor or proposed facility siting area that will be directly disturbed by the four proposed amendment construction activities, including associated physical works and activities. The proposed amendment footprint for each proposed amendment is described in subsection 1.1 and depicted on Figure 1-1.

3.2 Characterization of Potential Residual Effects

The following subsections provide a description of the potential for interactions of the proposed amendments with the VCs identified in the EAC Application. The proposed amendment will be assessed for the construction, operations and decommissioning phases of the Project, to determine whether there is a material change to the assessment provided in the EAC Application. Material change is defined as a change to the assessment criteria ratings used to make a determination of significance of an impact on a VC as described in subsection 3.6 of the EAC Application (Volume 1, Part B) including: spatial boundary, duration, frequency, reversibility, magnitude, likelihood, and confidence.

For many VCs, the existing conditions are similar to the conditions identified in the EAC Application; therefore, the potential adverse effects were not considered to be materially different from the effects considered in the EAC Application. Where a change in existing conditions or potential adverse effects on existing conditions occurs as a result of the proposed amendment, these differences are discussed.

Table 3-1 summarizes the assessment criteria used in the EAC Application for the characterization of potential residual effects. In accordance with the *2018 Act*, this Amendment Application does not include

significance determinations, as the BC EAO will complete an assessment report that includes significance conclusions. Similarly, a confidence rating for the significance determination is also not provided in this Amendment Application.

Table 3-1. Characterization of Residual Adverse Effects – Assessment Criteria

Assessment Criteria		Definition
SPATIAL BOUNDARY – Location of Residual Effect		
Proposed amendment footprint	The land area directly disturbed by the construction and clean-up activities of the proposed amendments, including associated physical works and activities (such as, permanent right-of-way, temporary construction camps, and TWS for construction).	
LSA	An LSA that varies with the VC being considered. The LSA is based on the geographic extent within which plants, animals, and humans are most likely to be affected by Project construction and operation.	
RSA	An RSA consists of the area that generally (but not always) extends beyond the LSA boundary and varies with the VC being considered. For each VC considered, a separate RSA boundary will be established in consideration of the Project Regional effects on the individual VC.	
Provincial	The area extending beyond Regional or administrative boundaries.	
National	The area extending beyond BC; however, confined to Canada.	
International	The area extending beyond Canada.	
TEMPORAL CONTEXT[a]		
Duration (period of the event causing the effect)	Immediate	Event is limited to less than or equal to 2 days during either the construction phase or operations phase.
	Short-term	Event occurs during the construction phase or is completed within any 1 year during the operations phase.
	Long-term	Ongoing event that is initiated during the construction phase and extends beyond the first year of the operations phase or is initiated during the operations phase and extends for the life of the Project.
Frequency (how often would the event that caused the effect occur)	Accidental	Occurs rarely over assessment period.
	Isolated	Confined to specified phase of the assessment period.
	Occasional	Occurs intermittently and sporadically over assessment period.
	Periodic	Occurs intermittently; however, repeatedly over the assessment period.
	Continuous	Occurs continuously over the assessment period.
Reversibility – Environmental (period of time over which the residual effect extends)	Immediate	Residual effect is alleviated in less than or equal to 2 days.
	Short-term	Greater than 2 days and less than or equal to 1 year to reverse residual effect.
	Medium-term	Greater than 1 year and less than or equal to 10 years to reverse residual effect.
	Long-term	Greater than 10 years to reverse residual adverse effects.
	Permanent	Residual effects are irreversible.
Reversibility – Socio-economic (period of time over which the residual effect extends)	Short-term	Residual effect limited to the construction phase or to less than any 1 year during operations phase.
	Medium-term	Residual effect extends into the first 2 years of the operations phase.
	Long-term	Residual effect extends throughout the remainder of the operations phase.
	Permanent	Residual effects are irreversible.
MAGNITUDE – of the Residual Effect (Environment Pillar)		
Negligible	Residual effects are not detectable.	
Low	Residual effects are detectable; however, well within environmental and/or regulatory standards.	
Medium	Residual effects are detectable and may approach; however, are still within the environmental and/or regulatory standards.	
High	Residual effects are beyond environmental and/or regulatory standards.	

Table 3-1. Characterization of Residual Adverse Effects – Assessment Criteria

Assessment Criteria	Definition
MAGNITUDE – of the Residual Effect (Social, Economic, Heritage, and Health Pillars)	
Negligible	No detectable change to the VC from existing (baseline) conditions.
Low	Change in the VC is detectable; however, has no effect on the social, economic, heritage, or health environment beyond that of an inconvenience or nuisance value.
Medium	Change in the VC is detectable and results in moderate modification in the social, economic, heritage, or health environment.
High	Change in the VC is large enough to result in a severe modification in the social, economic, heritage, or health environment.
PROBABILITY OF OCCURRENCE[b] – Likelihood of Residual Effect	
High	Likely
Low	Unlikely

[a] The assessment period for the effects assessment includes planning, construction, operation, and decommissioning or abandonment phases for the Project, while the assessment period for the cumulative effects assessment includes the above interval as well as the development, construction and operation phases of activities or projects that have previously occurred and those that are planned (publicly disclosed).

[b] Probability of occurrence refers to whether a residual effect is likely to occur. For each VC, the likelihood of the predicted residual effect using appropriate quantitative or qualitative terms, with sufficient description to understand how the conclusions were reached must be indicated.

3.3 Assessment Methodology for Section 25 Assessment Matters

The *2018 Act* was enacted in December 2019 and Section 25.2 includes additional assessment matters that were not previously included in the *Environmental Assessment Act*, S.B.C. 2002, c. 43 (the *2002 Act*) under which the Project was approved.

Through consultation with the BC EAO it was confirmed that the scope of the assessment for the Amendment Application would need to address all assessment matters in Section 25 of the *2002 Act,* but only as these matters apply to the proposed amendments. The BC EAO confirmed that a re-assessment of the Certified Project is not expected.

Section 25 of the *2002 Act* lists required assessment matters that must be considered in every assessment. Table 0-1 summarizes the Section 25 required assessment matters included in the *2002 Act* and where they are addressed in this Amendment Application. Most of Section 25 required assessment matters under the *2018 Act* are consistent with the original Project AIRs and the scope of the Project EAC Application. The Section 25 required assessment matters that were not directly assessed in the Project EAC Application include:

- disproportionate effects on distinct human populations, including populations identified by gender
- effects on biophysical factors that support ecosystem function
- effects on current and future generations

This Amendment Application assessed these three additional Section 25 assessment matters for the proposed amendments relative to the Certified Project. The assessment approach for each of the three topics is included in Section 21 to 23.

3.4 Cumulative Effects

The cumulative effects assessment evaluates the likely residual adverse effects associated with the Project in combination with potential adverse effects arising from other projects and activities that have been or will be carried out in a VC-specific LSA or RSA. Future projects considered in the assessment do not include proposed or hypothetical projects where formal plans have not been disclosed.

Spatial boundaries were designed to include the largest RSA for all VCs to determine whether existing activities and projects were to be included in the cumulative effects assessment. The following outlines the criteria for screening projects and activities for the cumulative effects assessment.

3.4.1 Spatial Boundary

- A project or activity was included if it is within the RSA for the VC.
- A project or activity was excluded if it was outside the RSA for the VC.

3.4.2 Temporal Boundary

- A project or activity was included if it was in the Provincial or Federal EA regulatory process, or otherwise reasonably expected to proceed (for example, logging).
- A project or activity was excluded from the inclusion list of reasonably foreseeable projects or activities and included as existing disturbance if it was known that it will be in development or operation prior to 2020.

3.4.3 Reasonably Foreseeable Developments

The list of reasonably foreseeable projects considered for the cumulative effects assessment in the EAC Application was updated for the purposes of this Amendment Application. Table 3-2 provides an updated Project list, including status in 2020 and new reasonably foreseeable developments from what was provided in Table A3.1-1 (Section 3.0, Volume 1, Part B) of the EAC Application. Figure 3-1 shows the mapped reasonably foreseeable developments listed in Table 3-2.

Overall, most of the previously mapped developments are now operating and therefore considered part of the existing disturbance. Table 3-3 lists unmapped foreseeable developments.

In summary, six projects are now in operation, three are in progress, three have been issued a certificate, one has started construction, and two have been put on hold or withdrawn. The search conducted for this Amendment Application has identified three new reasonably foreseeable developments that were not included in the EAC Application. These are the proposed Delta Grinding Facility, The Tilbury Phase 2 LNG Expansion and the proposed Tilbury Pacific LNG Jetty. All three are located on Tilbury Island in the City of Delta and are within the Community and Regional Infrastructure and Services RSA and Employment and Economic RSA.

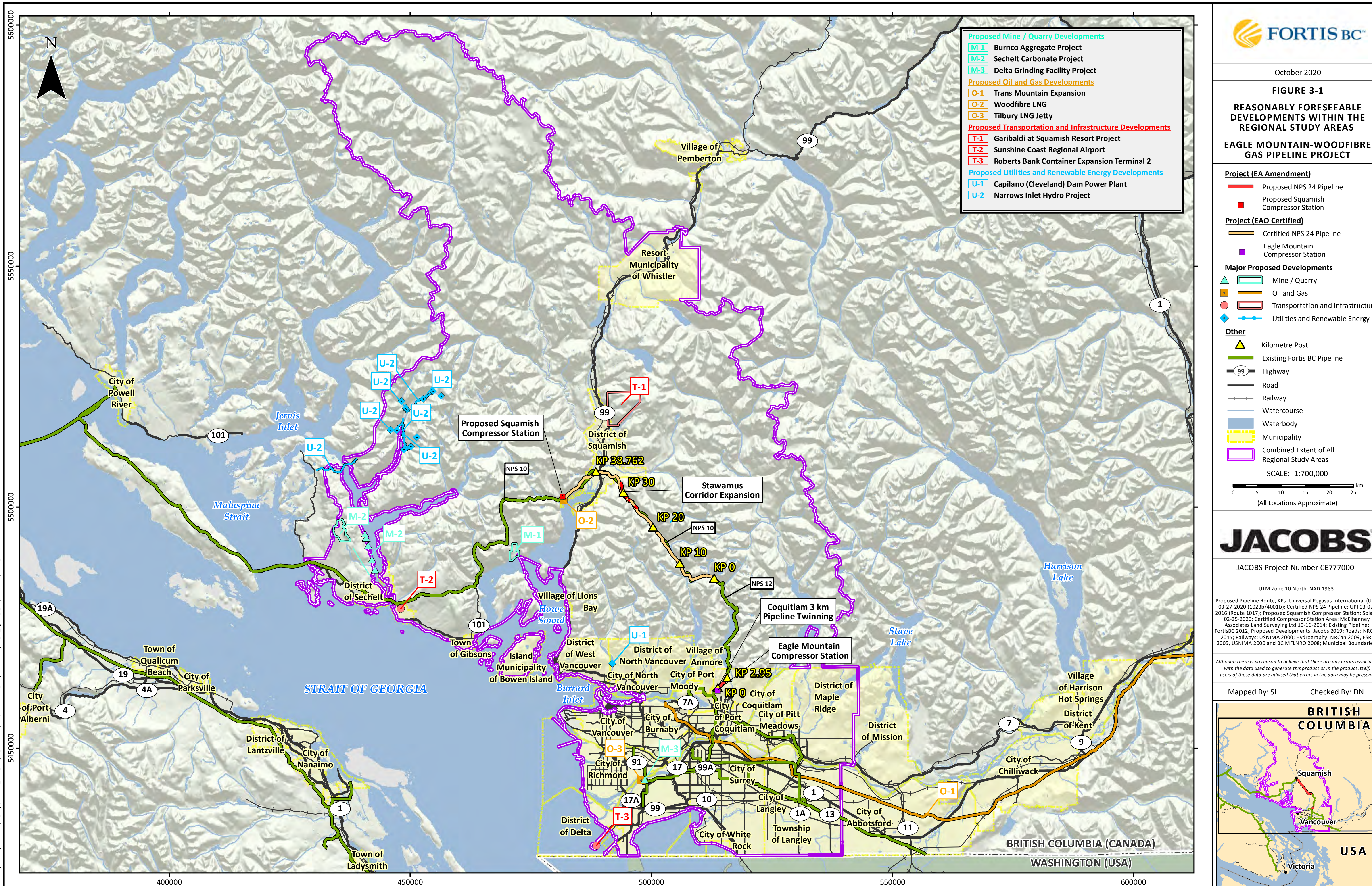

FORTIS BC
October 2020
FIGURE 3-1
REASONABLY FORESEEABLE DEVELOPMENTS WITHIN THE REGIONAL STUDY AREAS
EAGLE MOUNTAIN-WOODFIBRE GAS PIPELINE PROJECT
Project (EA Amendment)
Proposed NPS 24 Pipeline
Proposed Squamish Compressor Station
Project (EAO Certified)
Certified NPS 24 Pipeline
Eagle Mountain Compressor Station
Major Proposed Developments
Mine / Quarry
Oil and Gas
Transportation and Infrastructure
Utilities and Renewable Energy
Other
Kilometre Post
Existing Fortis BC Pipeline
Highway
Road
Railway
Watercourse
Waterbody
Municipality
Combined Extent of All Regional Study Areas
SCALE: 1:700,000
0 5 10 15 20 25 km
(All Locations Approximate)
JACOBS
JACOBS Project Number CE777000
UTM Zone 10 North. NAD 1983.
Proposed Pipeline Route, KPs: Universal Pegasus International (UPI) 03-27-2020 (1023b/4001b); Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Proposed Squamish Compressor Station: Solaris 02-25-2020; Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Existing Pipeline: FortisBC 2012; Proposed Developments: Jacobs 2019; Roads: NRCan 2015; Railways: USNIMA 2000; Hydrography: NRCan 2009, ESRI 2005, USNIMA 2000 and BC MFLNRO 2008; Municipal Boundaries:
Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.
Mapped By: SL
Checked By: DN
BRITISH COLUMBIA
Squamish
Vancouver
USA
Victoria
Proposed Mine / Quarry Developments
M-1 Burnco Aggregate Project
M-2 Sechelt Carbonate Project
M-3 Delta Grinding Facility Project
Proposed Oil and Gas Developments
O-1 Trans Mountain Expansion
O-2 Woodfibre LNG
O-3 Tilbury LNG Jetty
Proposed Transportation and Infrastructure Developments
T-1 Garibaldi at Squamish Resort Project
T-2 Sunshine Coast Regional Airport
T-3 Roberts Bank Container Expansion Terminal 2
Proposed Utilities and Renewable Energy Developments
U-1 Capilano (Cleveland) Dam Power Plant
U-2 Narrows Inlet Hydro Project
N
Proposed Squamish Compressor Station
Stawamus Corridor Expansion
Coquitlam 3 km Pipeline Twinning
Eagle Mountain Compressor Station
KP 38.762
KP 30
KP 20
KP 10
KP 0
KP 2.95
NPS 10
NPS 12
Village of Pemberton
Resort Municipality of Whistler
District of Squamish
City of Powell River
Jervis Inlet
Malaspina Strait
STRAIT OF GEORGIA
District of Sechelt
Town of Gibsons
Village of Lions Bay
Howe Sound
Island Municipality of Bowen Island
District of West Vancouver
District of North Vancouver
City of North Vancouver
Village of Anmore
City of Port Moody
Burrard Inlet
City of Vancouver
City of Burnaby
City of Coquitlam
City of Port Coquitlam
City of Pitt Meadows
District of Maple Ridge
District of Mission
City of Richmond
City of Surrey
City of Langley
Township of Langley
City of White Rock
District of Delta
City of Abbotsford
City of Chilliwack
District of Kent
Village of Harrison Hot Springs
Harrison Lake
Stave Lake
Town of Qualicum Beach
City of Parksville
City of Port Alberni
District of Lantzville
City of Nanaimo
Town of Ladysmith
BRITISH COLUMBIA (CANADA)
WASHINGTON (USA)
400000
450000
500000
550000
600000
5600000
5550000
5500000
5450000

Table 3-2. Reasonably Foreseeable Development (Mapped)

Map No.	Primary Applicant	Project, Facility or Activity	Status in 2014	Location	Development Type	Sources	Project Description	VC LSA or RSA	Project Status in 2020
Transportation Infrastructure									
T-1	Garibaldi at Squamish Inc. c/o Aquilini Development and Construction Inc.	Garibaldi at Squamish Resort Project	Under Review	Brohm Ridge, approximately 15 km north of Squamish, BC	Tourist Destination Resort	BC EAO Website: http://a100.gov.bc.ca/appsdata/epic/documents/p404/d35787/1370985575687_0ca1f76ddf6ddc30072a4b1d5d33620233fc685fec0c61966f56f2a08202bfd9.pdf Map: https://projects.eao.gov.bc.ca/p/garibaldi-at-squamish/detail	Garibaldi at Squamish Inc. (the proponent) proposes to develop a 2,775 ha all season resort on the slopes of Brohm Ridge. The main components of the proposed project include: • 5,739 housing units (including 1,700 hotel units); • 1,200 ha of proposed ski area; and • recreational trail network.	Air Quality RSA Community and Regional Infrastructure and Services RSA Employment and Economic LSA and RSA Fish RSA Grizzly RSA Human and Ecological Health RSA Heritage RSA Indigenous Interest RSA Land and Resources RSA Surface Water RSA Wetlands RSA Wildlife RSA	Certificate Issued
T-2	Yrainucap Development Corp.	Sechelt Airport Expansion Project	Proposed	Sechelt, BC	Airport Expansion	District of Sechelt: http://www.district.sechelt.bc.ca/Live/Transportation/Airport.aspx	Proposed airport development that includes terminal upgrades, extending the runway to 1,200 m, 12 new hangers, and 150 acres of light industrial area.	Community and Regional Infrastructure and Services RSA Employment and Economic LSA and RSA	Proposed
T-3	Vancouver Fraser Port Authority	Roberts Bank Terminal 2	Proposed	Delta, BC	Container Terminal	Port Metro Vancouver: http://www.robertsbankterminal2.com/ CEAA: https://ceaa-acee.gc.ca/050/evaluations/proj/80054	Port Metro Vancouver proposes the construction and operation of a new three-berth marine container terminal located at Roberts Bank in Delta, BC, approximately 35 km south of Vancouver. Located next to the existing Deltaport and Westshore terminals, the project would provide an additional 2.4 million units of container capacity per year at Roberts Bank.	Employment and Economic RSA Community and Regional Infrastructure and Services RSA	EA in progress
Utilities and Renewable Energy									
U-1	AltaGas Ltd.	Rainy River Hydroelectric Project	On hold	Howe Sound	Run-of-River Hydroelectric	CEAA (archived): https://www.ceaa-acee.gc.ca/052/details-eng.cfm?pid=7857	15 MW project 16 km north of Gibson's Landing. Withdrawn from CEAA submission in 2008.	Acoustic RSA Air Quality RSA Employment and Economic LSA and RSA Grizzly RSA Human and Ecological Health RSA Community and Regional Infrastructure and Services RSA Indigenous Interest RSA	On hold
U-2	BC Hydro	Interior to Lower Mainland Project	Construction Started	Between Merritt, BC and Coquitlam, BC	Transmission Line	BC Hydro: https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/projects/interior-lower-mainland-transmission/ilm-project-update-jan-2016.pdf BC EAO: http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_290.html Map: http://a100.gov.bc.ca/appsdata/epic/documents/p290/d26871/1226684637528_8e248a8d30d8ec3d0630f4b546ab8572fd54ab00cbfc.pdf	Construction of a new 500 kV transmission line between Nicola substation near Merritt and the Meridian Substation in Coquitlam.	TBD Acoustic RSA Air Quality RSA Employment and Economic LSA and RSA Grizzly RSA Human and Ecological Health RSA Heritage RSA Community and Regional Infrastructure and Services RSA Indigenous Interest RSA	Operational
U-3	BluEarth Renewables Inc.	Culliton Creek Power Project	Proposed	20 km north of Squamish, BC	Run-of-River Hydroelectric Project	BluEarth Renewables: https://blueearthrenewables.com/projects/culliton-creek-hydro-facility/	The Culliton Creek Hydro Project is a 15 MW run-of-river hydroelectric project located on Culliton Creek approximately 20 km north of the District of Squamish. The project includes an intake earthfill embankment with concrete spillway, a 3.2-km-long penstock, and a powerhouse. A new transmission line of 12.6 km 69 kV wood-pole transmission line will tie into the BC Hydro power grid.	Air Quality RSA Employment and Economic LSA and RSA Grizzly RSA	Operational

Table 3-2. Reasonably Foreseeable Development (Mapped)

Map No.	Primary Applicant	Project, Facility or Activity	Status in 2014	Location	Development Type	Sources	Project Description	VC LSA or RSA	Project Status in 2020
U-4	Box Canyon Hydro Corporation/Sound Energy Inc.	Box Canyon Hydroelectric Project	Proposed	Port Mellon, BC	Hydroelectric	Elemental energy Inc.: http://elementalenergy.ca/portfolio/box-canyon-hydro/	Proposed 15 MW hydroelectric project on Box Creek and Marty Creek located 9 km northeast of Port Mellon.	Air Quality RSA Employment and Economic RSA Grizzly RSA Human and Ecological Health RSA Community and Regional Infrastructure and Services RSA Indigenous Interest RSA	Operational
U-5	Greater Vancouver Regional District	Capilano (Cleveland) Dam Power Plant	Proposed	North Vancouver	Dam Power Plant	BC Major Projects: https://www2.gov.bc.ca/gov/content/employment-business/economic-development/industry/bc-major-projects-inventory	Proposed 14 MW plant built on the Capilano Watershed would include turbines and generators to produce power for about 6,000 homes.	Employment and Economic RSA Community and Regional Infrastructure and Services RSA	Proposed
U-6	Hydromax Energy Ltd.	Phantom Lake Hydropower Project	Proposed	Sechelt, BC	Hydropower Project	BC Major Projects: https://www2.gov.bc.ca/gov/content/employment-business/economic-development/industry/bc-major-projects-inventory	Proposed 15 MW hydropower project.	Employment and Economic RSA Grizzly RSA Community and Regional Infrastructure and Services RSA	On hold
U-7	NI Hydro Holding Corp.	Narrows Inlet Hydro Project	Proposed	30 km north of Sechelt, BC	Hydropower Project	BC Major Projects: https://www2.gov.bc.ca/gov/content/employment-business/economic-development/industry/bc-major-projects-inventory	Proposed hydropower project with 45 MW from the Ramona 3, Chickwat Creek and CC Creek projects.	Employment and Economic RSA Community and Regional Infrastructure and Services RSA	Construction started
U-8	Run-of River Power Inc.	Upper Pitt River Waterpower Project	Pre-application	35 km north of Pitt Meadows, BC	Run-of-River Hydroelectric Project	BC EAO: https://projects.eao.gov.bc.ca/p/upper-pitt-river-water-power/detail	Northwest Cascade Power Ltd. proposes to construct and operate seven run-of-the-river water power projects on tributaries to the Upper Pitt River with a combined capacity of 161 MW.	Heritage RSA Land and Resources RSA Indigenous Interest RSA Wildlife RSA	Withdrawn
U-9	Run of River Power Inc.	Mamquam Power Cluster	Proposed	Whistler, BC	Hydroelectric Project	BC Hydro: https://www.bchydro.com/work-with-us/selling-clean-energy/closed-offerings/clean-power-call/participants.html	Run of River Power has three potential projects located in the Upper Mamquam River Watershed, which flows into the Strait of Georgia near District of Squamish, BC approximately 70 km from Vancouver. The cluster's total potential plant capacity would be approximately 22 MW and would generate approximately 90 GWh/yr of clean, green renewable electricity.	Acoustic RSA Air Quality RSA Employment and Economic RSA Fish RSA Grizzly RSA Human and Ecological Health RSA Heritage RSA Community and Regional Infrastructure and Services RSA Land and Resources RSA Indigenous Interest RSA Surface Water RSA Wetlands RSA Wildlife RSA	Operational
U-10	Sea to Sky Power Corporation	Skookum Creek Power Project	Construction Started	Squamish, BC	Run-of-River Hydroelectric Project	BCG Engineering: https://bgcengineering.ca/power_skookum_creek.html CEAA (archived): https://www.ceaa-acee.gc.ca/052/details-eng.cfm?pid=63779	The Skookum Creek hydroelectric project is a 25 MW run-of-river project located approximately 70 km north of Vancouver and 12 km east of Squamish, BC in the Sea to Sky corridor. The project will generate 88,000 MW-hours per year of clean, renewable electricity, or enough electricity to power approximately 8,300 homes. The project is located on Skookum Creek, a tributary of the Mamquam River. The project will be connected to the BC Hydro electric system at District of Squamish via a 20 km, 138 kV transmission line.	Acoustic LSA and RSA Air Quality RSA Employment and Economic LSA and RSA Fish RSA Grizzly RSA Groundwater RSA Human and Ecological Health RSA Heritage RSA Community and Regional Infrastructure and Services RSA Land and Resources RSA Indigenous Interest LSA and RSA Surface Water RSA Wetlands RSA Wildlife RSA	Operational
U-11	Whistling Wind/ Whistler-Blackcomb	Whistler Wind Farm Project	Proposed	Whistler, BC	Wind Farm		Proposed wind farm in the Whistler-Blackcomb area. The community and partner, Whistling Wind are conducting a study to determine the feasibility of wind tower location on the west side of Whistler Mountain. Potential power supply for 6,000 homes.	Community and Regional Infrastructure and Services RSA Employment and Economic RSA	Undetermined

Table 3-2. Reasonably Foreseeable Development (Mapped)

Map No.	Primary Applicant	Project, Facility or Activity	Status in 2014	Location	Development Type	Sources	Project Description	VC LSA or RSA	Project Status in 2020
Oil and Gas Developments									
O-1	FortisBC	Tilbury Phase 2 LNG Expansion	Proposed	Delta, BC	LNG Facility Expansion	FortisBC: https://talkingenergy.ca/project/tilbury-LNG-expansion-project	Proposed expansion of the Tilbury LNG facility that will provide LNG as a clean fuel alternative to diesel for use in trucking, mining, and marine transportation. A second tank and a new liquefier will be included in the project. Located on Tilbury Island.	Community and Regional Infrastructure and Services RSA Employment and Economic RSA	Proposed – Identified after Project EAC issued.
O-2	Trans Mountain Pipeline ULC	Trans Mountain Expansion	In Progress	Edmonton, Alberta to Burnaby, BC	Pipeline	Trans Mountain: http://www.transmountain.com/project-overview CEAA: http://www.ceaa-acee.gc.ca/050/details-eng.cfm?evaluation=80061 MPMO: http://www2.mpmo-bggp.gc.ca/MPTracker/projectsummary-resumedeprojet.aspx?pid=213 BC EAO: https://projects.eao.gov.bc.ca/p/trans-mountain-expansion/detail	The Trans Mountain Expansion Project would include 987 km of new pipeline, new and modified facilities, such as pump stations and tanks, and the reactivation of 193 km of existing pipeline. The Westridge Marine Terminal would also be expanded.	Air Quality RSA Community and Regional Infrastructure and Services RSA Employment and Economic LSA and RSA Human and Ecological Health RSA Heritage RSA Land and Resources RSA Indigenous Interest RSA Wildlife RSA	Construction started
O-3	Woodfibre LNG Limited (WLNG)	WLNG project	Proposed	7 km southwest of District of Squamish, BC	LNG Facility	BC EAO: https://projects.eao.gov.bc.ca/p/woodfibre-lng/detail CEAA: https://www.ceaa-acee.gc.ca/050/evaluations/proj/80060?culture=en-CA MPMO: https://mpmo.gc.ca/projects/242	WLNG is proposing to construct and operate an LNG facility located 7 km southwest of Squamish, BC. The proposed project includes the development of a natural gas liquefaction facility and an LNG transfer facility. It is expected to produce between 1.5 and 2.1 million tonnes of LNG per year.	Acoustic RSA Air Quality RSA Community and Regional Infrastructure and Services LSA Employment and Economic LSA Geophysical LSA Grizzly RSA Human and Ecological Health LSA and RSA Land and Resources LSA and RSA Social Marine RSA Indigenous Interest LSA and RSA Vegetation RSA Wetlands LSA and RSA Wildlife LSA and RSA	Certificate issued
O-4	Tilbury Jetty LP	Tilbury Marine Jetty	N/A	Delta, BC	Marine Jetty	WesPac: https://tilburypacific.ca/	Tilbury Jetty Limited Partnership, which is jointly owned by Fortis LNG and Seaspan, is proposing to build a marine jetty in the lower Fraser River at a former industrial site next to FortisBC's Tilbury Liquefied Natural Gas Storage Facility in Delta, BC. The Project consists of: • Marine jetty with berthing and mooring facilities • Access trestle connecting to the shoreline • LNG line linking to FortisBC's Tilbury LNG facility • Vapour return line, water supply, and other utilities	Employment and Economic RSA Community and Regional Infrastructure and Services RSA	Proposed – Identified after Project EAC issued.
Mines/Quarries									
M-1	Burnco Rock Products Ltd.	Burnco Aggregate Project	Pre-application	Northwest shore of Howe Sound, approximately 22 km west-southwest of District of Squamish, BC	Sand and Gravel Mine	BC EAO: https://projects.eao.gov.bc.ca/p/burnco-aggregate/detail CEAA: http://www.ceaa-acee.gc.ca/050/details-eng.cfm?evaluation=54754 MPMO: http://www2.mpmo-bggp.gc.ca/MPTracker/projectsummary-resumedeprojet.aspx?pid=145	Burnco Rock Products Ltd. (the proponent) proposes to develop a sand and gravel aggregate pit to supply material to their ready-mix concrete plants in south Burnaby and Port Kells, BC. The project will include development of a marine barge loading facility. Initial production capacity is estimated to be on the order of 400,000 per year, increasing to 1 to 1.6 million tonnes per annum within a few years for the duration of the resource.	Air Quality RSA Community and Regional Infrastructure and Services RSA Employment and Economic RSA Grizzly RSA Human and Ecological Health RSA Land and Resources RSA Indigenous Interest RSA Wildlife RSA	Certificate Issued
M-2	Pan Pacific Aggregates Ltd.	Sechelt Carbonate Project	Pre-application	Approximately 15 km north of Sechelt, BC	Carbonate Rock Mine	BC EAO: https://projects.eao.gov.bc.ca/p/sechelt-carbonate/detail	Pan Pacific Aggregates Ltd. (the proponent) proposes to develop an open pit mine with a production capacity of 400,000 to 6,000,000 tonnes per annum. The mine life expectancy is 25 years.	Community and Regional Infrastructure and Services RSA Employment and Economic RSA	Scoping

Table 3-2. Reasonably Foreseeable Development (Mapped)

Map No.	Primary Applicant	Project, Facility or Activity	Status in 2014	Location	Development Type	Sources	Project Description	VC LSA or RSA	Project Status in 2020
Other									
M-3	Lehigh Hanson Materials Limited	Delta Grinding Facility Project	Proposed	Delta, BC	Cement Grinding Facility	CEAA: https://ceaa-acee.gc.ca/050/evaluations/proj/80168?culture=en-CA	Lehigh Hanson Materials Limited is proposing to construct, operate and decommission a grinding facility with a marine terminal adjacent to its existing cement plant facility located on Tilbury Island in Delta, British Columbia. As proposed, the Delta Grinding Facility Project would produce up to 650,000 tonnes of supplementary cementitious material per year when fully operational and would have an operational life of at least 40 years.	Community and Regional Infrastructure and Services RSA Employment and Economic RSA	Proposed – Identified after Project EAC issued.

Notes:

- Reasonably foreseeable developments with identified footprints outside of urban disturbed areas are mapped.
CEAA = Canadian Environmental Assessment Agency
GWh/yr = gigawatt hour(s) per year
MPMO = Major Projects Management Office
MW = megawatt (s)

Table 3-3. Reasonably Foreseeable Development (Unmapped)

Primary Applicant/ Developer	Project, Facility or Activity	Status	Location	Development Type	Sources	Project Description	Project Status in 2019
Transportation and Infrastructure							
Aquilini Renewable Energy	Tsawwassen Waste-to-Energy Project	Proposed	Tsawwassen First Nation property	Waste-to-Energy Facility	Delta Optimist: https://www.delta-optimist.com/news/region-discontinues-efforts-to-develop-garbage-incinerator-1.2149660	Waste-to-Energy plant.	Cancelled
City of Surrey	Organic Biofuel Facility	Proposed	Surrey, near the Port Kells Transfer Station	Organic Biofuel Facility	City of Surrey: http://www.surrey.ca/city-services/13015.aspx CBC: https://www.cbc.ca/news/canada/british-columbia/surrey-b-c-unveils-state-of-the-art-biofuel-plant-promises-no-foul-smells-1.4570761	80,000 metric tonnes/year of organic waste will be converted into compressed natural gas. The City of Surrey will provide the land.	Operational
District of Sechelt	Sechelt Wastewater Facility	Under Construction	Sechelt, BC	Wastewater Treatment	District of Sechelt: http://www.sechelt.ca/Live/Water-Sewer-Drainage/Water-Resource-Centre	Construction of a $21.3 million state of the art wastewater facility in Sechelt. Located in downtown Sechelt on the site of the existing Ebbtide Wastewater Treatment Plant and Parks & Public Works site, the new facility will include a greenhouse that uses innovative organic processes to filter waste products as a key feature of the treatment process. The design verifies the facility will integrate well with the surrounding neighbourhood and the adjacent Sechelt Marsh park.	Operational
Metro Vancouver	North Shore Wastewater Treatment Plant	Proposed	North Vancouver, BC	Wastewater Treatment Plant	Metro Vancouver: http://www.metrovancouver.org/services/liquid-waste/treatment/treatment-plants/lions-gate/Pages/default.aspx Acciona: https://northshorewwtp.ca/	Proposed construction of a new secondary sewage treatment plant near Burrard Inlet on the former BC Rail passenger station at McKeen Avenue and West First Street in the District of North Vancouver to replace the existing Lions Gate Primary Treatment plant at the north end of the Lions Gate Bridge.	Construction ongoing
	Metro Vancouver Waste-to-Energy Incineration Facility	Proposed	Vancouver, BC	Waste-to-Energy Facility	Metro Vancouver: http://www.metrovancouver.org/services/solid-waste/garbage-recycling/waste-to-energy-facility/about/Pages/default.aspx	Waste-to-energy facility mass-burn facility that recovers energy and metals from garbage that cannot be recycled. It generates enough energy to power 16,000 homes a year and recovers about 7,000 tonnes of metal annually. The facility is approved by the BC Minister of Environment through an Operational Certificate which was approved in 2016 and sets requirements for the facility's operation, including emissions limits, monitoring, reporting, and publication.	Operating
	Iona Island Wastewater Treatment Plant Upgrades	Proposed	Richmond, BC	Wastewater Treatment Plant Upgrades	Metro Vancouver: http://www.metrovancouver.org/services/liquid-waste/projects-initiatives/iona-island-wwtp-project/Pages/default.aspx	Proposed upgrades to the Iona Island wastewater treatment plant.	Project definition phase
Port Metro Vancouver	Deltaport Terminal, Road and Rail Improvement Project	Proposed	North Vancouver, BC	Rail Improvements	Port Metro Vancouver: https://www.portvancouver.com/development-and-permits/status-of-applications/deltaport-terminal-road-and-rail-improvement-project/	As part of the Container Capacity Improvement Program, Port Metro Vancouver has worked with the Province of BC and Deltaport operator TSI Terminal Systems Inc. to develop a plan to upgrade existing infrastructure that would increase Deltaport's container capacity by 600,000 TEUs, to a total of 2.4 million TEUs. The Deltaport Terminal, Road and Rail Improvement Project includes: • an overpass on the existing Roberts Bank causeway that will separate road and rail traffic; • reconfiguration of rail track and additional container handling equipment within the existing Deltaport Terminal; • additional rail track within the existing railway corridor and a portion of the Option Lands; and • road improvements on Deltaport Way to improve the movement of container trucks at Deltaport.	Construction ongoing
	Low-Level Road Project	Proposed	North Vancouver, BC	Road Improvements	Port Metro Vancouver: http://www.portmetrovancouver.com/en/projects/NorthShoreTradeArea.aspx https://www.portvancouver.com/news-and-media/news/port-metro-vancouvers-low-level-road-project-first-transportation-project-to-receive-isis-envision-sustainable-infrastructure-platinum-award/	The Low-Level Road Project includes elevating and realigning the existing Low-Level Road to the north, addresses slope stability, eliminates three at-grade rail crossings, improves road safety, and accelerates the City's Spirit Trail Master Plan. This will increase the international competitiveness of the North Shore Trade Area by improving the efficiency of Port operations while addressing long-standing community needs.	Operational
	Proposed Philip Avenue Overpass	Proposed	North Vancouver, BC	Road Improvements	District of North Vancouver: https://www.dnv.org/property-and-development/philip-avenue-overpas s	The Philip Avenue Overpass Project is one of several transportation investment projects that have been identified to help sustainably accommodate and enhance the growth in international trade within the North Shore Trade Area. The Philip Avenue Overpass Project will provide a new overpass above the rail tracks to minimize road/rail conflicts and make traffic flow in the area more continuous and reduce idling time and air emissions. The project will also eliminate the existing Pemberton Avenue at-grade rail crossing, which means that products can be shipped using longer trains, thereby reducing noise from rail car switching and shunting.	Operational

Table 3-3. Reasonably Foreseeable Development (Unmapped)

Primary Applicant/ Developer	Project, Facility or Activity	Status	Location	Development Type	Sources	Project Description	Project Status in 2019
Port Metro Vancouver (cont'd)	South Shore Corridor Project	Operation	North Vancouver, BC	Road Improvements	Port Metro Vancouver: https://www.portvancouver.com/wp-content/uploads/2015/05/2014-01-14-SSCP-Backgrounder.pdf Houle Electric: https://www.houle.ca/project/southshore/	The South Shore Corridor Project will include: • Stewart Street Elevated Road between Clark Drive and Victoria Drive; • pedestrian overpass at Victoria Drive; • realigned Commissioner Street; • intersection and roadway improvements on Stewart Street, Centennial Road and Commissioner Street; • reconfigured New Brighton Road; and • corridor-wide improvements including upgraded signage, installation of Intelligent Transportation Systems and fibre-optic cable upgrades.	Operational
Vancouver Fraser Port Authority and Canadian National Railway	Road and Rail Infrastructure Improvements for the Port of Vancouver	N/A	Vancouver, BC	Road and Rail Improvements	BC Trucking Association: https://www.bctrucking.com/bulletin/2018/06/25/road-rail-infrastructure-improvements-port-vancouver	On June 22, 2018, the Federal Minister of Transport announced a major investment in three projects for improvements to Port infrastructure, to reduce restrictions for truck traffic and increase the capacity of the rail infrastructure serving Vancouver's south shore Port area. The Vancouver Fraser Port Authority led the first two projects, with investment from Canadian National Railway and Canadian Pacific Railway to increase capacity, as well as providing crucial rail overpasses for trucks. Improvements include: • improving the existing Thornton Rail Tunnel ventilation system so that trains can pass through the tunnel more frequently; • improving the rail corridor by building 5.5 km of track adjacent to the existing double-tracked corridor; • designing and raising Douglas Road such that it crosses over the existing Canadian National Railway corridor; • building the Centennial Road overpass, a 600-m-long, two-lane elevated viaduct structure; • extending the existing two-lane Waterfront Road by 600 m; • realigning 350 m of Commissioner Street; and • building 9.4 km of new siding track and reconfiguring train switching operations within the Canadian Pacific Railway corridor, along the south shore of Burrard Inlet in the Cities of Vancouver and Burnaby. The third project led by Canadian National Railway, with investment from the Vancouver Fraser Port Authority, involves designing and building a 4.2-km-long secondary track, parallel to the existing Burrard Inlet line, in the City of Vancouver.	Proposed – Identified after Project EAC issued.
Vancouver Airport Authority	Vancouver International Airport Upgrades	Construction Started	Richmond, BC	Airport Upgrades	Vancouver Airport Authority: http://www.yvr.ca/en/passengers/construction/major-projects Global News: https://globalnews.ca/news/4274825/yvr-breaks-ground-9-1-billion-airport-upgrade-projects/	A 10-year strategy is planned to improve services for international and domestic flights. The upgrades include 700 m of corridors, moving walkways, and a high-speed baggage system for the international terminal, and upgrades to the domestic terminal. Airfield improvements will include runway safety enhancements and upgrades to roads, bridges, and dykes.	Construction ongoing
Vancouver Airport Fuel Facilities Corp.	Vancouver Airport Fuel Project	Certificate issued	Richmond, BC	Airport Upgrades	BC EAO: http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_346.html Vancouver Airport Fuel: https://www.vancouverairportfuel.ca/projectOverview	The proposed Vancouver Airport Fuel Project will include a marine terminal on the Fraser River, a storage facility, and a 15 km pipeline to Vancouver Airport.	In Progress
Utilities and Renewable Energy							
BC Hydro	Capilano Substation Upgrade	Proposed	North Vancouver, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/capilano.html	This project will add a new building, 25 kV and 60 kV indoor switchgear, and two 75 MVA 60/25 kV transformers to raise the capacity to 100 MVA at Capilano Substation. The upgrade will supply all Capilano load at 25 kV supply voltage and then retire the existing 12 kV transformers and switchgear.	In Progress
BC Hydro	Kidd 1 Substation Redevelopment	Construction Started	Vancouver, BC	Substation Upgrade	http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/160920/2009/02_June.pdf	Improvements to the Kidd 1 Substation in Vancouver to replace aging equipment and meet growing demand for electricity in the area.	Operational
BC Hydro	Kidd 2 Substation	Construction Started	Richmond, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/completed-projects.html	Replacing aging equipment and increase the capacity of the Kidd 2 Substation to meet the growing demand for electricity in the Richmond area. Upgrading Kidd 2 Substation involves installing two new transformers within the existing sound barrier enclosures and constructing a building to house new distribution feeder sections. Located at #4 Road and River Drive in Richmond	Operational
BC Hydro	Lynn Valley Substation Upgrade	Completed	North Vancouver, BC	Substation Upgrade	https://www2.gov.bc.ca/gov/content/employment-business/economic-development/industry/bc-major-projects-inventory/recent-reports	Lynn Valley is an existing substation supplying load to the North Vancouver area. Due to high load growth in the area, the station load has already exceeded the station firm capacity.	Operational

Table 3-3. Reasonably Foreseeable Development (Unmapped)

Primary Applicant/ Developer	Project, Facility or Activity	Status	Location	Development Type	Sources	Project Description	Project Status in 2019
BC Hydro	Barnard Substation	N/A	Burnaby, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/barnard.html	BC Hydro recently completed the new relay building in the northern part of the substation and currently preparing for the construction of a new switchgear building, scheduled to start in fall 2019.	Construction started – Identified after Project EAC issued.
BC Hydro	Camosun Substation Upgrade Project	N/A	Vancouver, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/camosun.html	Expanding the operations of the substation onto the vacant space inside the existing perimeter fence on the west side of the property.	Construction started – Identified after Project EAC issued.
BC Hydro	East Vancouver Substation	N/A	Vancouver, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/east-vancouver-substation.html	BC Hydro purchased property in East Vancouver for a future East Vancouver substation to replace the Murrin Substation in Chinatown.	Proposed – Identified after Project EAC issued.
BC Hydro	Mainwaring Substation Upgrade	N/A	Vancouver, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/mainwaring.html	This project includes replacing two transformers where they are currently located (as previously communicated) and an aging feeder section – the lattice structure within the substation.	Proposed – Identified after Project EAC issued.
BC Hydro	Sperling Substation Upgrade Project	N/A	Vancouver, BC	Substation Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/sperling.html	BC Hydro is planning to address the end-of-life conditions of some equipment at Sperling Substation by replacing and upgrading several electrical components.	Proposed – Identified after Project EAC issued.
BC Hydro	West End Substation	N/A	Vancouver, BC	New Upgrade	BC Hydro: https://www.bchydro.com/energy-in-bc/projects/west-end-substation.html	A new substation in the West End is needed to replace Dal Grauer Substation to ensure our customers in downtown Vancouver continue to have access to reliable power.	Proposed – Identified after Project EAC issued.
Regional Power	Sechelt Creek	In Operation	Half Moon Bay Electoral Area	Run-of-River Hydroelectric	Regional Power: http://www.regionalpower.com/work/sechelt-creek/ Map: http://web.viu.ca/earle/sechelt-creek/	In operation since 1997, a 16 MW facility located on Sechelt Creek with two turbine/generator sets of 8 MW each.	Operational
Regional Power	Bear Creek	In Operation	Sechelt Area	Run-of-River Hydroelectric	Regional Power: http://www.regionalpower.com/work/bear-creek/	The Bear Creek Hydro Project is a barge access only generation station is located near the town of Sechelt, BC. This Run-Of-River hydro project has the two power stations, Upper Bear and Lower Bear, which have a total capacity of 20 MW. The two stations are situated 8 km from each other and are connected to the BC Hydro Clowhom generation station via a new 138 kV transmission line constructed in partnership with Hydromax Energy Ltd.	Operational
Renewable Power Corporation	Tyson Creek Hydro Project	In Operation	Half Moon Bay Electoral Area	Run-of-River Hydroelectric	Renewable Power Corp: https://renewablepowercorp.com/new-page	9.3 MW hydroelectric plant constructed in 2008 to 2009 and operational in December 2009.	Operational
Renewable Power Corporation	McNair Creek Project	In Operation	Lower Sunshine Coast	Run-of-River Hydroelectric	Renewable Power Corp: https://renewablepowercorp.com/projects	9.8 MW hydroelectric plant constructed in 2004 and operational in 2005.	Operational
Sea to Sky Gondola	Squamish Gondola	Operation	Squamish, BC	Gondola	Sea to Sky Gondola: http://www.seatoskygondola.com Map: http://www.seatoskygondola.com/visit/how-get-here	Construction of a cable car gondola to run through Stawamus Chief Provincial Park to the top of Mount Habrich.	Operational
Veresen	Clowhom IPP	In Operation	Sechelt, BC	Run-of-River Hydroelectric	Canadian Projects Ltd: https://canprojects.com/projects/hydro/clowhom/	Operation of combined facilities with a total generation of 21 MW.	Operational
Mines/Quarries							
Crown Land Restoration Branch	Britannia Mine Remediation Project	Operation	1 Forbes Way, Britannia Beach, BC		BC Government: https://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/remediation-project-profiles/britannia-mine	Historic mining community is being remediated. Construction of mining museum, visitor centre and boardwalk completed in September 2010. A water treatment plant has been constructed and a small hydroelectric facility may be rebuilt.	In Progress

Notes:

1) Past, present, or reasonably foreseeable developments that have the potential to act in combination with the Project were excluded from mapping that met the following criteria:

- developments are located exclusively within the largest socio-economic RSA; whereby the cumulative effects assessment associated with these spatial boundaries uses a qualitative approach;
- developments are located on previously disturbed areas within urban Municipal boundaries;
- development details (such as, footprint, location) were not available; or in operation.

2) Specific locations for these reasonably foreseeable developments was not available, therefore the applicable VC LSA or RSA where these developments could not be determined, and they are not mapped on Figure 3-1.

MVA = Mega Volt Amp
TEU = twenty-foot equivalent units

4. Geophysical Environment

The assessment of potential adverse effects of the Project on the Soil Capability VC, Terrain Integrity VC, and Acid Rock Drainage (ARD) VC is provided in Section 4.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Soil Capability VC, Terrain Integrity VC, and ARD VC that may result from the proposed amendments, as described in subsection 1.1.

4.1 Spatial Boundaries

The spatial boundaries used in the geophysical environment assessment for each VC is provided in subsection 4.2.1 of the EAC Application (Volume 1, Part B). An RSA has not been established for any of the Geophysical Environment VCs since potential adverse effects are not anticipated to extend beyond the LSA.

Figure 4-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Soil Capability, Terrain Integrity, and ARD LSAs assessed in Section 4.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Does result in an expansion to the Soil Capability, Terrain Integrity, and ARD LSA assessed in Section 4.0 of the EAC Application.
- **Coquitlam Twinning** – Does result in an expansion to the Soil Capability, Terrain Integrity, and ARD LSAs assessed in Section 4.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Soil Capability, Terrain Integrity, and ARD LSAs assessed in Section 4.0 of the EAC Application since the newly proposed compressor unit and equipment will be installed within the existing facility boundary.
- **Squamish Compressor Station** – Does result in an expansion to the Soil Capability, Terrain Integrity, and ARD LSAs assessed in Section 4.0 of the EAC Application.

4.2 Existing Conditions

The existing conditions for the Soil Capability VC, Terrain Integrity VC, and ARD VC are provided in the 2015 EAC Application in the Soils Technical Data Report (TDR) (Volume 2, Appendix 1A) and the Terrain TDR (Volume 2, Appendix 1B).

Existing conditions for soil capability, terrain integrity, and ARD in the proposed amendment corridors, siting area, and Geophysical Environment LSA are summarized in this subsection. These conditions do not result in a material change to the overall setting considered in the EAC Application.

The following subsections provide a summary of the changes to existing conditions associated with the proposed amendment changes for each VC of the geophysical environment. The proposed amendments result in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Soil Capability, Terrain Integrity, and ARD VCs.

4.2.1 Soil Capability

4.2.1.1 Soil Characteristics

Soils encountered by the Stawamus Corridor Expansion, Coquitlam Twinning, and Squamish Compressor Station siting area are listed in Table 4-1.

Table 4-1. Soil Conditions within the Proposed Amendment Footprints and Siting Area

Approximate KP Range	Polygon ID	Soil Name	Soil Classification	Texture	Drainage	Parent Material
Stawamus Corridor Expansion						
24.8 to 27.0	N/A	N/A	Orthic Humo-Ferric Podzol	Sandy loam to loamy sand	Rapidly to well	Colluvial
			Orthic Humo-Ferric Podzol Orthic Ferro-Humic Podzol	Gravelly sandy loam to loamy sand	Moderately well; Imperfectly	Till
27.0 to 31.4	N/A	N/A	Orthic Humo-Ferric Podzol	Sandy loam to loamy sand	Moderately well	Colluvial; Till; Fluvial
31.4 to 32.4	N/A	N/A	Orthic Humo-Ferric Podzol; Typic Fibrisol (minor)	Sandy loam to loamy sand	Rapidly to well	Till; Colluvial; Bedrock
Coquitlam Twinning						
0.0 to 0.6; 1.0 to 1.5	35414	Buntzen (70%); Cannell (30%)	Duric Ferro-Humic Podzol; Orthic Humo-Ferric Podzol	Sandy Loam; Loam	Moderately well; Well	Eolian; Colluvial
0.6 to 1.0; 1.5 to 2.3	35420	Buntzen (70%); Steelhead (30%)	Duric Ferro-Humic Podzol; Duric Ferro-Humic Podzol	Sandy Loam; Sandy Loam	Moderately well; Imperfect	Eolian; Till
2.3 to 3.0	17828	Fellows (60%); Coquitlam (40%)	Orthic Ferro-Humic Podzol; Orthic Ferro-Humic Podzol	Sandy Loam; Silty Loam	Moderately well; Moderately well	Glaciolacustrine; Glaciolacustrine
Squamish Compressor Station Siting Area						
N/A	N/A	N/A	Orthic Ferro-Humic Podzol	Sandy Loam to loamy sand	Rapid to well; Moderately well	Colluvial; Till; Bedrock; Disturbed
N/A	N/A	N/A	Orthic Ferro-Humic Podzol to Orthic Dystric Brunisol	Gravelly sand	Rapid	Fluvial; Disturbed

Sources: SIFT 2019; CanSIS 2013; Luttmerding 1981; Moon and Brierley 1988; Soil Matters 2014; Appendix 1B of the EAC Application (Volume 2), Appendix A.

Stawamus Corridor Expansion

Soils along the Stawamus Corridor Expansion (KP 24.8 and KP 32.4) were assessed for the adjacent route described in Section 4.0 of the EAC Application (Volume 1, Part B), and primarily consist of Orthic Humo-Feric Podzols developed over primarily colluvial and till deposits. Orthic Ferro-Humic Podzols and Typic Fibrisols also occur to a lesser extent.

Coquitlam Twinning

Soils along the Coquitlam Twinning primarily consist of Buntzen, Fellow, and Coquitlam soils. Cannell and Steelhead soils occur to a lesser extent.

Buntzen soils are characterized by moderately well drained, sandy loam-textured Duric Ferro-Humic Podzols developed on moderately coarse eolian parent material overlaying moderately coarse morainal till. These soils occur on strongly sloping topography. These soils typically have LFH horizons approximately 2 centimetres (cm) thick overlaying a thin Ae horizon approximately 2-cm-thick. Buntzen soils are very friable within the upper 7 cm, friable up to 77 cm depth, and very firm lower subsoils (CanSIS 2013; Luttmerding 1981; SIFT 2019). These soils are not suitable for annually cultivated crops due to excessive stoniness, steep topography, and low nutrient and water-holding capacity (Bertrand R.A. et al. 1991).

Fellows soils are characterized by moderately well drained, sandy loam-textured Orthic Ferro-Humic Podzol developed on moderately coarse glaciolacustrine deposits. These soils occur on very gently sloping topography. These soils typically have LFH horizons approximately 15-cm-thick overlaying a thin Ae horizon approximately 4-cm-thick. Fellows soils are friable up to 32 cm depth, firm between 32 to 128 cm depth, with loose single grain soils from 128 to 180 cm below ground surface (CanSIS 2013; Luttmerding 1981; SIFT 2019). Loose consistency in lower subsoils may cause face instability during trenching or excavation. These soils are suitable for forage and annually cultivated crops; however, these soils are limited due to low nutrient and water-holding capacity (Bertrand R.A. et al. 1991).

Coquitlam soils are characterized by moderately well drained, silty loam-textured Orthic Ferro-Humic Podzol developed over medium-textured glaciolacustrine deposits. These soils occur on strongly sloping topography. These soils typically have humic horizons approximately 22-cm-thick overlaying a thin Ae horizon approximately 5-cm-thick. Coquitlam soils are friable and hard up to 70 cm depth, and firm and very hard between 70 to 95 cm below ground surface (CanSIS 2013; Luttmerding 1981; SIFT 2019). These soils are well suited for forage and annually cultivated crops. However, these soils are limited by root zone and water movement restrictions, as well as high erosion risk on slopes exceeding 5 percent (Bertrand R.A. et. al. 1991).

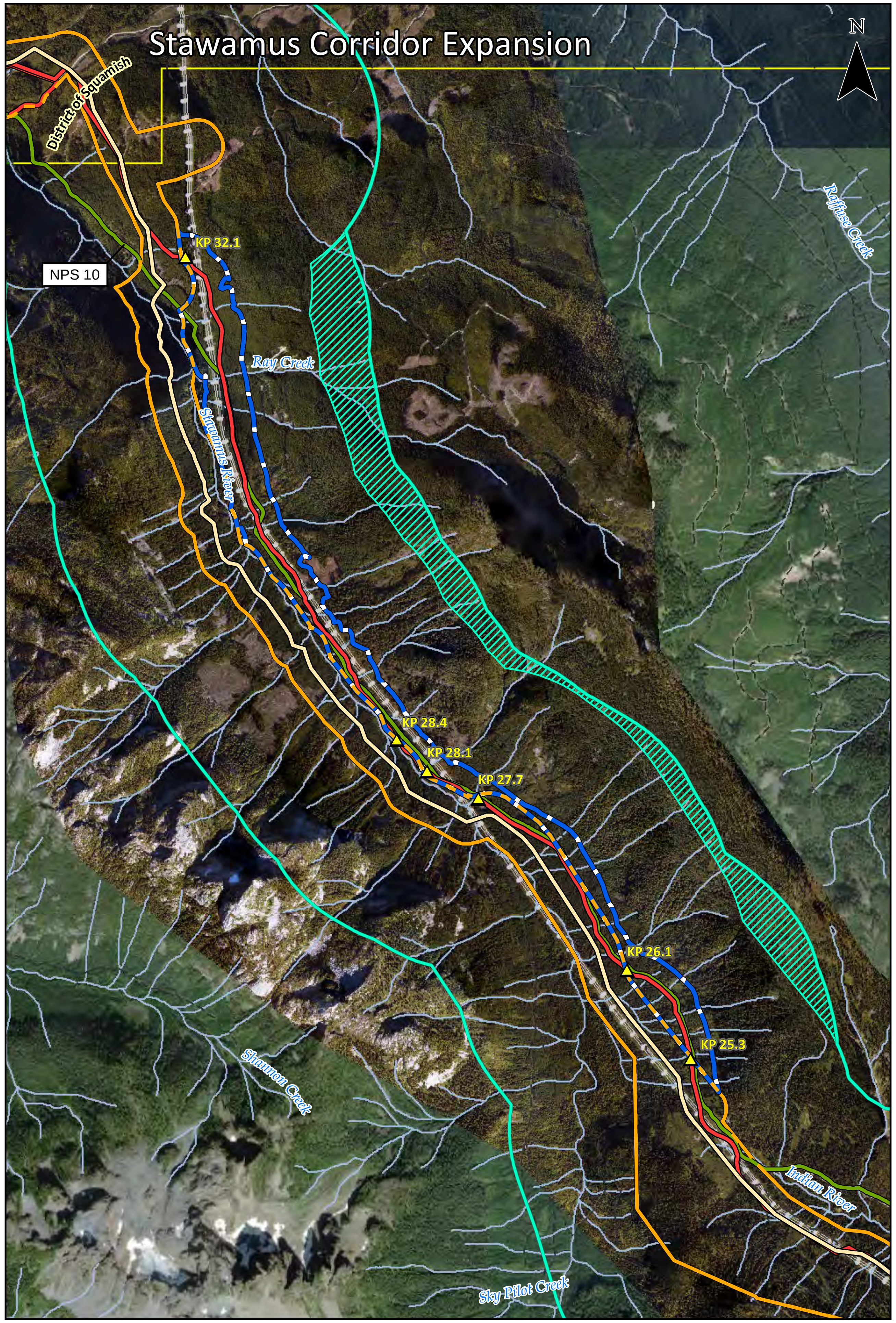
Cannell soils are characterized by well drained, loam-textured Orthic Humo-Ferric Podzol, developed on colluvial deposits overlaying acidic igneous bedrock. These soils occur on strongly rolling topography. These soils typically have LFH horizons approximately 10-cm-thick overlaying a thin Ae horizon approximately 3-cm-thick. Cannell soils are very friable to friable (CanSIS 2013; Luttmerding 1981; SIFT 2019).

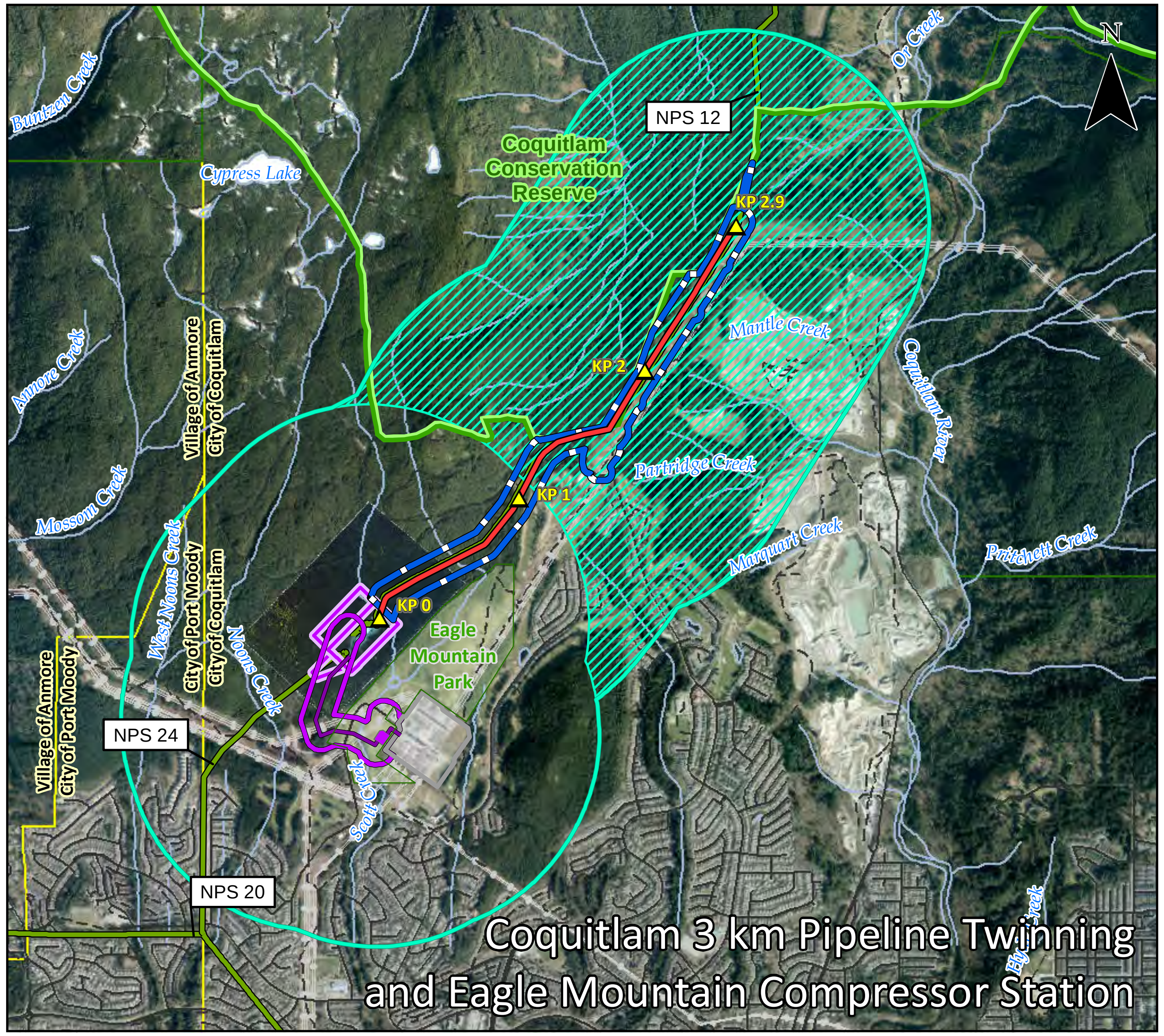
Steelhead soils are characterized by imperfectly drained, sandy loam-textured Duric Ferro-Humic Podzols developed on moderately coarse morainal till. These soils occur on moderately sloping topography. These soils typically have LFH horizons approximately 15-cm-thick overlaying a thin Ae horizon approximately 3-cm-thick. Steelhead soils are friable up to 62 cm depth, firm between 62 to 80 cm depth, and very firm 80 cm below ground surface (CanSIS 2013; Luttmerding 1981; SIFT 2019). These soils are not suitable for annually cultivated crops due to excessive stoniness, steep topography, and low nutrient and water-holding capacity (Bertrand R.A. et al. 1991).

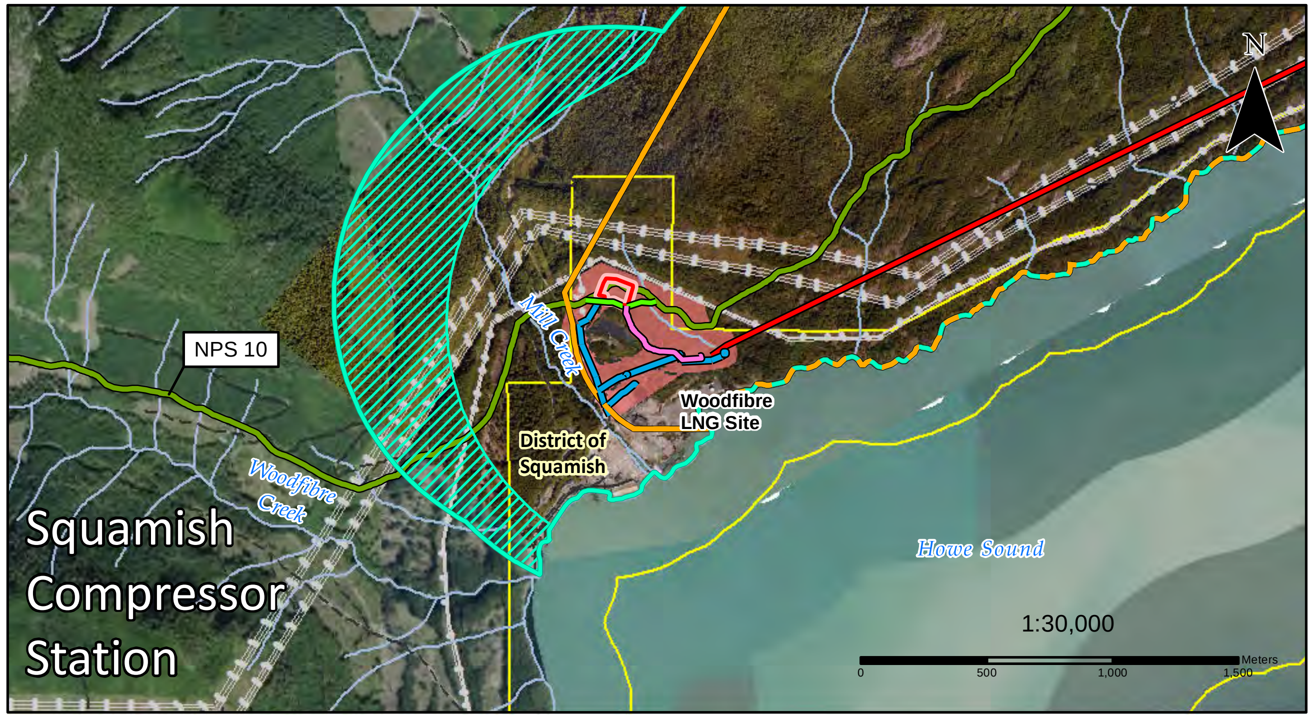
Squamish Compressor Station Siting Area

Soils within the Squamish Compressor Station siting area were assessed in Section 4.0 of the EAC Application (Volume 1, Part B) where the Certified Pipeline Corridor overlaps the Squamish Compressor Station siting area. Soils in this area primarily consist of Orthic Ferro-Humic Podzols developed over coarse textured colluvial materials and fluvial fans. These soils occur on moderate to excessively steep slopes. Soils within the southwest portion of the siting area may occur on low-to-moderate slopes (Soil Matters 2014; Moon and Brierley 1988).

Fellows soils are characterized by moderately well drained, sandy loam-textured Orthic Ferro-Humic Podzol developed on moderately coarse glaciolacustrine deposits. These soils occur on very gently sloping topography. These soils typically have LFH horizons approximately 15-cm-thick overlaying a thin Ae horizon approximately 4-cm-thick. Fellows soils are friable up to 32 cm depth, firm between 32 to 128 cm depth, with loose single grain soils from 128 to 180 cm below ground surface (CanSIS 2013; Luttmerding 1981; SIFT 2019). Loose consistency in lower subsoils may cause face instability during trenching or excavation. These soils are suitable for forage and annually cultivated crops; however, these soils are limited by due to low nutrient and water-holding capacity (Bertrand R.A. et al. 1991).







FORTIS BC

October 2020

FIGURE 4-1

GEOPHYSICAL ENVIRONMENT STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Geophysical Local Study Area
- Geophysical LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

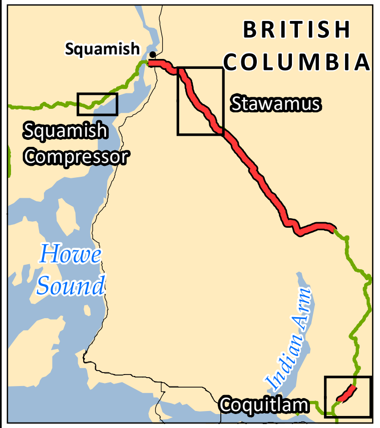
JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL | Checked By: DJN



4.2.1.2 Agricultural Land Reserve

None of the proposed amendments are located within designated Agricultural Land Reserve (ALR) land (ALC 2019).

4.2.2 Terrain Integrity

Existing terrain conditions within the proposed amendments are listed in subsection 4.2.2.

4.2.2.1 Bedrock and Surficial Geology

Stawamus Corridor Expansion

Bedrock and surficial geology along the Stawamus Corridor Expansion (KP 24.8 and KP 32.4) were assessed for the adjacent route described in Section 4.0 of the EAC Application (Volume 1, Part B). Current terrain mapping indicates that surficial materials primarily consist of morainal till, colluvial, and fluvial deposits (Appendix A).

Morainal till deposits underlain by colluvial materials are dominant between KP 24.8 and approximately KP 26.5 and between KP 29.7 to KP 32.4. Colluvial materials characterized by blanket veneers and talus cones, predominantly occupy by the Stawamus Corridor Expansion between approximately KP 26.5 to KP 28.2, and KP 28.8 to approximately KP 29.7. Fluvial primarily deposits occur between KP 28.2 and KP 28.8. Bedrock outcrops occur to a lesser extent along the western portion of the Stawamus Corridor Expansion corridor (Appendix A).

Coquitlam Twinning

Bedrock geology along the Coquitlam Twinning consists of diorite and granodiorite of the Coast Plutonic Complex (Appendix A). As described in Section 4.0 of the EAC Application (Volume 1, Part B), plutonic rock consists of a large composite igneous body formed by multiple intrusions of granodiorite, quartz diorite, and other predominantly felsic intrusive rock, and is known as the Coast Intrusion Complex. Crystalized coarse textured minerals consist primarily of quartz, plagioclase feldspar, potassium feldspar, and hornblende.

Bedrock exhibits highly variable conditions ranging from zones of extremely strong jointed blocky rock to zones of altered rock varying down to saprolites to weathered and broken rubble zones. Intermittent zones of saprolite or rubble are expected to continue along the Coquitlam Twinning. Bedrock was encountered at the tributary to Scott Creek crossing near KP 0.0 (Appendix A).

Most of the Coquitlam Twinning is underlain by morainal till deposits (Appendix A). Surficial materials along the southern portion of the Coquitlam Twinning (KP 0.0 to KP 1.0) consists of sandy till over moderately-steep terrain with local areas of coarse alluvial and colluvial deposits near streams. The middle portion of the loop (KP 1.0 to KP 1.3) encounters a well-defined crest and steep terrain bisected by several draws with incised gullies.

Bedrock outcrops at steeper portions near the crest with colluvial and alluvial fan deposits at the base are expected. The northeastern portion of the Coquitlam Twinning (KP 1.3 to KP 2.9) consists of undulating terrain characterized by coarse till and glacial deposits (Appendix A).

Squamish Compressor Station

Bedrock mapped in the region of the Squamish Compressor Station is described as Middle to Late Jurassic or early- to mid-Cretaceous granodiorite of the Coast Plutonic Complex (Massey et al. 2005). Golder Associates Ltd. (Golder) carried out a Geotechnical Assessment in 2019 in support of Project construction planning. During the Golder field reconnaissance in December 2019, exposed bedrock outcrops were observed on slopes within the Squamish Compressor Station siting area above the

Squamish Compressor Station site and in shallow stream channels. Bedrock observed at the surface and encountered during the 2019 subsurface geotechnical investigation typically comprised of fresh to slightly weathered, grey, coarse-grained medium-strong to very strong granodiorite (Appendix A).

Other surficial materials present in the Squamish Compressor Station siting area include colluvium, morainal material/till, and fluvial materials (Appendix A).

4.2.2.2 Geohazards

Stawamus Corridor Expansion

Mass Movement

Mass movement was assessed in Section 4.0 of the EAC Application (Volume 1, Part B). Mass movement (or mass wasting) is defined as the down slope movement of bedrock and surficial deposits under the influence of gravity.

Mass movement along the Stawamus Corridor Expansion (KP 24.8 and KP 32.4) has the potential to occur primarily as snow avalanches, debris flows, and rock slides. Snow avalanche pathways were observed along the entire length of the Stawamus Corridor Expansion corridor. Seepage instability above the Stawamus River was observed between KP 26.9 and KP 31.6. Cut and slope instability was observed around the existing forest service road cut slopes between KP 30.0 and KP 31.2. A historical landslide was documented within the southwest side of the valley, between KP 26.9 and KP 31.6. The landslide was triggered during construction of the existing FortisBC pipeline across the toe of the slope. At approximately KP 32.0, the Stawamus Corridor Expansion corridor encounters a bedrock-controlled slope where the potential for deep-seated movement was identified (Appendix A).

Erosion and Fluvial Processes

Stream-related geohazards were assessed in Section 4.0 of the EAC Application (Volume 1, Part B). Where the Project corridor crosses or parallels permanent and ephemeral streams, stream-related geohazards may be present. Streams are characterized by water and sediment moving under gravity in defined channels to progressively lower elevations. Stream-related processes include debris flows, avulsion, lateral erosion, and scour and may occur in conjunction with each other. Mass wasting, ice jams, and log jams may trigger stream processes through formation of obstructions in the stream channel.

Stream-related processes are a potential hazard along the Stawamus Corridor Expansion. Lateral erosion may occur where stream banks are composed of erodible material. Downward erosion may occur with erodible channel material if the stream profile is convex-up. Debris flows may also occur in steep drainages. Along the Stawamus Corridor Expansion, lateral erosion may occur where construction activities occur near the Stawamus River and associated drainages and tributaries (Appendix A).

Coquitlam Twinning

Mass Movement

Mass movement along the Coquitlam Twinning has the potential to occur primarily as debris flows, shallow rockslides, or rock falls. Large debris flows have occurred in proximity to the Coquitlam Twinning along steep slopes and natural failures obstructing the Coquitlam River were reported east of KP 1.7 to KP 3.0. The tributary to Scott Creek upslope of the Eagle Mountain Compressor Station is subject to debris flows.

Shallow landslide hazard levels are described in detail in Appendix A and classes range from 1 (most terrain with less than 15 percent slopes) to 5 (steep to very steeply sloping greater than 70 percent). Desktop review by Thurber (Appendix A) determined the shallow landslide hazard classes along route include the following.

- Class 1 (most terrain with slopes; <15 percent) is present along 46.2 percent of route
- Class 2 (most gently sloping; 15 to 30 percent) is present along 42.2 percent of route
- Class 3 (most moderate to moderately-steep sloping; 35 to 60 percent) is present along 11.6 percent of route

Erosion and Fluvial Processes

Along the Coquitlam Twinning, the tributary to Scott Creek near Eagle Mountain Compressor Station is interpreted as a debris flow channel and is also subject to avulsion upstream of the existing station. Overland water floor is a hazard to facilities, and subsequent erosion and sedimentation (Appendix A). Refer to the Geotechnical Assessment provided in Appendix 1B of the EAC Application (Volume 2) for further information and mitigative measures.

Another potential hazard is stream-related processes. Lateral erosion may occur where stream banks are composed of erodible material. Downward erosion may occur with erodible channel material if the stream profile is convex-up. Debris flows may also occur in steep drainages.

Squamish Compressor Station

Mass Movement

Mass movement at the Squamish Compressor Station siting area has the potential to occur primarily as snow avalanches, rockslides or rockfalls, debris slides, and debris flows. Rockslide and rockfall hazards were identified in rock cut slopes on the east side of Mill Creek. Debris slides and debris flows were also identified in the area and are likely to occur in steep tributaries and drainage lines (Knight Piésold 2014). Historical debris floods were identified on the Mill Creek drainage line approximately 1.5 km upstream of the WLNG project site, and along Woodfibre Creek extending into Howe Sound (Knight Piésold 2014). The Golder 2020 assessment states that no snow avalanche processes or rapid mass movement processes have been identified in the slopes immediately above the Squamish Compressor Station siting area. Refer to Appendix A and the Geotechnical Assessment provided in Appendix 1B of the EAC Application (Volume 2) for further information and mitigative measures.

Erosion and Fluvial Processes

Fluvial processes are a potential hazard at the Squamish Compressor Station. Gullying erosion is common in the area and a potential hazard on slopes. Erosion at permanent cut slopes is also a concern. Refer to Appendix A and the Geotechnical Assessment provided in Appendix 1B of the EAC Application (Volume 2) for further information and mitigative measures.

Earthquake Related Hazards

The Squamish Compressor Siting Area is generally comprised of dense glacial soils overlaying bedrock, which are unlikely to be prone to liquification in response to an earthquake (Appendix A).

4.2.3 Acid Rock Drainage

ARD is a term used to refer to the naturally-occurring acidic runoff generated when rocks containing sulphides are exposed to oxidation. Acidic waters formed by sulphide oxidation may break down other metal-bearing minerals and cause the release of dissolved metals, a process referred to as metal leaching (ML). In some cases, ML may occur without the onset of ARD, though they usually occur together.

Stawamus Corridor Expansion

Along the Stawamus Corridor Expansion (KP 24.8 and KP 32.4), current geotechnical studies identified a high potential for acid generating rock within the Gambier Group volcanic and sedimentary rocks and a moderate potential for acid generating rock within plutonic (volcanic intrusive) lithologies (Appendix A). Rock samples collected between KP 24.4 and 32.6 were identified as having a high ARD potential

(Appendix A). The desktop review identified a moderate to high ML/ARD hazard potential along most of the Stawamus Corridor Expansion, based on a combined assessment of MINIFILE, bedrock type, AMEC sample locations, potentially acid generating value, and mapped soil thickness.

- High ML/ARD hazard potential between KP 24.7 and KP 25.8; KP 29.6; KP 31.0 and KP 31.1; KP 31.2 and KP 31.3; KP 32.0 and KP 32.1.
- Moderate ML/ARD hazard potential between KP 26.6 and KP 26.7; KP 27.9 and KP 28.1; KP 29.4 and KP 29.6; KP 29.6 and KP 29.7; KP 29.8; KP 29.9 and KP 31.0; KP 31.1 and KP 31.2; KP 31.3 and KP 32.0; KP 32.1 and KP 33.5.
- Low ML/ARD hazard potential between KP 25.8 and KP 26.6; KP 26.7 and KP 27.9; KP 28.1 and KP 29.4; KP 29.7 and KP 29.8; KP 29.8 and KP 29.9 (Appendix A).

Coquitlam Twinning

There are no reported sulphide-bearing mineral occurrences along the Coquitlam Twinning, with the closest documented mineral occurrence located 7 km away. The LSA crosses Jurassic to Cretaceous age plutonic bedrock which has a moderate potential to host net acid generating rock The combined ML/ARD hazard potential for the Coquitlam Twinning was determined to be moderate from KP 0 to approximately KP 1.5 and low from approximately KP 1.5 to KP 2.9 (Appendix A).

Squamish Compressor Station

The potential for ML/ARD near the Squamish Compressor Station was assessed in Section 4.0 of the EAC Application (Volume 1, Part B) where the Certified Pipeline Corridor overlaps the Squamish Compressor Station siting area. Rock samples collected between KP 42.3 to 45.3, within the Terrain Integrity and ARD LSA, indicated that there is a low potential for ML/ARD (Appendix A). Refer to the Geotechnical Assessment provided in Appendix 1B of the EAC Application (Volume 2) for further information and mitigative measures.

In 2019 Golder collected rock samples to assess ML/ARD potential within the Squamish Compressor Station siting area. The bedrock represented by the samples was considered to have low ARD potential. ML potential is considered to be generally low given the relatively normal trace element concentrations in the samples. However, there is potential for leaching of aluminium (Appendix A).

4.3 Geophysical Effects Assessment

This subsection provides an update to the geophysical environment effects assessment previously presented in Section 4.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

4.3.1 Stawamus Corridor Expansion

There is a change in the existing conditions for the geophysical environment, including soil capability, terrain integrity, and ARD, related to the Stawamus Corridor Expansion as noted in subsection 4.2. However, the Stawamus Corridor Expansion is located adjacent to the Certified Pipeline Corridor and encounters geophysical environment conditions that are the same or comparable to those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the geophysical environment VC, during any phase of the Project. No positive effects to the geophysical environment VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the geophysical environment remain the same.

4.3.2 Coquitlam Twinning

As noted in subsection 4.2, there is a change in the existing conditions for the geophysical environment, including soil capability, terrain integrity, and ARD, related to the Coquitlam Twinning. The conditions for

the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the geophysical environment VC, during any phase of the Project. No positive effects to the geophysical environment VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the geophysical environment remain the same.

4.3.3 Eagle Mountain Compressor Station

The proposed amendment does not result in a change in the existing conditions for the geophysical environment, including soil capability, terrain integrity, and ARD as there is no change to the Certified Compressor Station Area or LSA. The conditions for the proposed amendment are the same as the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the geophysical environment VC during any phase of the Project. No positive effects to the geophysical environment VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the geophysical environment remain the same.

4.3.4 Squamish Compressor Station

As noted in subsection 4.2, there is a change in the existing conditions for the geophysical environment, including soil capability and terrain integrity related to the Squamish Compressor Station. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the geophysical environment VC, during any phase of the Project. No positive effects to the geophysical environment VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the geophysical environment remain the same.

4.4 Geophysical Environment Cumulative Effects Assessment

4.4.1 Stawamus Corridor Expansion

The proposed changes do not result in any material change to the assessment of potential cumulative adverse effects on the geophysical environment, including soil capability, terrain integrity, and ARD. There are no new reasonably foreseeable developments within the geophysical environment, including the Soil Capability, Terrain Integrity, and ARD LSAs. As was determined in the EAC Application, there are no potential cumulative adverse effect is anticipated for the Soil Capability, Terrain Integrity, and ARD VCs since the interaction between the potential residual adverse effect and other existing and reasonably foreseeable developments is considered negligible due to the minor and localized nature of the potential residual adverse effect.

4.4.2 Coquitlam Twinning

The proposed changes do not result in any material change to the assessment of potential cumulative adverse effects on the geophysical environment, including soil capability, terrain integrity, and ARD. There are no new reasonably foreseeable developments within the geophysical environment, including the Soil Capability, Terrain Integrity, and ARD LSAs. As was determined in the EAC Application, there are no potential cumulative adverse effect is anticipated for the Soil Capability, Terrain Integrity, and ARD VCs since the interaction between the potential residual adverse effect and other existing and reasonably foreseeable developments is considered negligible due to the minor and localized nature of the potential residual adverse effect.

4.4.3 Eagle Mountain Compressor Station

The proposed changes do not result in any material change to the assessment of potential cumulative adverse effects on the geophysical environment, including soil capability, terrain integrity, and ARD. There are no new reasonably foreseeable developments within the geophysical environment, including the Soil Capability, Terrain Integrity, and ARD LSAs. As was determined in the EAC Application, there are no potential cumulative adverse effect is anticipated for the Soil Capability, Terrain Integrity, and ARD VCs since the interaction between the potential residual adverse effect and other existing and reasonably foreseeable developments is considered negligible due to the minor and localized nature of the potential residual adverse effect.

4.4.4 Squamish Compressor Station

The proposed changes do not result in any material change to the assessment of potential cumulative adverse effects on the geophysical environment, including soil capability, terrain integrity, and ARD. There are no new reasonably foreseeable developments within the geophysical environment, including the Soil Capability, Terrain Integrity, and ARD LSAs. As was determined in the EAC Application, there are no potential cumulative adverse effect is anticipated for the Soil Capability, Terrain Integrity, and ARD VCs since the interaction between the potential residual adverse effect and other existing and reasonably foreseeable developments is considered negligible due to the minor and localized nature of the potential residual adverse effect.

4.5 References

4.5.1 Literature Cited

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Soil Matters Consulting Ltd. (Soil Matters). 2014. Soils Technical Report for the Proposed FortisBC Energy (Vancouver Island) Inc. Eagle Mountain – Woodfibre Gas Pipeline Project. Prepared for FortisBC. Nanoose Bay, British Columbia.

4.5.2 Data and Mapping References

BC Soil Information Finder Tool (SIFT). 2019. Soil Polygons. https://maps.gov.bc.ca/ess/hm/imap4m/

5. Atmospheric Environment

The assessment of potential adverse effects of the Project on the Acoustic Environment, Air Quality, and GHG Emissions VCs is provided in Section 5.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on acoustic environment, air quality, and GHG emissions that may result from the proposed amendment, as described in subsection 1.1.

5.1 Spatial Boundaries

The spatial boundaries used in the Acoustic Environment, Air Quality, and GHG Emissions effects assessment is provided in Section 5.2.1 of the EAC Application (Volume 1, Part B).

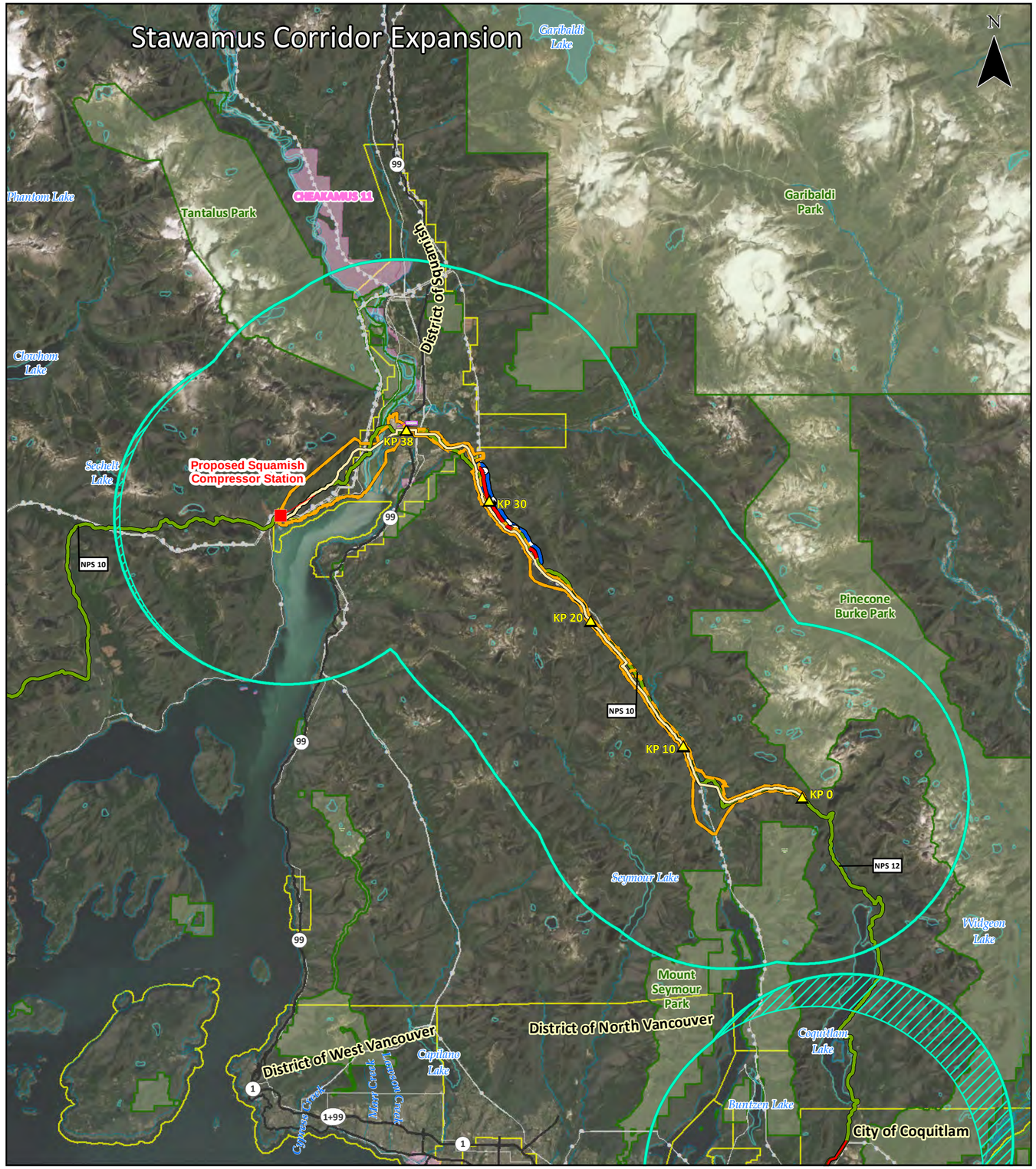
Figure 5-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each amendment results in an expansion in the Acoustic, Air Quality, and GHG Emissions LSA assessed in Section 5.0 of the EAC Application:

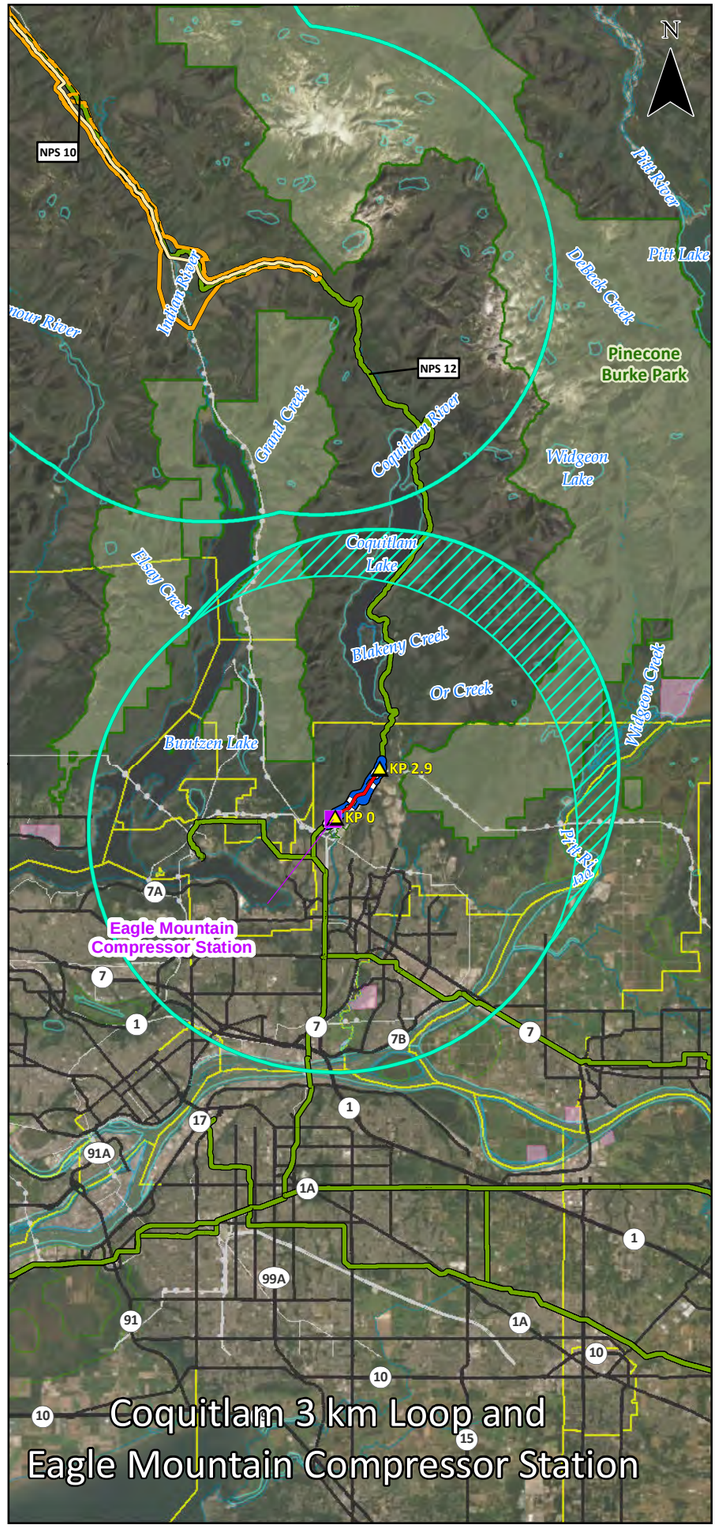
- **Stawamus Corridor Expansion** – Does result in an expansion to the Acoustic and Air Quality, LSA assessed in Section 5.0 of the EAC Application. There is no change to the GHG emissions spatial boundary as this VC used an international study area.

- **Coquitlam Twinning** – Does result in an expansion to the LSA assessed in the Acoustic and Air Quality Section 5.0 of the EAC Application. There is no change to the GHG emissions spatial boundary as this VC used an international study area.

- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Acoustic, Air Quality, and GHG Emissions LSA assessed in Section 5.0 of the EAC Application.

- **Squamish Compressor Station** – Does result in an expansion to the Acoustic and Air Quality LSA assessed in Section 5.0 of the EAC Application. There is no change to the GHG emissions spatial boundary as this VC used an international study area.





FORTIS BC

October 2020

FIGURE 5-1

ATMOSPHERIC ENVIRONMENT STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Squamish Compressor Station

Project (EAO Certified)
- Certified Application Corridor
- Certified NPS 24 Pipeline
- Eagle Mountain Compressor Station

Other
- Kilometre Post
- Existing FortisBC Pipeline
- Atmospheric Regional Study Area
- Atmospheric RSA Expansion
- Existing Electrical Transmission Line
- Municipality
- Road
- Watercourse / Waterbody
- Park/Protected Area
- First Nations Reserve

SCALE: 1:250,000

0 2 4 6 8 10 km

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.
Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023B/4001B); Existing Pipeline: FortisBC 2012; Proposed Application Corridor: CH2M 8-30-2019 (Revision 15); Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified NPS 24 Pipeline: LSA: Jacobs 03-24-2020; Electrical Transmission: Primary Engineering and Construction 01-07-2020; Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Proposed Squamish Compressor Station: Solaris 02-25-2020; Road: BC FLNRO Digital Road Atlas, 2010; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing, 2018; Existing Electrical Transmission Line, Parcel: Integrated Cadastral Information Society 03-24-2014; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; First Nation Reserve: Government of Canada 2019; Provincial Park: BC FLNRO, 2008; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: KP | Checked By: DJN

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5.2 Existing Conditions

The existing conditions for the Acoustic Environment, Air Quality, and GHG Emissions VCs are provided in Section 5.4 of the EAC Application (Volume 1, Part B). Existing conditions for acoustic environment, air quality, and GHG emissions are summarized in this section; however, these conditions do not result in a material change to the overall setting considered in the EAC Application.

5.2.1 Acoustic Environment

5.2.1.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located adjacent to the Certified Pipeline Corridor. The proposed amendment is located in a sparsely populated rural area with low ambient noise levels. No receptors were identified within 1.5 km.

5.2.1.2 Coquitlam Twinning

The proposed Coquitlam Twinning is located near a residential area with approximately 19 residences located within 1.5 km of the proposed corridor. The Coquitlam Twinning will involve an extension of Project construction phase that was already planned in the area (such as, for the Eagle Mountain Compressor Station, new electrical substation and associated electrical transmission lines) and is expected to have similar ambient noise levels during construction to what was assessed in the EAC Application.

5.2.1.3 Eagle Mountain Compressor Station

The total estimated sound power level from the existing and proposed amended equipment at the Eagle Mountain Compressor Station is 132 A-weighted decibels (dBA). This represents a 2 dBA increase over the total estimated sound power level at the source compared to the original planned expansion at the Eagle Mountain Compressor Station (Appendix B). This level of increase would just be perceptible to the human ear (Appendix B).

The proposed amendment for the Eagle Mountain Compressor Station was conservatively estimated to increase the existing noise level by the same 2 dBA increment from 41 to 43 dBA at receptor site 2, and from 40 to 42 dBA at receptor site 3 (Appendix B). These levels are below the permissible noise level as defined by the BC Oil and Gas Commission (BC OGC) Noise Control Best Practices Guideline (BC OGC 2018), which is 48 dBA at the closest noise sensitive areas from the compressor station. Therefore, it is expected that the Project will comply with the BC OGC Noise Control Best Practices Guideline.

5.2.1.4 Squamish Compressor Station

The LSA is evaluated as a 1.5-km-wide zone around the perimeter of the WLNG property line and adheres to the BC OGC Guideline receptor-based noise regulations. The RSA is the area extending 5 km from the Project boundary, which is consistent with the previous assessment's approach.

In addition to the need to identify receptors, the BC OGC Guideline outlines a cumulative approach to noise where other noise-regulated facilities must be identified and assessed. The only third-party facility within or overlapping with the LSA is the WLNG facility, which is considered in the assessment of compliance with BC OGC.

The operating scenario for the facility is predicted to result in compliance with the BC OGC daytime and nighttime Permissible sound levels (PSLs) as was the case in previous assessments. Multiple approaches to noise control have been pursued for the site, including building improvements, acoustic blankets, louvre treatments, and silencers. The updated expected contribution at the LSA boundary is 37.3 dBA compared to the previous assessment of 38 dBA at the LSA boundary receptor. Additional details are provided in the Noise TDR (Appendix B).

5.2.2 Air Quality

5.2.2.1 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion is expected to have low impacts to air quality for CACs (that is, sulphur dioxide [SO_2], nitrogen dioxide [NO_2], carbon monoxide [CO], particulate matter less than 10 micrometres [µm] [PM_{10}], and particulate matter less than 2.5 µm [$PM_{2.5}$]) and be limited to construction activities. Maximum concentrations for all substances are predicted to occur within the vicinity of the construction footprint. The Stawamus Corridor Expansion does not change the anticipated air emissions associated with pipeline construction or operation. Constructing the pipeline segment within the proposed Stawamus Corridor Expansion will involve the same type of construction activities, vehicles, and equipment used to estimate air emissions within the Certified Pipeline Corridor. Air emission estimates associated with pipeline construction are presented in Section 5.0 of the EAC Application (Volume 1, Part B).

5.2.2.2 Coquitlam Twinning

The proposed Coquitlam Twinning is expected to have low impacts to air quality (that is, SO_2, NO_2, CO, PM_{10}, and $PM_{2.5}$) and is limited to construction activities. Maximum concentrations for all substances are predicted to occur within the vicinity of the construction footprint. The Coquitlam Twinning does not materially change the anticipated air emissions associated with pipeline construction or operation. Although the Coquitlam Twinning will increase the overall length of pipeline constructed for the Project, an extension of the construction schedule is not anticipated. Further, construction of the Coquitlam Twinning will involve the same type of activities, vehicles, and equipment used to estimate air emissions for the Certified Project.

5.2.2.3 Eagle Mountain Compressor Station

The operation of two EMD compressor units within the existing Eagle Mountain Compressor Station in Coquitlam will not lead to any additional CAC emissions to the atmosphere.

5.2.2.4 Squamish Compressor Station

The amended design of the Squamish Compressor Station at the WLNG project site proposes similar components to the Mount Mulligan design: two approximately 6,300 hp gas turbine compressor units, one gas boilers, and one gas generator. Usage of the gas turbine compressor units is expected to fluctuate substantially by season (depending on gas demand). The design also includes one back-up boiler which will be used for backup purposes exclusively.

Dispersion modelling was conducted to quantify emissions effects associated with operating the proposed Squamish Compressor Station. The results of the dispersion modelling are provided in Table 5-1, with comparison to BC air quality objectives (AQOs). Additional details are provided in the Air Quality TDR (Appendix B).

Table 5-1. Maximum Predicted Concentrations for Squamish Compressor Station at WLNG

Contaminant	Averaging Period	BC AQO (µg/m^3)	Maximum Concentration without Background (µg/m^3)	Background (µg/m^3)	Maximum Concentration with Background (µg/m^3)
SO_2	1-hour[a]	183	1.0	16.5	17.5
	Annual	13	0.05	0.96	1.01
NO_2	1-hour[b]	188	n/a [d]	48.2	92.1
	Annual	60	n/a [d]	11.3	12.0
CO	1-hour	14,300	290.4	389.3	679.7
	8-hour	5,500	155.9	338.4	494.3

Table 5-1. Maximum Predicted Concentrations for Squamish Compressor Station at WLNG

Contaminant	Averaging Period	BC AQO (µg/m³)	Maximum Concentration without Background (µg/m³)	Background (µg/m³)	Maximum Concentration with Background (µg/m³)
PM_{10}	24-hour	50	1.9	13.8	15.7
$PM_{2.5}$	24-hour[c]	25	1.3	13.8	15.2
	Annual	8	0.3	5.6	5.9

[a] Based on 99th percentile of the daily 1-hour maximum, over 1 year.

[b] Based on 98th percentile of the daily 1-hour maximum, over 1 year.

[c] Based on annual 98th percentile of daily averages, over 1 year.

[d] NO_2 was estimated using the Ambient Ratio Method, which requires background to estimate value.

The air quality dispersion modelling was completed to identify the potential effects on air quality from the proposed Squamish Compressor Station site location during operations for CACs (SO_2, CO, $PM_{2.5}$/ PM_{10},and NO_2). Predicted concentrations were compared to the BC AQOs. All modelled maximum concentrations, including background, were below their respective criteria. As a result, no adverse air quality conditions are expected for the proposed Squamish Compressor Station.

5.2.3 Greenhouse Gases

BC's *Climate Change Accountability Act* (formerly the *Greenhouse Gas Reduction Targets Act)* makes commitments to reduce GHG emissions by 40 percent over 2007 levels by 2030, 60 percent over 2007 levels by 2040, and 80 percent over 2007 levels by 2050. In 2019, Bill 38-2019 (the *Climate Change Accountability Amendment Act*) added requirements for the Minister to establish an interim target for a specified year before 2030 and to establish targets for individual sectors. GHG emission targets for individual sectors must be made by March 31, 2021 but were not available at the time of writing. Table 5-2 summarizes the BC's GHG Targets.

Table 5-2. British Columbia Greenhouse Gas Targets

BC's GHG Targets	Annual GHG Emissions			
	2007	2030	2040	2050
Targeted Reduction over 2007 (%)	n/a	40%	60%	80%
Targeted GHG Emissions (kt CO_2e)	60,799	36,479	24,320	12,160

Source: Government of British Columbia 2017

Notes:

CO_2e = carbon dioxide equivalent
kt = kiloton(s)

5.2.3.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion does not change the anticipated GHG emissions associated with pipeline construction or operation. Constructing the pipeline segment within the proposed Stawamus Corridor Expansion will involve the same type of construction activities, vehicles, and equipment used to estimate GHG emissions within the Certified Pipeline Corridor. The amount of land clearing (that is, impacts on carbon sinks) is also anticipated to be similar for the proposed Stawamus Corridor Expansion compared to the Certified Pipeline Corridor since the Project construction footprint and TWS requirements will be similar for this pipeline segment. GHG emission estimates associated with pipeline construction are presented in Section 5.0 of the EAC Application (Volume 1, Part B).

5.2.3.2 Coquitlam Twinning

The Coquitlam Twinning is within the City of Coquitlam. The City of Coquitlam has developed a draft Community Climate Action Plan that aims to reduce community-wide GHG emissions by 15 percent below 2007 levels by 2031 (City of Coquitlam 2020). The Coquitlam Twinning is also within the Metro Vancouver planning area boundary. Metro Vancouver has developed the Climate 2050 strategy that targets a 45 percent reduction in emissions from 2010 levels, by 2030 (Metro Vancouver 2020).

The Coquitlam Twinning does not materially change the anticipated GHG emissions associated with pipeline construction or operation. Although the Coquitlam Twinning will increase the overall length of pipeline constructed for the Project, an extension of the construction schedule is not anticipated.

Further, construction of the Coquitlam Twinning will involve the same type of activities, vehicles, and equipment used to estimate GHG emissions for the Certified Project. The amount of land clearing (that is, impacts on carbon sinks) will be marginally increased as a result of the Coquitlam Twinning. However, due to route selection adjacent to an existing BC Hydro electrical transmission line and the existing FortisBC right-of-way, the construction footprint requirements and therefore land clearing requirements are minimized. GHG emission estimates associated with pipeline construction are presented in Section 5.0 of the EAC Application (Volume 1, Part B).

5.2.3.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is within the City of Coquitlam. The City of Coquitlam has developed a draft Community Climate Action Plan that aim to reduce community-wide GHG emissions by 15 percent below 2007 levels by 2031 (City of Coquitlam 2020). The Eagle Mountain Compressor Station is also within the Metro Vancouver planning area boundary. Metro Vancouver has developed the Climate 2050 strategy which targets 45 percent reduction in emissions from 2010 levels, by 2030 (Metro Vancouver 2020).

The proposed compressor station upgrade at Eagle Mountain includes the installation of two approximately 26,000 hp EMD compressor units within the existing Eagle Mountain Compressor Station, as an alternative to installing two 20,500 hp units in a 5-ha expanded area adjacent to the existing Eagle Mountain Compressor Station. There are no substantial changes to activities associated with the construction of the Eagle Mountain Compressor Station since the EAC Application, and GHG emissions from construction of Eagle Mountain Compressor Station are not expected to be different from those presented in Section 5.0 of the EAC Application (Volume 1, Part B). The amount of land clearing (that is, impacts on carbon sinks) associated with the Eagle Mountain Compressor Station is expected to be the same or less than what is described in the Certified Project as the new equipment will be accommodated within the existing facility.

The compressor units will not have direct on-site GHG emissions associated with the energy to run the units because the proposed compressor units are electric. Indirect GHG emissions will result from the use of grid electricity. In addition to direct and indirect GHG emissions associated with the operation of the compressors, fugitive emissions are expected from dry gas seal leaks, station blowdowns, and small component leaks. The results of the GHG emission estimate for the Eagle Mountain Compressor Station are provided in Table 5-3. Additional details including methodology used for these estimates is provided in the GHG Emissions TDR (Appendix B).

Table 5-3. Eagle Mountain Compressor Station GHG Emissions

Activity	Annual GHG Emissions (t/y)		GHG Emissions (t CO_2e/year)
	CH_4	CO_2	
Indirect GHG from Electricity Use	-	-	11,311
Dry Gas Seals	73.2	0.545	1,831
Station Blowdowns	16.6	0.123	414
Other Equipment Leaks	0.4	0.003	9
Total Emissions	**90.2**	**0.671**	**13,565**

Notes:

CH_4 = methane
CO_2 = carbon dioxide
t CO_2e/year = metric tonnes of Carbon Dioxide Equivalent
t/y = metric tonnes per year
Total CO_2e emissions rounded to units

5.2.3.4 Squamish Compressor Station

The Squamish Compressor Station location at the WLNG Site is within the District of Squamish. The District of Squamish adopted a Climate Change Action Plan on April 7, 2020, including plans to reduce emissions by 38,300 tonnes CO_2e by 2030 and reach net zero emissions by 2050 (District of Squamish 2020).

The Squamish Compressor Station proposed at the WLNG project site includes two approximately 6,300-hp gas turbine compressor units as an alternative to the Mount Mulligan location and design which included three 4,700 hp natural gas turbine compressor units. Although a different location for the Squamish Compressor Station is proposed, the predicted GHG emissions related to the construction of the compressor station are not expected to be different from those presented in Section 5.0 of the EAC Application (Volume 1, Part B) as construction will involve the same type of activities, vehicles, and equipment.

The amount of land clearing (that is, impacts on carbon sinks) associated with the Squamish Compressor Station at WLNG is expected to be less than what is described in the Certified Project for the Mt Mulligan site. The Squamish Compressor Station site at WLNG, including anticipated earth works, will be approximately 1 ha compared to the Squamish Compressor Station site at Mount Mulligan which involved approximately 4 ha of land clearing.

The Squamish Compressor Station will involve direct GHG emissions of CH_4, CO_2, and nitrous oxide (N_2O) during operations from natural gas run turbines, boilers, and a generator. In addition to direct GHG emissions, fugitive emissions are expected from dry gas seal leaks, station blowdowns, and small component leaks. The results of the GHG emission estimate for the Squamish Compressor Station at WLNG are provided in Table 5-4. Additional details including methodology used for these estimates is provided in the GHG Emissions TDR (Appendix B).

Table 5-4. Squamish Compressor Station Greenhouse Gas Emissions

Activity	Annual GHG Emissions (t/y)			GHG Emissions (t CO_2e/year)
	CH_4	CO_2	N_2O	
Gas Turbine	10.507	31,409	14.699	36,053
Boilers	0.010	31.540	0.014	36
Generators	0.009	21.647	0.007	24
Dry Gas Seals	21.971	0.613	--	549
Station Blowdowns	5.934	0.044	--	148
Other Equipment Leaks	0.364	0.003	--	9
Total Emissions	**38.795**	**31,463.047**	**14.720**	**36,819**

Note:
Total CO_2e emissions rounded to units.

5.3 Acoustic Environment Effects Assessment

This section provides an update to the Acoustic Environment effects assessment previously presented in subsection 5.5 of the EAC Application (Volume 1, Part B) for each proposed amendment.

5.3.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is not expected to change the anticipated ambient noise levels associated with overall Project construction since Project construction was already planned in the area. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Acoustic Environment VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to the acoustic environment remain the same.

5.3.2 Coquitlam Twinning

The Coquitlam Twinning is not expected to change the anticipated ambient noise levels associated with overall Project construction since Project construction was already planned in the area (such as, for the Eagle Mountain Compressor Station, new electrical substation, and associated electrical transmission lines). The proposed amendment may result in a longer construction period in the Coquitlam area and the mitigation identified in EAC Application to reduce sound levels during construction will be implemented. FortisBC will comply with the City of Coquitlam's *Noise Regulatio*n Bylaw No. 1233, 1982 during construction. FortisBC will apply for a Noise Bylaw Exemption Permit if construction activities are required outside of the time restrictions.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Acoustic Environment VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a

result, the conclusions identified in the EAC Application with respect to the acoustic environment remain the same.

5.3.3 Eagle Mountain Compressor Station

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Acoustic Environment VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to the acoustic environment remain the same.

5.3.4 Squamish Compressor Station

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Acoustic Environment VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to the acoustic environment remain the same.

5.4 Air Quality Effects Assessment

This section provides and update to the Air Quality effects assessment previously presented in subsection 5.6 of the EAC Application (Volume 1, Part B) for each proposed amendment.

5.4.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is not anticipated to change the air quality associated with overall Project construction. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Air Quality VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to air quality remain the same.

5.4.2 Coquitlam Twinning

The Coquitlam Twinning is not anticipated to change the air quality associated with overall Project construction. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Air Quality VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to air quality remain the same.

5.4.3 Eagle Mountain Compressor Station

The operation of two EMD compressor units within the existing Eagle Mountain Compressor Station in Coquitlam will not lead to any additional CAC emissions to the atmosphere. The Eagle Mountain Compressor Station does not change the air quality associated with overall Project construction. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Air Quality VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to air quality remain the same.

5.4.4 Squamish Compressor Station

The modeled maximum concentrations of all CACs during operation of the proposed Squamish Compressor Station were predicted to be below their respective BC AQOs criteria. The predicted air emissions for the Squamish Compressor Station at the WLNG project site are comparable to the predicted air emissions for the approved Squamish Compressor Station at the Mt. Mulligan Site. Air emissions during compressor station construction are anticipated to be comparable to those predicted in the EAC Application since the Project activities associated with the proposed amendment are the same as those described in the EAC Application.The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project activities associated with the proposed amendment are the same as those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Air Quality VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to air quality remain the same.

5.5 GHG Emissions Effects Assessment

This section provides and update to the GHG Emissions effects assessment previously presented in subsection 5.7 of the EAC Application (Volume 1, Part B) for each proposed amendment.

5.5.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion does not change the anticipated GHG emissions associated with overall Project construction. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the GHG Emission VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to GHG emissions remain the same.

5.5.2 Coquitlam Twinning

The Coquitlam Twinning does not change the anticipated GHG emissions associated with overall Project construction. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the GHG Emission VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to GHG emissions remain the same.

5.5.3 Eagle Mountain Compressor Station

GHG emissions from Eagle Mountain Compressor Station are estimated to be 13.6 kt CO_2e per year, which is substantially lower than the 66.2 kt CO_2e per year estimate presented in the EAC Application for the original Eagle Mountain Compressor Station upgrade design (Appendix B). At the time of the EAC Application, a large indirect electricity intensity factor was used to reflect the assumed addition of natural gas projects in the Province. As this has not happened, the BC published electricity factor was used in this assessment (Appnedix B). The proposed Eagle Mountain Compressor Station amendment results in a reduction of estimated GHG emissions of 52.6 kt CO_2e per year compared to the previous estimate when the amended design and current indirect electricity intensity factors are applied (Appendix B).

When estimated GHG emissions from operation of both the Eagle Mountain and Squamish compressor stations are considered together the total GHG emissions are estimated to be 50.4 kt CO_2e per year (see Section 5.5.4 for the contribution from the Squamish Compressor Station). This represents a decrease of 42.6 kt CO_2e per year compared to previous compressor designs and estimates.

Because existing conditions are comparable or improved compared to the EAC Application, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the GHG Emission VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to GHG emissions remain the same.

5.5.4 Squamish Compressor Station

GHG emissions from the Squamish Compressor Station are estimated to be 36.8 kt CO_2e per year, which is larger than presented in the Addendum 3 for the Mount Mulligan location and design which estimated GHG emissions of 26.8 CO_2e per year (Appendix B). This increase is due to the use of higher manufacturer-specific emission rates for the proposed gas turbines and an increase fuel consumption values.

When estimated GHG emissions from operation of both the Eagle Mountain and Squamish compressor stations are considered together the total GHG emissions are estimated to be 50.4 kt CO_2e per year (see Section 5.5.3 for the contribution from the Eagle Mountain Compressor Station). This represents a decrease of 42.6 kt CO_2e per year compared to previous compressor designs and estimates.

Because existing conditions are comparable or improved compared to the EAC Application, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the GHG Emission VC during any phase of the Project. No positive effects to the Atmospheric Environment VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to GHG emissions remain the same.

5.5.5 Comparison with British Columbia's GHG Emission Targets

The ongoing operational emissions from the entire Project (including pipeline and facility operation) are approximately 67.2 kt CO_2e per year including approximately 50.4 kt CO_2e from compressor station facilities (Appendix B) and 16.8 kt CO_2e from pipeline operations (EAC Application Volume 2 Appendix 1E). The operational emissions from the Project are 0.18 percent of the 2030 Provincial target GHG emissions, 0.28 percent of the 2040 Provincial target GHG emissions, and 0.56 percent of the 2050 Provincial target GHG emissions. Therefore, the Project is not anticipated to have a meaningful potential effect on the Province's ability to meet its targets under the *Climate Change Accountability Act*.

5.6 Atmospheric Cumulative Effects Assessment

This section provides and update to the Atmospheric cumulative effects assessment previously presented in subsections 5.5 to 5.7 of the EAC Application (Volume 1, Part B) for each proposed amendment.

5.6.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Acoustic Environment, Air Quality, and GHG Emissions VCs. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Stawamus Corridor Expansion. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Acoustic Environment, Air Quality, and GHG Emissions VCs.

5.6.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Acoustic Environment, Air Quality, and GHG Emissions VCs. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Coquitlam Twinning. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Acoustic Environment, Air Quality, and GHG Emissions VCs.

5.6.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Acoustic Environment, Air Quality, and GHG Emissions VCs. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Eagle Mountain Compressor Station. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Acoustic Environment, Air Quality, and GHG Emissions VCs.

5.6.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Acoustic Environment, Air Quality, and GHG Emissions VCs. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Squamish Compressor Station. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team

has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Acoustic Environment, Air Quality, and GHG Emissions VCs.

5.7 References

British Columbia Oil and Gas Commission (BC OGC). 2018. Noise Control Best Practices Guideline.

City of Coquitlam. 2020. Climate Action. Accessed August 2020. https://www.coquitlam.ca/387/Climate-Action

District of Squamish. 2020. Community Climate Action Plan. Accessed August 2020. https://squamish.ca/assets/5a46b62375/CCAP-Update-January-2020-v2.pdf

Government of British Columbia. 2017. 1990-2017 GHG Emission Summary for British Columbia. Accessed August 2020. https://www2.gov.bc.ca/gov/content/environment/climate-change/data

Metro Vancouver. 2020. Climate 2050 A Climate Strategy for the Metro Vancouver Region. Accessed August 2020. http://www.metrovancouver.org/climate2050

6. Water

The assessment of potential adverse effects of the Project on the Surface Water VC and Groundwater VC is provided in Section 6.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Surface Water VC and Groundwater VC that may result from the proposed amendments, as described in subsection 1.1.

6.1 Spatial Boundaries

The following list indicates whether each proposed amendment results in an expansion in the Surface Water and Groundwater LSA assessed in Section 6.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Does result in an expansion to the Surface Water and Groundwater LSA assessed in Section 6.0 of the EAC Application.
- **Coquitlam Twinning** – Does result in an expansion to the Surface Water and Groundwater LSA assessed in Section 6.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Surface Water and Groundwater LSA assessed in Section 6.0 of the EAC Application.
- **Squamish Compressor Station** – Does result in an expansion to the Surface Water and Groundwater LSA assessed in Section 6.0 of the EAC Application.

Figure 6-1 shows the groundwater spatial boundaries, including expansions, for the proposed amendments.

Surface water spatial boundaries, as described in Section 6.0 of the EAC Application (Volume 1, Part B), are applied to streams that are potentially impacted by the proposed amendments. The typical Surface Water RSA boundary is shown on Figure 6.2-1 of the EAC Application (Volume 1, Part B). Figures 6-2, 6-3, and 6-4 show the Surface Water RSA, including expansions, for the proposed amendments.

6.2 Existing Conditions

The existing conditions of the EAC Application for the Surface Water VC and Groundwater VC are provided in the Hydrology TDR (EAC Application, Volume 2, Appendix 1F) and Hydrogeology TDR (EAC Application, Volume 2, Appendix 1G).

Existing conditions for surface water and groundwater in the proposed amendment corridors, siting area and the Surface Water and Groundwater LSA are summarized in this subsection. These conditions do not result in a material change to the overall setting considered in the EAC Application.

6.2.1 Surface Water Quality and Quantity

6.2.1.1 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion amendment results in a change to the Surface Water LSA and, therefore, a change in existing conditions. The pipeline corridor of the Stawamus Corridor Expansion is within the Stawamus River Watershed located within the Howe Sound Sub-basin. The proposed Stawamus Corridor Expansion crosses tributaries to the Stawamus River including one named watercourse, Ray Creek. A total of 37 watercourses and 53 non-classified drainages (NCDs) were identified and assessed along the proposed corridor within the Stawamus Corridor Expansion as presented in the Fish and Fish Habitat TDR (Figure 4-1 and Figure 4-2 of Appendix C). Measured water quality and flow rates for the watercourses and NCDs crossed by the Stawamus Corridor Expansion are included the Fish and Fish Habitat TDR (Table 4-1 of Appendix C).

The Stawamus River Watershed is described in subsection 6.4.1 of the EAC Application (Volume 1, Part B). Although the LSA is expanded, the types and numbers of watercourses are similar to those in the LSA in the approved EAC Application (tributaries to the Stawamus River). Comparable existing conditions

are present in the Surface Water LSA for the Stawamus Corridor Expansion as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall surface water setting considered in the EAC Application.

6.2.1.2 Coquitlam Twinning

The proposed Coquitlam Twinning amendment results in a change to the Surface Water LSA and, therefore, a change in existing conditions. The proposed pipeline corridor of the Coquitlam Twinning overlaps with the watersheds associated with Scott Creek, Partridge Creek, Fulawka Creek, and Mantle Creek, within the Lower Coquitlam River Sub-basin. The proposed pipeline corridor also overlaps with the Coquitlam Lake Watershed boundary by approximately 1,900 square metres (m^2). The Coquitlam Lake Watershed boundary and the Coquitlam Conservation Reserve boundary discussed in other sections of this document are different. The watershed boundary is the biophysical watershed boundary based primarily on terrain and watercourse connectivity, whereas the Coquitlam Conservation Reserve is a land designation. A total of 10 watercourses and 25 NCDs were identified and assessed along the proposed corridor within the Coquitlam Twinning as presented in the Fish and Fish Habitat TDR (Figure 4-2). Measured water quality and flow rates for the watercourses crossed by the Coquitlam Twinning are included the Fish and Fish Habitat TDR Table 4-3 and Table 4-4 (Appendix C).

The Lower Coquitlam River Sub-basin is located downstream of the Coquitlam Lake dam and is within the Fraser River Watershed. The Lower Coquitlam River Sub-basin contains at least 30 watercourses within the 79 square kilometres (km^2) watershed. The Coquitlam River is approximately 18-km-long from the Lake Dam (~104 metres above sea level [masl]) to the confluence with the Fraser River (~0.4 masl). 30 percent of the Fraser River Watershed is located within zoning for resource extracting (which is the predominate land use in the Mantle, Partridge, and Fulawka Watersheds).

The Scott Creek Watershed is described in subsection 6.4.1 of the EAC Application (Volume 1, Part B).

The watersheds associated with Mantle Creek, Partridge Creek, and Fulawka Creek drain directly to the Lower Coquitlam River. The creeks run along the southern slope of Eagle Mountain in northwest Coquitlam and flow to the east towards the respective confluence with the Coquitlam River.

Table 6-1. Approximate Lengths of Watercourse for Mantle, Partridge, and Fulawka Creeks

Creek	Approximate Length of Watercourse
Mantle Creek	1.2 km
Partridge Creek	3.7 km
Fulawka Creek[a]	0.7 km

[a] referred to as Falacea Creek in Coquitlam River Watershed Society and the City of Coquitlam (2003)

The Coquitlam Lake Watershed drains to the Coquitlam Lake which supplies one third of the domestic water supply for Metro Vancouver and used for hydroelectric power (BC Hydro's Coquitlam dam is located at the south end of the lake) (Coquitlam River Watershed Society and City of Coquitlam 2003). The Coquitlam Conservation Reserve is managed as a protected watershed for domestic water supply. The drainage area of the Coquitlam Lake is 193 km^2 (Fish & Wildlife Compensation Program 2018). An estimated 0.002 km^2 is crossed by the proposed pipeline which is less than 0.01 percent of the total Coquitlam Lake Watershed. One NCD that was assessed with the proposed corridor (within planned workspace) was determined to flow towards Coquitlam Lake.

The EAC Application assessed the interaction of similar types of Project activities on existing conditions that are comparable to the existing conditions of the Coquitlam Twinning LSA. As a result, the updated existing conditions are not expected to result in a material change to the overall surface water setting considered in the EAC Application.

6.2.1.3 Squamish Compressor Station

The proposed amendment results in a change to the Surface Water LSA, and, therefore a change in existing conditions. The siting area is located within the Howe Sound Sub-basin and overlaps five watercourses and five NCDs which discharges to Howe Sound (Golder 2015) as presented in the Fish and Fish Habitat TDR (Figure 4-1 of Appendix C).

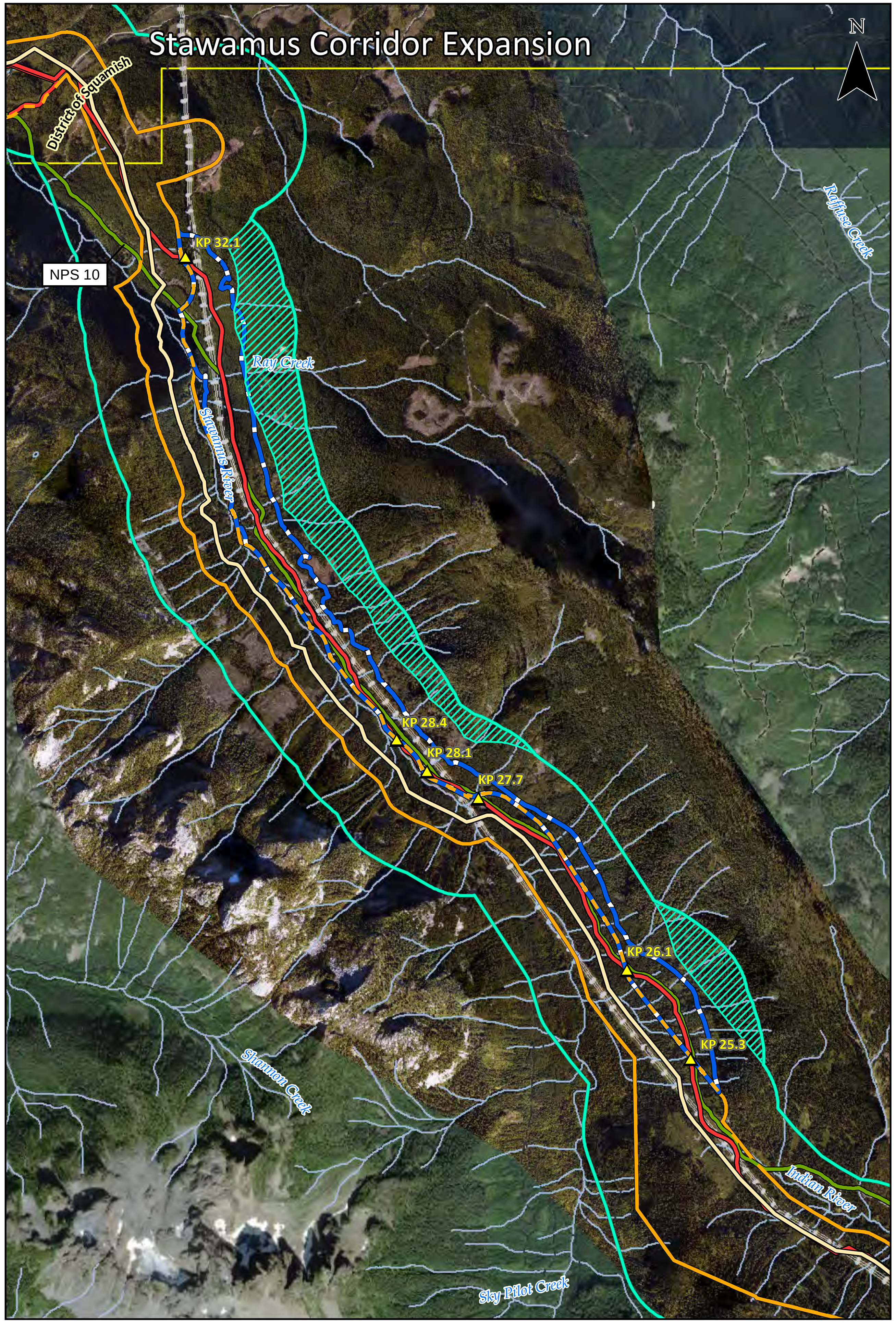
All of the NCDs and four of the watercourses converge into a single channel before draining into Howe Sound. The remaining watercourse flows into Mill Creek that discharges into Howe Sound. Additional small watercourses and NCDs that connect with the tributaries of Howe Sound and Mill Creek may be present in the siting area; however, watercourses are expected to be of similar nature to NCDs identified during assessments.

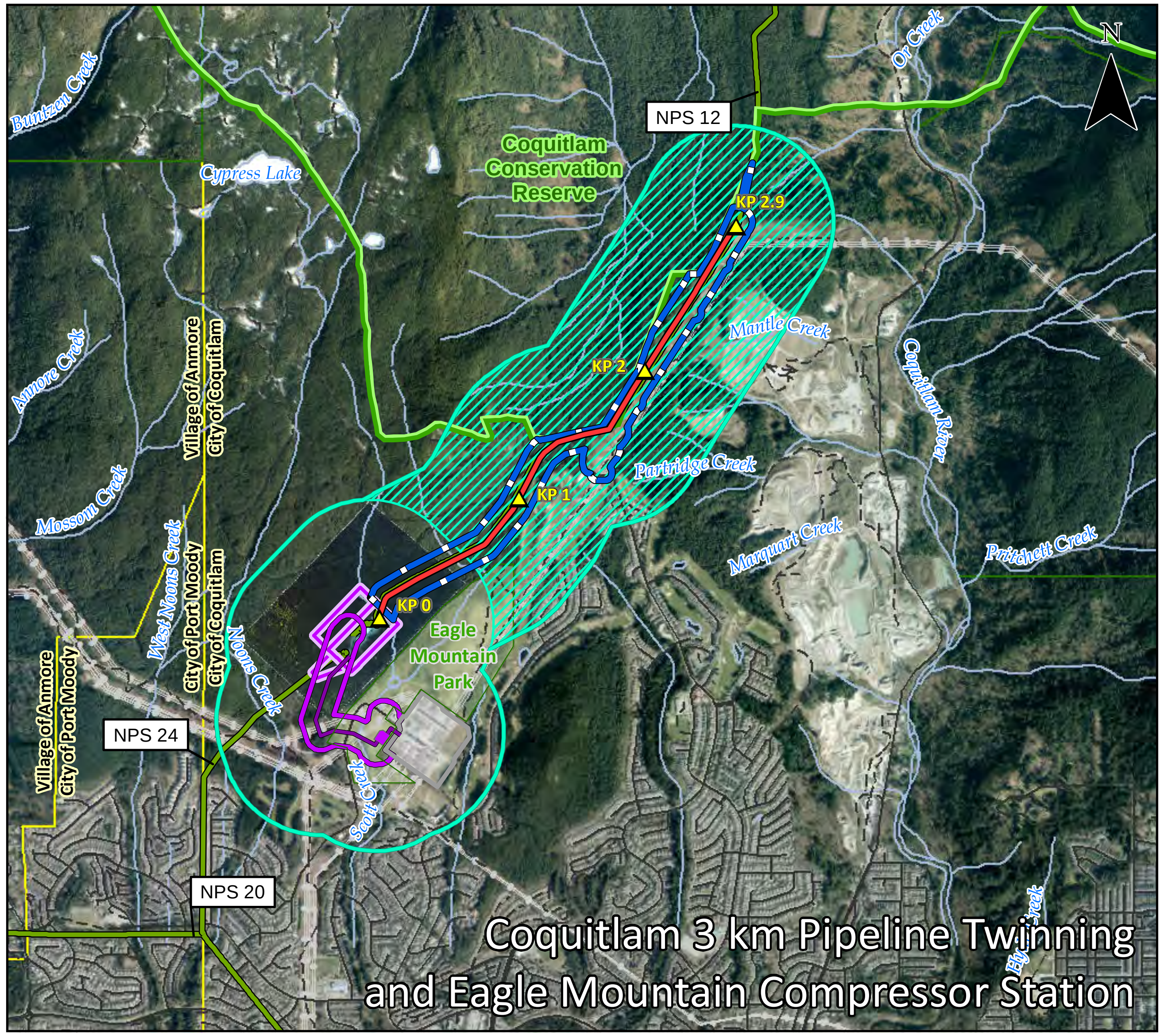
The Squamish Compressor Station siting area is located on the WLNG property which was previously used for pulp mill operations, which operated for over 100 years until its decommissioning in 2006 (Golder 2015). The site has previously been affected by the pulp mill operations and the upstream catchments have historically been affected by logging activities (Golder 2015).

The Howe Sound Sub-basin is discussed in subsection 6.4.1.1 of the EAC Application (Volume 1, Part B), and comparable existing conditions are expected in the Surface Water LSA for the Squamish Compressor Station siting area as those assessed in the EAC Application. As a result, the updated existing conditions are not expected to result in a material change to the overall surface water setting considered in the EAC Application.

6.2.1.4 Eagle Mountain Compressor Station

The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Surface Water and Groundwater VCs.





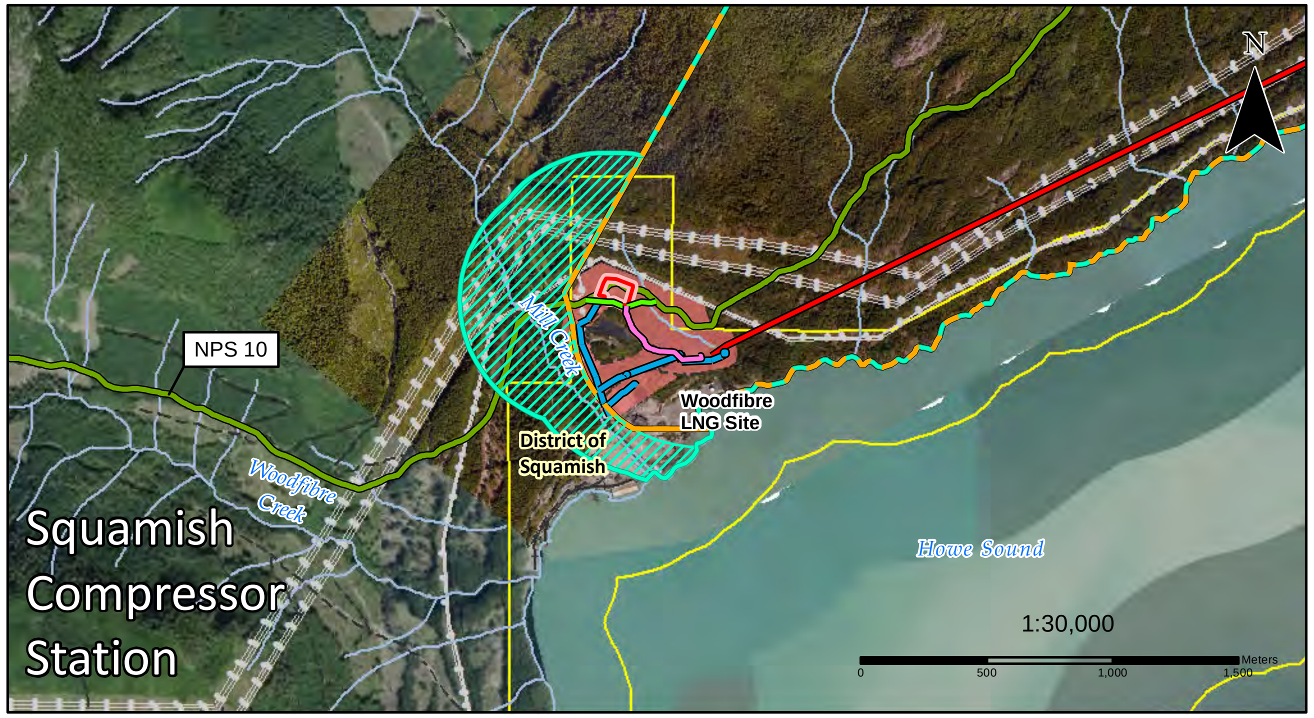


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FIGURE 6-1

GROUNDWATER STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Groundwater Local Study Area
- Groundwater LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000
0 250 500 750 1,000 metres
(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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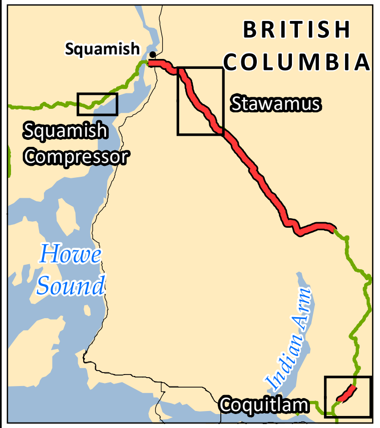

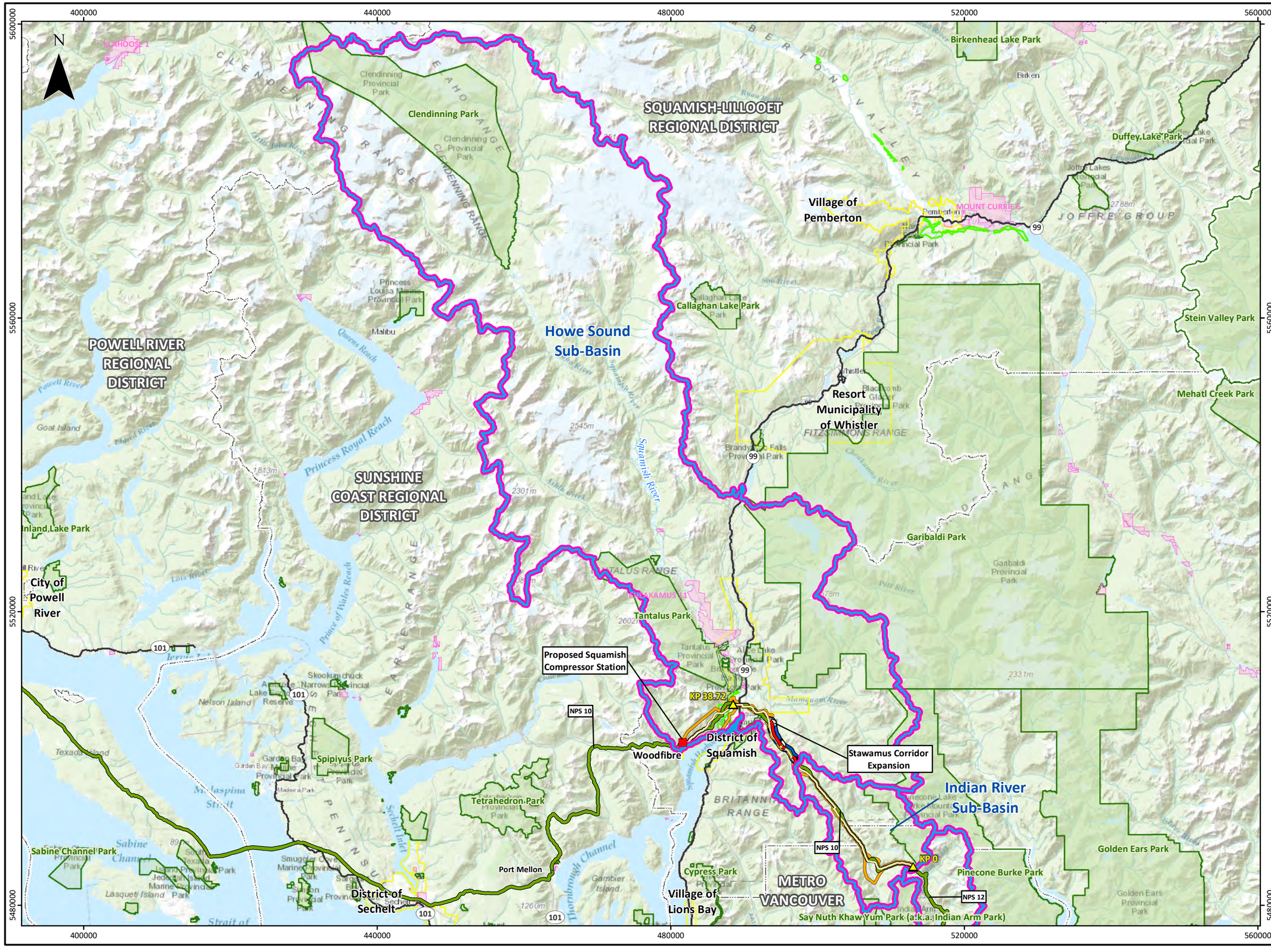

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FIGURE 6-2

SURFACE WATER RSA FOR THE STAWAMUS CORRIDOR EXPANSION AND SQUAMISH COMPRESSOR STATION

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Squamish Compressor Station

Project (EAO Certified)
- Certified Application Corridor
- Certified NPS 24 Pipeline

Other
- Kilometre Post (KP)
- Surface Water Regional Study Area
- Sub-Basin Boundary
- Wildlife Management Area
- Existing FortisBC Pipeline
- Road
- Park/Protected Area
- First Nations Reserve
- Waterbody
- Municipality
- Regional District

SCALE: 1:485,000

0 5 10 15 20 km

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); ; Existing Pipeline: FortisBC 2012; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Proposed Squamish Compressor Station: Solaris 02-25-2020; RSA: Jacobs 03-04-2020; Road: BC FLNRO Digital Road Atlas, 2010; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing, 2018; Hydrography: NRCan 2007-2011; First Nation Lands: Government of Canada 2018; Parks and Protected Areas: BC MFLNRO, 2010; Wildlife Management Areas: BC MFLNRO 2008;Base Imagery Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SZ	Checked By: DN

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FORTIS BC

October 2020

FIGURE 6-3

SURFACE WATER RSA FOR THE COQUITLAM 3 KM PIPELINE TWINNING AND EAGLE MOUNTAIN COMPRESSOR STATION

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline

Project (EAO Certified)
- Certified Application Corridor
- Certified NPS 24 Pipeline
- Eagle Mountain Compressor Station

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Surface Water Regional Study Area
- Sub-Basin Boundary
- Wildlife Management Area
- Road
- Park/Protected Area
- First Nations Reserve
- Waterbody
- Municipality

SCALE: 1:200,000

0 1 2 3 4 5 km

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); Existing Pipeline: FortisBC 2012; Proposed Application Corridor: Hatch 8-30-2019 (Revision 15); Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; RSA: Jacobs 03-04-2020; Road: BC FLNRO Digital Road Atlas, 2010; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing, 2018; Hydrography: NRCan 2007-2011; First Nation Lands: Government of Canada 2018; Parks and Protected Areas: BC MFLNRO, 2010; Wildlife Management Areas: BC MFLNRO 2008; Base Imagery Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SZ | Checked By: DN

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6.2.2 Groundwater Quality and Quantity

6.2.2.1 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion results in a change to the Groundwater LSA and therefore a change in existing conditions. The corridor is located in Stawamus River Watershed which is within the approved RSA and existing conditions are provided in subsection 6.4.2 of the EAC Application (Volume 1, Part B) and the Hydrogeology TDR of the EAC Application (Volume 2, Appendix 1G).

Comparable existing conditions are present in the Groundwater LSA for the Stawamus Corridor Expansion as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall groundwater setting considered in the EAC Application.

6.2.2.2 Coquitlam Twinning

The proposed amendment results in a change to the Groundwater LSA, and, therefore, a change in existing conditions. The pipeline is located within the Coquitlam River Watershed. The Groundwater LSA overlaps with the Coquitlam River Scott Creek, Partridge Creek, and Mantle Creek Sub-basins.

The Hydrogeology TDR of the EAC Application (Volume 2, Appendix 1G) identifies existing aquifers, well data, and the surficial geology for the approved LSA. There are no mapped aquifers and no available well data in the Coquitlam Twinning Groundwater LSA (Government of BC 2020). The surficial geology along the Coquitlam Twinning is Vashon Drift, which is made up of till, glaciofluvial, glaciolacustrine, and ice – contact deposits: lodgment till (with sandy loam matrix) minor flow till containing lenses and interbeds of glaciolacustrine laminated stony silt (Coquitlam River Watershed Society and the City of Coquitlam 2003).

A search of the BC Site Registry was conducted on April 15, 2019 and identified the Meridian Substation as a historical contaminated site within the EAC Application Corridor for the Coquitlam Twinning (Government of BC 2019). The Meridian Substation is located approximately 455 m southwest (downslope) of the existing Eagle Mountain Compressor Station and KP 0 of the Coquitlam Twinning. The location was confirmed using Integrated Cadastral Information Society data on October 16, 2013 (Environmental Site ID 41074278). The site is located within the existing LSA of the EAC Application.

Comparable existing conditions are expected in the Groundwater LSA for the Coquitlam Twinning as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall groundwater setting considered in the EAC Application.

6.2.2.3 Squamish Compressor Station

The proposed amendment results in a change to the Groundwater LSA and therefore a change in existing conditions. The siting area is located in the Mill Creek Valley which is within the approved RSA and existing conditions are provided in Hydrogeology TDR of the EAC Application (Volume 2, Appendix 1G). A summary of site contamination at the Squamish Compressor Station siting area is provided in subsection 13.2; no groundwater contamination was identified.

Similar types of Project activities and comparable existing conditions are present in the Groundwater LSA for the Squamish Compressor Station siting area as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall groundwater setting considered in the EAC Application.

6.2.2.4 Eagle Mountain Compressor Station

The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Groundwater VC.

6.3 Surface and Groundwater Effects Assessment

This subsection provides an update to the surface and groundwater effects assessment previously presented in Section 6.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

6.3.1 Stawamus Corridor Expansion

The proposed the Stawamus Corridor Expansion does not result in a change in the existing conditions for the Groundwater VC as there is no change to the Groundwater LSA. As noted in subsection 6.2, there is a change in the existing conditions for the Surface Water VC related to the Stawamus Corridor Expansion as the pipeline corridor overlaps with 37 watercourses and 53 NCDs. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the Project components that may intersect watercourses or groundwater flow resulting from construction and operations are expected to be similar to those described in subsection 6.6 of the EAC Application (Volume 1, Part B). Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Surface Water or Groundwater VC during any phase of the Project. No positive effects to the Surface Water or Groundwater VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Surface Water and Groundwater VC remain the same.

6.3.2 Coquitlam Twinning

As noted in subsection 6.2, there is a change in the existing conditions for the Surface Water and Groundwater VC related to the Coquitlam Twinning as the corridor is within the Coquitlam River Sub-basins of Scott Creek, Partridge Creek, and Mantle Creek 10 watercourses and 25 NCDs were identified along the proposed corridor. In addition, the pipeline centreline will overlap with the boundary of the Coquitlam Conservation Reserve between KP 1.7 and KP 1.8 for approximately 160 m.

The Coquitlam Twinning overlaps the Coquitlam Conservation Reserve; therefore, FortisBC will work with Metro Vancouver to confirm that the Project Environmental Management Plan (EMP) meets requirements in Metro Vancouver's Watershed & Environmental Management Contractor Documents. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects or characterization of residual adverse effects for the Surface Water and Groundwater VC during any phase of the Project. No positive effects to the Surface Water or Groundwater VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Surface Water and Groundwater VC remain the same.

6.3.3 Eagle Mountain Compressor Station

The proposed Eagle Mountain Compressor Station does not result in a change in the existing conditions for the Surface Water and Groundwater VC as there is no change to the Certified Compressor Station Area or LSA. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Surface Water or Groundwater VC during any phase of the Project. No positive effects to the Surface Water or Groundwater VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Surface Water and Groundwater VC remain the same.

6.3.4 Squamish Compressor Station

As noted in subsection 6.2, there is a change in the existing conditions for the Surface Water and Groundwater VCs related to the Squamish Compressor Station siting area. The corridor overlaps with five watercourses and five NCDs within the Mill Creek Valley Watershed. The proposed amendment does not

include any diversions of watercourses or NCDs. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects or characterization of residual adverse effects for the Surface Water and Groundwater VC during any phase of the Project. No positive effects to the Surface Water or Groundwater VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Surface Water and Groundwater VC remain the same.

6.4 Surface and Groundwater Cumulative Effects Assessment

6.4.1 Stawamus Corridor Expansion

The proposed changes do not result in any material change to existing conditions or Project-level adverse effects for the Surface Water and Groundwater VC. Some previously identified future developments are now in operation since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Surface Water and Groundwater RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Surface Water and Groundwater VC.

6.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Surface Water and Groundwater VC. Some previously identified future developments are now in operation since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Surface Water and Groundwater RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Surface Water and Groundwater VC.

6.4.3 Eagle Mountain Compressor Station

The proposed changes do not result in any material change to existing conditions or Project-level adverse effects for the Surface Water and Groundwater VC. Some previously identified future developments are now in operation since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Surface Water and Groundwater RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Surface Water and Groundwater VC.

6.4.4 Squamish Compressor Station

The proposed changes do not result in any material change to existing conditions or Project-level adverse effects for the Surface Water and Groundwater VC. Some previously identified future developments are now in operation since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Surface Water and Groundwater RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in

combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Surface Water and Groundwater VC.

6.5 References

Coquitlam River Watershed Society and the City of Coquitlam. 2003. Lower Coquitlam River Watershed Atlas.

Fish & Wildlife Compensation Program. 2018. Coquitlam-Buntzen Watershed Action Plan. Accessed June 2020. https://fwcp.ca/app/uploads/2019/08/Action-Plan-Coastal-Region-Coquitlam-Buntzen-Watershed-Jul-2020.pdf

Golder Associates Ltd. (Golder). 2015. Surface Water Quantity and Quality Baseline Report. Prepared for Woodfibre LNG Limited.

Government of British Columbia (Government of BC). 2019. Environmental Remediation Sites Layer iMapBC Accessed via BC iMap on April 15, 2019. https://maps.gov.bc.ca/ess/hm/imap4m/

Government of British Columbia (Government of BC). 2020. Groundwater Wells and Aquifers Layer iMapBC Accessed via BC iMap on March 5, 2020. https://maps.gov.bc.ca/ess/hm/imap4m/

7. Fish and Fish Habitat

The assessment of potential adverse effects of the Project on the Fish and Fish Habitat VC is provided in Section 7.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Fish and Fish Habitat VC that may result from the proposed amendments, as described in subsection 1.1.

7.1 Spatial Boundaries

The spatial boundaries used in the fish and fish habitat assessment are provided in Section 7.0 of the EAC Application (Volume 1, Part B). LSA boundaries, as described in Section 7.0 of the EAC Application (Volume 1, Part B), are applied to streams that are potentially impacted by the proposed amendments. Depictions of typical LSA and RSA boundaries are shown on Figures 7.2-1A to 7.2-1C in Section 7.0 of the EAC Application (Volume 1, Part B). The Fish and Fish Habitat RSA for the Coquitlam Twinning is expanded to include additional sub-basins crossed by the pipeline corridor, including for Partridge, Mantle, and Fulawka Creeks. This RSA is the same as the Surface Water RSA, shown in Figure 6-3.

The following list indicates whether each proposed amendment results in an expansion in the Fish and Fish Habitat LSA assessed in Section 7.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Does result in an expansion to the Fish and Fish Habitat LSA assessed in Section 7.0 of the EAC Application.
- **Coquitlam Twinning** – Does result in an expansion to the Fish and Fish Habitat LSA assessed in Section 7.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Fish and Fish Habitat LSA assessed in Section 7.0 of the EAC Application.
- **Squamish Compressor Station** – Does result in an expansion to the Fish and Fish Habitat LSA assessed in Section 7.0 of the EAC Application.

7.2 Existing Conditions

The existing conditions for the Fish and Fish Habitat VC are provided in the EAC Application in the Fish and Fish Habitat TDR (Volume 2, Appendix 1H). The subsections as follows provide a summary of the changes to existing conditions associated with the proposed amendments. The review of existing conditions was informed by desktop reviews of publicly available data and additional fish habitat field surveys conducted in summer 2019. Details of the fish habitat field surveys, including methods and results are provided in the Fish and Fish Habitat TDR (Appendix C of this Amendment Application).

7.2.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is within the Stawamus River Watershed which is within the Howe Sound Sub-basin. Several tributaries to the Stawamus River are crossed, including one named watercourse, Ray Creek, which is non-fish-bearing at the crossing due to a downstream waterfall that is impassable to fish. Stream Riparian Classifications of mapped and unmapped streams were determined during fish habitat assessments conducted in summer 2019. 37 watercourses (including 1 S2, 18 S3, and 18 S4 streams) and 53 NCDs were identified and assessed along the proposed amendment corridor (Figure 4-1 in Appendix C). Barriers to fish access were present within or below the study areas of all but one watercourse and an adjoining roadside ditch. Fish are not expected to be present in the remaining watercourses or NCDs throughout their study areas. The fish-bearing watercourse provided suitable habitat for resident trout and char species but limited habitat potential for spawning activities, while fish habitat potential in the roadside ditch was considered to be poor.

The Stawamus River Watershed is discussed in the Aquatic Assessment TDR (Volume 2, Appendix 1H), and similar types of Project activities and comparable existing conditions are present in the Fish and Fish Habitat LSA for the Stawamus Corridor Expansion as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall fish and fish habitat setting considered in the EAC Application.

7.2.2 Coquitlam Twinning

The Coquitlam Twinning pipeline corridor is within the Fraser River Watershed and crosses tributaries of the Coquitlam River, including Scott, Partridge, Fulawka, and Mantle Creeks. Fish species previously documented in the Scott Creek Sub-basin are discussed in the Aquatic Assessment TDR (Volume 2, Appendix 1H), and similar species are expected in the other Coquitlam River catchments.

The existing conditions of the Coquitlam Twinning pipeline corridor Surface Water RSA within the Lower Coquitlam River Sub-basin has been updated in this report (subsection 6.2.1.2). A total of 10 watercourses and 25 NCDs were identified and assessed along the proposed corridor. None of these streams were determined to be fish-bearing, but likely flow into fish habitat downstream of the corridor.

The EAC Application assessed the interaction of similar types of Project activities on comparable existing conditions that are present in the Coquitlam Twinning Fish and Fish Habitat LSA. As a result, the updated existing conditions do not otherwise cause a material change to the overall fish and fish habitat setting considered in the EAC Application.

7.2.3 Eagle Mountain Compressor Station

The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Fish and Fish Habitat VC.

7.2.4 Squamish Compressor Station

Five watercourses and five NCDs were identified and assessed within the Squamish Compressor Station siting area (Figure 4-1 in Appendix C). These watercourses and NCDs were not included in the EAC Application. Four of the watercourses and all of the NCDs converge into a single channel before draining into Howe Sound. A field study identified the presence of barriers to fish access near the intertidal zone and in upstream reaches of these watercourses, confirming them as non-fish-bearing. The remaining watercourse flows into Mill Creek before joining Howe Sound. This watercourse was also inaccessible to fish due to barriers in its lower reach, upstream of its confluence with Mill Creek. Additional small watercourses and NCDs that may connect with the tributaries of Howe Sound and Mill Creek may be present in the siting area. Additional aquatic features are expected to be similarly non-fish-bearing and would be assessed depending on Project interaction at the permitting stage. The siting area overlaps approximately 20 m of upland forest above Mill Creek however leaves a vegetated buffer that is generally greater than 50 m and avoids clearing on steep approach slopes.

The Howe Sound Sub-basin is discussed in Aquatic Assessment TDR (Volume 2, Appendix 1H), and similar types of Project activities and comparable existing conditions are present in the Fish and Fish Habitat LSA for the Squamish Compressor Station as those assessed in the EAC Application. As a result, the updated existing conditions do not otherwise cause a material change to the overall fish and fish habitat setting considered in the EAC Application.

7.3 Fish and Fish Habitat Effects Assessment

This subsection provides an update to the Fish and Fish Habitat effects assessment previously presented in Section 7.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

7.3.1 Stawamus Corridor Expansion

The proposed amendment does not result in a change in the existing conditions for the Fish and Fish Habitat VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The proposed amendment avoids two large fish-bearing crossings (Stawamus River which is an S2 and S1B stream at the previous upper and lower crossing location, respectively) and crosses instead one small fish-bearing watercourse (S3) and another small watercourse (S4) that may be fish-bearing.

There are fewer crossings on large non-fish-bearing watercourses and more crossings on smaller non-fish-bearing watercourses with the proposed amendment (estimated at 1 vs. 4 S2s, 4 vs. 14 S3s and 0 vs. 10 S4s, with Stream Riparian Classifications representing their location in a community watershed). There are several NCDs along both alignments.

In general, the nature of watercourse crossing interactions is the same on both alignments. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Fish and Fish Habitat VC during any phase of the Project. No positive effects to the Fish and Fish Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Fish and Fish Habitat VC remain the same.

7.3.2 Coquitlam Twinning

The proposed amendment does not result in a change in the existing conditions for the Fish and Fish Habitat VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Fish and Fish Habitat VC during any phase of the Project. No positive effects to the Fish and Fish Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Fish and Fish Habitat VC remain the same.

7.3.3 Eagle Mountain Compressor Station

The proposed amendment does not result in a change in the existing conditions for the Fish and Fish Habitat VC. The Certified Compressor Station Area for the Eagle Mountain Compressor Station is unchanged. Because existing conditions are unchanged, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Fish and Fish Habitat VC during any phase of the Project. No positive effects to the Fish and Fish Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Fish and Fish Habitat VC remain the same.

7.3.4 Squamish Compressor Station

The proposed amendment does not result in a change in the existing conditions for the Fish and Fish Habitat VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The watercourses identified within the Squamish Compressor Station sitting area were determined to be non-fish-bearing. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Fish and Fish Habitat VC during any phase of the Project. No positive effects to the Fish and Fish Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Fish and Fish Habitat VC remain the same.

7.4 Fish and Fish Habitat Cumulative Effects Assessment

7.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Fish and Fish Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

Recreational and infrastructure development are the largest contributors to cumulative instream and riparian disturbance within the Fish and Fish Habitat RSA. At the time of EAC Application filing, there was one tourist destination resort and two hydroelectric projects within the Fish and Fish Habitat RSA. Levels of development in the Fish and Fish Habitat RSA have remained relatively unchanged since the EAC Application filing.

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Fish and Fish Habitat RSA that may contribute to cumulative instream or riparian disturbance. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Fish and Fish Habitat VC.

7.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Fish and Fish Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Fish and Fish Habitat RSA that may contribute to cumulative instream or riparian disturbance. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Fish and Fish Habitat VC.

7.4.3 Eagle Mountain Compressor Station

The proposed changes do not result in any material change to existing conditions or Project-level adverse effects for Fish and Fish Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Fish and Fish Habitat RSA that may contribute to cumulative instream or riparian disturbance. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Fish and Fish Habitat VC.

7.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Fish and Fish Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3).

The WLNG project is the largest contributor to cumulative riparian disturbance within the Fish and Fish Habitat RSA for the Squamish Compressor Station. The WLNG project was previously identified in the EAC Application as a reasonably foreseeable development acting cumulatively with the Project. No new impacts to fish and fish habitat are anticipated to act cumulatively with the Squamish Compressor Station

and the assessment team assumes that both proponents will work together to apply industry-standard mitigation to reduce cumulative effects.

The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Fish and Fish Habitat RSA that may contribute to cumulative instream or riparian disturbance. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Fish and Fish Habitat VC.

8. Vegetation

The assessment of potential adverse effects of the Project on the Vegetation VC is provided in Section 8.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Vegetation VC that may result from the proposed amendments, as described in subsection 1.1.

8.1 Spatial Boundaries

The spatial boundaries used in the vegetation assessment are provided in subsection 8.2.1 of the EAC Application (Volume 1, Part B) and are summarized as follows.

Figure 8-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Vegetation LSA assessed in subsection 8.2.1 of the EAC Application:

- **Stawamus Corridor Expansion** – Results in an expansion to the Vegetation LSA assessed in subsection 8.2.1 of the EAC Application.
- **Coquitlam Twinning** – Results in an expansion to the Vegetation LSA assessed in subsection 8.2.1 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Vegetation LSA assessed in subsection 8.2.1 of the EAC Application.
- **Squamish Compressor Station** – Results in an expansion to the Vegetation LSA assessed in subsection 8.2.1 of the EAC Application.

8.2 Existing Conditions

The existing conditions for the Vegetation VC are provided in the EAC Application in the Vegetation TDR (Volume 2, Appendix 1I).

8.2.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located on the north slope of the Stawamus River Valley southeast of the District of Squamish. The majority of the native vegetation along the Stawamus Corridor Expansion is composed of young to mature zonal conifer forests. These forests are dominated by Western hemlock and Western redcedar trees with varying amounts of understory vegetation. Co-dominant tree species include amabilis fir, Douglas-fir, red alder, bigleaf maple, and paper birch. Characteristic shrub species (such as, salal, vine maple, thimbleberry, salmonberry, willows, red huckleberry, and devil's-club) were observed. Common herbs found within forested areas include sword fern, wood fern, deer fern, lady fern, foamflower, queen's-cup, rosy twistedstalk, and goatsbeard.

Shrub-dominated vegetation is present along the existing pipeline right-of-way and forest service roads adjacent to the Stawamus Corridor Expansion, composed of similar native vegetation as in forested areas. However, some non-native vegetation species occur along the maintained roads and right-of-way, including foxglove, oxeye daisy, bull thistle, common plantain, common St. John's-wort, white clover, hairy cat's-ear, orange hawkweed, timothy, colonial bentgrass, and orchard grass. Provincially and Regionally invasive plant species and their priority status are described in the updated Vegetation TDR (Appendix D).

No plant species of conservation concerns, rare ecological communities or old forests were observed along the Stawamus Corridor Expansion.

8.2.2 Coquitlam Twinning

The Coquitlam Twinning is located on the south slope of Eagle Mountain in northwest Coquitlam. This proposed amendment is in the very dry maritime variant of the Coastal Western Hemlock (CWHdm) biogeoclimatic (BGC) zone, where Western hemlock and Western redcedar are the most commonly observed tree species. Less common tree species include Douglas-fir, amabilis fir, bigleaf maple, paper birch, and cherry.

Understory vegetation is dominated by vine maple, red huckleberry, thimbleberry, red elderberry, sword fern, deer fern, and trailing blackberry. Scattered non-native vegetation includes Himalayan blackberry, Scotch broom, English ivy, oxeye daisy, and foxglove. Further information on ecological classifications and BGC zones is provided in Section 8.0 of the EAC Application (Volume 1, Part B) and the Vegetation TDR (Volume 2, Appendix 1I).

The Coquitlam Twinning includes single-storied and two-storied Western hemlock and Western redcedar forests approximately 60 to 100 years old adjacent to an existing right-of-way. Forests occur on both sides of the centreline along the southern half of the route from approximately KP 0 to KP 1.6 and only to the west of the centreline along the northern half of the route from approximately KP 1.6 to KP 3.0. Three small wetlands associated with Mantle Creek occur from KP 2.4 to KP 2.6. These include two small graminoid marshes and one swamp, all within the corridor; however, only the swamp intersects the corridor.

All three wetlands are designated as Blue-listed ecological communities as described in the updated Vegetation TDR (Appendix D). A BC Hydro transmission line occurs to the east of the centreline along the northern half of the route. A gravel pit, golf course, and residential areas occur to the southeast.

8.2.3 Eagle Mountain Compressor Station

The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Vegetation VC.

8.2.4 Squamish Compressor Station

On April 17, 2019, a site reconnaissance was conducted at the Squamish Compressor Station siting area. Forests at the siting area consist of either pole-sapling red alder stands approximately 20 to 40 years old, or young to maturing Western hemlock stands between 60 to 100 years old. The pole-sapling red alder stands were most commonly associated with an understory of Himalayan blackberry and a variety of herbs (such as, sword fern and fireweed). The young to maturing forests were dominated by Western hemlock with co-dominant tree species such as Western redcedar, Douglas-fir, bigleaf maple, red alder, and paper birch.

The understory in these forests varied from very sparse (<1 percent cover) to moderately diverse (5 to 25 percent cover) species, including salal, red huckleberry, red elderberry, vine maple, salmonberry, sword fern, deer fern, bracken fern, common horsetail, and flat moss. Cleared areas and a network of gravel roads and rights-of-way intersected the forest stands. Roadside vegetation tended to have a high percent cover of non-native plant species, such as Himalayan blackberry, bluegrass species, orchard grass, velvet-grass, ribwort plantain, common St. John's-wort, foxglove, Japanese coltsfoot, and creeping buttercup.

Five non-native invasive plants were incidentally observed in the Squamish Compressor Station siting area. All five non-native plants are considered priority invasive plant species under the Sea to Sky Invasive Plant Council (SSISC) as described in the updated Vegetation TDR (Appendix D).

One invasive plant, Japanese knotweed (*Reynoutria japonica*), has a 'Contain' status and is also a Provincially-regulated Noxious weed under the BC *Weed Control Act*. In accordance with the regulations, the landowner or lease owner must control Noxious weeds. Japanese knotweed spreads rapidly through root systems that may extend from a parent plant up to 20 m laterally and up to a depth of 3 m. Japanese knotweed threatens biodiversity and disrupts the food chain by reducing available habitat and increasing soil erosion potential. Stream banks are at risk as exposed knotweed roots break off and float downstream to form new infestations.

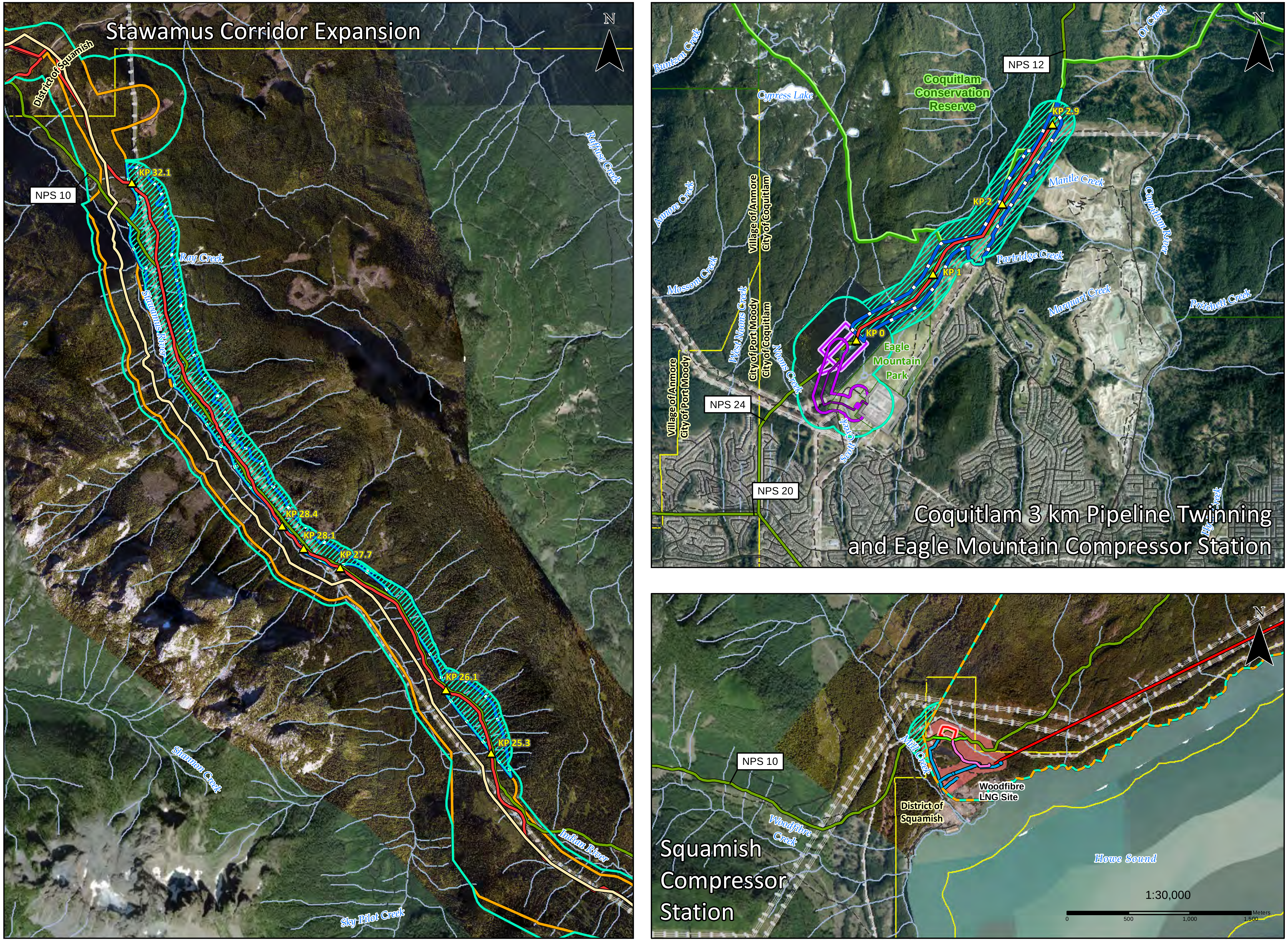

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FIGURE 8-1

VEGETATION STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)

- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)

- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other

- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Vegetation Local Study Area
- Vegetation LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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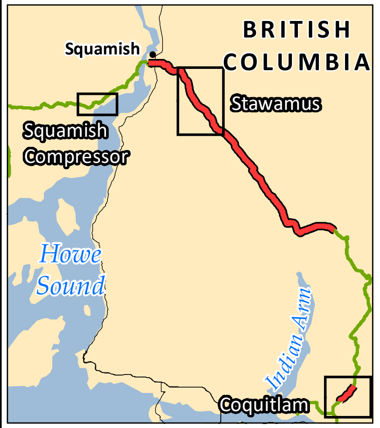


8.3 Vegetation Effects Assessment

This subsection provides an update to the Vegetation VC effects assessment previously presented in Section 7.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

8.3.1 Stawamus Corridor Expansion

No rare plant populations or rare ecological communities were identified along the Stawamus Corridor Expansion; therefore, the proposed amendment does not result in a change in the existing conditions for the Vegetation VC. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, therefore no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Vegetation VC during any phase of the Project. No positive effects to the Vegetation VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Vegetation VC remain the same.

8.3.2 Coquitlam Twinning

As noted in subsection 8.2, there is a change in the existing conditions for the Vegetation VC related to the Coquitlam Twinning, as additional rare ecological wetland communities were identified that may be subject to direct or indirect disturbance from Project activities. Three small wetlands associated with Mantle Creek occur from KP 2.4 to KP 2.6. These include two small graminoid marshes and one swamp; however, only the swamp intersects the corridor. All three wetlands are considered Blue-listed ecological communities.

The nature of the disturbance that these communities will experience is equivalent to that described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Vegetation VC during any phase of the Project. No positive effects to the Vegetation VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Vegetation VC remain the same.

8.3.3 Eagle Mountain Compressor Station

No rare plant populations or rare ecological communities have been identified within the existing Eagle Mountain Compressor Station. As there is no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station, the proposed amendment does not result in a change in the existing conditions for the Vegetation VC. Because the existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Vegetation VC during any phase of the Project. No positive effects to the Vegetation VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Vegetation VC remain the same.

8.3.4 Squamish Compressor Station

No rare plant populations or rare ecological communities were identified within the Squamish Compressor Station siting area. In addition to the non-native and/or invasive plants listed in the EAC Application, six additional non-native and/or invasive plants were observed within the Squamish Compressor Station siting area as described in subsection 8.2 and in the updated Vegetation TDR for the proposed amendment.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect

interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterizations of residual effects for the Vegetation VC during any phase of the Project. No positive effects to the Vegetation VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Vegetation VC remain the same.

8.4 Vegetation Cumulative Effects Assessment

This subsection provides and update to the vegetation cumulative effects assessment previously presented in subsection 8.5.3 of the EAC Application (Volume 1, Part B) for each proposed amendment.

8.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Vegetation VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Vegetation RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Vegetation VC.

8.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Vegetation VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Vegetation RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Vegetation VC.

8.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Vegetation VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Vegetation RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Vegetation VC.

8.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Vegetation VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Vegetation RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Vegetation VC.

9. Wetlands

The assessment of potential adverse effects of the Project on the Wetland Function VC is provided in Section 9.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Wetland Function VC that may result from the proposed amendments, as described in subsection 1.1.

9.1 Spatial Boundaries

The spatial boundaries used in the wetlands assessment are provided in subsection 9.2.1 of the EAC Application (Volume 1, Part B).

Figure 9-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Wetlands LSA assessed in subsection 9.2.1 of the EAC Application:

- **Stawamus Corridor Expansion** – Results in an expansion to the Wetlands LSA assessed in subsection 9.2.1 of the EAC Application.
- **Coquitlam Twinning** – Results in an expansion to the Wetlands LSA assessed in subsection 9.2.1 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Wetlands LSA assessed in subsection 9.2.1 of the EAC Application.
- **Squamish Compressor Station** – Results in an expansion to the Wetlands LSA assessed in subsection 9.2.1 of the EAC Application.

9.2 Existing Conditions

The existing conditions for the Wetland Function VC are provided in the EAC Application in the Wetland Evaluation TDR (Volume 2, Appendix 1J). The review of existing conditions was informed by desktop reviews of publicly available data and additional field surveys conducted in spring and summer 2019. Details of the wetland field surveys, including methods and results are provided in the Wetlands TDR (Appendix E of this Amendment Application).

Table 9-1 provides a summary of the changes to existing conditions associated with the proposed amendments. These conditions do not result in a material change to the overall setting considered in the EAC Application.

Table 9-1. Existing Conditions for the Wetland Function Related to the Proposed Amendment

VC	Existing Conditions
Wetland Function	**Stawamus Corridor Expansion:** the proposed amendment does not result in a change in the existing conditions for the Wetland Function VC. The desktop of review and the wetland field survey conducted in summer 2019 did not identify any wetlands along the Stawamus Corridor Expansion (BC MFLNRORD 2020). **Coquitlam Twinning:** the proposed amendment will result in a change in the existing conditions for the Wetland Function VC. During the wetland field survey, three small wetlands associated with Mantle Creek were identified between KP 2.4 to KP 2.6. These include two small graminoid marshes and one swamp, all three are within the corridor, but only the swamp intersects the corridor. The swamp is a Western redcedar – Western hemlock/ skunk cabbage that is shrub-dominated and is surrounded by a young Western hemlock and Western redcedar forest. Dominant understory vegetation species include salmonberry, skunk cabbage, common rush, small-flowered bulrush, lady fern, and devil's club. The graminoid marshes are dominated by cattails, rushes, and sedges and can be best described as cattail marshes. The three wetland communities are described as follows and in Appendix E of this Amendment Application. • Graminoid marsh, approximately 0.06 ha in size located at approximately KP 2.4. • Western redcedar – Western hemlock/skunk cabbage swamp approximately 0.01 ha in size located at approximately KP 2.5. • Graminoid marsh, approximately 0.02 ha in size located at approximately KP 2.6. **Eagle Mountain Compressor Station:** the proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Wetland Function VC. No wetlands were identified at this compressor station during the field survey conducted for the EAC Application. **Squamish Compressor Station:** the proposed amendment does not result in a change in the existing conditions for the Wetland Function VC. The desktop of review (iMapBC – BC Freshwater Atlas) and the wetland field survey conducted in summer 2019 did not identify any wetlands within the Squamish Compressor Station siting area.

9.3 Wetlands Effects Assessment

This subsection provides an update to the Wetlands effects assessment previously presented in subsection 9.5 of the EAC Application (Volume 1, Part B) for each proposed amendment.

9.3.1 Stawamus Corridor Expansion

No wetlands were identified along the Stawamus Corridor Expansion; therefore, the proposed amendment does not result in a change in the existing conditions for the Wetland Function VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wetland Function VC during any phase of the Project. No positive effects to the Wetland VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wetland Function VC remain the same.

9.3.2 Coquitlam Twinning

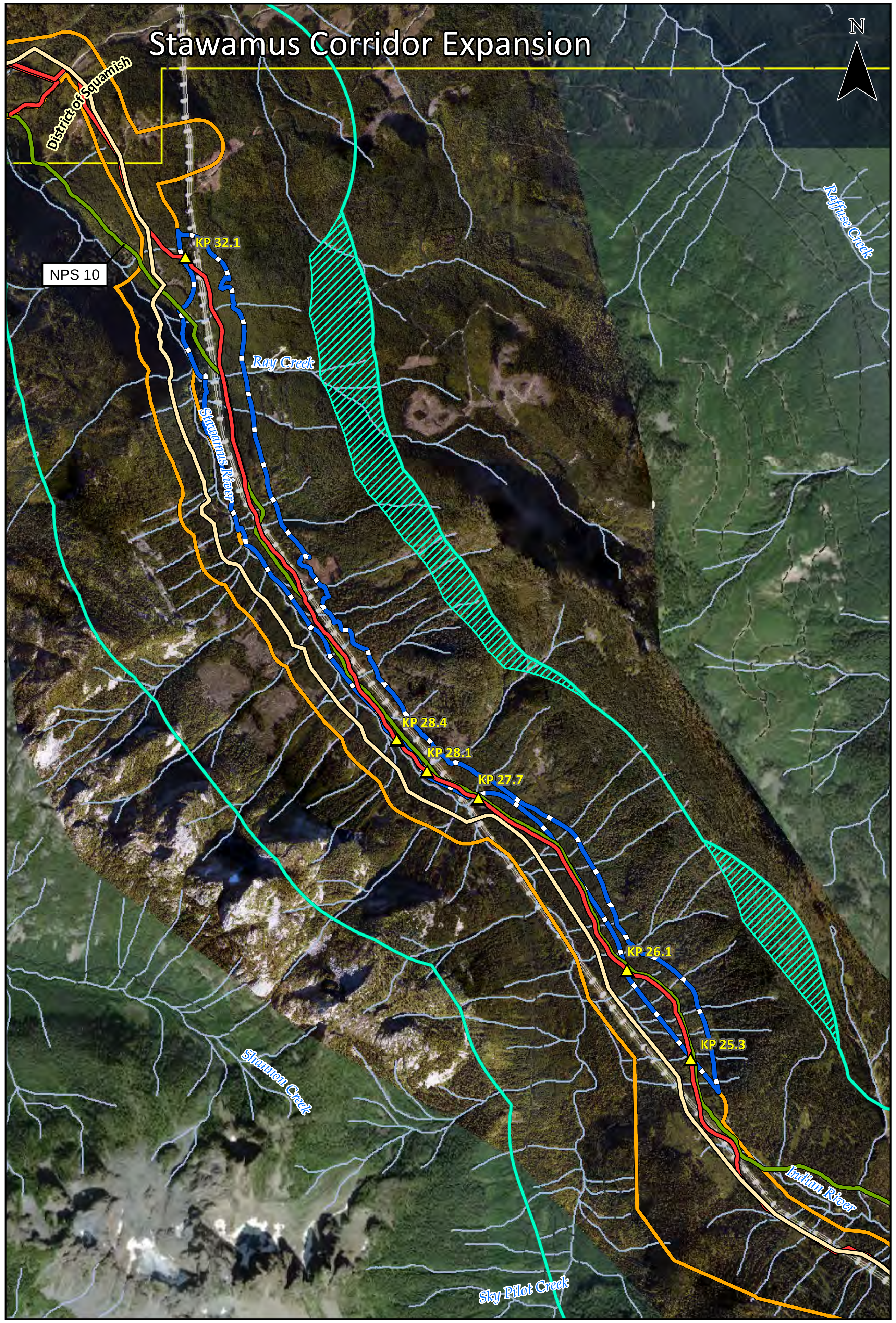
As noted in subsection 9.2, there is a change in the existing conditions for the Wetland Function VC related to the Coquitlam Twinning, as additional wetlands were identified that may be subject to direct or indirect disturbance from Project activities. However, the nature of the disturbance that these wetlands will experience is equivalent to that described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wetland Function VC during any phase of the Project. No positive effects to the Wetland VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wetland Function VC remain the same.

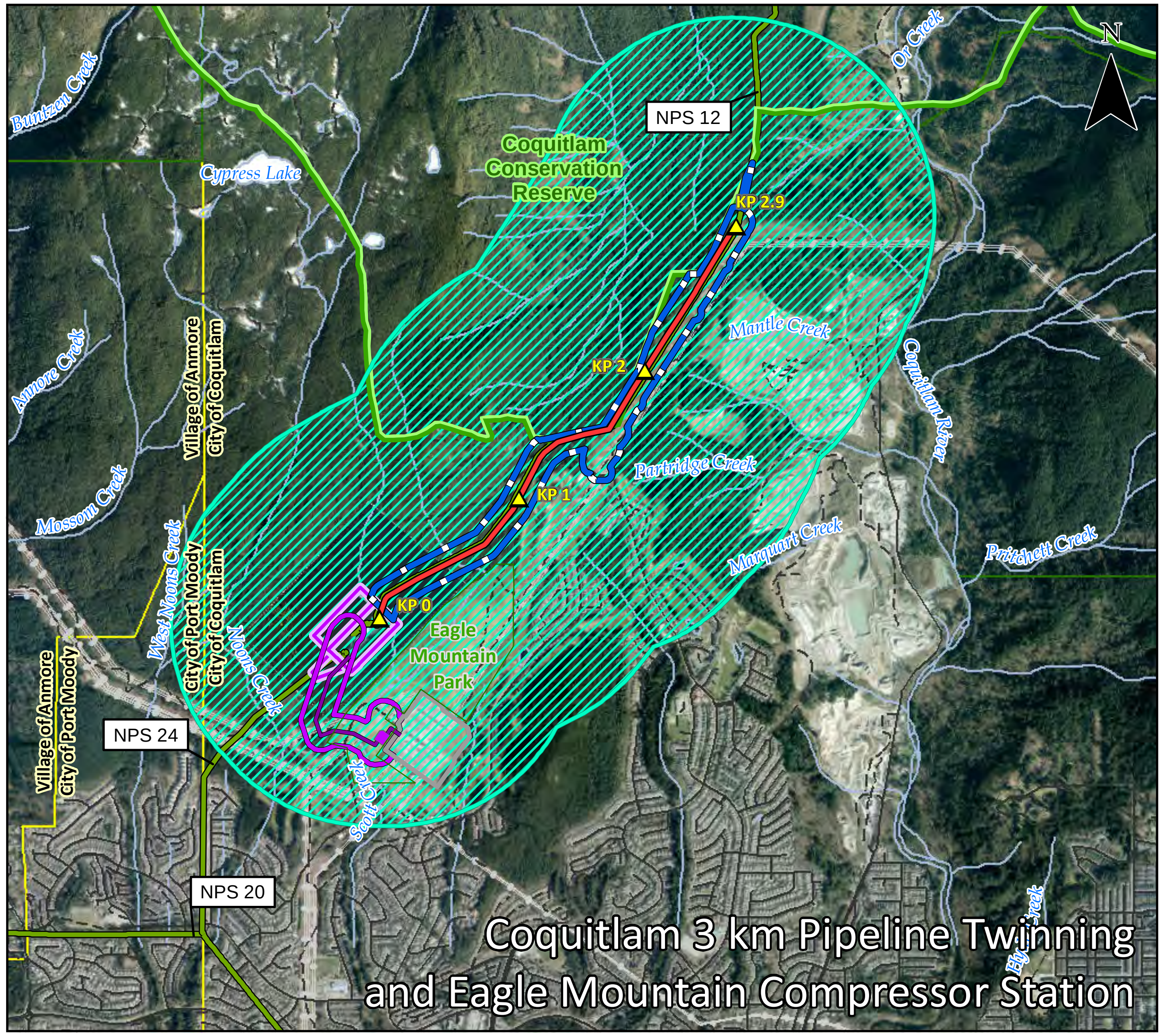
9.3.3 Eagle Mountain Compressor Station

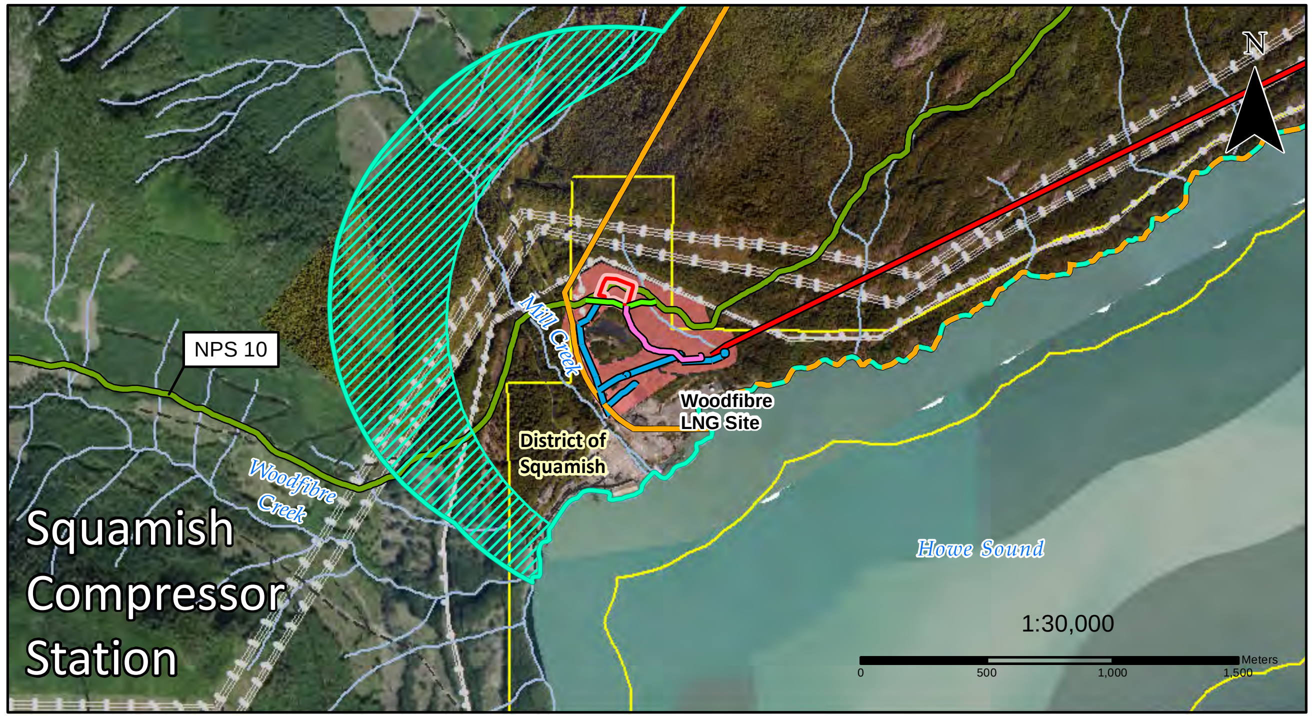
No wetlands have been identified within the Certified Compressor Station Area for the Eagle Mountain Compressor Station. As the proposed amendment does not result in a change to the Certified Compressor Area, the proposed amendment does not result in a change in the existing conditions for the Wetland Function VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wetland Function VC during any phase of the Project. No positive effects to the Wetland VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wetland Function VC remain the same.

9.3.4 Squamish Compressor Station

No wetlands were identified within the Squamish Compressor Station siting area; therefore, the proposed amendment does not result in a change in the existing conditions for the Wetland Function VC. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wetland Function VC during any phase of the Project. No positive effects to the Wetland VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wetland Function VC remain the same.







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October 2020

FIGURE 9-1

WETLANDS STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)

- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)

- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other

- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Wetlands Local Study Area
- Wetlands LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor: CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

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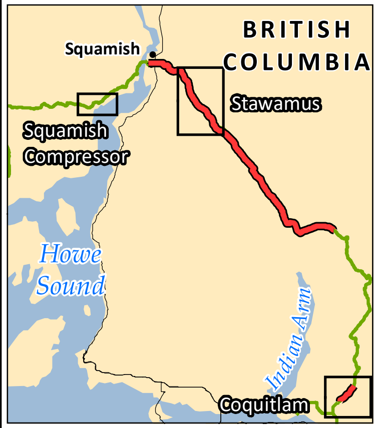


9.4 Wetlands Cumulative Effects Assessment

This subsection provides and update to the wetlands cumulative effects assessment previously presented in subsection 9.5.3 of the EAC Application (Volume 1, Part B) for each proposed amendment.

9.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wetland Function VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wetland Function RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wetland Function VC.

9.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wetland Function VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wetland Function RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wetland Function VC.

9.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wetland Function VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wetland Function RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wetland Function VC.

9.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wetland Function VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wetland Function RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wetland Function VC.

9.5 References

British Columbia Ministry of Forests, Lands, Natural Resources Operations and Rural Development (BC MFLNRORD). 2020. BC Freshwater Atlas Wetlands (digital file). Data Modified (BC Gov) April 2020. Acquired June 2020. https://catalogue.data.gov.bc.ca/dataset/freshwater-atlas-wetlands

10. Wildlife

The assessment of potential adverse effects of the Project on the Wildlife and Wildlife Habitat VC is provided in Section 10.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Wildlife and Wildlife Habitat VC that may result from the proposed amendments, as described in subsection 1.1.

10.1 Spatial Boundaries

The spatial boundaries used in the wildlife assessment are provided in subsection 10.2.1 of the EAC Application (Volume 1, Part B).

Figure 10-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Wildlife and Wildlife Habitat LSA assessed in subsection 10.2.1 of the EAC Application:

- **Stawamus Corridor Expansion** – The proposed amendment results in an expansion of the Wildlife and Wildlife Habitat LSA assessed in subsection 10.2.1 of the EAC Application.
- **Coquitlam Twinning** – The proposed amendment results in an expansion of the Wildlife and Wildlife Habitat LSA assessed in subsection 10.2.1 of the EAC Application.
- **Eagle Mountain Compressor Station** – The proposed amendment does not result in a change to the Wildlife and Wildlife Habitat LSA assessed in subsection 10.2.1 of the EAC Application.
- **Squamish Compressor Station** – The proposed amendment results in an expansion of the Wildlife and Wildlife Habitat LSA assessed in subsection 10.2.1 of the EAC Application.

10.2 Existing Conditions

The existing conditions for the Wildlife and Wildlife Habitat VC are provided in the EAC Application in the Wildlife TDR (Volume 2, Appendix 1K) and the Wildlife Modelling and Species Accounts TDR (Volume 2, Appendix 1L).

The review of existing conditions was informed by desktop reviews of publicly available data and additional wildlife surveys conducted during spring and summer of 2015 and 2019. The following surveys were conducted during the 2019 field program:

- wildlife habitat feature reconnaissance
- breeding bird survey
- pond-dwelling amphibians survey
- northern goshawk survey
- marbled murrelet survey
- coastal tailed frog survey

Details of the wildlife and wildlife habitat field surveys, including methods and results are provided in the Wildlife and Wildlife Habitat TDR (Appendix F of this Amendment Application). Existing conditions for wildlife and wildlife habitat for the proposed amendment corridors, siting area, and expanded Wildlife and Wildlife Habitat LSA are summarized in this subsection and in Table 10-1. This summary focuses on differences in existing conditions when assessing the proposed amendments relative to the assessment provided in the EAC Application. These conditions do not result in a material change to the overall setting considered in the EAC Application.

Table 10-1. Existing Conditions for the Wildlife and Wildlife Habitat Related to Proposed Amendment

Proposed Amendment	Existing Conditions
Stawamus Corridor Expansion	A search of the BC CDC database (BC CDC 2019) identified no new records of wildlife species listed under Schedule 1 of the *SARA* (ECCC 2019) or by the COSEWIC (COSEWIC 2019) within the Stawamus Corridor Expansion LSA compared to those identified in the EAC Application. There is one masked species occurrence with overlap of the Stawamus Corridor Expansion LSA (BC ENV 2019b). Jacobs confirmed through consultation with the BC CDC that the masked species occurrence is not located within the Stawamus Corridor Expansion corridor (Clare pers. comm. 2019). The Stawamus Corridor Expansion crosses three marbled murrelet (*Brachyramphus marmoratus*) (Threatened by *SARA* and COSEWIC, Blue-listed) Critical Habitat polygons (Environment Canada 2014) assessed for biophysical attributes during the 2015 and 2019 field programs. The Stawamus Corridor Expansion does not overlap any other Critical Habitat for Federally-listed species at risk or any other identified wildlife areas (BC ENV 2018, 2019a; BC MFLNRORD 2019a, 2019b, 2019d, 2019e, 2019f, 2019g, 2019h; Bird Studies Canada and Nature Canada 2019). Wildlife surveys were conducted along the Stawamus Corridor Expansion, consistent with the methods described in the Wildlife TDR (Volume 2, Appendix 1K). Surveys were completed for: northern goshawk (*Accipiter gentilis laingi*) (Threatened by *SARA*, Special Concern by COSEWIC, Red-listed); marbled murrelet; and coastal tailed frog (*Ascaphus truei*) (Special Concern by *SARA* and COSEWIC). Results from these surveys are provided in full in Appendix F of this Amendment Application and summarized as follows: • No new BGC subzone was encountered. Wildlife habitat encountered was consistent with habitat previously described in the EAC Application. • No northern goshawks were detected during call-playback surveys. No evidence of northern goshawk nesting or occupancy was detected incidentally during the wildlife surveys. There is low to moderately suitable nesting habitat for northern goshawk present along the Stawamus Corridor Expansion. • Coastal tailed frogs were confirmed at 14 of 39 streams along the Stawamus Corridor Expansion; of these, 13 streams were identified as coastal tailed frog breeding sites. Of the 25 streams where no coastal tailed frogs were detected, 10 had low to medium rated habitat quality and 15 were considered unsuitable habitat for coastal tailed frog. • Marbled murrelet nesting habitat within the Critical Habitat polygons crossed by the Stawamus Corridor Expansion was rated as having low suitability, as they lack the biophysical attributes of Critical Habitat for marbled murrelet. Marbled murrelet was confirmed transiting through the Stawamus Valley, but they did not exhibit nesting behaviour and numbers were low (zero to two birds detected during each radar survey). None were detected with audio/visual surveys or autonomous recording units. • Three bird species at risk were identified incidentally during marbled murrelet surveys, including one observation of band-tailed pigeon, one observation of olive-sided flycatcher, and two observations of common nighthawk; except for the common nighthawk, each of these birds had previously been observed during Project surveys. • No other wildlife habitat features that warrant site-specific mitigation were identified (such as, stick nests, dens, mineral licks, rocky outcrops and cliffs, wetlands). • No new species with special conservation status were observed.

Table 10-1. Existing Conditions for the Wildlife and Wildlife Habitat Related to Proposed Amendment

Proposed Amendment	Existing Conditions
Coquitlam Twinning	A search of the BC CDC database (BC CDC 2019) identified no new records of wildlife species listed under Schedule 1 of the *SARA* (ECCC 2019) or by COSEWIC (COSEWIC 2019) within the Coquitlam Twinning LSA compared to those identified in the EAC Application. There is one masked species occurrence with overlap of the Coquitlam Twinning LSA (BC ENV 2019b). The Coquitlam Twinning does not directly overlap any Critical Habitat for Federally-listed species at risk or any other identified wildlife areas (BC ENV 2018, 2019a; BC MFLNRORD 2019a, 2019b, 2019d, 2019e, 2019f, 2019g, 2019h; Bird Studies Canada and Nature Canada 2019). The terminus of the Coquitlam Twinning is approximately 223 m southwest of Critical Habitat for marbled murrelet (ECCC 2019). Wildlife surveys were conducted along the Coquitlam Twinning in spring and summer 2019, consistent with the methods described in the Wildlife TDR (Volume 2, Appendix 1K). Surveys included: wildlife habitat feature reconnaissance; breeding bird survey; northern goshawk survey; and pond-dwelling amphibians survey. Results from these surveys are summarized in the following points: • No new BGC subzone was encountered. Wildlife habitat encountered was consistent with habitat previously described in the EAC Application. • Amphibian breeding (western toad [*Anaxyrus boreas]* [Special Concern by *SARA* and COSEWIC]) was confirmed at Mantle Creek (south crossing location); no evidence of amphibian breeding was detected at the north crossing location of Mantle Creek, although habitat is suitable and could support breeding amphibians. • Incidental observations documented three northern red-legged frog adults in seepages along the corridor in dense, forested areas. Evidence of northern red-legged frog breeding was not observed along the Coquitlam Twinning. • There were eight bird species recorded along the Coquitlam Twinning that were not previously recorded during the EAC Application bird surveys, which include: bald eagle, common raven, downy woodpecker, northern flicker, northwestern crow, red-breasted nuthatch, spotted towhee, and willow flycatcher. • Two bird species of special conservation status was identified during the breeding bird surveys and incidentally: olive-sided flycatcher and band-tailed pigeon. Both species were previously identified during the EAC Application bird surveys. • Mean bird species richness, species diversity, and density were all within the value ranges previously reported for the EAC Application bird surveys. • No northern goshawks were detected during call-playback surveys. Given the structural stage of the forests and proximity to disturbance, there is no suitable nesting habitat for northern goshawk present along the Coquitlam Twinning. No evidence of northern goshawk nesting or occupancy was detected incidentally during the wildlife surveys. • No other wildlife habitat features that warrant site-specific mitigation were identified (such as, stick nests, dens, mineral licks, rocky outcrops and cliffs, wetlands). • No new species with special conservation status were observed.
Eagle Mountain Compressor Station	The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Wildlife and Wildlife Habitat VC. No field surveys were conducted for the Eagle Mountain Compressor Station as the proposed amendment does not involve new habitat; therefore, information collected for the EAC Application remains relevant.

Table 10-1. Existing Conditions for the Wildlife and Wildlife Habitat Related to Proposed Amendment

Proposed Amendment	Existing Conditions
Squamish Compressor Station	The Squamish Compressor Station siting area overlaps the WLNG project site, a previous mill site, and the proposed location of the WLNG project. The site has been previously cleared and is surrounded by second growth coniferous forest. The disturbed nature of the site has limited potential for wildlife habitat. A search of the BC CDC database (BC CDC 2019) identified no records of wildlife species listed under Schedule 1 of the *SARA* (ECCC 2019) or by COSEWIC (COSEWIC 2019) within direct overlap of the Squamish Compressor Station siting area. The northeast corner of the Squamish Compressor Station siting area is adjacent to the WHA 2-517 for spotted owls (BC MFLNRORD 2019d). Suitable foraging and nesting habitat for western screech-owl (*Megascops kennicottii) (*Threatened by *SARA* and COSEWIC, BC Blue-listed) was identified within the Squamish Compressor Station siting area during baseline studies for the WLNG project (Hemmera 2015a; 2019). High-value western screech-owl nesting habitat was identified along Mill Creek, which has overlap with the west side of the Squamish Compressor Station siting area. Potential foraging habitat was identified within the forested area on the northwest side of the siting area. Hemmera conducted nocturnal call-playback surveys and deployed ARUs to assess the occurrence of western screech-owl within suitable nesting and foraging habitat in 2015 and again in 2019 (Hemmera 2015a; 2019). In 2015, call play-back surveys were conducted over two sessions in June and July. A single male resident western screech-owl was detected during both sessions. Follow-up surveys were conducted in April 2019, and no western screech-owl detections were made during any of the three nights of call-playback surveys or the seven nights of ARU deployment. The Squamish Compressor Station siting area is not located within 200 m of any IBAs (Bird Studies and Nature Canada 2019) and does not overlap with any other identified wildlife areas or wetlands (BC ENV 2018, 2019a; BC MFLNRORD 2019a, 2019b, 2019e, 2019f, 2019g, 2019h). The Squamish Compressor Station siting area overlaps the Squamish-Lillooet GBPU, which is Provincially-designated as Threatened. An Old Growth Management Area (legal) is located approximately 440 m to the northeast of the Squamish Compressor Station siting area, and patches of Forest Cover Reserve are located approximately 185 m to the southeast (BC MFLNRORD 2019a, 2019c). The Squamish Compressor Station siting area overlaps with one Critical Habitat polygon for marbled murrelet (Environment Canada 2014). Hemmera. previously conducted a marbled murrelet habitat assessment for the WLNG project, which determined that the habitat within this polygon is not high-value marbled murrelet terrestrial nesting habitat, as it is in a fragmented, small, isolated forest stand (Hemmera 2014, 2015b). The surrounding area is mostly comprised of non-vegetated or sparsely vegetated areas dominated by pioneering species, saplings, and shrubs. Consideration of additional nesting habitat requirements suggests that this stand is likely too small and too isolated to provide any value as marbled murrelet nesting habitat (Hemmera 2014). Preliminary site visits were conducted in spring and summer 2019. Findings from these site visits are summarized as follows: • No wildlife habitat features that warrant site-specific mitigation were identified (such as, stick nests, dens, mineral licks, rocky outcrops and cliffs, wetlands). • Ephemeral drainages were observed on-site but did not have the potential to provide pond-dwelling amphibian breeding habitat. • There is no potential habitat for coastal tailed frog breeding habitat within the Squamish Compressor Station siting area, as they require year-round flow. • There is dense, low vegetation present on-site that has the potential to provide riparian/shrub nesting bird habitat.

Notes:

ARU = autonomous recording unit
BC CDC = BC Conservation Data Centre
COSEWIC = Committee on the Status of Endangered Wildlife in Canada
GBPU = Grizzly Bear Population Unit
IBA = Important Bird Area
SARA = *Species at Risk Act*
WHA = Wildlife Habitat Area

10.3 Wildlife and Wildlife Habitat Effects Assessment

This subsection provides an update to the Wildlife and Wildlife Habitat effects assessment previously presented in Section 10.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

10.3.1 Stawamus Corridor Expansion

The EAC Application considered potential and residual effects to wildlife habitat, movement, and mortality risk associated with Project construction, operation, and decommissioning activities. Desktop and field data collection for this proposed amendment are outlined in detail in the Wildlife and Wildlife Habitat TDR (Appendix F). Findings from desktop and field data collection indicated some change in existing conditions for the Wildlife and Wildlife Habitat VC for the proposed Stawamus Corridor Expansion compared to the EAC Application; however, these findings do not result in a material change to the overall wildlife existing conditions assessed in the EAC Application. For instance, the following species at risk or their habitat were detected within the Stawamus Corridor Expansion: marbled murrelet, coastal tailed frog, band-tailed pigeon, olive-sided flycatcher, and common nighthawk. These detections of species at risk or their habitat were comparable to that described in the EAC Application.

Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wildlife and Wildlife Habitat VC during any phase of the Project. No positive effects to the Wildlife and Wildlife Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same.

10.3.2 Coquitlam Twinning

The EAC Application considered potential and residual effects to wildlife habitat, movement, and mortality risk associated with Project construction, operation, and decommissioning activities. Desktop and field data collection for this proposed amendment indicated that existing conditions are similar to that described in the EAC Application. Species at risk were identified including band-tailed pigeon, olive-sided flycatcher, northern red-legged frog, and Western toad, however, detections of species at risk and their habitat were comparable to that described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wildlife and Wildlife Habitat VC during any phase of the Project. No positive effects to the Wildlife and Wildlife Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same.

10.3.3 Eagle Mountain Compressor Station

As there is no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station, the proposed amendment does not result in a change to the existing conditions as described in the EAC Application. The conditions for the proposed amendment are the same as the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also unchanged, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wildlife and Wildlife Habitat VC during any phase of the Project. No positive effects to the Wildlife and Wildlife Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same.

10.3.4 Squamish Compressor Station

As outlined in subsection 10.2, there is a change in the existing conditions for the Wildlife and Wildlife Habitat VC related to western screech-owl in relation to the Squamish Compressor Station. The western

screech-owl nesting and foraging habitat within the Squamish Compressor Station siting area is considered a material change in existing conditions from the EAC Application, as new potential nesting and foraging habitat not previously included has been identified within the Squamish Compressor Station siting area.

Changes in habitat availability and effectiveness was previously identified as a potential effect in the EAC Application for the Project Footprint (Volume 1, Part B, Section 10.5.1). This potential effect now also applies to the Squamish Compressor Station siting area during construction and operation. Results of surveys conducted in 2019 suggest that there is low likelihood of western screech-owl nesting within the Squamish Compressor Station siting area (Hemmera 2019). The EMP developed for the EAC Application included completion of pre-construction wildlife surveys to identify habitat features that warrant site-specific mitigation, which encompasses pre-construction surveys for western screech-owl.

The western screech-owl nesting and foraging habitat within the Squamish Compressor Station siting area is considered a material change in existing conditions from the EAC Application. However, western screech-owl was previously identified as a key indicator and changes in habitat availability and effectiveness was assessed in the EAC Application. Existing mitigation developed in the EMP is considered suitable and therefore, the characterization of residual effects and conclusions identified in the EAC Application with respect to changes in habitat availability and effectiveness remain the same.

All other aspects of the existing conditions for the Wildlife and Wildlife Habitat VC for the Squamish Compressor Station conditions are comparable to those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Wildlife and Wildlife Habitat VC during any phase of the Project. No positive effects to the Wildlife and Wildlife Habitat VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same.

10.4 Wildlife and Wildlife Habitat Cumulative Effects Assessment

This subsection provides an update to the Wildlife and Wildlife Habitat VC cumulative effects assessment previously presented in Section 10.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

10.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wildlife and Wildlife Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wildlife and Wildlife Habitat RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wildlife and Wildlife Habitat VC.

10.4.2 Coquitlam Twinning

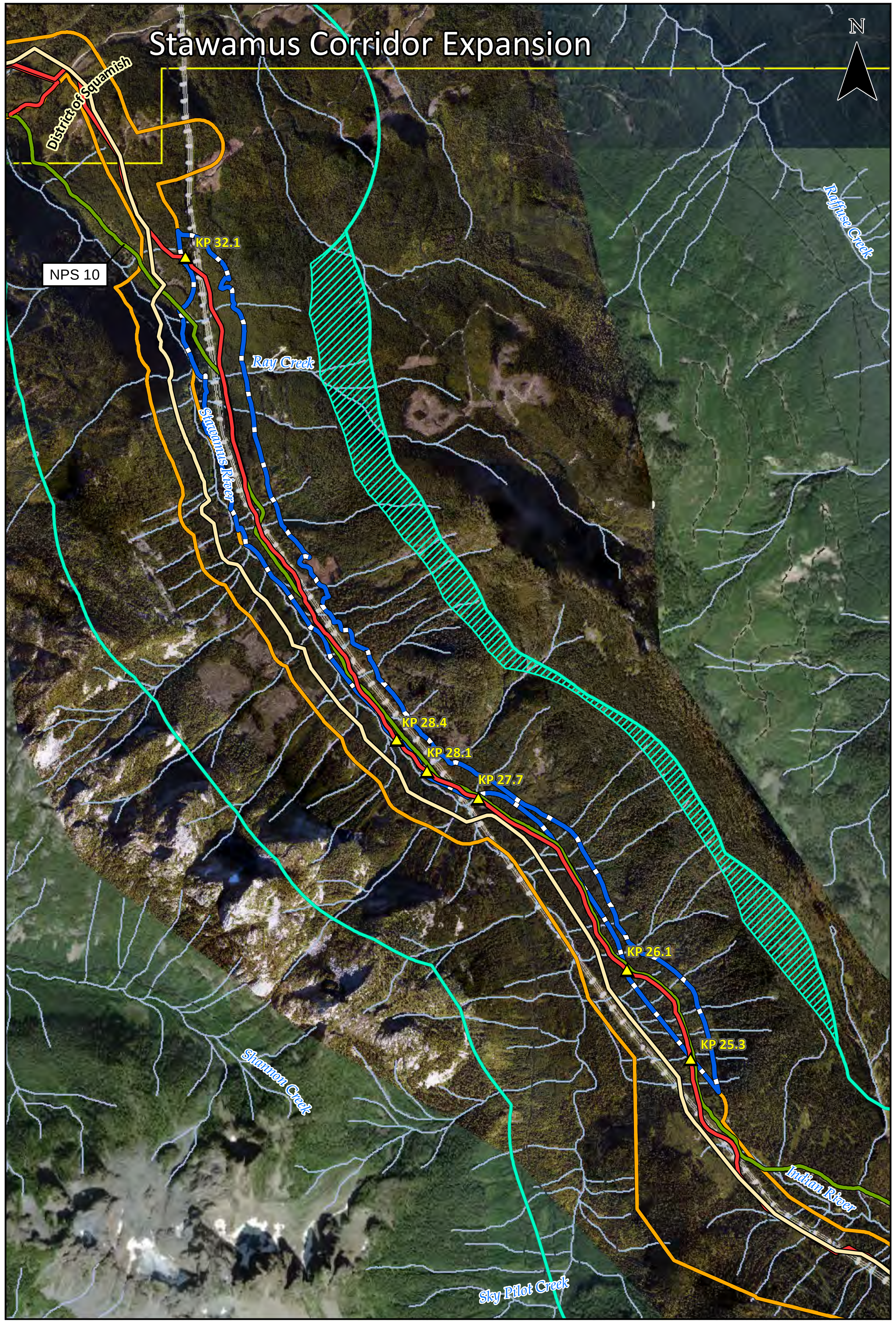
The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wildlife and Wildlife Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wildlife and Wildlife Habitat RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wildlife and Wildlife Habitat VC.

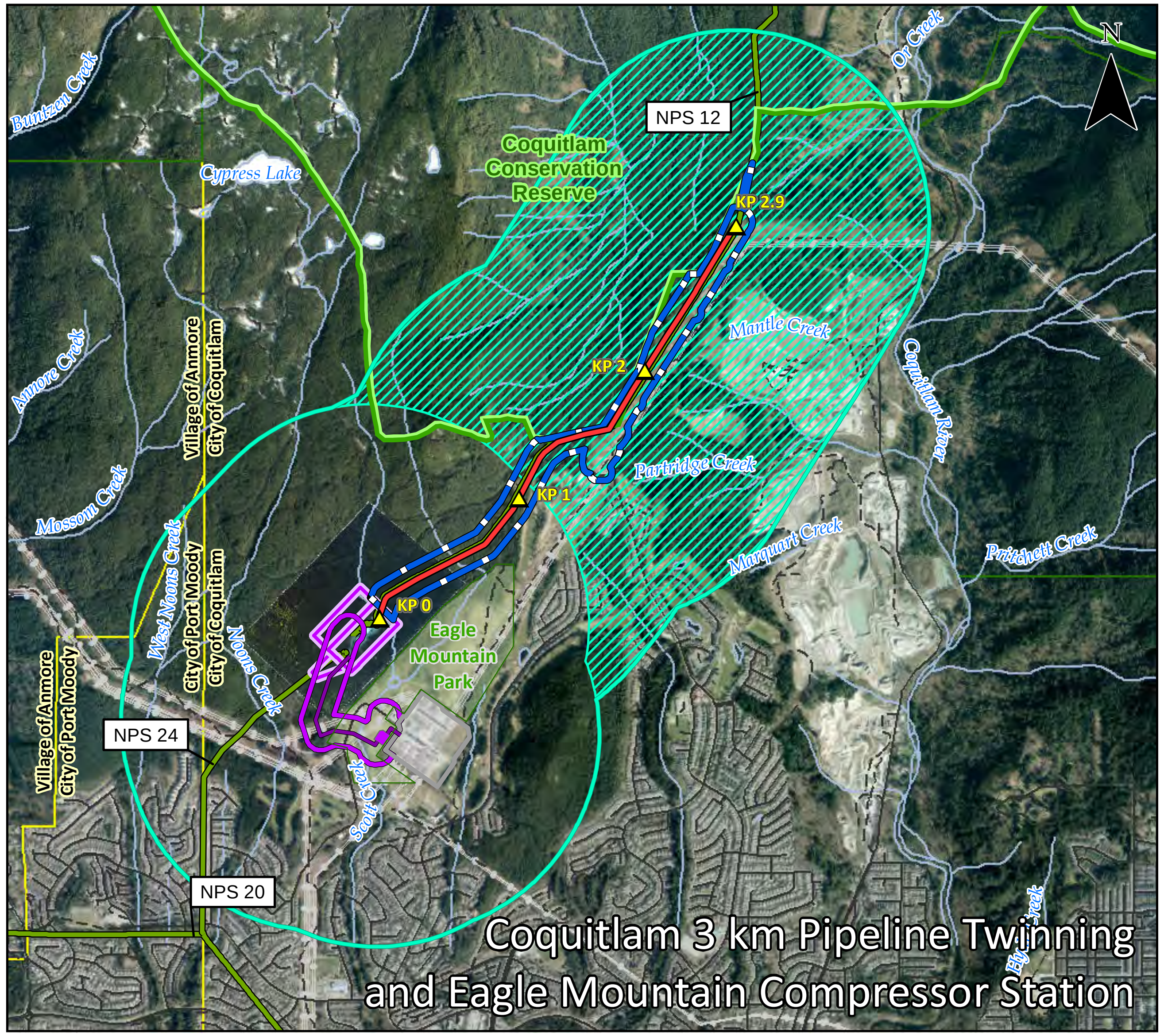
10.4.3 Eagle Mountain Compressor Station

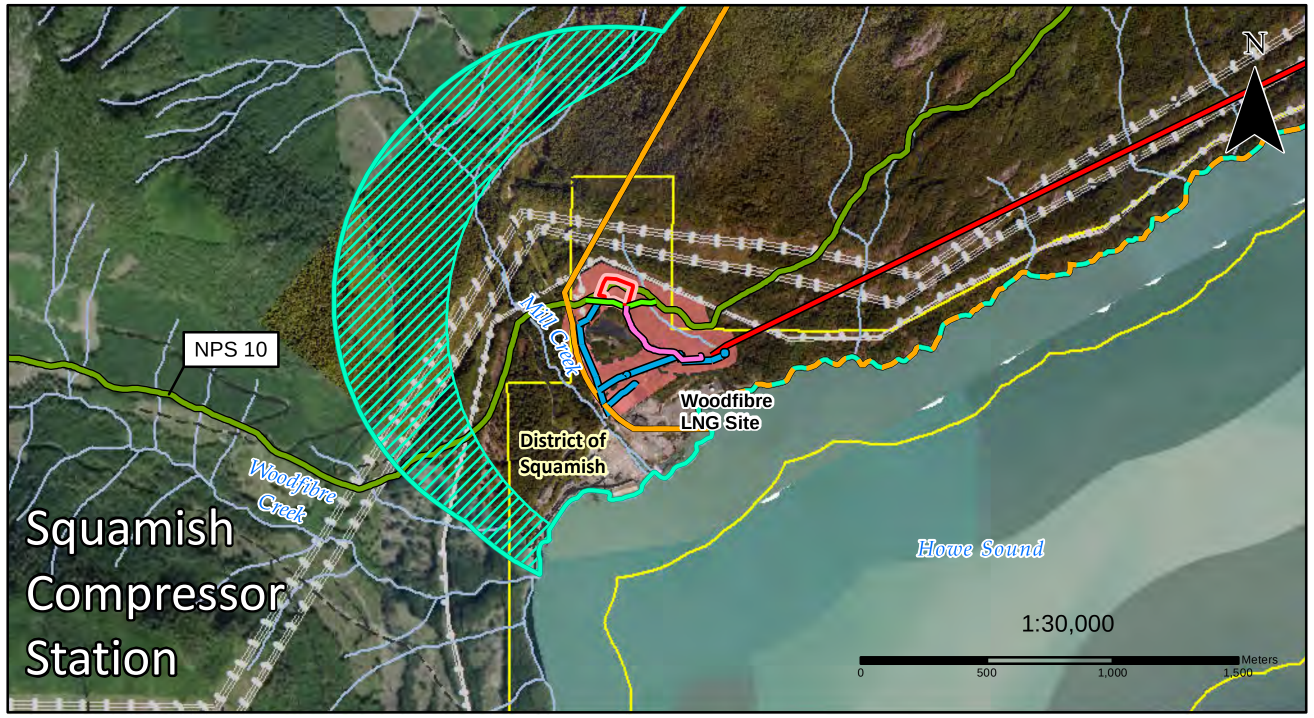
The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wildlife and Wildlife Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wildlife and Wildlife Habitat RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wildlife and Wildlife Habitat VC.

10.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Wildlife and Wildlife Habitat VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Wildlife and Wildlife Habitat RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Wildlife and Wildlife Habitat VC.







FORTIS BC

October 2020

FIGURE 10-1

WILDLIFE STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Wildlife Local Study Area
- Wildlife LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor: CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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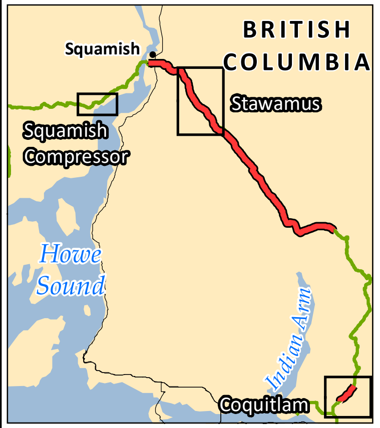

10.5 References

10.5.1 Personal Communication

Jacobs wishes to thank the following people for their assistance in providing information on the existing conditions for wildlife and wildlife habitat in the proposed amendment corridor and expanded Wildlife and Wildlife Habitat LSA and RSA:

Clare, Jacqueline. Conservation Mapping Lead, BC Conservation Data Centre, Ministry of Environment and Climate Change Strategy. 2019. Personal communication (email) with Sarah McLaughlin, Jacobs. August 26.

10.5.2 Literature Cited

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11. Economic Effects Assessment

The assessment of potential adverse effects of the Project on the Economy and Employment and Labour Force VCs is provided in Section 11.0 of the EAC Application (Volume 1, Part B). The Economy VC included consideration of interactions and potential effects related to: government revenue; contracts and procurement; and business disruption. The Employment and Labour Force VC included consideration of interactions and potential effects related to: employment and training and labour force. Anticipated Project benefits are comparable to those presented in the EAC Application. The proposed amendments do not result in a decrease in the anticipated Project benefits.

The following subsections describe changes to the assessment of potential adverse effects on the Economy VC and Employment and Labour Force VC that may result from the proposed amendments, as described in subsection 1.1.

11.1 Spatial Boundaries

The spatial boundaries used in the economic effects assessment are provided in subsection 11.2.1 of the EAC Application (Volume 1, Part B). The following list indicates whether each proposed amendment results in an expansion in the Economic LSA assessed in Section 11.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Does not result in an expansion to the Economic LSA assessed in Section 11.0 of the EAC Application.
- **Coquitlam Twinning** – Does not result in an expansion to the Economic LSA assessed in Section 11.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Economic LSA assessed in Section 11.0 of the EAC Application.
- **Squamish Compressor Station** – Does not result in an expansion to the Economic LSA assessed in Section 11.0 of the EAC Application.

The proposed amendments do not result in an expansion of the Economic LSA or RSA, as all the proposed amendment components are in Regional Districts previously included in the EAC Application study area.

11.2 Existing Conditions

The existing conditions for the Economy VC and Employment and Labour Force VC are provided in the EAC Application in the Economic, Social, and Health TDR (Volume 2, Appendix 1M). The proposed amendments are located within the Economic LSA and RSA as described in the EAC Application.

Existing conditions for economy, employment, and labour force in the proposed amendment footprint and Economy and Employment and Labour Force LSA and RSA are summarized in this subsection.

11.2.1 Economy

This subsection provides an update to existing conditions pertinent to the Economy and Employment and Labour Force VCs in the Economic LSA and RSA. This includes information related to government revenue, key economic sectors that may interact with Project contracting and procurement, Local businesses on or near the proposed amendment footprint, as well as Official Community Plans (OCPs) and Regional Growth Strategies (RGS).

Major sources of government revenue for communities and Districts in the Economic RSA have not materially changed from those described in the EAC Application, although revenues change annually.

Sources of government revenue from the Project, including proposed amendments, will include corporate income from Contractors and Suppliers, income taxes paid by construction workers directly or indirectly employed by the Project, and net sales taxes paid on goods and services. The proposed amendments will not change the anticipated government revenue associated with the Project. Further, the potential effects of the capital and operating expenditures of the Project and proposed amendments on Federal, Provincial, and Local government revenues are considered to be economic benefits; therefore, were not considered in the economy assessment of adverse effects.

Project benefits are not anticipated to decrease as a result of the proposed amendments. Project investment, including the proposed amendments, remains consistent with the EAC Application as the proposed amendments do not involve material increases in capital spending by FortisBC. Capital costs associated with the Coquitlam Twinning are incremental and do not materially change the overall Project-related capital expenditures. Therefore, Project investment does not merit further assessment. Contracting and procurement opportunities resulting from the proposed amendments are not anticipated to materially change from those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

11.2.1.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located within Electoral Area D of the Squamish-Lillooet Regional District (SLRD). This Region is guided by the Sea to Sky Land and Resource Management Plan, the SLRD RGS (amended in 2018), and the SLRD Electoral Area D OCP. The SLRD Electoral Area D OCP objectives and policies are based on the SLRD RGS (SLRD 2013). To achieve a sustainable economy, the RGS includes the following objectives:

- Promote northern development initiatives that contribute to economic growth throughout the Region
- Support strengthening transportation linkages within the Region, the interior, and the lower mainland that support new investment
- Support various investment strategies (such as, industrial, tourism, agricultural) at a Regional and Sub-Regional level to compliment economic development, diversification, and assist the transition from traditional resource industries
- Support balancing the creation of housing with employment to contribute to developing complete communities (SLRD 2018b)

In 2018, the SLRD reported total revenue in the amount of $22.7 million (SLRD 2018a). The top sources of revenue in 2018 were requisition at 31.4 percent, members recovered debt at 24.7 percent, and conditional grants (Federal and Provincial) at 15.0 percent (SLRD 2018a). Key economic sectors in the Region include tourism, agriculture, construction, forestry, energy, and mining (SLRD 2020).

The Stawamus Corridor Expansion is adjacent to the existing FortisBC NPS 10 pipeline. The Stawamus Corridor Expansion is located east of the District of Squamish and outside the District planning boundaries. The Stawamus Corridor Expansion is located approximately 3 km from the nearest commercially zoned area in the District of Squamish at KP 32.1 (Squamish 2020b). There are 977 businesses within the District of Squamish in a variety of industries from agriculture, forestry, resource extraction and manufacturing to construction, retail, professional services, hospitality, and tourism (Squamish 2020a).

11.2.1.2 Coquitlam Twinning

The Coquitlam Twinning is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. Regional plans applicable to this area are the City of Coquitlam Citywide OCP and Metro Vancouver's RGS, Metro Vancouver 2040 – Shaping Our Future (Metro Vancouver 2010).

The City of Coquitlam OCP states that it is important to foster a balance between economic activities that support Local business needs as well as those of export markets. To achieve this balance, the OCP includes policies and objectives that promote established sectors (such as, industrial, office, and retail) as

well as creating an attractive environment for emerging sectors with high propensities for exports (such as, technology, tourism, and the film industry) (Coquitlam 2001).

In 2018, the City of Coquitlam reported total revenue in the amount of $432.4 million (Coquitlam 2018). The top sources of revenue in 2018 were taxation at 38.0 percent; fees, rates, and service charges at 25.1 percent; and Municipal land sales at 17.6 percent (Coquitlam 2018). Key economic sectors in the City of Coquitlam are professional services, retail and wholesale trade, manufacturing, technology, public administration, transportation, and construction (Coquitlam 2020b).

The Coquitlam Twinning overlaps the Westwood Plateau Golf and Country Club from approximately KP 0.9 to KP 1.2 for approximately 3.5 ha. The proposed amendment footprint in this area overlaps with 0.2 ha of the golf course property and does not include any of the fairway or greens. The Coquitlam Twinning is located approximately 1 km from the nearest commercially zoned area at KP 0, and 300 m from residential housing between KP 0.7 and KP 1.6 (Coquitlam 2020a). Other businesses close to the Coquitlam Twinning include industrial, construction, and technology businesses, a security business, and a bed and breakfast.

11.2.1.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. Regional plans applicable to this area are the City of Coquitlam Citywide OCP and Metro Vancouver's RGS, Metro Vancouver 2040 – Shaping Our Future (Metro Vancouver 2010).

The City of Coquitlam OCP states that it is important to foster a balance between economic activities that support Local business needs as well as those of export markets. To achieve this balance, the OCP includes policies and objectives that promote established sectors (such as, industrial, office, and retail) as well as creating an attractive environment for emerging sectors with high propensities for exports (such as, technology, tourism, and the film industry) (Coquitlam 2001).

In 2018, the City of Coquitlam reported total revenue in the amount of $432.4 million (Coquitlam 2018). The top sources of revenue in 2018 were taxation at 38.0 percent; fees, rates, and service charges at 25.1 percent; and Municipal land sales at 17.6 percent (Coquitlam 2018). Key economic sectors in the City of Coquitlam are professional services, retail and wholesale trade, manufacturing, technology, public administration, transportation, and construction (Coquitlam 2020a).

The Eagle Mountain Compressor Station is located approximately 650 m from the nearest residential area (Coquitlam 2020a). Businesses close to the Eagle Mountain Compressor Station include a bed and breakfast, the Westwood Plateau Golf Course and Country Club, construction and technology businesses, and professional service offices.

11.2.1.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish at the WLNG project site. The District of Squamish OCP was updated in 2018. It indicates that District of Squamish has experienced growth in several sectors, including hospitality and tourism; knowledge and education; alternative and renewable energy technology; high tech start-ups; film production; and light manufacturing (Squamish 2018b). However, District of Squamish does experience challenges with affordability, labour, and infrastructure pressures (Squamish 2018b). The OCP identifies the following main objectives for economic development:

- Understand and address labour needs and gaps within the community, as well as skills, expertise, and talent of their citizenry
- Increase Local employment opportunities and job participation rates
- Support diversified and sustainable economic growth and productivity
- Enhance employment infrastructure to meet Local business needs (Squamish 2018b)

In 2018, the District of Squamish reported total revenue in the amount of $52.9 million (Squamish 2018a). The top source of revenue in 2018 was utility user fees at 26.6 percent, followed by own source revenue at 9.9 percent, and government transfers at 3.6 percent (Squamish 2018a). Key economic sectors in District of Squamish are accommodation and food services, construction, retail trade, health care and social assistance, professional, scientific, and technical services (Trade and Invest BC 2020).

The Squamish Compressor Station is located on the northeast portion of the WLNG project site, which is zoned for intensive industrial use (Squamish 2018b). The WLNG project site is not accessible by public roads. The Squamish Compressor Station is located approximately 6 km from the nearest commercially zoned area in the District of Squamish (Squamish 2020b). There are 977 businesses within the District of Squamish in a variety of industries from agriculture, forestry, resource extraction, and manufacturing to construction, retail, professional services, hospitality, and tourism (Squamish 2020a).

11.2.2 Employment and Labour Force

11.2.2.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located within Electoral Area D of the SLRD. In 2016, SLRD Electoral Area D consisted of a labour force of 540 people with a participation rate of 63.5 percent, below the SLRD overall (75.5 percent) and the Provincial average (63.9 percent).

Sales, service, and management occupations represented the main occupational sectors. The population that had completed an apprenticeship or acquired a trades certificate or diploma was approximately 15.5 percent for Electoral Area D and 10.4 percent for the SLRD. Participation in trades and related occupations has decreased from 18.5 percent in 2011 to 14.8 percent in 2016 (Statistics Canada 2017).

The median income for SLRD Electoral Area D in 2015 for persons 15 years and over was $42,240 above the SLRD average of $35,599 and the Provincial average of $33,012 (Statistics Canada 2017). SLRD Electoral Area D median income was not available for the EAC Application.

11.2.2.2 Coquitlam Twinning

The Coquitlam Twinning is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. The labour force of the City of Coquitlam has increased since the EAC Application. In 2016, 75,475 individuals were active in the labour force in the City of Coquitlam with a participation rate of 65.1 percent, lower than the 2011 participation rate of 66.8 percent presented in the EAC Application. Participation in trades and related occupations has decreased slightly to 12.9 percent from 15.3 percent in 2011, as presented in the EAC Application. Major economic sectors in the City of Coquitlam remain similar to those reported in the EAC Application and include professional services, retail and wholesale trade, manufacturing, technology, public administration, transportation, and construction.

The median income in the City of Coquitlam has increased since the EAC Application. The median income in 2015 for persons 15 years and over was $32,612, comparable to the Provincial average of $33,012 and higher than the 2011 median income of $29,112 presented in the EAC Application (Statistics Canada 2013, 2017).

11.2.2.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. For updated employment and labour force conditions in the City of Coquitlam, see the statistics presented in subsection 11.2.2.2.

11.2.2.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish. The labour force of the District of Squamish has increased since 2011 as reported in the EAC Application. In 2016,

11,655 individuals were active in the labour force in the District of Squamish with a participation rate of 76.4 percent, higher than the 2011 participation rate of 76.1 percent presented in the EAC Application.

Major employment sectors remain similar to those reported in the EAC Application, with sales and service, business, finance and administration, and trades and related occupations the main occupation sectors. The population that had completed an apprenticeship or acquired a trades certificate or diploma was approximately 6.4 percent down from 8.1 percent in 2011.

The median income in 2015 for persons 15 years and over was $40,119, above the Provincial average of $33,012 and notably higher than the 2011 median income of $33,799 presented in the EAC Application (Statistics Canada 2017). Refer to Section 18 for more information on existing conditions and potential effects on Indigenous groups.

11.2.2.5 Kwikwetlem First Nation

In 2016, Kwikwetlem First Nation had a labour participation rate of 57.1 percent. Participation rates for previous years are not available. Key industry sectors include health and education and manufacturing and construction (Statistics Canada 2017). Refer to Section 18 for more information on existing conditions and potential effects on Indigenous groups.

11.2.2.6 Musqueam Nation

Musqueam Nation labour participation has increased since the EAC Application. In 2016, Musqueam Nation reported a labour participation rate of 61.3 percent, slightly higher than the 60.8 percent participation rate in 2011 presented in the EAC Application. Key industry sectors include health and education, business services, manufacturing and construction, and wholesale and retail (Statistics Canada 2017). Refer to Section 18 for more information on existing conditions and potential effects on Indigenous groups.

11.2.2.7 Squamish Nation

Employment and labour force information for Squamish Nation was not provided in the EAC Application due to confidentiality of the Squamish Nation EAA process. In 2016, Squamish Nation had a labour force participation rate of 56 percent. Key industry sectors included retail trade; accommodation and food services; construction; professional, scientific and technical services; educational services; and public administration (Statistics Canada 2018).

11.2.2.8 Tsleil-Waututh Nation

Tsleil-Waututh Nation labour participation has decreased since the EAC Application. In 2016, Tsleil-Waututh Nation had a labour participation rate of 70.4 percent, lower the 76.0 percent participation rate in 2011. Key industry sectors include health and education, business services, and wholesale and retail (Statistics Canada 2017). Refer to Section 18 for more information on existing conditions and potential effects on Indigenous groups.

11.3 Economy Effect Assessment

This subsection provides an update to the economy effects assessment previously presented in subsection 11.5 of the EAC Application (Volume 1, Part B) for each proposed amendment. As noted in subsection 11.2 of this Amendment Application, there are some minor changes in the existing conditions for the Economy VC related to Local businesses near the Project Footprint.

Project benefits are not anticipated to decrease as a result of the proposed amendments. Project investment, including the proposed amendments, remains consistent with the EAC Application as the proposed amendments do not involve major increases in capital spending by FortisBC. The capital expenditure is anticipated to be an incremental economic benefit and has not been further assessed. Contracting and procurement opportunities resulting from the proposed amendments are not anticipated

to materially change from those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

The Project investment, including the proposed amendments, remains consistent with the EAC Application, as the proposed amendments do not involve any notable change in capital spending by FortisBC. Additionally, the proposed amendments are not anticipated to materially change the contracting and procurement opportunities from those described in the EAC Application. Therefore, the proposed amendments do not result in any material change to the assessment of potential adverse effects or residual adverse effects for the Economy VC during any phase of the Project. As a result, characterization of the residual effect identified in the EAC Application with respect to the Economy VC remains the same.

11.3.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located east of the District of Squamish and outside the District planning boundaries. The Stawamus Corridor Expansion is located approximately 3 km from the nearest commercially zoned area in the District of Squamish at KP 32.1 (Squamish 2020b). There are 977 businesses within the District of Squamish in a variety of industries from agriculture, forestry, resource extraction, and manufacturing to construction, retail, professional services, hospitality, and tourism (Squamish 2020a). The proposed Stawamus Corridor Expansion is not anticipated to increase disruption of businesses beyond what was assessed in the EAC Application. Existing conditions and potential positive and negative direct and indirect effects on the economy for the proposed amendment are comparable to those provided in the EAC Application. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Economy VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Economy VC remain the same.

11.3.2 Coquitlam Twinning

The Coquitlam Twinning overlaps the Westwood Plateau Golf and Country Club from approximately KP 0.9 to KP 1.2 for approximately 3.5 ha. The proposed amendment footprint in this area overlaps with 0.2 ha of the golf course property and does not include any of the fairway or greens. The Coquitlam Twinning is located approximately 1 km from the nearest commercially zoned area at KP 0, and 300 m from residential housing between KP 0.7 and KP 1.6 (Coquitlam 2020a). Due to its proximity to areas used for business purposes, the construction of the proposed Coquitlam Twinning has the potential to temporarily disrupt commercial businesses including the golf course, gravel operation, and retail and service providers.

The EAC Application considered potential disruption of Local businesses during construction in the Economic LSA including reduced access, reduced parking, dust, and noise. It is anticipated that the types and extent of temporary disruptions to businesses associated with construction of the Coquitlam Twinning are similar to those considered in the EAC Application. Some land acquisition will be required associated with the proposed Coquitlam Twinning, and land acquired will be compensated in accordance to laws and regulations. As such, the proposed Coquitlam Twinning is not anticipated to increase disruption of businesses beyond what was assessed in the EAC Application. Existing conditions and potential positive and negative direct and indirect effects on the economy for the proposed amendment are comparable to those provided in the EAC Application. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Economy VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Economy VC remain the same.

11.3.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station involves an increase in hp of the additional compressor units from the EAC Application, and no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station. It is not anticipated that the effect of disruption to Local businesses resulting from the proposed amendment will exceed what was identified in the EAC Application. As such, the Eagle Mountain Compressor Station is not anticipated to increase disruption of businesses beyond what was assessed in the EAC Application. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Economy VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Economy VC remain the same.

11.3.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish on the northeast portion of the WLNG project site. The Squamish Compressor Station is located approximately 6 km from the nearest commercially zoned area in the District of Squamish (Squamish 2020b). There are 977 businesses within the District of Squamish in a variety of industries from agriculture, forestry, resource extraction, and manufacturing to construction, retail, professional services, hospitality, and tourism (Squamish 2020a). The proposed Squamish Compressor Station is not anticipated to increase disruption of businesses beyond what was assessed in the EAC Application. Existing conditions and potential positive and negative direct and indirect effects on the economy for the proposed amendment are comparable to those provided in the EAC Application. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Economy VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Economy VC remain the same.

11.4 Economy Cumulative Effects Assessment

11.4.1 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion does not result in a material change to Project-level adverse effects for the Economy VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments in City of Delta, have been identified in the Economy VC RSA (subsection 3.3). While these new reasonably foreseeable developments are within the Economy VC RSA, they are not near the Project.

It is anticipated that some of the activities from existing and reasonably foreseeable development (including those proposed since the EAC Application) within the Economic RSA may overlap in both time and space with the proposed amendment construction phase. However, the potential changes are anticipated to be comparable to those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

Although new reasonably foreseeable developments have been identified in the Economic VC RSA, they are both located in the City of Delta and the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Stawamus Corridor Expansion do not result in any material change to the assessment of potential cumulative adverse effects on the Economy VC.

11.4.2 Coquitlam Twinning

The proposed Coquitlam Twinning does not result in a material change to Project-level adverse effects for the Economy VC. Some previously identified future developments are now in operation, since the

submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Economic VC RSA (subsection 3.3). While these new reasonably foreseeable developments are within the Economy VC RSA, they are not near the Project.

It is anticipated that some of the activities from existing and reasonably foreseeable development (including those proposed since the EAC Application) within the Economic RSA may overlap in both time and space with the proposed amendment construction phase. This may contribute to an increase in noise, dust, and use of access roads, and consequently increase the disruption of Local and Regional businesses. However, the potential changes are anticipated to be comparable to those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

Although new reasonably foreseeable developments have been identified in the Economy VC RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Coquitlam Twinning do not result in any material change to the assessment of potential cumulative adverse effects on the Economy VC.

11.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in a material change to Project-level adverse effects for the Economy VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Economic VC RSA (subsection 3.3). While these new reasonably foreseeable developments are within the Economy VC RSA, they are not near the Project.

It is anticipated that some of the activities from existing and reasonably foreseeable development (including those proposed since the EAC Application) within the Economic RSA may overlap in both time and space with the proposed amendment construction phase. This may contribute to an increase in noise, dust, and use of access roads, and consequently increase the disruption of Local and Regional businesses. However, the potential changes are anticipated to be comparable to those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

Although new reasonably foreseeable developments have been identified in the Economy VC RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Economy VC.

11.4.4 Squamish Compressor Station

The proposed Squamish Compressor Station does not result in a material change to Project-level adverse effects for the Economy VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Economy VC RSA (subsection 3.3). While these new reasonably foreseeable developments are within the Economy VC RSA, they are not near the Project.

It is anticipated that some of the activities from existing and reasonably foreseeable development (including those proposed since the EAC Application) within the Economic RSA may overlap in both time and space with the proposed amendment construction phase. This may contribute to an increase in noise, dust, and use of access roads, and consequently increase the disruption of Local and Regional businesses. However, the potential changes are anticipated to be comparable to those described in Volume 1, Section 11.0 and Volume 2, Appendix 1M of the EAC Application.

Although new reasonably foreseeable developments have been identified in the Economic VC RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Squamish Compressor Station do not result in any material change to the assessment of potential cumulative adverse effects on the Economy VC.

11.5 Employment and Labour Force Effects Assessment

This subsection provides an update to the employment and labour force effects assessment previously presented in subsection 11.6 of the EAC Application (Volume 1, Part B) for each proposed amendment.

The effects assessment presented in subsection 11.6 of the EAC Application did not identify any residual adverse effects for the Employment and Labour Force VC. Due to construction schedule optimization, the peak workforce for the Project as a whole including the proposed amendments under consideration in this update, may be lower than what is presented in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in EAC Application and past addenda prepared for the Project. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects for the Employment and Labour Force VC during any phase of the Project.

11.5.1 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion does not result in a material change to Project-level adverse effects for the Employment and Labour Force VC. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Employment and Labour Force VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Employment and Labour Force VC remain the same.

11.5.2 Coquitlam Twinning

The proposed Coquitlam Twinning does not result in a material change to Project-level adverse effects for the Employment and Labour Force VC. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Employment and Labour Force VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Employment and Labour Force VC remain the same.

11.5.3 Eagle Mountain Compressor Station

The proposed Eagle Mountain Compressor Station does not result in a material change to Project-level adverse effects for the Employment and Labour Force VC. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Employment and Labour Force VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Employment and Labour Force VC remain the same.

11.5.4 Squamish Compressor Station

The proposed Squamish Compressor Station does not result in a material change to Project-level adverse effects for the Employment and Labour Force VC. Therefore, the proposed amendment does not materially change the identification, characterization, and assessment of potential adverse effects on the Employment and Labour Force VC as provided in the EAC Application. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Employment and Labour Force VC remain the same.

11.6 Employment and Labour Force Cumulative Effects Assessment

In alignment with Volume 1, Part B, Section 3.0, subsection 3.9.3 Cumulative Effects Assessment Methodology, if an Environmental, Social, Economic, Heritage, or Health VCs evaluated in the effects assessment had no residual adverse effects predicted, no further analysis of that VC is required in the cumulative effects assessment. As there are no likely residual adverse effects, further assessment for residual and cumulative adverse effects is not required for the Employment and Labour Force VC.

11.7 References

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12. Community and Regional Infrastructure and Services

The assessment of potential adverse effects of the Project on the Community Utilities and Services VC, Transportation Infrastructure VC, and Community VC is provided in Section 12.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Community Utilities and Services VC, Transportation Infrastructure VC, and Community VC that may result from the proposed amendments, as described in subsection 1.1.

The Community Utilities and Services VC included consideration of interactions and potential effects related to: emergency services, health care services, recreational facilities, accommodation, waste management, social services, and advanced education facilities. The Transportation Infrastructure VC included consideration of interactions and potential effects related to: road infrastructure and use patterns and airports and railways. The Community VC included consideration of interactions and potential effects related to community quality of life.

12.1 Spatial Boundaries

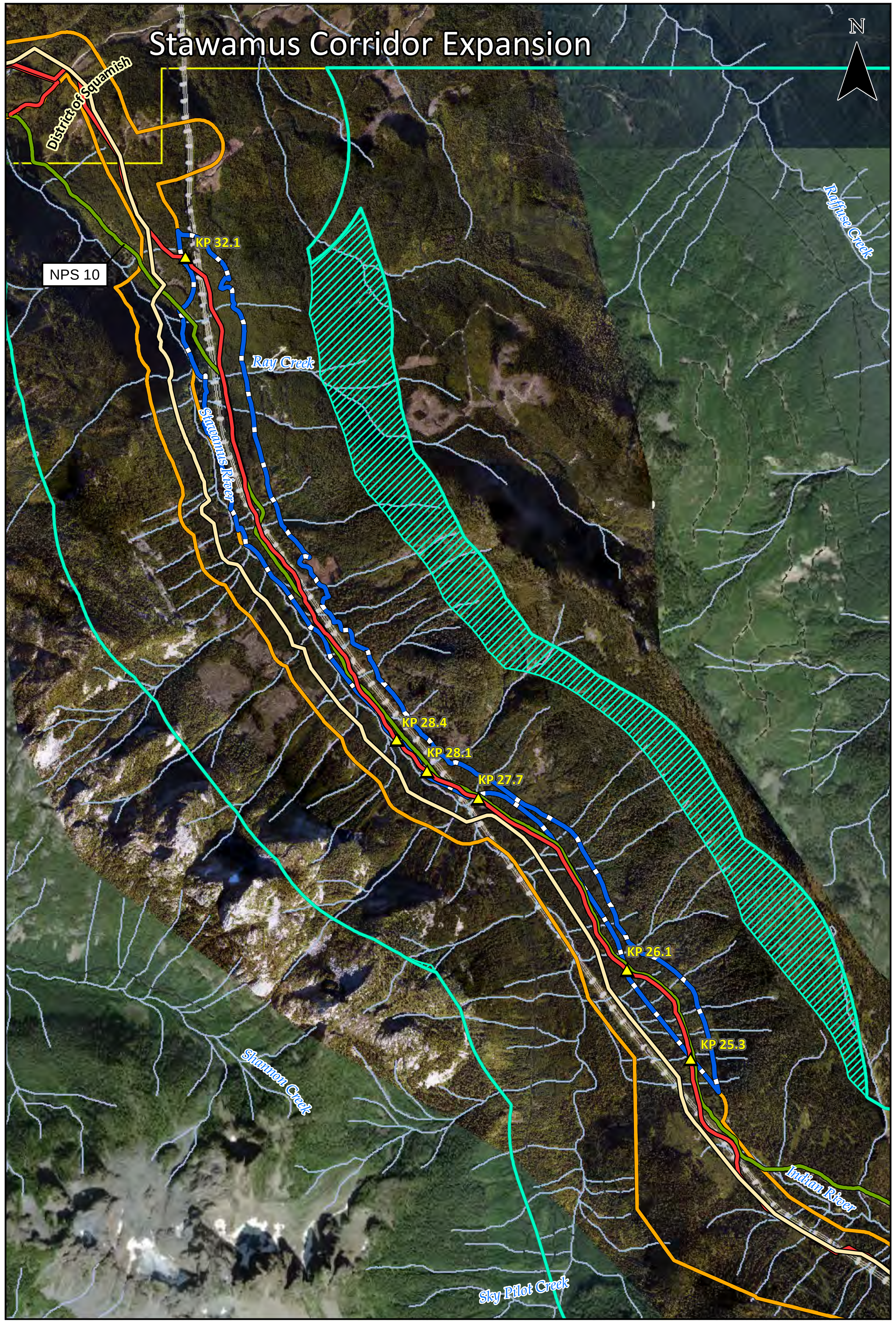
The spatial boundaries used in the community and Regional infrastructure and services effects assessment are provided in subsection 12.2.1 of the EAC Application (Volume 1, Part B). Figure 12-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Community and Regional Infrastructure and Services LSA assessed in Section 12.0 of the EAC Application:

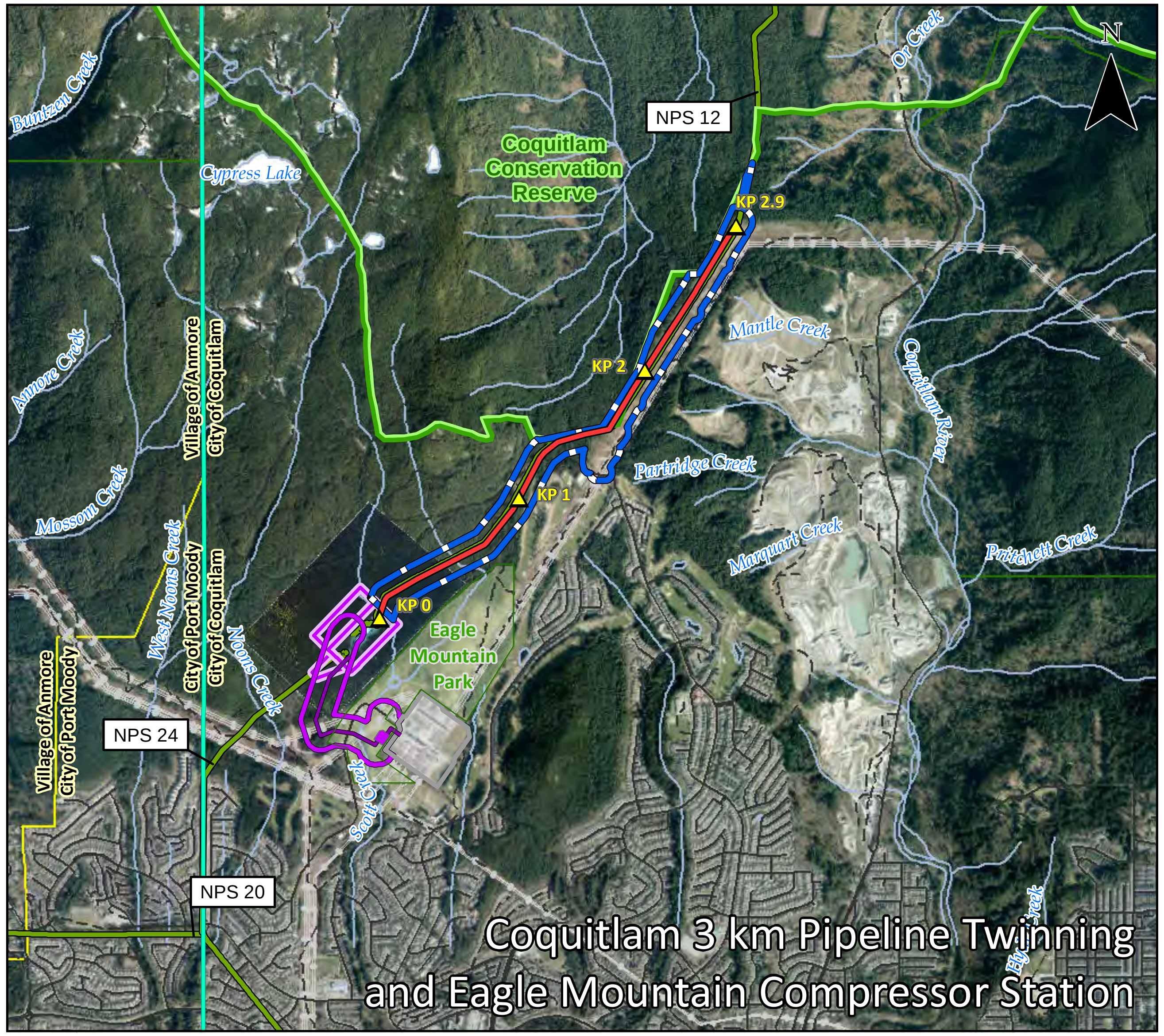
- **Stawamus Corridor Expansion** – Does result in a minor expansion to the Community and Regional Infrastructure and Services LSA assessed in Section 12.0 of the EAC Application due to the change in the 2 km band centred on the Project Footprint centreline (that is, 1 km on both sides of the Project Footprint centreline).
- **Coquitlam Twinning** – Does result in a minor expansion to the Community and Regional Infrastructure and Services LSA assessed in Section 12.0 of the EAC Application due to the change in the 2 km band centred on the Project Footprint centreline (that is, 1 km on both sides of the Project Footprint centreline).
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Community and Regional Infrastructure and Services LSA assessed in Section 12.0 of the EAC Application, as it does not result in a change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station.
- **Squamish Compressor Station** – Does not result in an expansion to the Community and Regional Infrastructure and Services LSA assessed in Section 12.0 of the EAC Application, as it is located within the District of Squamish.

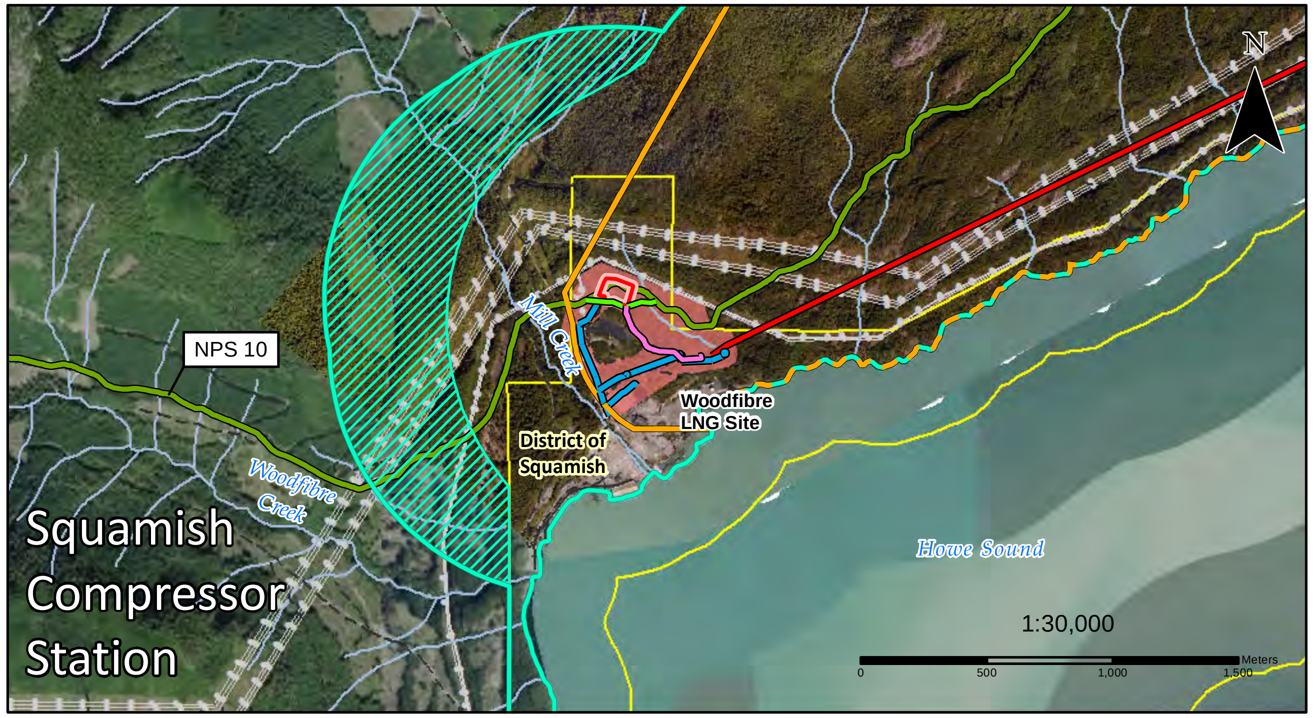
The proposed amendments do not result in an expansion of the Community and Regional Infrastructure and Services RSA, as all proposed amendment components are in Regional Districts previously included in the EAC Application study area.

12.2 Existing Conditions

This subsection provides an update to existing conditions pertinent to the Community Utilities and Services VC, Transportation Infrastructure VC, and Community VC. In some cases, the Regional and Municipal social and community characteristics have changed since the EAC Application and a summary of select characteristics has been provided to reflect these changes. Select characteristics were chosen based on factors most likely to interact with the proposed amendments and where updated information is likely to be available pertinent to the proposed amendment areas, including population, housing and commercial accommodation, emergency services, waste management, and community quality of life. This summary focuses on differences in existing conditions when assessing the proposed amendments relative to the assessment provided in the EAC Application.







FORTIS BC

October 2020

FIGURE 12-1

COMMUNITY AND REGIONAL INFRASTRUCTURE AND SERVICES STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Community Local Study Area
- Community LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

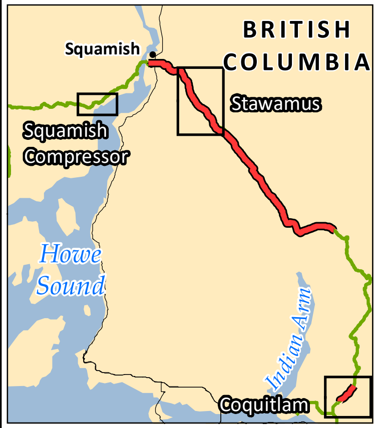
JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor: CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL	Checked By: DJN



12.2.1 Community Utilities and Services

12.2.1.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located within the SLRD Electoral Area D, and approximately 640 m from the residential area Valleycliffe within the District of Squamish at KP 32.1 (Squamish 2020e). Given the proximity to the District of Squamish, it is anticipated that the proposed amendment will interact with some community utilities and services in the District of Squamish, particularly related to workforce. The most recent year with statistical data available is 2016. In 2016 the population of the SLRD Electoral Area D was 1,057, which was a 26.4 percent increase from 2011 (Statistics Canada 2017c). In 2016, the number of privately occupied dwellings was 439 (Statistics Canada 2017c). In 2016, the median monthly shelter cost for owned dwellings was $1,746, while the median monthly cost of rental housing was $1,438 (Statistics Canada 2017c; SLRD 2020b). The percentage of households spending 30 percent or more of their total income on housing was 28.6 percent (Statistics Canada 2017c).

In the District of Squamish, the vacancy rate has remained unchanged from what was presented in the EAC Application at 0.3 percent (CMHC 2019). An internet search conducted in 2020 identified over 450 commercial accommodation units and 300 private short-term rentals in the District of Squamish area. New developments for accommodation and housing in District of Squamish have been identified since 2016, including the Garibaldi at Squamish Resort and a 76-unit low-to-moderate income rental apartment building in Dentville (Squamish 2020a). It is anticipated that there will be seasonal fluctuations in the availability of commercial accommodation in the District of Squamish area due to tourism.

The community utilities and services pertinent to the District of Squamish (such as, emergency services, health care services, recreational facilities, accommodation, waste management, social services, advanced education facilities) were described in the Economic, Social, and Health TDR (Volume 2, Section 1M). Fire services in the southern Region of the SLRD are dispatched by E-Comm in Vancouver to fire halls in Britannia Beach, Garibaldi, Birken, Pemberton, Whistler, and District of Squamish, with Squamish Fire Hall 2 being the closest to the Stawamus Corridor Expansion (SLRD 2020a; Squamish 2020c).

Protective services in the District of Squamish include fire rescue, RCMP, and the Squamish Emergency Program (Squamish 2020d). Currently, there is a need in District of Squamish to partner with other jurisdictions including Federal and Provincial safety networks (Squamish 2020d). District of Squamish has two ambulances that operate 7 days a week, however periodic staffing challenges can result in the ambulances being out of service from time to time (Chua 2019). BC Emergency Health Services has a Regional deployment model that enables ambulances to be sent from one community to another, however the geographic Region is large, and this can result in shortages in some areas (Chua 2019).

Health services in District of Squamish are predominantly provided through Squamish General Hospital, Hilltop House, Squamish Community Health Centre, and Squamish Mental Health and Substance Use Services (VCH 2020).

The SLRD partners with member Municipalities to manage solid waste disposal. In the District of Squamish, solid waste is managed by Green for Life Environmental and is diverted to either the Squamish Landfill or the Recycling Centre (SLRD 2020c).

The volume of service and commercial accommodation needs for the proposed amendment are anticipated to be consistent with those presented in the EAC Application and past addenda. Due to construction schedule optimization, the peak workforce may be lower than what is presented in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in EAC Application and past addenda prepared for the Project. Worker accommodation is anticipated to include both commercial and construction camp accommodation. The construction camp included in the Project EAC and assessed as part of Addendum 2 filed in September 2015 will include medical personnel, supplies, and equipment to respond to medical needs.

12.2.1.2 Coquitlam Twinning

The proposed Coquitlam Twinning is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. The population of City of Coquitlam and the number of private dwellings has increased since the EAC Application. In 2016, the population of the City of Coquitlam was 139,284, which was a 9.8 percent increase since 2011. The number of privately occupied dwellings was 51,325, which was an increase of 12.6 percent since 2011. The 2016 census listed a median monthly shelter cost for owned dwellings of $1,417, an 8.1 percent increase from 2011 (Statistics Canada 2017a). The median monthly payment for rental housing in 2016 was $1,136, a 19.7 percent increase from 2011 (Statistics Canada 2017a). The percentage of households spending 30 percent or more of their total income on dwelling costs was 25.6 percent, which has decreased from 32.7 percent in 2011 (Statistics Canada 2017a).

In the October 2019, the City of Coquitlam had a 0.9 percent rental vacancy rate, down from 3.2 percent in October of 2013 (CMHC 2019). No additional commercial accommodation units were identified since the EAC Application.

The community utilities and services pertinent to the City of Coquitlam area (such as, emergency services, health care services, recreational facilities, accommodation, waste management, social services, advanced education facilities) were described in the EAC Application. Public safety services are provided by the City of Coquitlam, BC Ambulance Service, and the Coquitlam RCMP.

Coquitlam Fire and Rescue responds to fires, medical emergencies, motor vehicle incidents, public-assistance requests, and animal rescues. Coquitlam Fire and Rescue can also respond to wild-land urban interface fire-fighting and Chemical, Biological, Radiation, Nuclear, and Explosives incidents. Dispatch services are provided by E-Comm and can mobilize services from any of the four fire halls in the City of Coquitlam and one auxiliary fire hall location (Coquitlam 2020c).

The Coquitlam RCMP serve the communities of Anmore, Belcarra, Coquitlam, Port Coquitlam, and the Kwikwetlem First Nation, covering a jurisdiction of almost 200 km^2 (RCMP 2018). The Coquitlam RCMP Main Detachment is located within the City of Coquitlam. Two additional Community Police Stations are located within the City of Coquitlam.

There are two BC Ambulance Service stations within the City of Coquitlam (BC Emergency Health Services 2020). Fraser Health provides health care services to the City of Coquitlam including long-term care, assisted living, dialysis, mental health, and various rehabilitation services (Fraser Health Authority 2018). The Eagle Ridge Hospital provides 24/7 emergency care and other medical services within the City of Coquitlam.

The City of Coquitlam and Metro Vancouver manage the City's solid waste. Metro Vancouver collects and treats the Region's wastewater in one of five wastewater treatment plants (Metro Vancouver 2019).

Due to construction schedule optimization, the peak workforce may be lower than what is presented in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in EAC Application and past addenda prepared for the Project. In the City of Coquitlam, commercial accommodation will be used to house the construction-related workforce.

12.2.1.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. Due to construction schedule optimization, the peak workforce may be lower than what is presented in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in EAC Application and past addenda prepared for the Project. In the City of Coquitlam, commercial accommodation will be used to house the construction-related workforce.

For updated utilities and services setting information for the City of Coquitlam, refer to the statistics presented in subsection 12.2.1.2.

12.2.1.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish. The population of the District of Squamish and the number of private dwellings has increased since the EAC Application.

Population and housing information for the District of Squamish has been provided as follows. For updated setting information on other utilities and services for the District of Squamish, refer to the statistics presented in subsection 12.2.1.1.

In 2016, the population of the District of Squamish was 19,512, which was a 13.7 percent increase since 2011 as presented in the EAC Application (Statistics Canada 2017b). The number of privately occupied dwellings was 7,260, an increase of 11.3 percent since 2011 (Statistics Canada 2017b). The median monthly shelter cost of owned dwellings was $1,752 in Squamish, a 10.6 percent increase from 2011 (Statistics Canada 2017b). The median monthly rental housing costs was $1,201, a 23.3 percent increase from 2011 (Statistics Canada 2017b). The percentage of households spending 30 percent or more of their total income on dwelling costs has remained nearly the same at 36.4 percent, which was 36.3 percent in 2011 (Statistics Canada 2017b). In the District of Squamish, the vacancy rate has remained unchanged from what was presented in the EAC Application at 0.3 percent (CMHC 2019).

The volume of service and commercial accommodation needs for the proposed amendment are anticipated to be consistent with those presented in the EAC Application and past addenda. Due to construction schedule optimization, the peak workforce may be lower than what is presented in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in EAC Application and past addenda prepared for the Project. Worker accommodation may include both commercial and construction camp accommodation. The construction camp included in the Project EAC and assessed as part of Addendum 2 filed in September 2015 will include medical personnel, supplies, and equipment to respond to medical needs.

12.2.2 Transportation and Infrastructure

12.2.2.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is in the SLRD Electoral Area D and approximately 640 m south of the residential area of Valleycliffe within the District of Squamish at KP 32.1 (Squamish 2020e). Access to the Stawamus Corridor Expansion is by Local and resource roads, including the Mamquam River Forest Service Road and the Stawamus-Indian River Road. Both recreational and industrial users utilize these roads. Road infrastructure and use patterns as well as rail and airport use for the Stawamus Corridor Expansion are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part B).

12.2.2.2 Coquitlam Twinning

The proposed Coquitlam Twinning is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. The access routes to the Eagle Mountain Compressor Station, which is KP 0 of the Coquitlam

Twinning, are owned and maintained by the City of Coquitlam. Highways, arterial, and collector roads in the surrounding area will be used to transport equipment, supplies, and workers during construction. Road infrastructure and use patterns as well as rail and airport use for the Coquitlam Twinning are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part B). However, the volume of Project-related traffic is anticipated to increase on Eagle Mountain Drive and Plateau Boulevard.

12.2.2.3 Eagle Mountain Compressor Station

The existing Eagle Mountain Compressor Station is located within the neighbourhood of Westwood Plateau in northwest Coquitlam. The Eagle Mountain Compressor Station is accessible via Eagle Mountain Drive. The access routes to the Eagle Mountain Compressor Station are owned and maintained by the City of Coquitlam. Road infrastructure and use patterns, as well as rail and airport use for the Eagle Mountain Compressor Station are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part B).

12.2.2.4 Squamish Compressor Station

There are no public access roads within the District of Squamish to access the proposed Squamish Compressor Station site. A marine dock at Woodfibre will be constructed as part of the WLNG project and will be used by FortisBC during the construction of the Squamish Compressor Station to transport materials, equipment, and personnel. Section 13, Land and Resource includes potential effects related to use of navigable waterways.

12.2.3 Community

Due to construction schedule optimization, the peak workforce for the Project may be lower than what is presented in in the EAC Application. However, this Amendment Application adopted a conservative approach and anticipates that the Project construction workforce will be consistent with what was presented in the EAC Application. Worker accommodation may include both commercial and construction camp accommodation. The Coquitlam Twinning will use commercial accommodation in the City of Coquitlam to house the temporary construction workforce.

12.2.3.1 Stawamus Corridor Expansion

Limited new information regarding changes in select community quality of life indicators for the SLRD have been identified since the EAC Application. According to the Squamish Community Foundation's Vital Signs Report, in 2015/16, 78.8 percent of people surveyed reported a strong or somewhat strong sense of community belonging, an increase of 3.4 percent from 2007/08. The same report indicated that 93 percent of people responded that they were satisfied or very satisfied with their overall life, a slight decrease of 1.6 percent since 2009/10 (Squamish Community Foundation 2017).

In 2018 Squamish had a crime severity index of 67.2 and a violent crime severity index of 92.0 (Statistics Canada 2020a). The crime rate in Squamish was 6,477.9 per 100,000 population, with a total of 1,425 incidents, a decrease from previous years (Statistics Canada 2020b). Overall, crime rates in Squamish have fallen over the last 5 years (Gaudet 2018; Statistics Canada 2020b).

District of Squamish has a rich arts, culture, and heritage scene, with activities and events hosted nearly every weekend during the summer (Squamish Community Foundation 2017). In 2017, there were 52 permitted events in District of Squamish including parades, concerts, festivals, and street parties. District of Squamish has 15 recreational outlets and 11 cultural amenities (Trade and Invest BC 2020).

As discussed in previous sections, the Project workforce including the proposed amendments, is anticipated to be consistent with what was presented in the EAC Application and past addenda prepared for the Project. Worker accommodation may include both commercial and construction camp accommodation.

12.2.3.2 Coquitlam Twinning

In the 2019 Coquitlam Citizen Survey, 98 percent of participants ranked their quality of life as good or very good (Coquitlam 2020b). The survey also indicated that 48 percent of participants said that the quality of life in Coquitlam has stayed the same over the past 5 years and 33 percent said that it has improved (Coquitlam 2020b). Only 5 percent of participants listed crime as an important Local issue (Coquitlam 2020b). In 2018 Coquitlam had a crime severity index of 53.5 and a violent crime severity index of 42.4 (Statistics Canada 2020a). The crime rate in Coquitlam was 5,288.7 per 100,000 population, with a total of 7,904 incidents (Statistics Canada 2020b). While total crime increased in the Province by 3.2 percent in 2018, it decreased in Coquitlam by 4.5 percent (McKenna 2019).

Many festivals and events are held in the City of Coquitlam every year, including multicultural festivals, arts events, live concerts, and seasonal celebrations (Coquitlam 2020a). The City of Coquitlam has 13 recreational facilities and 8 cultural amenities (EDCD 2018).

As discussed in previous sections, the Project workforce including the proposed amendments, is anticipated to be consistent with what was presented in the EAC Application and past addenda prepared for the Project. Although no additional workforce is required, construction of the proposed amendment may result in a temporary increase of nuisance factors (such as, dust and noise). The Coquitlam Twinning will use accommodation within Metro Vancouver to house the temporary construction workforce.

12.2.3.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is located within the City of Coquitlam. See subsection 12.2.3.2 for updated information on community quality of life and socio-economic indices for the City of Coquitlam.

No additional workers are required for the Eagle Mountain Compressor Station and nuisance conditions (such as, noise and dust during construction) are not anticipated to materially change from those discussed in the EAC Application.

12.2.3.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish. See subsection 12.2.3.1 for updated information on community quality of life and socio-economic indices for the District of Squamish.

As discussed in previous sections, the Project workforce including the proposed amendments, is anticipated to be consistent with what was presented in the EAC Application and past addenda prepared for the Project. Worker accommodation may include both commercial and construction camp accommodation.

12.3 Community Utilities and Services Effects Assessment

This subsection provides and update to the community utilities and services effects assessment previously presented in subsection 12.5 of the EAC Application (Volume 1, Part B) for each proposed amendment.

12.3.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion does not change the anticipated Project workforce or utility and services demands associated with overall Project construction. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a

result, the conclusions identified in the EAC Application with respect to community utilities and services remain the same.

12.3.2 Coquitlam Twinning

Construction of the Coquitlam Twinning will not require additional workers beyond what is presented in the EAC Application. Although Local workers will be utilized to the extent feasible, temporary workers may use community utilities and services within the Community and Regional Infrastructure and Services LSA and RSA, particularly in the City of Coquitlam, during construction.

It is anticipated that where temporary workers are required, there is sufficient capacity in the City of Coquitlam to accommodate the change in workforce and associated use of community utilities and services. Construction of the Coquitlam Twinning is expected to result in increase in solid, liquid, and hazardous waste associated with construction and the temporary workforce. Waste from construction of the Coquitlam Twinning could increase demand on landfills, transfer stations, and wastewater treatment facilities.

The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Overall, the change in community utilities and services is not considered material and does not change the assessment of potential adverse effects, mitigation, or characterization of residual effects. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to community utilities and services remain the same.

12.3.3 Eagle Mountain Compressor Station

The proposed Eagle Mountain Compressor Station amendment does not change the anticipated workforce or utility/services demands associated with its construction. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to community utilities and services remain the same.

12.3.4 Squamish Compressor Station

Locating the Squamish Compressor Station on the WLNG project site will not change the workforce requirements, nor the types of community utilities and services used during construction. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to community utilities and services remain the same.

12.4 Community Utilities and Services Cumulative Effects Assessment

12.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to Project-level adverse effects for Community Utilities and Services VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Consistent with the EAC Application, it is anticipated that some existing activities (such as, residential, and commercial development) and reasonably foreseeable future developments in the Community and Regional Infrastructure and Services RSA may coincide spatially and temporally with Project construction, and cumulatively increase demand on community utilities and services. However, the newly identified reasonably foreseeable developments do not introduce new capacity limitations related to emergency services, health care services, social services, recreational facilities, and waste management beyond what was included in the EAC Application.

In the District of Squamish, the vacancy rate has remained unchanged from what was presented in the EAC Application at 0.3 percent (CMHC 2019). Although the peak Project workforce will be consistent with or less than the estimate in the EAC Application, existing and reasonably foreseeable developments in combination with Project construction could increase demand for short-term accommodation and result in upward pressure on housing costs as concluded in the EAC Application. FortisBC continues to collaborate with the District of Squamish, Squamish Nation, and Tsleil-Waututh Nation on accommodation planning and to discuss concern pertaining to workforce accommodation.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Community Utilities and Services VC.

12.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to Project-level adverse effects for Community Utilities and Services VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Although construction of the proposed amendments will not require additional workforce, construction of the Coquitlam Twinning may incrementally increase demand on certain community utilities or services (for example, disposal of construction materials). However, these increases are minimal in the context of the Project. Increased demand on emergency services, health care services, social services, recreational facilities, accommodation, and waste management within the Community and Regional Infrastructure and Services RSA associated with the influx on temporary workers was previously assessed in the EAC Application and the proposed amendments do not result in any material change to Project-level adverse effects for the Community Utilities and Services VC.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Community Utilities and Services VC.

12.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to Project-level adverse effects for Community Utilities and Services VC. Some previously identified future developments are now in

operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Community Utilities and Services VC.

12.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to Project-level adverse effects for Community Utilities and Services VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Consistent with the EAC Application, it is anticipated that some existing activities (such as, residential, and commercial development) and reasonably foreseeable future developments in the Community and Regional Infrastructure and Services RSA may coincide spatially and temporally with Project construction, and cumulatively increase demand on community utilities and services. However, no new capacity limitations have been identified related to emergency services, health care services, social services, recreational facilities, and waste management.

In the District of Squamish, the vacancy rate has remained unchanged from what was presented in the EAC Application at 0.3 percent (CMHC 2019). Although the peak Project workforce will be consistent or less than the estimate in the EAC Application, existing and reasonably foreseeable developments in combination with Project construction could increase demand for short-term accommodation and result in upward pressure on housing costs as concluded in the EAC Application. FortisBC continues to collaborate with the District of Squamish, Squamish Nation, and Tsleil-Waututh Nation on accommodation planning and to discuss concerns pertaining to workforce accommodation.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Community Utilities and Services VC.

12.5 Transportation Infrastructure Effects Assessment

This subsection provides an update to the transportation infrastructure effects assessment previously presented in subsection 12.6 of the EAC Application (Volume 1, Part B) for each proposed amendment.

12.5.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located adjacent to the existing corridor and will use the access roads identified in the EAC Application. The forest service roads used for construction may require upgrades for pipeline construction, as was previously considered in the EAC Application. However, the proposed Stawamus Corridor Expansion is not anticipated to increase Project-related traffic or physical disturbance to highways and Local roads beyond what was assessed in the EAC Application. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. No positive effects to the Transportation VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to transportation infrastructure remain the same.

12.5.2 Coquitlam Twinning

The Coquitlam Twinning may result in an increase in the volume of Project-related traffic on Eagle Mountain Drive and Plateau Boulevard. Highways, arterial, and collector roads in the surrounding area will be used to transport equipment, supplies, and workers during construction. Although additional volume of Project-related traffic and use of transportation infrastructure is anticipated during the construction of the Coquitlam Twinning, the types, use, and capacity of the transportation infrastructure are comparable to those presented in the EAC Application. The proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. No positive effects to the Transportation VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to the transportation infrastructure remain the same.

12.5.3 Eagle Mountain Compressor Station

The proposed amendment does not change the anticipated road infrastructure and use patterns beyond what was assessed in the EAC Application. The existing conditions for the proposed amendment are the same as the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. No positive effects to the Transportation VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to transportation infrastructure remain the same.

12.5.4 Squamish Compressor Station

There are no public access roads within the District of Squamish to access the proposed Squamish Compressor Station siting area. A marine dock at Woodfibre will be constructed as part of the WLNG project and will be used by FortisBC during the construction of the Squamish Compressor Station to transport materials, equipment, and personnel. Section 13, Land and Resource includes potential effects related to use of navigable waterways. The existing conditions for the proposed amendment are the same as the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. No positive effects to the Transportation VC were identified in the EAC Application or this Amendment Application. As a result, the conclusions identified in the EAC Application with respect to transportation infrastructure remain the same.

12.6 Transportation and Infrastructure Cumulative Effects Assessment

12.6.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Transportation and Infrastructure VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Construction of the proposed amendments will use the highways and resource roads indicated in the EAC Application. Transportation use and routes are not expected to change the Project-level adverse effects on transportation infrastructure.

The road transportation system in the Community and Regional Infrastructure and Services RSA is used by residents, tourists, and industry. Cumulative effects on road infrastructure and use patterns are considered in the context of increasing residential and commercial development.

Some of the reasonably foreseeable developments may overlap temporally and spatially with Project construction activities. These conditions are consistent with the conditions presented in the EAC Application. Updated reasonably foreseeable developments are provided in subsection 3.3. The levels of development have remained relatively consistent with the conditions described in the EAC Application, considering both small residential developments and large developments (such as, the Garibaldi at Squamish development). Developments in the Community and Regional Infrastructure and Services RSA will likely use Regional highways and roads for the movement of materials and people. However, these transportation systems are designed to handle fluctuations and increases in demand.

The implementation of mitigation measures presented in the EAC Application (such as, the use of multi-passenger vehicles to transport workers to and from site) will reduce the Project's contribution to cumulative change in traffic on highways and Local roads in the Community and Regional Infrastructure and Services RSA.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Transportation and Infrastructure VC.

12.6.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Transportation and Infrastructure VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Construction of the proposed amendment will use highways and roads within the City of Coquitlam and traffic delays and reroutes may occur during construction. The Coquitlam Twinning may present minor increases in traffic and changes in transportation use and routes. However, they do not change the Project-level adverse effects on transportation infrastructure.

The road transportation system in the Community and Regional Infrastructure and Services RSA is used by residents, tourists, and industry. Cumulative effects on road infrastructure and use patterns are considered in the context of increasing residential and commercial development. Some of the reasonably foreseeable developments may overlap temporally and spatially with Project construction activities. These conditions are consistent with the conditions presented in the EAC Application. Updated reasonably foreseeable developments are provided in subsection 3.3. The levels of development have remained relatively consistent with the conditions described in the EAC Application, considering both small residential developments and large developments. Developments in the Community and Regional Infrastructure and Services RSA will likely use Regional highways and roads for the movement of materials and people. However, these transportation systems are designed to handle fluctuations and increases in demand.

The implementation of mitigation measures presented in the EAC Application (such as, the use of multi-passenger vehicles to transport workers to and from site) will reduce the Project's contribution to cumulative change in traffic on highways and Local roads in the Community and Regional Infrastructure and Services RSA.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any

material change to the assessment of potential cumulative adverse effects on the Transportation and Infrastructure VC.

12.6.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Transportation and Infrastructure VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

The road transportation system in the Community and Regional Infrastructure and Services RSA is used by residents, tourists, and industry. Cumulative effects on road infrastructure and use patterns are considered in the context of increasing residential and commercial development. Some of the reasonably foreseeable developments may overlap temporally and spatially with Project construction activities. These conditions are consistent with the conditions presented in the EAC Application. Updated reasonably foreseeable developments are provided in subsection 3.3. The levels of development have remained relatively consistent with the conditions described in the EAC Application, considering both small residential developments and large developments. Developments in the Community and Regional Infrastructure and Services RSA will likely use Regional highways and roads for the movement of materials and people. However, these transportation systems are designed to handle fluctuations and increases in demand.

The implementation of mitigation measures presented in the EAC Application (such as, the use of multi-passenger vehicles to transport workers to and from site) will reduce the Project's contribution to cumulative change in traffic on highways and Local roads in the Community and Regional Infrastructure and Services RSA.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Transportation and Infrastructure VC.

12.6.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for Transportation and Infrastructure VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, and new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA (subsection 3.3).

Construction of the Squamish Compressor Station will use highways and barge to transport materials, equipment, and workers. The proposed amendment does present changes in transportation use and routes. However, it does not change the Project-level adverse effects on transportation infrastructure.

The road transportation system in the Community and Regional Infrastructure and Services RSA is used by residents, tourists, and industry. Cumulative effects on road infrastructure and use patterns are considered in the context of increasing residential and commercial development. Some of the reasonably foreseeable developments may overlap temporally and spatially with Project construction activities. These conditions are consistent with the conditions presented in the EAC Application. Updated reasonably foreseeable developments are provided in subsection 3.3. The levels of development have remained relatively consistent with the conditions described in the EAC Application, considering both small residential developments and large developments (such as, the Garibaldi at Squamish development). Developments in the Community and Regional Infrastructure and Services RSA will likely use Regional highways and roads for the movement of materials and people. However, these transportation systems are designed to handle fluctuations and increases in demand.

The implementation of mitigation measures presented in the EAC Application (such as, the use of multi-passenger vehicles to transport workers to and from site) will reduce the Project's contribution to cumulative change in traffic on highways and Local roads in the Community and Regional Infrastructure and Services RSA.

Although new reasonably foreseeable developments have been identified in the Community and Regional Infrastructure and Services RSA, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the Transportation and Infrastructure VC.

12.7 Community Effects Assessment

This subsection provides an update to the community effects assessment previously presented in subsection 12.7 of the EAC Application (Volume 1, Part B) for each proposed amendment.

12.7.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion does not result in an increase in anticipated peak workforce during any phase of the Project compared to what is provided in the EAC Application. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Community VC remain the same.

12.7.2 Coquitlam Twinning

The Coquitlam Twinning does not result in an increase in anticipated peak workforce during any phase of the Project compared to what is provided in the EAC Application. Temporary nuisance conditions (such as, noise and dust) may incrementally increase in this new area associated with construction of the proposed amendment. However, such potential effects were addressed in the EAC Application. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Community VC remain the same.

12.7.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station involves an increase in hp of the additional compressor units from the EAC Application, and no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station. The proposed amendment does not result in an increase in anticipated peak workforce during any phase of the Project compared to what is provided in the EAC Application. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not materially change the assessment of potential adverse effects, mitigation, or characterization of residual effects on the Community VC during any phase of the Project. With the

addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Community VC remain the same.

12.7.4 Squamish Compressor Station

The Squamish Compressor Station is not expected to result in an increase in anticipated peak workforce during any phase of the Project compared to what is provided in the EAC Application. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. The potential direct and indirect interactions resulting from the proposed amendment are the same as those described in the EAC Application. Therefore, the proposed amendment does not materially change assessment of potential adverse effects, mitigation, or characterization of residual effects on the Community VC during any phase of the Project. With the addition of the proposed amendment, it is anticipated that the Project benefits (includes positive effects both direct and indirect) will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). As a result, the conclusions identified in the EAC Application with respect to the Community VC remain the same.

12.8 Community Cumulative Effects Assessment

12.8.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Community VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Stawamus Corridor Expansion. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Community VC.

12.8.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Community VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Coquitlam Twinning. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Community VC.

12.8.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Community VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Eagle Mountain Compressor Station. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects

remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Community VC.

12.8.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Community VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). New reasonably foreseeable developments have been identified; however, both are in the City of Delta outside of the Community RSA for the Squamish Compressor Station. Activities associated with the proposed amendment acting in combination with reasonably foreseeable developments may cause disruptions to community quality of life, however the assessment of effects remains consistent with the EAC Application. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Community VC.

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13. Land and Resources Use

The assessment of potential adverse effects of the Project on the Land and Resources Use VC is provided in Section 13.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Land and Resources Use VC that may result from the proposed amendments, as described in subsection 1.1.

13.1 Spatial Boundaries

The spatial boundaries used in the Land and Resources Use effects assessment are in subsection 13.2.1 of the EAC Application (Volume 1, Part B) and are summarized as follows. Figure 13-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Land and Resources Use LSA assessed in Section 13.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Results in an expansion to the Land and Resources Use LSA assessed in subsection 13.2.1 of the EAC Application.
- **Coquitlam Twinning** – Results in an expansion to the Land and Resources Use LSA assessed in subsection 13.2.1 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Land and Resources Use LSA assessed in subsection 13.2.1 of the EAC Application.
- **Squamish Compressor Station** – Results in an expansion to the Land and Resources Use LSA assessed in subsection 13.2.1 of the EAC Application.

13.2 Existing Conditions

The existing conditions for the Land and Resources Use VC are provided in subsection 13.4 of the EAC Application (Volume 1, Part B) and in the Economic, Social, and Health TDR (Volume 2, Appendix 1M). Existing land and resources use conditions in the proposed amendment footprint and Land and Resources Use LSA and RSA are summarized in this subsection.

For the following Land and Resources Use KIs of the existing conditions for the proposed amendments are comparable to the existing conditions assessed in the EAC Application (Volume 1, Part B, Section 13.0).

- Human habitation
- Consistency with land use plans
- Visual aesthetics
- Parks and Protected Areas
- Recreational use
- Recreational hunting, fishing, and gathering
- Commercial recreation and tourism
- Forestry
- Mineral and subsurface resources
- Linear infrastructure
- Navigability of waterways

One KI, contaminated sites in relation to the Squamish Compressor Station, is considered a material change in existing conditions from the EAC Application as new Areas of Environmental Concern (AECs) not previously included are present within the Squamish Compressor Station siting area and not present at the Mount Mulligan site.

Table 13-1 includes a description of the existing conditions for each KI within the proposed amendment corridor, Squamish Compressor Station siting area, Land and Resources Use LSA, and RSA for each proposed amendment.

Table 13-1. Existing Conditions for Land and Resources Use Related to the Key Indicators for the Proposed Amendments

Key Indicator	Existing Conditions
Human habitation	The Land and Resources Use LSA includes the following Municipalities: the District of Squamish; the RMOW; and the City of Coquitlam. The proposed amendments do not result in interactions with Municipalities not previously included in the EAC Application. **Stawamus Corridor Expansion:** In the District of Squamish, there are lands zoned as residential located approximately 640 m north of KP 32.1, in the neighbourhood of Valleycliffe (Squamish 2020). **Coquitlam Twinning:** In northwest Coquitlam, there are lands zoned as residential located approximately 300 m to the south of KP 1.6 of the Coquitlam Twinning (Coquitlam 2020). **Eagle Mountain Compressor Station:** In Northwest Coquitlam, there are lands zoned as residential located approximately 650 m to the southeast of the existing Eagle Mountain Compressor Station (Coquitlam 2020). **Squamish Compressor Station:** There are no permanent residents in proximity of the Squamish Compressor Station siting area. The nearest occupied location is 5.5 km east directly across Howe Sound at Darrell Bay, and downtown Squamish is over 7.2 km to the northeast (Squamish 2020).
Consistency with land use plans	Consistency with land use plans applicable to the Project are described in the EAC Application (Volume 1, Part B, Section 13.0). Land use plans applicable to the proposed amendments were reviewed and a summary of any changes to these land use plans since the EAC Application filing is provided as follows. **All proposed amendments:** The Sea to Sky Clean Air Society introduced the Air Quality Management Plan Implementation Framework in 2015 (Sea to Sky Clean Air Society 2015). The Sea to Sky Airshed covers the full extent of the Project and proposed amendments. The Implementation Framework guides implementation of the Air Quality Management Plan outlines short- to long-term strategies for each goal in the Air Quality Management Plan. The Implementation Framework does not discuss actions for industrial proponents. The Tsleil-Waututh Nation CCP was updated in 2015 to integrate more community feedback on health and social planning (Tsleil-Waututh 2010). **Stawamus Corridor Expansion:** The Sea to Sky Land and Resource Management Plan encompasses the entire Project Footprint, except for the Eagle Mountain Compressor Station and Coquitlam Twinning (Government of BC 2019). Finalized in April 2008 (amended in 2009, 2010, and 2013), the Sea to Sky Land and Resource Management Plan identifies land use zones to guide management of resources. The Stawamus Corridor Expansion lies within the All Resource Uses Permitted Zone and the Front Country Zone. The All Resource Uses Permitted Zone permits timber harvesting, mineral, and energy development, and public and commercial recreation. Resource management direction for the Front Country Area includes two primary objectives: visual quality and recreational values. Additional, non-legal objectives within the Sea to Sky Land and Resource Management Plan that interact with the Stawamus Corridor Expansion include the Squamish Nation Wildlife Focus Area for Elk, GBPU boundaries, and the Squamish Forest District (Government of BC 2008). **Eagle Mountain Compressor Station and Coquitlam Twinning:** The City of Coquitlam OCP has been amended since the filing of the EAC Application (Coquitlam 2001). The existing Eagle Mountain Compressor Station and the Coquitlam Twinning are located within the plan boundaries of the Northwest Coquitlam Area Plan. The Northwest Coquitlam Area Plan, Policy D-2 – Zoning, was amended in April 2016. The proposed Eagle Mountain Compressor Station amendment is located on lands zoned ‘civic and major industrial’ while the Coquitlam Twinning is located on lands zoned ‘rural resource’, which allows for some industrial uses. The terminus of the Coquitlam Twinning is located on lands zoned ‘protected resource – watershed’. The Coquitlam Conservation Reserve is managed as a protected watershed for domestic water supply. The Coquitlam Conservation Reserve surrounds Coquitlam Lake which supplies one third of the domestic water supply for Metro Vancouver and is used for hydroelectric power. The following plans are applicable to the management of Coquitlam Conservation Reserve: • The Metro Vancouver Drinking Water Management Plan sets the direction and priority for drinking water initiatives for Metro Vancouver and its member Municipalities. One of the plan’s three goals is to verify sufficient drinking water supply (Metro Vancouver 2011) • The Coquitlam Water Source Water Use Plan (developed by BC Hydro) outlines the existing facility operations for the Coquitlam-Buntzen Project and the water management implications of the Project operations (BC Hydro 2005) **Squamish Compressor Station:** The District of Squamish adopted an updated OCP in June 2018 (Squamish 2017). The OCP is guided by five core goals: resilient, liveable, healthy, connected, engaged. The OCP provides policies and objectives for community services, parks and recreation, environmental stewardship, and neighbourhoods. The Squamish Compressor Station is located on lands zoned ‘heavy industrial’.

Table 13-1. Existing Conditions for Land and Resources Use Related to the Key Indicators for the Proposed Amendments

Key Indicator	Existing Conditions
Visual aesthetics	**Stawamus Corridor Expansion:** The Stawamus Corridor Expansion does not interact with any VLI polygons (Government of BC 2019). **Eagle Mountain Compressor Station and Coquitlam Twinning:** These proposed amendments do not overlap VLI polygons (BC MFLNRORD 2019a). **Squamish Compressor Station:** The Squamish Compressor Station overlaps with 100 percent of VLI polygon 501, which was previously described in the EAC Application (Volume 1, Part B, Section 13.0). The VQO of VLI polygon 501 is to maintain partial retention (1.6 to 7 percent). The Squamish Compressor Station is located within the approved project site for the WLNG facility on previously disturbed land that has been historically used for industrial activities. Therefore, the footprint associated with the Squamish Compressor Station is not considered to alter the visual quality of VLI polygon 501.
Parks and Protected Areas	The proposed amendments do not result in interactions with Parks and Protected Areas not previously included in the EAC Application. **Stawamus Corridor Expansion:** The Stawamus Corridor Expansion is entirely located within the Stawamus Community Watershed and approximately 1.22 km east of the Stawamus Chief Park (BC MEWPS 2011; BC MFLNRORD 2018a). **Eagle Mountain Compressor Station and Coquitlam Twinning**: The existing Eagle Mountain Compressor Station and Coquitlam Twinning are located north of the Eagle Mountain Municipal Park (at its nearest point the Coquitlam Twinning centreline is approximately 0.1 km from KP 0.7). In addition, the Coquitlam Twinning is 860 m west of Pinecone Burke Park (BC MFLNRORD 2018a). **Squamish Compressor Station:** Murrin Provincial Park is located approximately 4 km southeast of the Squamish Compressor Station (across Howe Sound) (BC MFLNRO 2011).
Recreational use including hunting, fishing, gathering, guide outfitting, trapping, commercial recreation, and tourism	**Stawamus Corridor Expansion:** The Stawamus Corridor Expansion is located within the Vancouver, Coast, and Mountains tourism region (Government of BC 2019). A mountain biking trail known as the Mamquam Plunge Connector is located 1,595 m to the north. The trail is mainly used for mountain biking and dirt biking and connects to a network of access roads in the area (Trail Forks 2019). The Sky Pilot Trail Network is located approximately 2,676 m to the west (Government of BC 2019). The Sky Pilot Trail Network is 14.6-km-long and used for hiking, trail running, and nature trips, although it is only recommended for experienced hikers (All Trails 2019). The Stawamus Corridor Expansion is located within Wildlife Management Unit 2-8 and registered trapline area TR0207T001 (Government of BC 2019). As such, it is presumed that hunting activities occur within the area. This proposed amendment does not overlap with any guide outfitting territories (Government of BC 2019). **Eagle Mountain Compressor Station and Coquitlam Twinning**: The Coquitlam Twinning crosses a mountain bike trial (known as 'lung buster') at approximately KP 1.2 the mountain trail bike trail follows the existing FortisBC right-of-way for approximately 0.5 km to KP 1.7. The Tri-Cities Off Road Cycling Association builds and maintains trails in the LSA (Tri-Cities Off Road Cycling Association 2019). The Coquitlam Twinning overlaps the Westwood Plateau Golf and Country Club from approximately KP 0.9 to KP 1.2 for approximately 3.5 ha. The proposed amendment footprint in this area overlaps with 0.2 ha of the golf course property and does not include any of the fairway or greens. The Eagle Mountain Compressor Station and Coquitlam Twinning are located within Wildlife Management Unit 2-8, but do not overlap with any registered traplines or guide outfitting territories (Government of BC 2019). **Squamish Compressor Station:** As described in the EAC Application, a trail used by experienced hikers begins in the WLNG area and runs northeast to Echo Lake and on to Lake Lovely Water (Dunn pers. comm.). The following commercial recreation and tourism activities occur in the Land and Resources Use RSA, specifically in the vicinity of the Squamish Compressor Station and are previously described in the EAC Application: marine tours, cruises sightseeing, fishing, and kayaking. The Squamish Compressor Station siting area crosses two commercial recreation tenures: 239274 (heli skiing) and R112041 (miscellaneous). This proposed amendment is located near the Howe Sound shoreline and will have limited to no interaction with commercial heli skiing operations. The Squamish Compressor Station siting area is located within Wildlife Management Unit 2-5 (Government of BC 2019). A registered trapping area (TR0205T018) overlaps the entire Squamish Compressor Station siting area and a guide outfitter certificate (200696) overlaps the western portion of the siting area (Government of BC 2019).

Table 13-1. Existing Conditions for Land and Resources Use Related to the Key Indicators for the Proposed Amendments

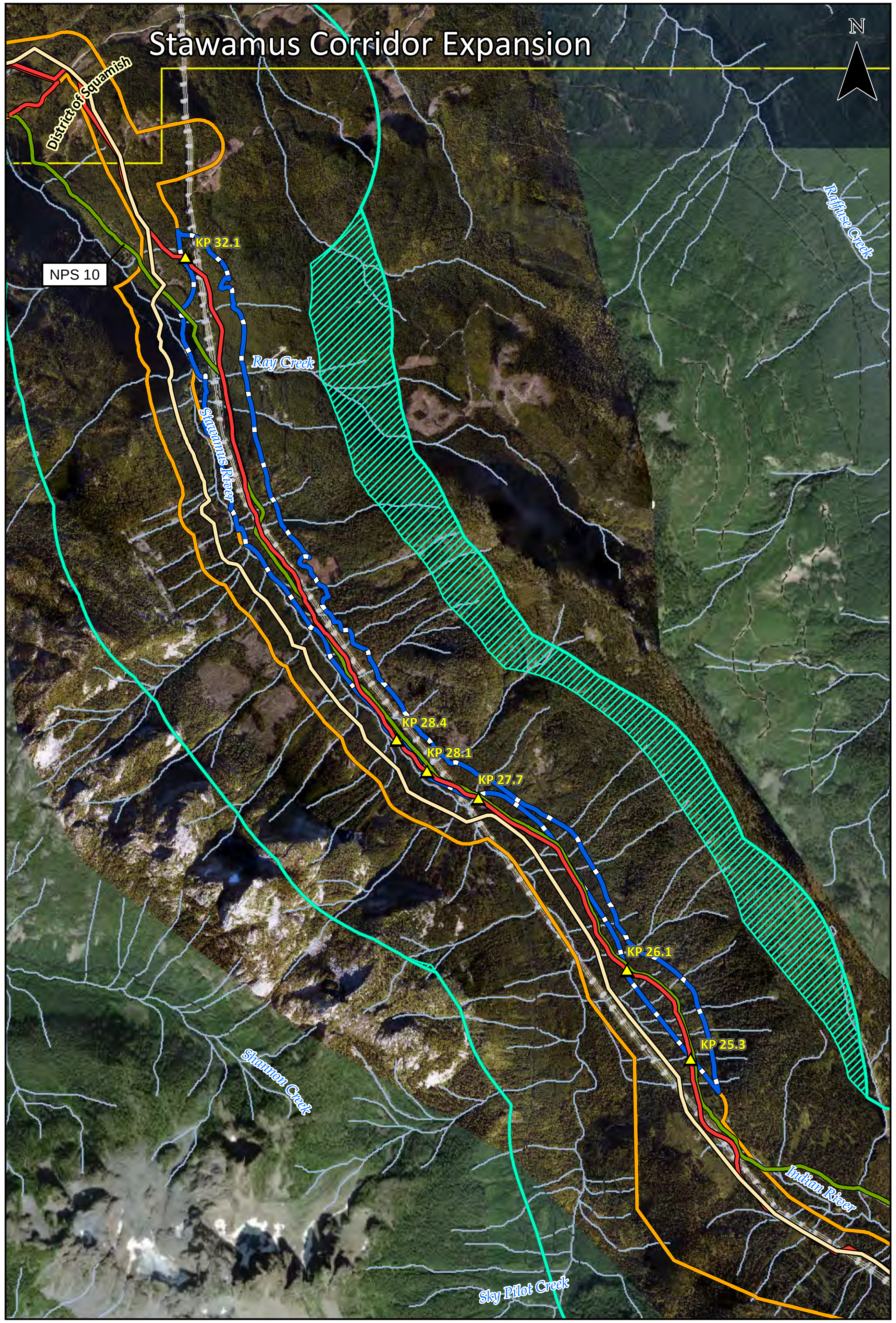
Key Indicator	Existing Conditions
Forestry	**All proposed amendments:** The proposed amendments are in South Coast Forest Region and do not cross any Old Growth Management Areas (legal or non-legal) (BC MFLNRO 2009a, 2009b). **Stawamus Corridor Expansion:** The Stawamus Corridor Expansion is located within the Sea to Sky Natural Resource District, specifically the Chinook Timber Sales Area 2 and Soo Timber Supply Area (Government of BC 2019). The forest overlapping the Stawamus Corridor Expansion is primarily second growth. This proposed amendment overlaps one woodlot for 5.3 ha and one forest tenure for 0.1 ha (BC MFLNRORD 2018, 2019b). Approximately 3,774 ha of merchantable timber will be cleared for the Stawamus Corridor Expansion footprint (Hedberg 2019). **Eagle Mountain Compressor Station and Coquitlam Twinning**: These proposed amendments are in the Chilliwack Natural Resource District, specifically in the Chinook Timber Sales Area 2 and Fraser Timber Supply Area. The forest overlapping both of these proposed amendments is second growth. The Coquitlam Twinning overlaps two forest tenures for a total of 0.9 ha (BC MFLNRORD 2018, 2019b). Approximately 5,949 ha of merchantable timber will be cleared for the Coquitlam Twinning footprint (Hedberg 2019). **Squamish Compressor Station:** The Squamish Compressor Station is located on privately owned land within the Sea to Sky Natural Resource District and Soo Timber Supply Area.
Mineral and subsurface resources	**Stawamus Corridor Expansion:** The Stawamus Corridor Expansion overlaps mineral claims 1020897 and 1047217 for 17.9 ha and 6.3 ha, respectively (BC MFLNRORD 2019c, BC Ministry of Energy, Mines and Petroleum Resources 2019). The remaining proposed amendments do not overlap mineral tenures.
Contaminated Sites	**Stawamus Corridor Expansion:** A search of iMAP BC was conducted on August 22, 2019 and the search did not reveal any historical or potential current contaminated sites within the Stawamus Corridor Expansion. **Eagle Mountain Compressor Station and Coquitlam Twinning:** A search of iMAP BC was conducted on April 15, 2019 and revealed a historical contaminated site within the EAC Application Corridor. The Meridian Substation is located approximately 455 m southwest (downslope) of the existing Eagle Mountain Compressor Station and KP 0 of the Coquitlam Twinning and is listed as a historical contaminated site. The location was confirmed using Integrated Cadastral Information Society data on October 16, 2013 (Environmental Site ID 41074278) **Squamish Compressor Station:** The WLNG project site is a contaminated site under the BC *Environmental Management Act*. Remediation work has occurred at the property since 2006 with the decommissioning of the former pulp mill in 2006. Keystone conducted investigations (such as, Stage 1 and 2 PSIs, DSI, and the SSI) for the WLNG project. Results of these investigations, as they apply to the Squamish Compressor Station siting area, are summarized as follows (Keystone 2014a, 2014b). • One AEC, where contamination was confirmed, overlaps the Squamish Compressor Station siting area (Figure 13-2). AEC 3 Area 1 was identified as a fill area and was investigated during the completion of the Stage 1 and 2 PSI, DSI, and the SSI. Soil contamination was identified for the following COCs: trichloroethane and select metals at depths between 0.3 to 4.6 m below ground surface (Keystone 2014b). Groundwater and soil vapour (including the application of attenuation factors) were investigated and contamination was not identified within these media. • An old landfill, old borrow pit, and burn pit are described in the Keystone investigations (Keystone 2014b). The workspace associated with the lateral pipeline connecting the Squamish Compressor Station and the Custody Transfer Station slightly overlaps the eastern boundary of the old landfill. The old borrow pit and burn pit are located within the Squamish Compressor Station siting area and does overlap the Squamish Compressor Station footprint. Previous investigations identified soils with various wood, copper, concrete, steel, burner, and mill waste to maximum investigation depths ranging from approximately 1.5 m to 2.5 m. • A historical waste asbestos disposal area (covenant area) is located within the Squamish Compressor Station siting area. Components of the Squamish Compressor Station are not located on the asbestos disposal area and this area will be avoided during construction. • The CofC for the uplands portion of the WLNG project site was issued by the BC ENV in December 2014 (BC MOE 2014) with specific risk controls/conditions for AEC 3 were identified in the CofC and the PVP. The CofC does not include the old landfill site.

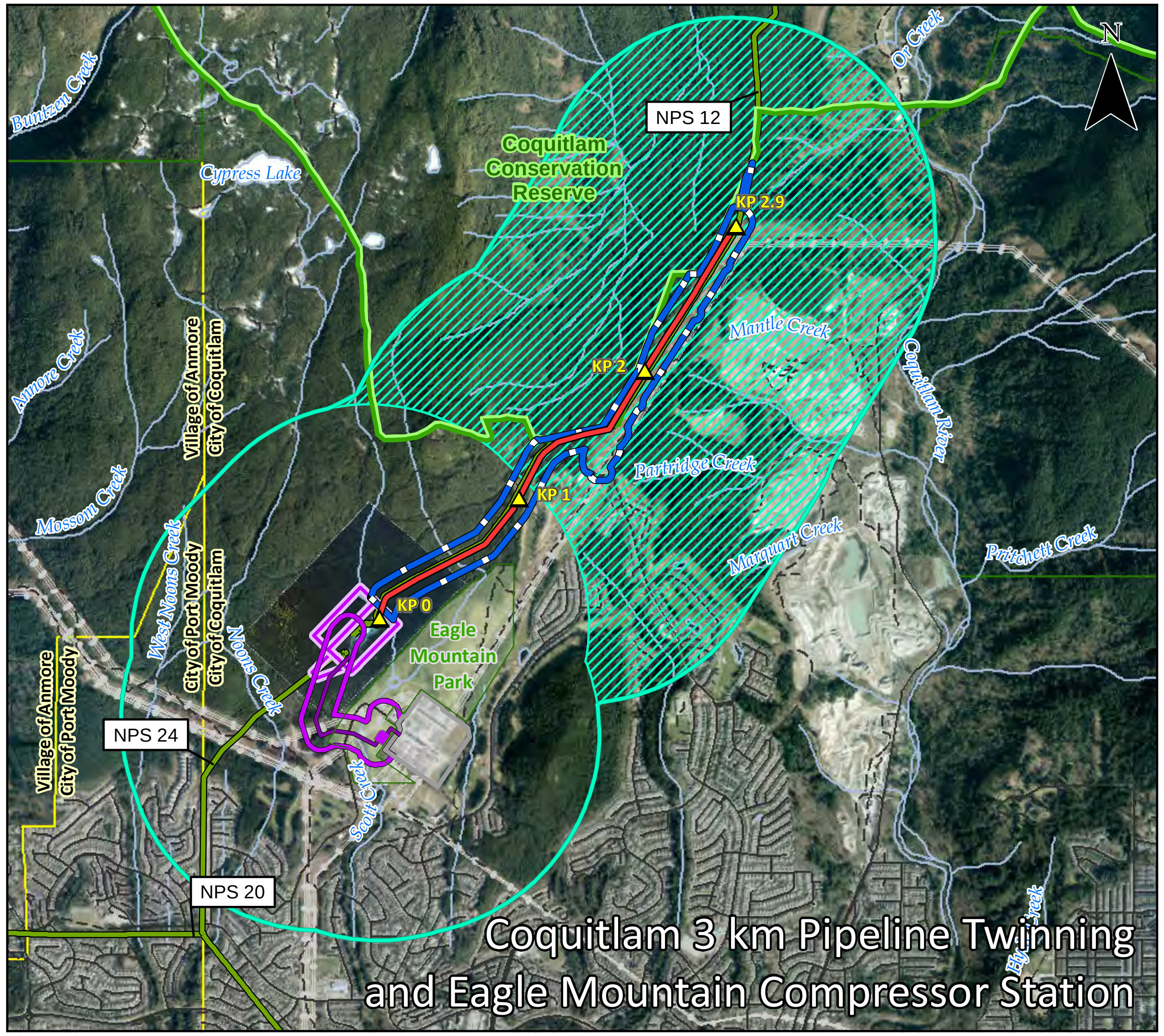
Table 13-1. Existing Conditions for Land and Resources Use Related to the Key Indicators for the Proposed Amendments

Key Indicator	Existing Conditions
Linear infrastructure	**Stawamus Corridor Expansion:** An existing FortisBC NPS 10 gas pipeline parallels the Stawamus Corridor Expansion for approximately 80 percent of its total length. In addition, there is a 500 kV BC Hydro transmission line (CKY – Cheekeye to MDN – Meridian) that parallels the Stawamus Corridor Expansion for the entirety of its length (Government of BC 2019). **Eagle Mountain Compressor Station and Coquitlam Twinning:** An existing FortisBC NPS 12 gas pipeline runs south to north of the Eagle Mountain Compressor Station and parallels the Coquitlam Twinning for its entire length. The Coquitlam Twinning route also parallels a BC Hydro 500 kV transmission line between KP 1.6 and KP 3.0. **Squamish Compressor Station:** The FortisBC NPS 10 gas pipeline runs through the north section of the Squamish Compressor Station siting area. The two BC Hydro 500 kV transmission lines are located north of the WLNG project site, outside of the Squamish Compressor Station siting area.
Navigability of Waterways – Marine Navigability in Howe Sound	**Stawamus Corridor Expansion, Eagle Mountain Compressor Station and Coquitlam Twinning:** There are no navigable waterways in the LSA of these proposed amendments **Squamish Compressor Station:** Commercial marine vessel traffic in Howe Sound includes commercial fishing vessels, marine tourism operators such as sport fishing guides and marine transportation operators. Commercial and government vessels in the Howe sounds include passenger ferries, tugs and barges, deep sea cargo ships, Canadian navy and other government ships, fishing boats, and water taxis. Recreational vessels include yachts, pleasure boats, and water taxis. Approximately 60-100 cargo vessels call annually at Squamish Terminals, which is a deep-water terminal in the District of Squamish specializing in break-bulk products (that is, lumber and steel products) (Ocean Watch 2016 and Squamish Chief 2020)

Notes:

BC ENV = BC Ministry of Environment and Climate Change Strategy
CCP = Comprehensive Community Plan
COC = Contaminant of Concern
CofC = Certificate of Compliance
DSI = Detailed Site Investigation
Keystone = Keystone Environmental Ltd.
PSI = Preliminary Site Investigation
PVP = Performance Verification Plan
SSI = Supplemental Site Investigation
VLI = Visual Landscape Inventory
VQO = Visual Quality Objective





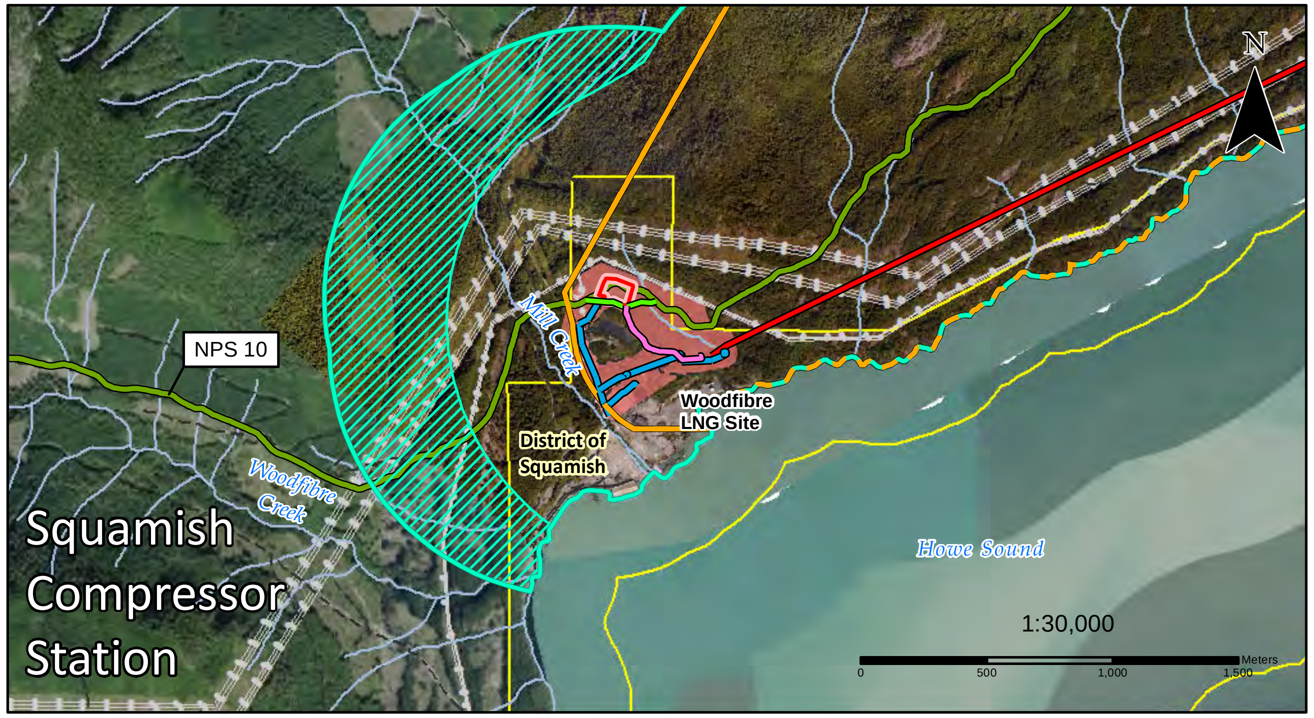


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FIGURE 13-1

LAND AND RESOURCE USE STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Land Local Study Area
- Land LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000
0 250 500 750 1,000 metres
(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL	Checked By: DJN

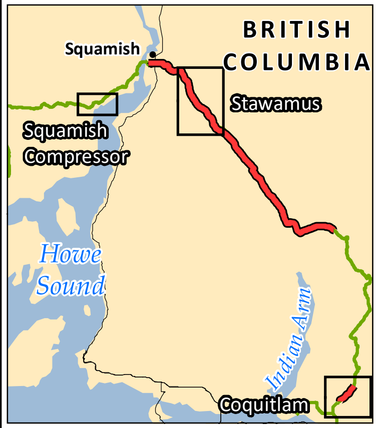

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FIGURE 13-2

SQUAMISH COMPRESSOR STATION SITING AREA KNOWN CONTAMINATION

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)

- Proposed Fortis NPS 24 Pipeline Route
- Proposed 25 kV Electrical Transmission Line
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Riser Site
- Custody Transfer Station
- Workspace (Temporary and Extra)
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)

- Certified Pipeline Corridor

Other

- ML/ARD Potential
- Existing FortisBC Pipeline
- Stream
- Resource Road
- Elevation Contour (5m Interval)
- Existing Electrical Transmission Line
- AEC 3 (Soil Contamination)
- Burrow Pit
- Landfill Outline
- Asbestos Avoidance Area
- Parcel

SCALE: 1:3,600

0 50 100 Meters

JACOBS®

JACOBS Project Number CE777000

UTM Zone 10 North. NAD 1983.
Proposed Pipeline Route, Footprint (Workspace, Riser Site): Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Existing Pipeline: FortisBC 2012; CTS: FortisBC 2-25-2020; Contours: KBR Technical Services 2017-05-04; Compressor Station: KBR 2019-01-24; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; Asbestos, AEC, Landfill, Burrow Pit: Keystone Environmental 2014; Constraints: Province of BC, 2018; Environment Canada, 2016; Roads: BC FLNRO Digital Road Atlas, 2010; Hydrography: BC MFLNRO 2008, Jacobs 2019; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing. 2016; Existing Electical Transmission Line, Parcels: Integrated Cadastral Information Society 03-24-2014; Base Imagery: .

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL | Checked By: DJN

\\brooksdefiles\GIS_SHARE - \\jacobs.com\Common\Shared\CNW\GIS_Proj\CE774000_fortis_EGP\GIS_PRODUCTS\2020\AMENDMENT_APR\AMENDMENT\EGP_A4_Figure13_2_LandfillResource_Squamish_Red.mxd slee3 3/9/2020 4:38:10 PM

13.3 Land and Resources Use Effects Assessment

This subsection provides and update to the Land and Resources Use effects assessment previously presented in subsection 13.5 of the EAC Application (Volume 1, Part B) for each proposed amendment.

13.3.1 Stawamus Corridor Expansion

The proposed amendment does not result in a change to the existing conditions for the Land and Resources Use VC. The Stawamus Corridor Expansion is located adjacent to the Certified Pipeline Corridor and encounters land and resources use conditions that are the same or comparable to those described in the EAC Application.

For instance, the comparable segment of the Certified Pipeline Corridor is also within the Stawamus River community watershed, VLI polygons are not crossed by either pipeline corridor, recreational uses within the Stawamus Corridor Expansion and the Certified Pipeline Corridor are similar, and both corridors parallel an existing electrical transmission line. This proposed amendment also responds to feedback from Squamish Nation, who have asked FortisBC to reduce the visual impacts of the Project. By rerouting the pipeline corridor parallel to the existing NPS 10 pipeline, visual impacts of the Project are equivalent or reduced compared to the those assessed in the EAC Application. The proposed pipeline centreline within the Stawamus Corridor Expansion parallels existing linear disturbances for 6.8 km (92 percent of entire length of 6.8 km), compared to 2.1 km (30 percent) for the equivalent segment within the Certified Pipeline Corridor.

The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Land and Resources Use VC during any phase of the Project. No positive effects to the Land and Resources Use VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Land and Resources Use VC remain the same.

13.3.2 Coquitlam Twinning

The EAC Application included an assessment of Project components that are within the land and resources use for the Coquitlam Twinning specifically, the Eagle Mountain Compressor Station expansion and a connecting electrical transmission line. These Project components encountered similar land and resource conditions as the Coquitlam Twinning including nearby residential areas, Eagle Mountain Municipal Park, recreational land uses (such as, biking and golfing), and nearby linear infrastructure.

The Certified Project did not previously cross the Coquitlam Conservation Reserve; however, it is crossed by the existing FortisBC NPS 12 gas pipeline. Although the Coquitlam Twinning pipeline centreline will overlap with the Coquitlam Conservation Reserve for approximately 160 m, the Project is consistent with the Metro Vancouver or City of Coquitlam water management plans as the Project is not located with hydrological catchment area of Coquitlam Lake managed by these plans.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Land and Resources Use VC during any phase of the Project. No positive effects to the Land and Resources Use VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Land and Resources Use VC remain the same.

13.3.3 Eagle Mountain Compressor Station

The proposed amendment does not result in a change to the existing conditions for the Land and Resources Use VC since the proposed changes to the Eagle Mountain Compressor Station are within

Certified Compressor Station Area. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Land and Resources Use VC during any phase of the Project. No positive effects to the Land and Resources Use VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Land and Resources Use VC remain the same.

13.3.4 Squamish Compressor Station

During construction of the Squamish Compressor Station materials, equipment and personnel will be transported to the WLNG project site via barges and passenger vessels. A marine dock at Woodfibre will be constructed as part of the WLNG project and will be used by FortisBC. Addendum 2 filed in September 2015, estimated that the number of barge round trips to WLNG during Project construction would be approximately 253 round trips for transporting equipment, materials and spoil material. Addendum 2 estimated that the number of passenger vessel round trips to WLNG would be approximately 936 round trips.

Specific requirements for marine transportation will be determined during the Project permitting phase. The total number of barge and passenger vessel trips to WLNG is not anticipated to substantially increase from what is presented in Addendum 2 as a result of constructing the Squamish Compressor Station at the WLNG project site. Therefore, the proposed amendment does not result in any material change to the assessment and residual effects characterization for the potential residual effect “disruption to watercourse users on navigable waterways” is comparable to the EAC Application and Addendum 2.

As noted in subsection 13.2, there is a change in the existing conditions for the Land and Resources Use VC related to contaminated sites in relation to the Squamish Compressor Station. The contaminated site information for the Squamish Compressor Station is considered a material change in existing conditions from the EAC Application as new AECs not previously included are present within the Squamish Compressor Station siting area.

Physical disturbance of previously contaminated sites was previously identified as a potential effect in the EAC Application for the Project Footprint (Volume 1, Part B, Section 13.0). This potential effect now also applies to the Squamish Compressor Station siting area during construction and operation. Table 13-2 provides information on the updated potential adverse effect assessment as a result of the proposed amendments.

The updated potential adverse effects assessment finds that the previously identified potential effect of physical disturbance of previously contaminated sites now also applies to the Squamish Compressor Station. As new AECs are known to overlap the Squamish Compressor Station siting area, additional mitigation has been developed to address contamination concerns. The mitigation proposed is considered to be adequate to address contamination concerns and no potential residual effects were identified.

All other aspects of the existing conditions for the Land and Resource Use VC for the Squamish Compressor Station conditions are comparable to those described in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Land and Resource Use VC during any phase of the Project. No positive effects to the Land and Resource Use VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Land and Resource Use VC remain the same.

Table 13-2. Updated Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Land and Resources Use

Potential Adverse Effect	Project Component/ Location/ Activity	Spatial Boundary	Key Recommendations/Mitigation	Potential Residual Adverse Effect
Key Indicator: Contaminated Sites				
Physical disturbance of previously contaminated sites	Squamish Compressor Station/ construction and operation	Squamish Compressor Station siting area	• Avoid or manage known areas of contaminated soil sediment, and groundwater as directed by the Environmental Inspector. Implement the Spill, Fuel, and Hazardous Materials Contingency Plan if contaminated soil, sediments, and groundwater are discovered during construction. Comply with applicable measures provided in the Waste Management Plan and Spill, Fuel, and Hazardous Materials Contingency Plan for handling of contaminated material. • Dispose of contaminated soil that does not meet applicable regulatory criteria at a licensed landfill. Obtain waste acceptance at the disposal facilities for each location anticipated to contain contaminated soil or groundwater. Determine the need for a waste manifest prior to hauling. If required, the waste manifest should be obtained from the Environmental Inspector and completed by a Transportation of Dangerous Goods-certified Contractor employee before hauling. Wherever warranted, have disposal acceptance for all wastes anticipated during construction in place prior to initiation of construction. • Transport, handle, use, and dispose of hazardous materials in accordance with Provincial and Federal regulatory requirements, and as identified in the Waste Management Plan and the Spill, Fuel, and Hazardous Materials Contingency Plan. • Any changes to sediment use will be promptly identified to the BC ENV Director and an application for an amendment or new CofC may be necessary. The CofC does not cover the landfill and borrow pit area. If construction is anticipated to affect the landfill footprint, additional measures may be required to verify landfill integrity. • The footprint of the Squamish Compressor Station overlaps known contamination; therefore, soil remediation will be required prior to construction. Remedial and development plans would need to be provided to the BC ENV Director. • If contamination remains in place (that is, not all removed), risk controls in accordance with the current CofC and PVP, and mitigation measures for managing contamination should be developed. • As per the CofC and PVP, should construction occur within areas which have conditions within the CofC, a qualified Health and Safety officer must develop a site-specific health and safety plan. • Avoid locating Project components (such as, construction work areas, roads, and so forth) on the historical waste asbestos disposal area.	No potential residual adverse effect was identified since mitigation appropriate for the contaminants found in these locations will be implemented if they cannot be avoided. By implementing industry-accepted best practices, potential residual adverse effects can be avoided.

13.4 Land and Resources Use Cumulative Effects Assessment

13.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Land and Resources Use VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Land and Resources Uses RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Land and Resources Use VC.

13.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Land and Resources Use VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Land and Resources Use RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Land and Resources Use VC.

13.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Land and Resources Use VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Land and Resources Use RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Land and Resources Use VC.

13.4.4 Squamish Compressor Station

With the exception of contaminated sites, the proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Land and Resources Use VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Land and Resources Use RSA.

As noted in subsection 13.2, there is a change in the existing conditions regarding contaminated sites related to the Squamish Compressor Station (considered a non-material change). The proposed amendment results in a material change to mitigation measures, however there is no material change to the assessment of potential adverse effects, residual effects or cumulative effects for land and resources use during the construction phase of the Project with regards to contaminated sites.

As a result, conclusions identified in the EAC Application with respect to the land and resources use remain the same. Construction and operation of the Squamish Compressor Station will act cumulatively with the construction of the WLNG project. The WLNG project was previously identified in the EAC Application as a reasonably foreseeable development acting cumulatively with the Project. The assessment team determined that the existing and reasonably foreseeable developments acting in

combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on land and resources use.

13.5 References

13.5.1 Personal Communication

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BC Ministry of Energy, Mines and Petroleum Resources. 2019c. Mineral, Placer and Coal Tenure Spatial View (digital file). Victoria, BC. Acquired August 16, 2019. https://catalogue.data.gov.bc.ca/dataset/mta-mineral-placer-and-coal-tenure-spatial-view.

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14. Heritage Resources

The assessment of potential adverse effects of the Project on the Heritage Resources VC, which include archaeological, palaeontological, and historical resources is provided in Section 14.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on the Heritage Resources VC that may result from the proposed amendments, as described in subsection 1.1.

14.1 Spatial Boundaries

The spatial boundaries used in the heritage resources effects assessment are provided in subsection 14.2.1 of the EAC Application (Volume 1, Part B) and are summarized as follows.

Figure 14-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each proposed amendment results in an expansion in the Heritage Resources LSA assessed in Section 14.0 of the EAC Application:

- **Stawamus Corridor Expansion** – Does not result in an expansion to the Heritage Resources LSA assessed in Section 14.0 of the EAC Application.
- **Coquitlam Twinning** – Does not result in an expansion to the Heritage Resources LSA assessed in Section 14.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Does not result in an expansion to the Heritage Resources LSA assessed in Section 14.0 of the EAC Application.
- **Squamish Compressor Station** – Does not result in an expansion to the Heritage Resources LSA assessed in Section 14.0 of the EAC Application.

14.2 Existing Conditions

The existing conditions for the Heritage Resources VC are provided in the EAC Application in Section 14.0 (Volume 1, Part B). Existing conditions for heritage resources in the proposed amendment corridor and Heritage Resources RSA are summarized in this subsection; however, these conditions do not result in a material change to the overall setting considered in the EAC Application.

The BC *Heritage Conservation Act* (BC *HCA*) protects archaeological resources located on both public and private land throughout the Province and is administered by the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BC MFLNRORD) Archaeology Branch. Sites and objects are protected under Section 13 of the BC *HCA* by virtue of their antiquity (pre-1846) or under Section 9 as Provincial Heritage Sites, if designated as such by an Order-in-Council. The BC *HCA* necessitates that a Permit issued by the Minister or designate must be in place prior to the altering of any protected archaeological sites.

An Archaeological Impact Assessment (AIA) for the Project was completed from August 2014 to September 2016. The AIA was completed under BC *HCA* Permit 2014-0188, Stó:lō Nation Investigation Permit 2014-063, and Tsleil-Waututh Nation Permit 2014-050. In total, eight archaeological sites were identified during the AIA, and six sites were within the originally proposed BC OGC corridor. The AIA Final Report was submitted to the BC MFLNRORD Archaeology Branch for review and approval. Copies of the AIA Final Report were also submitted to respective Indigenous groups for review.

An Archaeology Overview Assessment (AOA) will be completed for the proposed amendment corridors to determine the potential for heritage resources within these areas. This desktop review will inform the possible scope for a new AIA for the proposed amendment areas. Should an AIA be required for the Project, a Section 12 Heritage Inspection Permit administered by the BC MFLNRORD Archaeology Branch will be completed.

Table 14-1 provides a summary of the changes to existing conditions associated with the proposed amendment changes.

Table 14-1. Existing Conditions for Heritage Resources Related to the to the Key Indicators for the Proposed Amendments

KI	Existing Conditions
Archaeological Sites	**Stawamus Corridor Expansion:** There are no previously recorded heritage resource sites located in the vicinity of the Stawamus Corridor Expansion (BC MFLNRORD 2019). However, archaeological potential is high due to microtopographical landforms in association watercourses and the presence of mature, undisturbed tree stands. An AOA will be completed to determine the overall potential for heritage resources relative to the proposed amendment corridor. If required, an AIA of the proposed amendment will be completed prior to construction. **Coquitlam Twinning:** There are no previously recorded heritage resource sites located in the vicinity of the Coquitlam Twinning (BC MFLNRORD 2019). However, archaeological potential is high due to microtopographical landforms in association watercourses and the presence of mature, undisturbed tree stands. An AOA will be completed to determine the overall potential for heritage resources relative to the proposed amendment corridor. If required, an AIA of the proposed amendment will be completed prior to construction. **Eagle Mountain Compressor Station**: There are no previously recorded heritage resource sites located in the vicinity of the Eagle Mountain Compressor Station (BC MFLNRORD 2019). The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, no AIA of the proposed amendment is anticipated prior to construction **Squamish Compressor Station:** There are no previously recorded heritage resource sites located in the vicinity of the Squamish Compressor Station (BC MFLNRORD 2019). However, archaeological potential is high due to microtopographical landforms in association watercourses and the presence of mature, undisturbed tree stands. An AOA will be completed to determine the overall potential for heritage resources relative to the proposed amendment footprint. If required, an AIA of the proposed amendment will be completed prior to construction.
Palaeontological Sites	**Stawamus Corridor Expansion:** A BC Heritage Branch-approved Senior Palaeontologist should complete a desktop assessment for the proposed amendment to determine the potential effects to palaeontological resources. **Coquitlam Twinning:** A BC Heritage Branch-approved Senior Palaeontologist should complete a desktop assessment for the proposed amendment to determine the potential effects to palaeontological resources. **Eagle Mountain Compressor Station:** A BC Heritage Branch-approved Senior Palaeontologist should complete a desktop assessment for the proposed amendment to determine the potential effects to palaeontological resources **Squamish Compressor Station:** A BC Heritage Branch-approved Senior Palaeontologist should complete a desktop assessment for the proposed amendment to determine the potential effects to palaeontological resources.
Historic Sites	**Stawamus Corridor Expansion:** No formally recognized historic sites are in the vicinity of the Stawamus Corridor Expansion (BC MFLNRORD 2019). Therefore, no effects are anticipated to any formally recognized historic sites. **Coquitlam Twinning:** No formally recognized historic sites are in the vicinity of the Coquitlam Twinning (BC MFLNRORD 2019). Therefore, no effects are anticipated to any formally recognized historic sites. **Eagle Mountain Compressor Station:** No formally recognized historic sites are in the vicinity of the Eagle Mountain Compressor Station (BC MFLNRORD 2019). Therefore, no effects are anticipated to any formally recognized historic sites. **Squamish Compressor Station:** No formally recognized historic sites are in the vicinity of the Squamish Compressor Station (BC MFLNRORD 2019). Therefore, no effects are anticipated to any formally recognized historic sites.

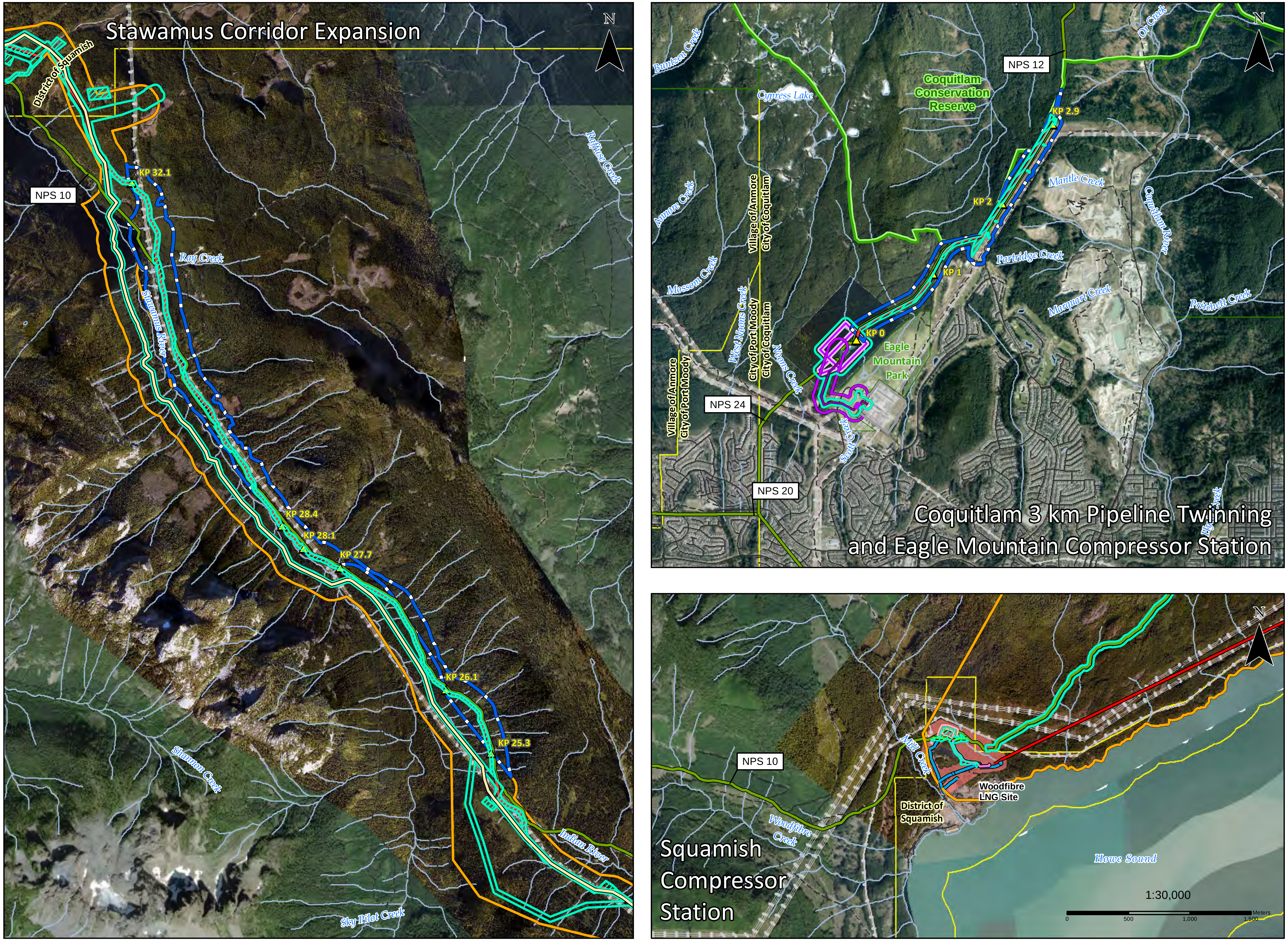

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FIGURE 14-1

HERITAGE RESOURCES STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Heritage Local Study Area
- Heritage LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

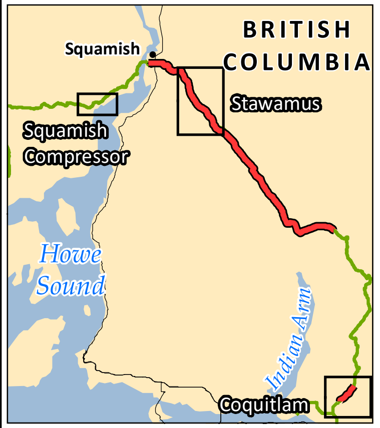
JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL	Checked By: DJN



14.3 Heritage Resources Effects Assessment

This subsection provides an update to the heritage resources effects assessment previously presented in Section 14.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

14.3.1 Stawamus Corridor Expansion

The proposed amendment does not result in a change in the existing conditions for the Heritage Resources VC. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Heritage Resources VC during any phase of the Project. No positive effects to the Heritage Resources VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Heritage Resources VC remain the same.

14.3.2 Coquitlam Twinning

The proposed amendment does not result in a change in the existing conditions for the Heritage Resources VC. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Heritage Resources VC during any phase of the Project. As a result, conclusions identified in the EAC Application with respect to the Heritage Resources VC remain the same.

14.3.3 Eagle Mountain Compressor Station

The proposed amendment does not result in a change in the existing conditions for the Heritage Resources VC. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Heritage Resources VC during any phase of the Project. No positive effects to the Heritage Resources VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Heritage Resources VC remain the same.

14.3.4 Squamish Compressor Station

The proposed amendment does not result in a change in the existing conditions for the Heritage Resources VC. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Heritage Resources VC during any phase of the Project. No positive effects to the Heritage Resources VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Heritage Resources VC remain the same.

14.4 Heritage Resources Cumulative Effects Assessment

This subsection provides and update to the heritage resources cumulative effects assessment previously presented in Section 14.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

14.4.1 Stawamus Corridor Expansion

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Heritage Resources VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Heritage Resources RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Heritage Resources VC.

14.4.2 Coquitlam Twinning

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Heritage Resources VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Heritage Resources RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Heritage Resources VC.

14.4.3 Eagle Mountain Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Heritage Resources VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Heritage Resources RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Heritage Resources VC.

14.4.4 Squamish Compressor Station

The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Heritage Resources VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Heritage Resources RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Heritage Resources VC.

14.5 References

British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BC MFLNRORD). 2019. Remote Access to Archaeological Data (RAAD). Victoria, BC. Accessed August 2019. https://arcmaps.gov.bc.ca/ess/sv/raad/Index2.html

15. Health Effects Assessment

The assessment of potential adverse effects of the Project on the Human Health VC and Ecological Health VC is provided in Section 15.0 of the EAC Application (Volume 1, Part B). The following subsections describe changes to the assessment of potential adverse effects on Human Health VC and Ecological Health VC that may result from the proposed amendment, as described in subsection 1.1.

15.1 Spatial Boundaries

The spatial boundaries used in the Health effects assessment are provided in subsection 15.2.1 of the EAC Application (Volume 1, Part B).

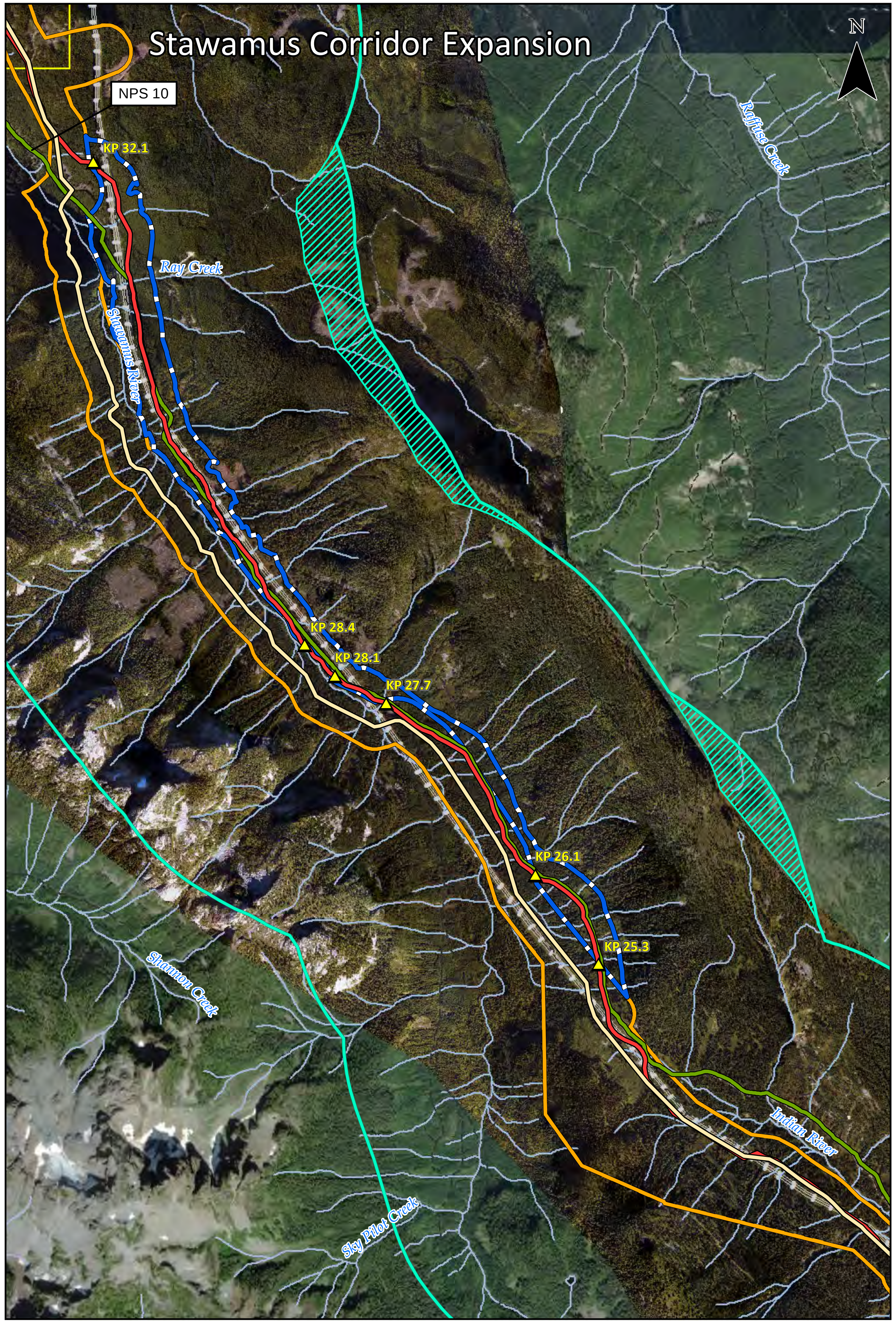
Figure 15-1 shows the spatial boundaries, including expansions, for the proposed amendments. The following list indicates whether each amendment results in an expansion in the Health LSA assessed in Section 15.0 of the EAC Application:

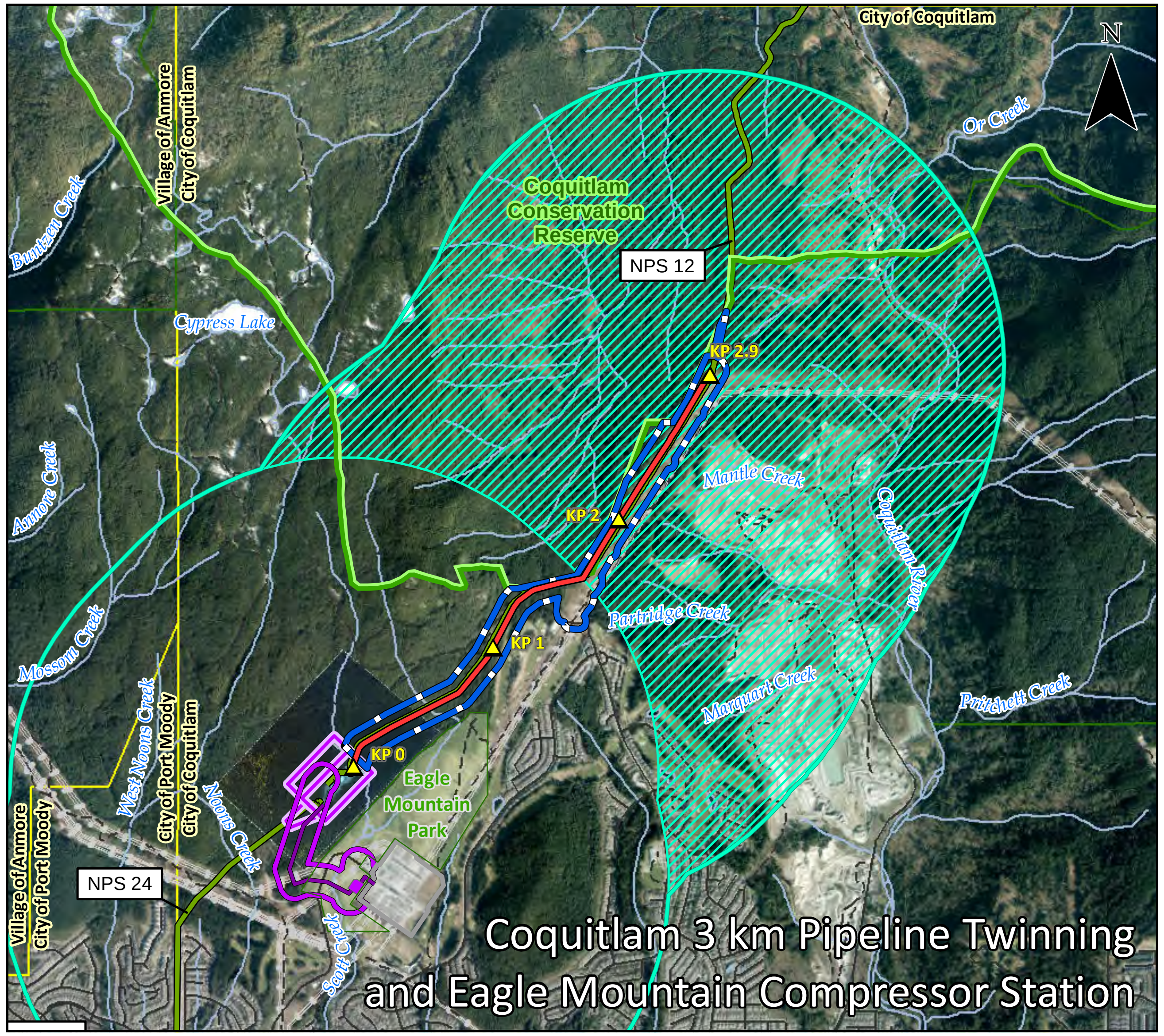
- **Stawamus Corridor Expansion** – Results in an expansion to the Health LSA assessed in Section 15.0 of the EAC Application.
- **Coquitlam Twinning** – Results in an expansion to the Health LSA assessed in Section 15.0 of the EAC Application.
- **Eagle Mountain Compressor Station** – Results in an expansion to the Health LSA assessed in Section 15.0 of the EAC Application.
- **Squamish Compressor Station** – Results in an expansion to the Health LSA assessed in Section 15.0 of the EAC Application.

15.2 Existing Conditions

The existing conditions for the Human Health VC and Ecological Health VC are provided in the EAC Application in the Economic, Social, and Health TDR (Appendix 3 of Volume 2, Appendix 1M). Existing conditions for human and ecological health in the proposed amendment footprint and Health LSA and RSA are summarized in this section, however, these conditions do not result in a material change to the overall setting considered in the EAC Application.

Table 15-1 provides a summary of the changes to existing conditions associated with the proposed amendment changes.





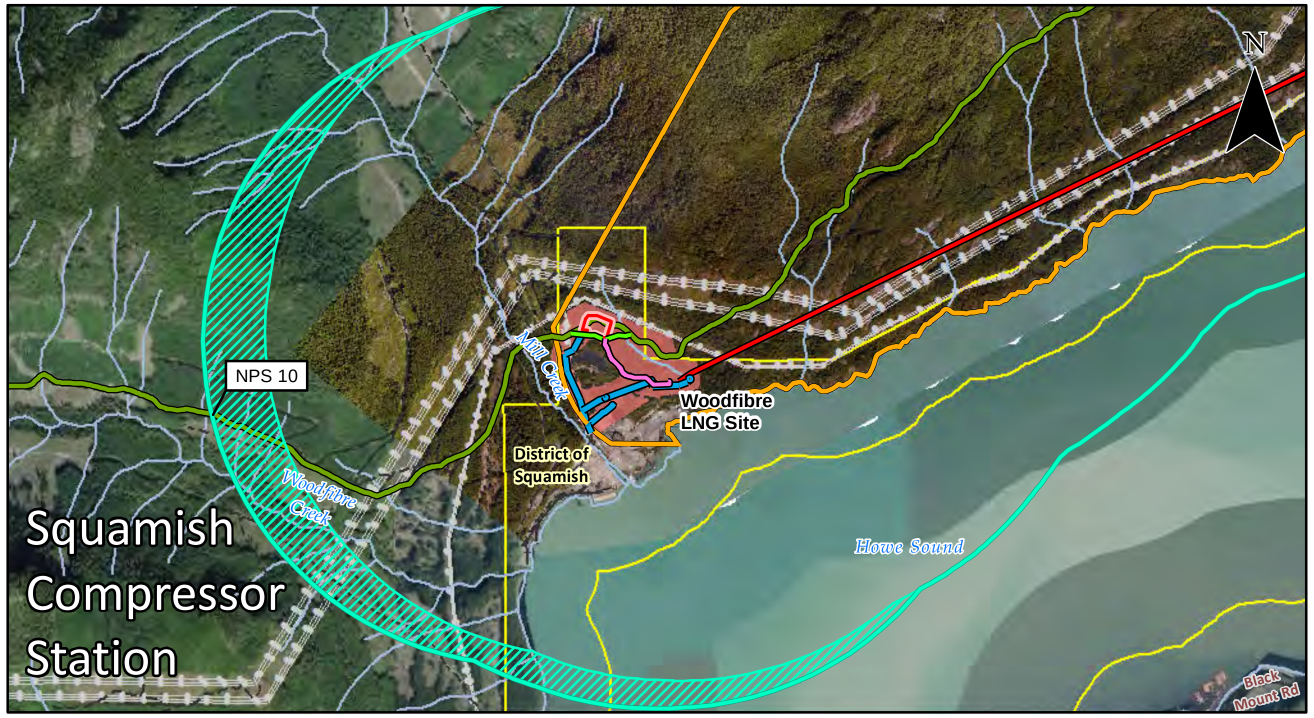


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FIGURE 15-1

HEALTH STUDY AREA BOUNDARY CHANGE

EAGLE MOUNTAIN - WOODFIBRE GAS PIPELINE PROJECT AMENDMENT

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Existing FortisBC Pipeline
- Health Local Study Area
- Health LSA Expansion
- Municipality
- Road
- Resource Road
- Existing Electrical Transmission Line
- Park & Protected Areas
- Coquitlam Conservation Reserve
- Meridian Substation

SCALE: 1:35,000

0 250 500 750 1,000 metres

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL	Checked By: DJN

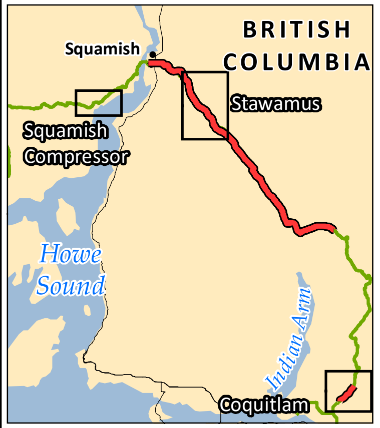

Table 15-1. Change in Existing Conditions for the Health Valued Components Related to the Amendment Changes

VC	Existing Conditions
Human Health	**Stawamus Corridor Expansion:** the proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, soil, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Coquitlam Twinning:** the proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure, and stressors (for example, noise, or COPCs in air, water, soil, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all KIs of Human Health. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Eagle Mountain Compressor Station:** the proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, soil or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Squamish Compressor Station:** the proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all KIs of Human Health. Potential COPCs in soil are likely present in the proposed compressor station location, however as the site is subject to a CofC, potential exposures to COPCs are expected to be mitigated via risk management plans that include health and safety plans, physical barriers to the soil and administrative controls. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC.
Ecological Health	**Stawamus Corridor Expansion:** the proposed amendment does not result in a change in the existing conditions for the Ecological Health VC. The desktop review of the likely effects for country foods quality (with respect to consumption by identified human receptors) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC. **Coquitlam Twinning:** the proposed amendment does not result in a change in the existing conditions for the Ecological Health VC. The desktop review of the likely effects for country foods quality (with respect to consumption by identified human receptors) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC. **Eagle Mountain Compressor Station:** the proposed amendment does not result in a change in the existing conditions for the Ecological Health VC. The desktop review of the likely effects for country foods quality (with respect to consumption by identified human receptors) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC. **Squamish Compressor Station:** the proposed amendment does not result in a change in the existing conditions for the Ecological Health VC. The desktop review of the proposed location and the requirements in the CofC eliminates the potential of ecological receptors for country foods quality (with respect to consumption by identified human receptors) due to barriers and prohibition of vegetation on-site. The health effects are anticipated to be similar, and not materially different from, those described in the EAC Application for all Ecological Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC.

Note:
COPC = contaminant of potential concern

15.3 Health Effects Assessment

This section provides and update to the human and ecological health effects assessment previously presented in Section 15.0 of the EAC Application (Volume 1, Part B) for each proposed amendment.

15.3.1 Stawamus Corridor Expansion

This proposed amendment involves an extension of the existing Certified Pipeline Corridor for approximately 7 km in the Stawamus River Valley. The extension will have an average width of approximately 200 m. Based on a preliminary desktop review using iMapBC and aerial imagery, the Stawamus Corridor Expansion crosses approximately 1 fish-bearing watercourse, 36 non-fish-bearing watercourses, and 53 NCDs. Aquatic assessments completed confirm that mitigation measures will focus on managing risk of mobilizing sediments of nonfish-bearing watercourse crossings, and into fish habitats. Stream and riparian restoration methods are recommended where fish habitat is confirmed, and riparian values may be lost.

The proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined through noise, air quality, drinking water quality, and soil and sediment quality. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC during any phase of the Project. No positive effects to the Human Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Human Health VC remain the same.

The proposed amendment does not result in a change in the existing conditions for the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors). As described, the affected tributaries are comparable to the Certified Project, therefore effects on fisheries as country food are not expected to be impacted. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC during any phase of the Project. No positive effects to the Ecological Health VC were identified in the EAC Application or this Amendment Application. As a result, significance conclusions identified in the EAC Application with respect to the Ecological Health VC remain the same.

15.3.2 Coquitlam Twinning

The Coquitlam Twinning amendment is within the Coquitlam River Watershed, and crosses headwater catchments associated with tributaries of the Coquitlam River, including Scott Creek and Mantle Creek. The Coquitlam River is a salmon-bearing river and the focus of considerable fisheries enhancement efforts, including re-establishment of the historic sockeye run. Tributaries can provide important fish habitat for certain life stages of fish (such as, rearing) and provide flow and nutrient inputs to downstream habitats. A total of 10 watercourses and 25 NCDs were identified and assessed along the proposed corridor within the Coquitlam Twinning as presented in the Fish and Fish Habitat TDR. The watercourses were determined to be non-fish-bearing. Mitigation measures will manage for erosion and downstream sedimentation and limiting off-road public access.

The proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined through noise, air quality, drinking water quality, and soil and sediment quality. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC during

any phase of the Project. No positive effects to the Human Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Human Health VC remain the same.

The proposed amendment does not result in a change in the existing conditions for the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors). As described, the affected tributaries are shown as non-fish-bearing, therefore effects on fisheries as country food are not expected to be impacted. The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC during any phase of the Project. No positive effects to the Ecological Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Ecological Health VC remain the same.

15.3.3 Eagle Mountain Compressor Station

This amendment does not involve expansion of the previous corridor or footprint for fish and fish habitat, precluding the need for further assessment of the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors) as the proposed changes are unlikely to affect fish and fish habitat.

The proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined through noise, air quality, drinking water quality, and soil and sediment quality. As described previously, the change to the compressor configuration are expected to be similar to approved configuration (a potential sound increase of 2 dBA at receptors, but still in compliance with guidelines; fewer local air emissions; no other changes). The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC during any phase of the Project. No positive effects to the Human Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Human Health VC remain the same.

The proposed amendment does not result in a change in the existing conditions for the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors). The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC during any phase of the Project. No positive effects to the Ecological Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Ecological Health VC remain the same.

15.3.4 Squamish Compressor Station

The footprint of the proposed alternative location appears to overlap an existing landfill area on the WLNG project site. The subject location also includes a BC ENV CofC (Site 9930, Dec. 2014) for remedial actions carried out at that time. Based on PSI and DSI, a Human Health and Ecological Risk Assessment (HHERA) was carried out.

The paradigm used for the health assessment in the Certified Project examined contaminants of concern, operable exposure pathways and likely human and ecological receptors combinations. The outcome of the assessment in Section 15.0 of the EAC Application for the site of the certified compressor stations did not identify any contaminants of concern within the Project Footprint, and therefore health risks from receptor exposure to contaminants in soil was considered negligible. For other aspects of the linear project, the soil exposure pathway (direct contact – accidental or incidental ingestion of contaminated soil, or dermal contact with contaminated soil) and concluded that within the Project Footprint potential

exposure to soil for recreational users and traditional land users would be restricted due to limited frequency of exposure, and limited time spent in the Project Footprint.

In comparison, construction worker's exposure would be significantly more frequent, and more intense. However, considering the use of administrative controls (health and safety plans, use of personal protective equipment (PPE), soil management, and proper use of equipment) potential exposures to contaminated soil would be mitigated or minimized, and therefore health risk effects due to soil exposure were not identified.

As the proposed alternative compressor station location has a CofC, limited remediation has taken place and residual contaminants are expected to be in soil and groundwater which requires the implementation of administrative controls (that is, a health and safety plan) to mitigate any potential construction or utility worker exposure to contaminated soil and groundwater, or secondary pathways of exposure (such as, vapour emissions from soil and groundwater).

Once constructed, the compressor station would not be subject to recreational or other types of use other than the operation of the pipeline, therefore other receptor types are not expected to encounter contaminants in soil. In considering ecological receptors, the CofC prohibits the establishment of deep rooting vegetation, or burrowing animals, which mitigates the potential for use of ecological receptors for country foods. Furthermore, the CofC requires that a barrier (such as, asphalt or concrete) cover the site area containing industrial operations, and that the site is not accessible to the public. The use of risk management requirements (that is, a health and safety plan, vapour mitigation, barriers to soil, and other administrative controls that prevent receptors on-site) would result in minimizing or mitigating potential human and ecological health risks.

Air quality modelling for the proposed alternative location for the compressor station in Squamish was considered in the context of the Human Health VC. Predicted concentrations were compared to the BC AQOs and CAAQS and all modelled maximum concentrations, including background, were below their respective criteria. The proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC during any phase of the Project for the proposed Squamish Compressor Station.

Noise modelling for the proposed alternative location for the compressor station in Squamish was considered in the context of the Human Health VC. Predicted sound levels were compared to the BC OGC PSLs and all modelled levels, including background, were below their respective criteria. The proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC for sound during any phase of the Project for the proposed Squamish Compressor Station.

This amendment does not involve material change to fish and fish habitat, precluding the need for further assessment of the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors) since the proposed changes are unlikely to affect fish and fish habitat.

The proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined through noise, air quality, drinking water quality, and soil and sediment quality. As described, the change to the compressor station location is expected to be different (in soil quality) than the Certified Project, but given the proposed sites risk management requirements and administrative requirements, the existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC during any phase of the Project. No positive effects to the Human Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Human Health VC remain the same.

The proposed amendment does not result in a change in the existing conditions for the Ecological Health VC as examined for country foods quality (with respect to consumption by identified human receptors). The existing conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application. Because existing conditions are comparable, and the potential direct and indirect interactions resulting from the proposed amendment are also comparable, there is no material change to the assessment of potential adverse effects, mitigation, or residual effects for the Ecological Health VC during any phase of the Project. No positive effects to the Ecological Health VC were identified in the EAC Application or this Amendment Application. As a result, conclusions identified in the EAC Application with respect to the Ecological Health VC remain the same.

15.4 Health Cumulative Effects Assessment

This section provides and update to the health cumulative effects assessment previously presented in Section 15.0 of the EAC Application (Volume 1, Part B) for each proposed amendment. The proposed amendment does not result in any material change to existing conditions or Project-level adverse effects for the Human Health or Ecological Health VC. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). The search conducted for this Amendment Application did not identify any new reasonably foreseeable developments within the Human Health VC LSA or RSA. Therefore, the assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendment do not result in any material change to the assessment of potential cumulative adverse effects on the Human Health VC or Ecological Health VC.

15.4.1 Stawamus Corridor Expansion

A cumulative effects assessment is not deemed warranted for potential residual adverse effects determined to be unlikely, or of low probability. Therefore, the proposed amendment does not result in any material change to the assessment of potential cumulative adverse effects on the Human Health VC or the Ecological Health VC, since the potential residual adverse effects are low probability and are not expected to interact cumulatively with other existing and reasonably foreseeable developments.

15.4.2 Coquitlam Twinning

A cumulative effects assessment is not deemed warranted for potential residual adverse effects determined to be unlikely, or of low probability. Therefore, the proposed amendment does not result in any material change to the assessment of potential cumulative adverse effects on the Human Health VC or the Ecological Health VC, since the potential residual adverse effects are low probability and are not expected to interact cumulatively with other existing and reasonably foreseeable developments.

15.4.3 Eagle Mountain Compressor Station

A cumulative effects assessment is not deemed warranted for potential residual adverse effects determined to be unlikely, or of low probability. Therefore, the proposed amendment does not result in any material change to the assessment of potential cumulative adverse effects on the Human Health VC or the Ecological Health VC, since the potential residual adverse effects are low probability and are not expected to interact cumulatively with other existing and reasonably foreseeable developments.

15.4.4 Squamish Compressor Station

A cumulative effects assessment is not deemed warranted for potential residual adverse effects determined to be unlikely, or of low probability. Therefore, the proposed amendment does not result in any material change to the assessment of potential cumulative adverse effects on the Human Health VC or the Ecological Health VC, since the potential residual adverse effects are low probability and are not expected to interact cumulatively with other existing and reasonably foreseeable developments.

15.5 References

CH2M HILL Energy Canada, Ltd. (CH2M) 2015. Application for an Environmental Assessment Certificate for the Proposed FortisBC Energy Inc. Eagle Mountain – Woodfibre Gas Pipeline Project.

16. Accidents or Malfunctions

Accidents and malfunctions are unplanned events that have the potential to result in adverse environmental, economic, social, heritage, or health effects, should they occur. While the rigorous standards and practices that are in place make accidents or malfunctions unlikely or rare for the proposed Project, the potential consequences are evaluated such that emergency response and contingency planning can be identified to reduce the risk and the severity of the consequences. FortisBC has evaluated potential risks in this section as they relate to the proposed amendments.

16.1 Background and Assessment Methodology

FortisBC is committed to designing, constructing, operating, and decommissioning or abandoning the Project and proposed amendments in a safe and environmentally responsible manner that respects the communities within which it operates. The assessment of risks and consequences associated with potential accidents or malfunctions was provided in Section 16.0 of the EAC Application (Volume 1, Part B). The potential accidents or malfunctions that were assessed in the EAC Application include:

- Contamination from spills
- Spills of hazardous substances stored on-site
- Pipeline leakage or failure
- Utility interruptions
- Fires or explosions
- Fly rock from blasting
- Motor vehicle and marine vessel accidents
- Acid or metal leaching
- Sediment releases into watercourses

The risk assessment of potential accidents or malfunctions addresses both the risk of occurrence and the potential consequences if the risk materializes, and includes the following steps:

- Identification of accidents or malfunctions that could occur during construction
- Operations and decommissioning or abandonment of the proposed Project
- Identification of interactions that are expected to occur between VCs and potential accidents or malfunctions
- Determination of unmitigated likelihood and consequence of an accident or malfunction
- Identification of mitigation measures to reduce likelihood of an accident or malfunction occurring and reduce the consequence in the event of an accident or malfunction
- Identification of potential residual adverse effects
- Determination of the mitigated likelihood of the accident or malfunction occurring
- Characterization of the potential risk of the accident or malfunction

Assessment methodology, including risk characterization and confidence indicators, are further described as follows and in subsection 16.3 of the EAC Application.

Table 16-1 defines each category of likelihood and consequence used in the risk evaluation for each accident and malfunction scenario. The definitions of likelihood and consequence were adapted from the University of New South Wales Environmental Risk Rating Procedure and were revised to align with the definitions for the assessment criteria for characterizing potential residual adverse effects (UNSW 2010).

The methodology used to assess the potential risk of an accident or malfunction involved the use of a risk evaluation matrix (Table 16-2). The risk evaluation matrix was adapted from the Risk Management

Guideline for the BC Public Sector (Province of BC 2012) and was revised to align with the consideration of potential consequence of adverse effects of accidents or malfunctions.

Table 16-1. Definitions for Each Category of Likelihood and Consequence

	Category	Description
Likelihood	Almost Certain	Is expected to occur in most circumstances and has a history of occurrence. Occurrence can be expected once a year or more frequently
	Likely	Will probably occur in most circumstances. Occurrence is expected once in 1 to 3 years
	Possible	Could occur at some point. Occurrence is expected once in every 3 to 5 years
	Unlikely	Not likely to occur in normal circumstances. Occurrence could occur once during the life of the proposed Project
	Rare	May occur only in exceptional circumstances. Occurrence is not expected during the life of the proposed Project
Consequence	Severe	Resulting environmental, social, economic, heritage and health effects are considered severe and will take more than 10 years to reverse
	Major	Resulting environmental, social, economic, heritage and health effects are considered major and can be reversed in less than 10 years
	Moderate	Resulting environmental, social, economic, heritage and health effects are detectable, and can be reversed in less than or equal to 1 year
	Minor	Resulting environmental, social, economic, heritage and health effects are barely detectable and can be reversed in less than or equal to 1 month
	Negligible	Resulting environmental, social, economic, heritage and health effects are barely to not detectable and can be reversed in 2 days or less

The likelihood of an accident or malfunction and the consequence if it were to occur are ranked on 5-point scales based on the definitions described in Table 16-1, the product of which determines the corresponding risk level. Likelihood is the probability of the event actually occurring, and consequence is a measure of the severity and magnitude of the potential adverse effects. Likelihood ranges from rare to almost certain and consequence ranges from a negligible to severe effect.

Table 16-2. Risk Evaluation Matrix

		Consequence				
		Severe	Major	Moderate	Minor	Negligible
Likelihood	Almost Certain	Very High	Very High	High	Medium	Low
	Likely	Very High	High	High	Medium	Low
	Possible	High	High	Medium	Low	Low
	Unlikely	Medium	Medium	Medium	Low	Low
	Rare	Medium	Low	Low	Low	Low

Source: Province of BC 2012

Note: The colour coding is used as a visual aid to convey risk, which has possible risk levels ranging from low to very high, red being very high risk, orange being high risk, yellow being medium risk, and green being low risk.

16.1.1 Confidence in Risk Assessment

The potential risk for each residual adverse effect identified is accompanied by an indicator of the level of confidence in the risk assessment as low, medium, or high. Level of confidence was determined with reference to the availability of data and precedents and by considering the degree of scientific uncertainty

or the existence of other factors beyond the control of the assessment team. Confidence levels are defined as follows:

- **Low** – Assessment is based on incomplete understanding of cause-effect relationships and incomplete data pertinent to the Project Footprint.
- **Moderate** – Assessment is based on good understanding of cause-effect relationships using data from outside the Project Footprint or incompletely understood cause-effect relationships using data pertinent to the Project Footprint.
- **High** – Assessment is based on good understanding of cause-effect relationships and data pertinent to the Project Footprint.

Where confidence in the risk assessment is medium or low, appropriate follow-up and monitoring programs are provided.

16.2 Stawamus Corridor Expansion

The proposed Stawamus Corridor Expansion does not result in the addition of any new potential accidents or malfunctions that have not been identified and assessed in Section 16.0 of the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential risks, adverse effects, mitigation, or residual effects for accidents or malfunctions during any phase of the Project. As a result, assessment conclusions identified in the EAC Application with respect to accidents or malfunctions remain the same.

16.3 Coquitlam Twinning

The proposed Coquitlam Twinning does not result in the addition of any new potential accidents or malfunctions that have not been identified and assessed in Section 16.0 of the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential risks, adverse effects, mitigation, or residual effects for accidents or malfunctions during any phase of the Project. As a result, assessment conclusions identified in the EAC Application with respect to accidents or malfunctions remain the same.

16.4 Eagle Mountain Compressor Station

The proposed Eagle Mountain Compressor Station amendment does not result in the addition of any new potential accidents or malfunctions that have not been identified and assessed in Section 16.0 of the EAC Application. Therefore, the proposed amendment does not result in any material change to the assessment of potential risks, adverse effects, mitigation, or residual effects for accidents or malfunctions during any phase of the Project for these sections of the amendment. As a result, assessment significance conclusions identified in the EAC Application with respect to accidents or malfunctions remain the same.

16.5 Squamish Compressor Station

As a result of the proposed location of the Squamish Compressor Station site and its proximity to the WLNG facility (approximately 400 m), the potential for interactions between the WLNG facility and the Squamish Compressor Station was evaluated to better understand potential for accidents or malfunctions. See subsection 1.1.4 for details on the Squamish Compressor Station. A new potential interaction that was identified and not assessed in Section 16.0 of the EAC Application is the potential for a fire and explosion at WLNG as a result of an uncontrolled gas release from the Squamish Compressor Station. As a result, the risk to human populations (that is, workers at the WLNG facility or Squamish Compressor Station), potential for loss or damage to adjacent property, or adverse effects on Local emergency services, and Local economies was considered.

Upon review, it was determined that although the consequence of a fire or explosion as a result of an uncontrolled gas release would be severe to workers at the WLNG facility, to adjacent property, and to Local emergency services and Local economies, the likelihood is rare, even under exceptional circumstances. Two studies (SNC 2019; Risktec 2019) were completed during detailed engineering and design and were used to inform this section of this Amendment Application. The location of the Squamish Compressor Station was chosen based on the detailed engineering and design risk assessment and, as a result, the location of the Squamish Compressor Station is considered to be a safe distance from the WLNG facility. The following subsections provide further information on this risk.

16.5.1 Hazard Identification

Given the proximity of the Squamish Compressor Station site to the WLNG facility (400 m), this subsection identifies potential accident or malfunction scenarios that could have a risk to off-site human populations, potential for loss or damage to adjacent property, or adverse effects on Local emergency services and Local economies.

The proposed design of the Squamish Compressor Station includes controlled vents which release gas to the atmosphere. This may be done manually to safely conduct maintenance on the facilities or automatically to depressurize all or part of the piping systems in an emergency. This process is known as a blowdown which is done by depressurizing gas from piping and equipment from the main process flow in the compressor station. The blowdown occurs through vent stacks designed such that mixing of the released gas with the air will occur at an elevation above grade to minimize potential hazards to personnel or equipment at ground level. FortisBC has identified three blowdown inventories (volumes) for the Squamish Compressor Station at the WLNG project site which includes two unit blowdowns and a station blowdown. Through the ‘Flammable Dispersion Modelling Study for V2 Site’ (SNC 2019), FortisBC was able to demonstrate that there is no risk of fires or explosions as a result of utilizing the proposed blowdowns at Squamish Compressor Station, which are part of normal and controlled operations at this proposed facility.

In addition, FortisBC conducted a quantitative risk assessment (Risktec 2019) to understand the potential risks due to interaction between the WLNG facility and the Squamish Compressor Station in the event of uncontrolled gas release and loss of containment, such as pipe rupture.

16.5.2 Potential Adverse Effects and Proposed Mitigation

As mentioned, the only new potential interaction not already assessed in Section 16.0 of the EAC Application is the potential for a fire and explosion at the WLNG project site as a result of an uncontrolled gas release. Table 16-3 presents the potential adverse effects that could result from an uncontrolled gas release and outlines the unmitigated likelihood and consequences of such an event, as well as the mitigation that addresses the risk and the potential residual adverse effects that remain after mitigation. The quantitative risk analysis of an uncontrolled gas release that was conducted during engineering and design and was used to inform this subsection of this proposed Amendment Application.

The identification of potential adverse effects and assessment of unmitigated likelihood and consequences is based on the worst-case scenario involving a severe fire and explosion as a result of an uncontrolled gas release causing extensive damage. As a result, a range of unmitigated likelihood and consequences is listed for each potential adverse effect.

Table 16-3. Updated Potential Adverse Effects, Mitigation Measures and Residual Adverse Effects of the Squamish Compressor Station for Accidents or Malfunctions – Operations Decommissioning Project Phase

Fires and explosions as a result of an uncontrolled gas release	Affected VCs	Unmitigated Likelihood	Unmitigated Consequence	Key Recommendations / Mitigation Measures	Potential Residuals Effects
Risk to workers at the WLNG facility	• Human Health • Community	Rare	Severe	**Specific Measures to be applied at the Squamish Compressor Station:** • Apply additional emergence response measures such as a system that rapidly alerts operators in the event of a major gas release • Provide gas detection on the ventilation intakes of FortisBC and WLNG's manned and occupied buildings if not already installed • Provide perimeter gas detection at WLNG and/or the Squamish Compressor Station site to alert site personnel to an uncontrolled gas release from the Squamish Compressor Station • Mitigate risks through sound design, compliance with codes and industry safe practices • Conduct HAZOP to identify, address, and mitigate all such risks • Gas detection inside all buildings • Remote monitoring of operations as well as on-site operators • Routine audit, inspection, and calibration of safety devices • Routine inspection of all piping and equipment for corrosion and defects **General Measures:** • Implement the Fire Response Plan (subsection 6.7 of the EMP as part of the EAC Application), notify proper authorities and cut or plow fire breaks in the event of a wildfire or an accidental fire associated with the Project. **In the Event of a Fire or Explosion:** Implement the ERP (subsection 6.7 of the EMP as part of the EAC Application).	Fire or explosion as a result of an uncontrolled gas release could lead to injury or death of off-site human populations.
Loss or Damage to Adjacent Property Due to Fire	• Air Quality • GHG Emissions • Human Health • Community • Community Utilities and Services • Transportation Infrastructure and Facilities • Land and Resources Use	Rare	Severe		Fires or explosions could lead to a loss or damage to adjacent property.
Adverse Effects on Local Emergency Services and Local Economies	• Community Utilities and Services • Transportation Infrastructure and Facilities • Community • Economy	Rare	Severe		Fires or explosions could adversely affect Local emergency services and Local economies.

The first line of mitigation is mitigation through safe design. The Squamish Compressor Station will be designed to have several autonomous safety systems including pressure detection, temperature detection, combustible gas detection and fire detection. These autonomous safety systems have the capability to shut down and lock out the compressors, isolate the station from the pipeline transmission system, vent high pressure gas and shutdown utility systems. FortisBC will implement mitigation as outlined in the EAC Application EMP and ERP to prevent and respond to fires or explosions. In the EAC Application, the EMP is discussed in detail in Section 23.0 (Volume 1, Part E), and follow-up programs and monitoring are discussed in Section 24.0 (Volume 1, Part E). Table 16-3 provides information on the updated potential adverse effect assessment as a result of the proposed Squamish Compressor Station amendment.

16.5.3 Potential Adverse Effects Before Mitigation

The following paragraphs summarize the potential adverse effects associated with fires or explosions as a result of an uncontrolled gas release before the implementation of mitigation.

16.5.3.1 Risk to Workers at the WLNG Facility

A fire or explosion as a result of an uncontrolled gas release could pose a risk to the adjacent WLNG facility. The location of the Squamish Compressor Station site is remote and within the approved footprint of the WLNG Project site. In the event of an uncontrolled gas release from the Squamish Compressor Station causing a fire or explosion at the adjacent WLNG facility where humans are in the vicinity, human health, air quality, GHG emissions, and community life might also be affected.

The unmitigated consequences of a fire or explosion as a result of an uncontrolled gas release resulting in risk to workers at the WLNG facility are considered to be severe, as the adverse effects could be irreversible. The unmitigated likelihood of a fire or explosion as a result of an uncontrolled gas release resulting in risk to workers at the WLNG facility is considered to be rare, as fires and explosions as a result of an uncontrolled gas release may occur only in exceptional circumstances and occurrence is not expected to occur during the life of the proposed Project.

The consequences and likelihood of a fire or explosion as a result of an uncontrolled gas release caused by the proposed Project resulting in risk to workers at the WLNG facility can be further reduced through the application of the Fire Response Plan as well as mitigation such as ensuring that all necessary fire-fighting equipment is on hand and that all personnel are trained in its proper use.

16.5.3.2 Loss or Damage to Adjacent Property Due to Fire

A fire or explosion as a result of an uncontrolled gas release could pose a risk to adjacent property. The location of the Squamish Compressor Station site is remote and within the approved project site for the WLNG facility. In the event of a large fire or explosion where humans are in the vicinity of the event, human health, air quality, greenhouse gas emissions and community life might also be affected.

The unmitigated consequences of a fire or explosion as a result of an uncontrolled gas release resulting in loss or damage to adjacent property are considered to be severe, since the adverse effects could take more than 10 years to reverse (subsection 16.1 of this Amendment Application or subsection 16.3.1 of the EAC Application for definitions of likelihood and consequence). The unmitigated likelihood of a fire or explosion as a result of an uncontrolled gas release resulting in loss or damage to adjacent property is considered to be rare, as fires and explosions as a result of an uncontrolled gas release may occur only in exceptional circumstances and occurrence is not expected to occur during the life of the proposed Project.

The consequences and likelihood of a fire or explosion as a result of an uncontrolled gas release caused by the proposed Project resulting in loss or damage to adjacent property can be further reduced through the application of the Fire Response Plan as well as mitigation such as ensuring that all necessary fire-fighting equipment is on hand.

16.5.3.3 Adverse Effects on Local Emergency Services and Local Economies

A fire or explosion as a result of an uncontrolled gas release may require a response from Local emergency services (that is, fire department, law enforcement, medical services), potentially temporarily increasing the demand on Local emergency services to respond as the location is considered remote. The Local economy could also be affected should damage occur to the WLNG facility.

The unmitigated consequences of a fire or explosion as a result of an uncontrolled gas release affecting Local emergency services and Local economies are considered to be severe, since the adverse effects of damage to the WLNG project site could take more than 10 years to reverse, directly impacting Local economies.

The unmitigated likelihood of a fire or explosion as a result of an uncontrolled gas release affecting Local emergency services and Local economies is considered to be rare, as fires and explosions as a result of an uncontrolled gas release may occur only in exceptional circumstances and occurrence is not expected to occur during the life of the proposed Project.

The consequences and likelihood of a fire or explosion as a result of an uncontrolled gas release caused by the proposed Project resulting in loss or damage to adjacent property can be reduced through the application of the Fire Response Plan as well as mitigation such as ensuring that all necessary fire-fighting equipment is on hand.

16.5.4 Determination of Potential Risk After Mitigation

This subsection examines the likelihood, consequences, and overall potential risk of fires or explosions during operations and decommissioning or abandonment of the proposed Project on each VC, pursuant to Section 9.0 Accidents or Malfunctions of the AIR. Table 16-4 summarizes this assessment. Only those VCs determined to be affected by fires or explosions are included in this discussion.

Table 16-4. Mitigated Likelihood, Consequences, Potential Risk, and Confidence for Fires or Explosions as a Result of an Uncontrolled Gas Release

Event	Potential Residual Effects	Mitigated Likelihood	Mitigated Consequence	Potential Risk	Confidence	Recommended Follow-up and Monitoring
Fires and explosions as a result of an uncontrolled gas release	Fires and explosions as a result of an uncontrolled gas release could lead to injury or death of workers at the WLNG facility	Rare	Severe	Medium*	High	Implement the Environmental Monitoring Program
	Fires and explosions as a result of an uncontrolled gas release could lead to a loss or damage to adjacent property	Rare	Severe	Medium	High	Implement the Environmental Monitoring Program
	Fires or explosions could adversely affect Local emergency services and Local economies	Rare	Severe	Medium	High	Implement the Environmental Monitoring Program

*The potential risk for each residual adverse effect identified is accompanied by an indicator of the level of confidence in the risk assessment as low, medium or high. See subsection 16.1.1 of the EAC Application for confidence level definitions.

The potential residual adverse effects associated with fires or explosions as a result of an uncontrolled gas release, following the implementation of mitigation measures, are summarized as follows.

16.5.4.1 Fires and Explosions as a Result of An Uncontrolled Gas Release Could Lead to Injury or Death of Off-site Human Populations

The mitigated likelihood of a fire or explosion as a result of an uncontrolled gas release caused by the proposed Project leading to injury or death of off-site human populations is considered to be rare. With the implementation of mitigation measures, fires, or explosions as a result of an uncontrolled gas release are not expected to occur during the life of the proposed Project. The mitigated consequences of a fire or explosion leading to injury or death of off-site human populations is considered to be severe as, depending on the extent of the injury or death it causes, the residual adverse effect could be irreversible. Consequently, the mitigated risk of a fire or explosion as a result of an uncontrolled gas release leading to injury or death of off-site human populations is medium.

Confidence is considered to be high based on FortisBC's extensive experience, the 'FortisBC Energy Inc. V2 Compressor Station Quantitative Risk Assessment' report (Risktec 2019), the effectiveness of mitigation, and professional judgment.

16.5.4.2 Fires and Explosions as a Result of An Uncontrolled Gas Release Could Lead to a Loss or Damage to Adjacent Property

The mitigated likelihood of a fire or explosion as a result of flammable gas dispersion caused by the proposed Project leading to loss or damage to adjacent property is considered to be rare. With the implementation of mitigation, fires or explosions as a result of flammable gas dispersion are not expected to occur during the life of the proposed Project. The mitigated consequences of a fire or explosion leading to loss or damage to adjacent property are considered to be severe since, depending on the size and the location of the fire as well as the extent of the damage it causes, the residual adverse effect could take more than 10 years to reverse. Consequently, the mitigated risk of a fire or explosion as a result of flammable gas dispersion leading to loss or damage to adjacent property is medium.

Confidence is considered to be high based on FortisBC's extensive experience, the 'FortisBC Energy Inc. V2 Compressor Station QRA' report (Risktec 2019), the effectiveness of mitigation, and professional judgment.

16.5.4.3 Fires or Explosions Could Adversely Affect Local Emergency Services and Local Economies

The mitigated likelihood of a fire or explosion affecting Local emergency services and Local economies is considered to be rare since, with the implementation of mitigation measures, fires or explosions are not expected to occur during the life of the proposed Project. The mitigated consequences of a fire or explosion affecting Local emergency services and Local economies are considered to be severe since the adverse effects of damage to the WLNG project site could take more than 10 years to reverse, directly impacting Local economies. Consequently, the mitigated risk of a fire or explosion as a result of an uncontrolled gas release affecting Local emergency services and Local economies is medium.

Confidence is considered to be high based on FortisBC's extensive experience, the Risktec report (Risktec 2019), the effectiveness of mitigation, and professional judgment.

16.5.5 Summary

FortisBC has a favourable record for safely constructing and operating its natural gas pipeline system in BC. FortisBC has been operating gas pipelines and compressor stations in BC for over 50 years and has a strong commitment to safety in its values, policies, and practices.

Potential accidents or malfunctions for this proposed amendment include fires or explosions as a result of an uncontrolled gas release from the Squamish Compressor Station site. The potential risk of each accident or malfunction is evaluated by examining the likelihood and consequence of an event that has the potential to adversely affect a VC identified in the AIR as part of the EAC Application.

The potential residual adverse effects of accidents or malfunctions associated with the proposed amendment include:

- adverse effects on human health, including serious injury and fatality
- adverse effects on community utilities and services, including loss of power
- adverse effects on Local emergency services and Local economies, including increased demand on emergency services

While major accidents and malfunctions are rare, the risks and related mitigation measures are supported by a likelihood and consequence analysis to determine a risk rating. Considering the mitigation, the potential residual adverse effects of accidents or malfunctions are low risk.

16.6 References

Risktec Solutions (Canada) Limited (Riskec). FortisBC Energy Inc. V2 Compressor Station Quantitative Risk Assessment. Prepared for the FortisBC Energy Inc. Eagle Mountain Gas Pipeline Project. October 2019.

SNC Lavalin Inc (SNC). Flammable Dispersion Modelling for V2 Site. Prepared for the FortisBC Energy Inc. Eagle Mountain Gas Pipeline Project. October 2019.

17. Effects of Environment on the Project

The assessment of risks and consequences associated with potential effects of the environment on the Project was provided in Section 17.0 of the EAC Application (Volume 1, Part B). The potential effects of the environment on the Project that were assessed in the EAC Application include:

- natural seismic events
- fire
- slope stability and mass wasting events
- extreme weather
- predicted future climate scenarios (including sea level rise and changes in extreme weather)
- forest pests and pathogens
- marine clays

The proposed amendment does not result in the addition of any new potential effects of the environment on the Project that have not been identified and assessed in the EAC Application.

18. Indigenous Groups Information Requirements

18.1 Introduction

This section describes the potential adverse effects of the proposed amendments on Indigenous groups. In the EAC Application the term 'Aboriginal' was used to describe these communities; however, since 2015, 'Indigenous' has been used for consistency with the United Nations Declaration on the Rights of Indigenous Peoples. Similarly, in the EAC Application the term "Aboriginal Interests" was used, which has since been changed by the BC EAO to "Section 35 rights" and "Indigenous Interests." Indigenous Interests are defined in the BC EAO User Guide (version 1.01, March 30, 2020) (Government of BC 2020) as "effects on Indigenous nations and rights recognized and affirmed by Section 35 of the *Constitution Act, 1982*." The assessment of "Aboriginal Interests" in the EAC Application included Section 35 rights.

As described in Volume 1, Part C, Section 19.0 of the EAC Application, the four Indigenous groups whose Indigenous Interests may be affected by the Project are listed as follows in geographic order, from west to east:

- Squamish Nation
- Tsleil-Waututh Nation
- Musqueam Nation
- Kwikwetlem First Nation

Figure 18-1 identities the traditional territories of the four potentially affected Indigenous groups in relation to the proposed amendments. Note that Tsleil-Waututh Nation has informed FortisBC that they prefer the term 'consultation area' when referring to the area outlined on Figure 18-1 as the Province adopted this area for consultation and is not a definitive representation of what Tsleil-Waututh Nation considers to be its traditional territory.

During the development of the EAC Application in in 2014 and 2015, these Indigenous groups were considered either directly affected by the Project or had expressed a specific interest in the planning, construction, or operations of the Project. Therefore, the Indigenous Interests of these groups are being considered for the proposed amendments. Information on the ethnography, language, land use setting, and planning, governance, and economy of each Indigenous group is provided in Section 18.0 of the EAC Application (Volume 1, Part C).

During the EAC Application development, at the request of Squamish Nation, FortisBC and Squamish Nation negotiated FortisBC's involvement in a parallel assessment process led by the Squamish Nation (the Squamish Nation Process). Specifics of the process are confidential, as are discussions and the consultations themselves. It is for this reason that information from the Squamish Nation was not included in the EAC Application. However, at the request of the BC EAO, a supplemental document titled, Report to the BC Environmental Assessment Office as required under the Section 13 Order, November 10, 2014 for the FortisBC Energy Inc. Eagle Mountain – Woodfibre Gas Pipeline Project, May 3, 2016 (the Section 13 Report), was submitted to the BC EAO. FortisBC is including modified Squamish Nation information in subsections 18.2, 18,3, 18.5, and 18.6 to meet the requirements of the Squamish Nation Process and Section 32 of the *2018 Act*.

Although the Project's AIRs did not require that Musqueam Nation be included in Part C of the EAC Application, due to the interest Musqueam Nation expressed in the Project and its potential adverse effects on watercourses and fishing, an assessment of the adverse effects of the Project on their ability to fish was included in the EAC Application. Accordingly, Musqueam Nation has been considered in this Amendment Application.

FORTIS BC

October 2020

FIGURE 18-1

EAGLE MOUNTAIN – WOODFIBRE GAS PIPELINE PROJECT IN RELATION TO INDIGENOUS GROUPS' CONSULTATION AREAS

Project (EA Amendment)
- Proposed NPS 24 Pipeline
- Proposed Squamish Compressor Station

Project (EAP Certified)
- Certified NPS 24 Pipeline
- Eagle Mountain Compressor Station

Other
- Kilometre Post (KP)
- Reserve < 100 ha
- Squamish Nation Consultation Area
- Tsleil-Waututh Nation Consultation Area
- Musqueam Nation Consultation Area*
- Kwikwetlem First Nation Consultation Area
- Existing FortisBC Pipeline
- Provincial Boundary
- First Nation Reserve
- Municipality
- Road
- Highway
- Waterbody
- Parks & Protected Areas

*Draft – to be confirmed

SCALE: 1:700,000

0 10 20 Kilometers

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

UTM Zone 10 North. NAD 1983.
Proposed Pipeline Route, KP: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); Existing Pipeline: FortisBC 2012; Certified Eagle Mountain CS: Primary Engineering and Construction 01-28-2020; Proposed Squamish Compressor Station: Solaris 02-25-2020; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Roads: NRCan 2015; Hydrography: BC MFLNRO 2008; Reserves: CH2M HILL 2014; Kwikwetlem Traditional Territory: Kwikwetlem First Nation 06-15-2010; Tsleil-Waututh Consultation Area: Derived from Tsleil-Waututh Nation Consultation Area Map 2008 (accessed online 20-03-2014); Other Traditional Territories: BC FLNRO 2005; Municipal Boundaries, Railway: BC Gov 2019; Provincial Park: BC FLNRO, 2008; First Nation Reserve: Government of Canada 2014; Hillshade: TERA Environmental Consultants 2008

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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Section 18 provides updated information to the EAC Application's Indigenous groups information requirements for the proposed amendments as well as new information required under the *2018 Act* that was not required in the EAC Application under the *2002 Act*. Information updated since the EAC Application includes the following:

- Subsection 18.2: provides a summary of engagement since the submission of the EAC Application, as well as detailed information regarding engagement with the four Indigenous groups on the proposed amendments.
- Subsection 18.3: provides an update to the Indigenous groups effects assessment previously presented in the EAC Application for each proposed amendment.
- Subsection 18.4: summarizes the potential cumulative adverse effects on Indigenous Interests through the interaction of cumulative adverse effects assessed in this Amendment Application regarding the proposed amendments.
- Subsection 18.5: assesses other matters of concern in relation to the proposed amendments that were originally raised by Indigenous groups during engagement on the Project. These matters were not assessed as Aboriginal Interests in the EAC Application (now called Indigenous Interests under the *2018 Act*) as they are not related to Section 35 rights but were still issues that FortisBC felt were important to be addressed.

New requirements under the *2018 Act* that relate specifically to Indigenous groups but do not relate to Section 35 rights are included as new sections of this Amendment Application. These new sections include:

- Subsection 18.6: describes the potential effects on current and future generations regarding the Inter-generational Transmission of Traditional Knowledge (IGTK) within Indigenous groups.
- Subsection 18.7: references the disproportionate effects on distinct human populations in relation to Indigenous groups. The assessment of disproportionate effects on distinct human populations, including distinct populations within Indigenous groups, is provided in Section 21.

18.2 Indigenous Engagement

This subsection provides detailed information regarding engagement with the four Indigenous groups on the proposed amendments up to September 25, 2020, per FortisBC's engagement procedures and principles outlined in the Eagle Mountain – Woodfibre Gas Pipeline Project Aboriginal Consultation Plan (Aboriginal Consultation Plan), dated September 2014. Following the submission of this Amendment Application to the BC EAO, there will be additional opportunities for engagement related to the proposed amendments.

Please refer to the Aboriginal Consultation Plan for further information on:

- FortisBC's corporate Indigenous relationship principles (Section 2.0)
- FortisBC's Project-specific Indigenous Relationship Principles (Section 3.0)
- Indigenous groups consulted for the Project (Section 6.0)
- Indigenous consultation methodology (Section 7.0)
- pre-Amendment Application consultation activities (Section 8.0)
- consultation that was proposed for the EAC Application review phase (Section 9.0)
- documentation of the consultation up to September 2014 (Section 10.0)
- consultation reporting (Section 11.0) (AMEC 2014a)

Additional information on the engagement conducted with Indigenous groups for the Project is available in Section 18.0 Background and Consultation (Volume 1, Part C) of the EAC Application and in the Project's Aboriginal Consultation Reports (dated November 2014 and May 2015) (AMEC 2014b, 2015).

The Aboriginal Consultation Plan also includes:

- Past engagement activities on the proposed amendments with:
  - Squamish Nation
  - Tsleil-Waututh Nation
  - Musqueam Nation
  - Kwikwetlem First Nation
- Planned engagement
- Engagement documentation
- Indigenous groups' comments

Note that due to the extraordinary circumstances of the novel coronavirus disease 2019 (COVID-19) pandemic, FortisBC has adapted its engagement processes for the EAC Amendment Application. As part of its corporate approach to COVID-19, FortisBC reached out to 57 Indigenous groups in its service territory with offers of support, including immediate donations to communities to assist with respect to the pandemic. Work is ongoing to understand and respond to the changing needs of each individual community. As each Indigenous group is setting its own priorities with respect to how they address the pandemic. The engagement for each group regarding the proposed amendments is described in subsections 18.2.2. to 18.2.4.

18.2.1 Squamish Nation Engagement

Engagement regarding the Project with Squamish Nation began in May 2013 and is ongoing. FortisBC held meetings at regularly scheduled intervals with Squamish Nation throughout the Squamish Nation Process to discuss the Project and has had numerous email communications, telephone calls, and exchanged letters relating to the Project leading up to Squamish Nation's conditional approval of the Project in 2016. FortisBC and Squamish Nation established the FortisBC-Squamish Nation Environmental Working Group (FSE) under the Squamish Nation EAA, dated June 22, 2016. The FSE meets regularly, and approximately monthly since mid-2019. The FSE continues to work to meet the conditions of the Squamish Nation EAA, and where appropriate, to resolve Squamish Nation's issues regarding the Project at a bilateral level. The FSE has also been the principal forum for preliminary discussions regarding the proposed amendments. The FSE is not, however, an approving body for any amendments to the Squamish Nation EAA, and while there has been technical engagement on the proposed amendments, neither resolution of all information needs nor overall consent for the amendments from Squamish Nation is implied.

Under the Squamish Nation Process, past and planned engagement regarding the Project, including the proposed amendments, are confidential to promote an open forum for exploring issue resolution. As such, details regarding the purpose and topics of communications are not included in this summary; instead, high-level summaries have been provided.

18.2.1.1 Past and Planned Engagement Activities

Through the FSE, FortisBC has provided Squamish Nation with the same information regarding the proposed amendments as the other Indigenous groups, and held meetings to discuss the proposed amendments, including:

- regular meetings, communications, and presentations between February 20, 2019 and submission of this Amendment Application
- a letter package providing a summary on the proposed amendments (May 24, 2019)
- communications regarding the communication protocol with respect to the proposed amendments

In addition, FortisBC is continuing discussions with Squamish Nation regarding community benefits and procurement.

FortisBC communicated with Squamish Nation in mid-March at the start of the COVID-19 pandemic regarding scheduled meetings and means by which FortisBC could assist the Nation during the pandemic. FortisBC also enquired about the best way to continue engaging with Squamish Nation or if it was preferable to hold off for a few weeks. Squamish Nation continued to engage with FortisBC at a technical level throughout the spring and summer of 2020 to the filing of this Amendment Application. Engagement on administrative and governance matters of the Amendment (deliberation and decision-making process for Squamish Nation decision makers) did not advance as intended in spring 2020, largely due to COVID-19 priorities. The agenda items at Chief and Council meetings were altered due to the pandemic and discussions regarding the proposed amendments were postponed.

FortisBC understands that as part of the Squamish Nation Process, Squamish Nation generally expects to:

a) consider the merits of this Amendment Application

b) identify information gaps, if any

c) solicit further Squamish Nation community input on topics of concern

d) collaborate as needed with BC EAO

e) inform FortisBC of Squamish Nation's decision to amend all, none, or some of the four proposed amendments FortisBC has formally requested

Should the ongoing COVID-19 pandemic restrict or otherwise negatively alter Squamish Nation's governance consideration of this Amendment Application, FortisBC will take reasonable measures to find workable engagement processes.

18.2.1.2 Squamish Nation Issues and FortisBC Responses

Under the Squamish Nation Process, engagement regarding Squamish Nation's issues and FortisBC's response to those concerns is confidential and Squamish Nation's conditions continue to apply. As such, details regarding Squamish Nation's concerns and FortisBC's responses are incorporated into the Squamish Nation Process (subsection 18.3.1, Table 18-4 Squamish Nation Conditions in Relation to the proposed amendments).

18.2.2 Tsleil-Waututh Nation Engagement

18.2.2.1 Past and Planned Engagement Activities

Past Engagement

Engagement with Tsleil-Waututh Nation regarding the Project began in May 2013 and is ongoing. This engagement is consistent with the principles and policies described in the Aboriginal Consultation Plan.

FortisBC has held regular meetings with Tsleil-Waututh Nation to discuss the Project since the filing of the EAC Application and has had numerous email communications, telephone calls, and exchanged letters relating to the Project. FortisBC had previously signed agreements with Tsleil-Waututh Nation: a Memorandum of Understanding, Capacity Funding Agreement, and funding for a Traditional Land Use (TLU) study and are in the process of updating the Capacity Funding Agreement for continued involvement in the Project, including the proposed amendments.

The COVID-19 pandemic did not result in any interruptions of FortisBC's engagement with Tsleil-Waututh Nation. Tsleil-Waututh Nation informed FortisBC on March 17, 2020 that its Treaty, Lands, and Resources staff were working remotely and would be able to continue bi-weekly meetings via conference calls and continue with other phone calls and email exchange. FortisBC understands that the COVID-19 pandemic may continue to impact Tsleil-Waututh Nation's capacity to respond or participate in engagement regarding the proposed amendments and continues to seek ways to accommodate the capacity challenges.

An issue raised by Tsleil-Waututh Nation during engagement for the Project was the Tsleil-Waututh Work Avoidance Zones (WAZ). Tsleil-Waututh Nation has informed FortisBC that its concerns regarding the WAZ are ongoing and are a primary issue regarding the Project; therefore, a number of key communications with Tsleil-Waututh Nation have focused on the WAZ since the filing of the EAC Application.

The WAZ are “areas of specific concern in the Indian River Watershed that are culturally, spiritually, and environmentally significant to us [Tsleil-Waututh Nation] and to the overall integrity of the watershed” (George pers. comm.). The WAZ are delineated by Tsleil-Waututh Nation as part of the Nation’s stewardship goals and policy. FortisBC remains committed to incorporating Tsleil-Waututh Nation’s feedback into the pipeline routing and design, including avoidance of the WAZ unless not technically feasible, and to continue to work with Tsleil-Waututh Nation on micro-routing, stream crossings, and construction methods in and around these zones if avoidance is not technically feasible.

FortisBC conducted a field visit with Tsleil-Waututh Nation on November 21 and 22, 2018. Meetings regarding Project updates, the WAZ and routing, mitigations, background and general information relating to the Project, work plan, capacity funding, Condition Management Plans (CMPs), field programs and Tsleil-Waututh employment opportunities, fish and fish habitat (and specifically impacts on the pink salmon run), the technical table, and commitments to facilitate Tsleil-Waututh Nation monitoring for field and geotechnical investigation activities within the Indian River Valley occurred on:

- January 24, 2017
- January 24, 2018
- January 25, 2019
- February 8, 2019
- May 3, 2019
- June 27, 2019
- August 8, 2019
- August 20, 2019
- October 25, 2019
- February 14, 2020
- February 21, 2020
- March 9, 2020
- May 8, 2020
- May 18, 2020
- May 22, 2020
- June 12, 2020
- June 17, 2020
- July 3, 2020
- July 31, 2020
- August 14, 2020
- August 28, 2020

Phone calls, letters and email regarding Project information, updates and scheduling, the WAZs, feasibility studies, fish and fish habitat, the technical table, the work plan, a benefits agreement, capacity funding, scheduling technical and other meetings, archaeology, the technical table, draft meeting agendas, follow-up on meetings, and review of meeting notes, the CMPs, the EAC Extension, and other Project matters were exchanged on a regular basis between February 28, 2017 and October 9, 2020. In 2017 communications on average were conducted bi-monthly, and monthly in the first half 2018, quarterly from June 2018 to December 2019, and regularly in 2020.

Communications specifically regarding the proposed amendments include:

- On May 24, 2019 FortisBC sent a letter to Tsleil-Waututh Nation as a follow-up to the meeting held on May 3, 2019. FortisBC summarized the proposed amendment process and requested engagement with Tsleil-Waututh Nation on the proposed changes prior to submitting the Amendment Application. FortisBC proposed another meeting on June 27, 2019 to review the proposed changes.
- On May 31, 2019, FortisBC sent a letter to Tsleil-Waututh Nation as an additional follow-up to the meeting held on May 3, 2019. FortisBC addressed questions regarding the WAZ, Indian River Crossing, and archaeological sites near the Cascades. The letter also contained information regarding the proposed amendments and a list of answers to questions to FortisBC posed by Tsleil-Waututh Nation.
- On January 31, 2020, FortisBC and Tsleil-Waututh Nation had a conference call regarding a meeting to be held on February 2, 2020, which would include discussion on the proposed amendments.

- On February 4, 2020, FortisBC emailed Tsleil-Waututh Nation to provide summary notes of the conference call held on January 31, 2020. Notes provided details on the helicopter geotechnical program, the Squamish Compressor Station' geotechnical program, the WAZ, and proposed amendments.
- On May 8, 2020, Tsleil-Waututh Nation, the BC OGC, and FortisBC had a conference call on a number of Project topics, including the amendments.
- On May 22, 2020, Tsleil-Waututh Nation and FortisBC had a conference call during which Tsleil-Waututh Nation indicated to FortisBC that review of the proposed amendment Project Description was underway, and comments would be forthcoming.
- On May 26, 2020, FortisBC emailed Tsleil-Waututh Nation with notes on a number of Project topics, including the amendments and the 2020 look ahead schedule.
- On June 25, 2020, Tsleil-Waututh Nation emailed FortisBC with its preliminary review of the proposed amendment Project Description. The email stated that the comments were not necessarily an exhaustive list of comments and concerns in regard to the proposed amendments as ongoing consultation and review are required. The comments have been added to Table 18-1 as applicable and incorporated into the Amendment Application where practicable.
- On July 31, 2020, Tsleil-Waututh Nation and FortisBC had a conference call on a number of Project updates, including the proposed amendments.
- On August 14, 2020, Tsleil-Waututh Nation and FortisBC had a conference call on a number of Project updates, including the proposed amendments.
- On August 28, 2020, Tsleil-Waututh Nation and FortisBC had a conference call on a number of Project updates, including the proposed amendments. On September 29, 2020, FortisBC emailed Tsleil-Waututh Nation to provide notes on the proposed amendment, among other topics.
- On October 9, 2020, FortisBC emailed Tsleil-Waututh Nation to provide project updates regarding the proposed amendments and other topics.

Planned Engagement

FortisBC is committed to continuing regular engagement with Tsleil-Waututh Nation regarding the proposed amendments and other matters relating to the Project as identified by Tsleil-Waututh Nation (such as, the WAZ, the geotechnical program and permitting). Tsleil-Waututh Nation and FortisBC are developing a plan for engagement on an at least a bi-weekly basis for two meeting themes:

1) A bi-weekly meeting to discuss FortisBC projects including the Project
2) Bi-weekly technical meetings focused on resolving outstanding WAZ issues

18.2.2.2 Tsleil-Waututh Nation Issues and FortisBC Responses

Table 18-1 summarizes the issues raised by Tsleil-Waututh Nation related to the proposed amendments and FortisBC's response up to the filing date of this Amendment Application.

Table 18-1. Tsleil-Waututh Nation Issues and FortisBC Responses

Tsleil-Waututh Nation Issue	FortisBC Response
• Requested the outcome of the geotechnical work. Although not specifically raised as an issue regarding the proposed amendments, slope stability interaction with riparian habitat may be applied to the proposed amendments.	• FortisBC submitted the geotechnical investigation findings from 2019 to Tsleil-Waututh Nation on January 24, 2020. • FortisBC will continue to engage with Tsleil-Waututh Nation on regulatory applications and geotechnical programs.
• Tsleil-Waututh Nation is concerned about the pipeline route, including the areas of the Indian River headwaters, the Cascades, and Indian River crossing. Although not specifically raised as an issue regarding the proposed amendments, issues regarding the pipeline route in general may be applied to the proposed Stawamus Corridor Expansion amendment.	• FortisBC will continue to engage with Tsleil-Waututh Nation on the pipeline route.
• Request for a workshop to discuss mitigations to protect fish and fish habitat in the Indian River.	• FortisBC commits to conducting this workshop once Tsleil-Waututh Nation indicates the timing is appropriate. Tsleil-Waututh Nation has indicated that resolution of its WAZ issues are required prior to this workshop occurring.
• Tsleil-Waututh Nation requested that the FortisBC team respond to all questions posed within past letters.	• Responses to questions were provided in a letter sent to Tsleil-Waututh Nation on May 31, 2019.
• Tsleil-Waututh Nation is concerned about water withdrawal from the Indian River and the potential effects on the pink salmon run.	• The proposed amendments will not materially alter the water needs as presented in the EAC Application. FortisBC is committed to collaborating with Tsleil-Waututh Nation to mitigate potential effects of water withdrawal during operations, particularly during pink salmon runs.
• Tsleil-Waututh Nation is concerned about the following aspects of the proposed Stawamus Corridor Expansion amendment: – the intersection of the amendment route with old growth forests. – timing of marbled murrelet surveys. – the potential impact to marbled murrelet habitat.	• The forested portion of the proposed amendment is less than 250 years old and does not possess the structural attributes of an old forest. It is an even-aged, dense conifer forest approximately 80-120 years old, comprised of Douglas-fir, western hemlock and amabilis fir. • Five radar survey and nine audio visual surveys were completed between June 27 and July 31, 2019 (during the nesting season). • Results in the EAC Application identified a 2.4 percent (4.6 ha) decrease in habitat for mature/old forest birds, a 6.6 percent decrease (61.0 ha) in habitat for early seral forest birds and a 2.0 percent decrease (13.2 ha) in habitat for riparian and water birds as a result of the proposed Project. These effects are considered an over-estimate since the right-of-way will be smaller than the corridor assessed in the EAC Application. Metrics for loss of habitat for bird KIs was not reported in the Amendment but there was found to be no material change as a result of the proposed Amendment. The Wildlife Mitigation and Monitoring Plan includes further measures to avoid and reduce effects to bird habitat.
• Tsleil-Waututh Nation is concerned about the following aspects of the proposed Coquitlam Twinning amendment: – how impacts upon the forested swamp will be mitigated during construction, and if there is potential habitat loss of the swamp. – how potential impacts upon identified amphibian species will be mitigated, and if all species identified as present were previously assessed within the EAC Application. • Tsleil-Waututh Nation would like the opportunity to review the aquatic assessments conducted as part of the proposed works.	• FortisBC will determine an appropriate pipeline installation method for wetlands by considering and balancing a variety of technical, environmental, Indigenous and stakeholder input, and economic considerations, along with site-specific conditions. The proposed pipeline construction activities will require wetland crossings; however, mitigation will be implemented to verify that “no net loss” of Wetland Function is achieved. This will be described in the Wetlands Management Plan. • Potential effects to amphibian species will be mitigated through measures detailed in the Construction Environmental Management Plan and Wildlife Mitigation and Monitoring Plan (under development in 2020). All species present were assessed in the EAC Application: Western toad was assessed as a key indicator while red-legged frog was assessed within the pond-dwelling amphibians key indicator. • FortisBC provided the Aquatics TDR to Tsleil-Waututh Nation once it was completed.

Table 18-1. Tsleil-Waututh Nation Issues and FortisBC Responses

Tsleil-Waututh Nation Issue	FortisBC Response
▪ Tsleil-Waututh Nation is concerned about noise from the Squamish and Eagle Mountain Compressor Stations and want to know if the large horsepower EMD compressor units proposed (20,500 hp to 26,000 hp) will cause an increase in noise. ▪ Tsleil-Waututh Nation would like to know how noise will be managed and mitigated.	• For clarification, the Eagle Mountain Compressor Station was originally approved to have two approximately 20,500 horse power (hp) EMD compressor units. The amendment is proposing two approximately 26,000 hp EMD compressor units. The Squamish Compressor Station approved at Mt Mulligan included up to three 4,700 hp natural gas turbine compressor units. The amendment is proposing the Woodfibre LNG Site for the Squamish Compressor Station which will include two approximately 6,300 hp gas turbine compressor units. • Updated noise studies will be completed for both compressor stations as part of the Amendment Application. Preliminary results from the noise studies indicate that the proposed compressor station amendments will be within the permissible noise levels defined by the BC OGC Noise Control Best Practices Guideline. • Mitigation measures to reduce project effects related to noise during construction and operation are included in the EAC Application. No new mitigation measures related to noise control are proposed as a result of the proposed amendments. • During operations FortisBC will comply with appropriate Provincial and Municipal regulatory guidelines related to noise during construction as well as operation of compressor stations to reduce disturbance related to noise.
• Tsleil-Waututh Nation is concerned about the following aspects of the proposed Squamish Compressor Station amendment: ▪ Since the compressor station overlaps with the Squamish-Lillooet Grizzly Bear Unit, the Nation wants information on the studies that will be conducted to determine the effects on Grizzly Bears and Wolves. ▪ Receiving more information on the proposed wildlife studies. ▪ Providing input into the scope and design of the wildlife studies.	• Grey wolf was not included as a KI in the EAC Application or Amendment. Grizzly bear was a KI species in the EAC Application and Amendment Application. All grizzly bear studies for the Amendment Application have been completed by wildlife biologists according to accepted Provincial methods. Further detail can be found in the TDR, which was provided to Tsleil-Waututh Nation. Construction and post-construction monitoring programs to help limit effects to grizzly bears will be defined in the Grizzly Bear Mitigation and Monitoring Plan. • Wildlife studies listed in the Amendment Project Description have already been completed. The studies were conducted by wildlife biologists following accepted Provincial methodologies. Further details can be found in the TDR.

18.2.3 Musqueam Nation Engagement

18.2.3.1 Past and Planned Engagement Activities

Engagement with Musqueam Nation regarding the Project began in July 2013 and is ongoing. This engagement is consistent with the principles and policies described in the Aboriginal Consultation Plan.

FortisBC has held meetings with Musqueam Nation to discuss the Project since the filing of the EAC Application and has had email communications, telephone calls, and exchanged letters relating to the Project. FortisBC had previously signed agreements with Musqueam Nation regarding the Project, including a Capacity Funding Agreement for continued involvement in the Project.

Note that the COVID-19 pandemic has resulted in a number of Musqueam Nation staff working remotely. Musqueam Nation provided a form letter on March 31, 2020 advising that the Musqueam community would be restricting all access to off-reserve traffic and that Musqueam would not be sending their archaeology crews into the field. FortisBC understands that COVID-19 may continue to impact Musqueam Nation's capacity to respond or participate in engagement regarding the proposed amendments and continues to seek ways to accommodate the capacity challenges in a considered and sensitive approach.

Past Engagement

- On February 10, 2020 FortisBC emailed Musqueam Nation to give updates on the proposed amendments and upcoming discussions with Indigenous groups and stakeholders.
- On February 11, 2020, FortisBC emailed Musqueam Nation to be in contact on Project updates.
- On June 26, 2020, FortisBC emailed Musqueam Nation to provide a project update and workplan.
- On July 31, 2020, FortisBC called Musqueam Nation to provide Project updates, including the proposed amendments.
- On August 5, 2020, FortisBC emailed Musqueam Nation to provide notes on the July 31 call.
- On August 6, 2020, FortisBC emailed Musqueam Nation to provide CMP and proposed amendments materials.
- On August 10, 2020, FortisBC and Musqueam Nation exchanged email regarding the proposed amendments and CMPs.
- On August 19, 2020, FortisBC and Musqueam Nation exchanged email regarding the proposed amendments, CMPs, and next steps.
- On September 24, 2020, FortisBC emailed the Musqueam Nation to provide a draft Work Plan and to follow-up on the next steps for the proposed amendment process.

Planned Engagement

Musqueam Nation have expressed interest in conducting a technical review of documents relating to the proposed amendments, including this Amendment Application. Musqueam Nation are determining the extent to which they wish to be involved in the review.

18.2.3.2 Musqueam Nation Issues and FortisBC Responses

At the time of filing of this Amendment Application, Musqueam Nation had not raised issues relating to the proposed amendments. FortisBC will continue to engage Musqueam Nation to understand and respond to potential issues.

18.2.4 Kwikwetlem First Nation Engagement

18.2.4.1 Past and Planned Engagement Activities

Engagement with Kwikwetlem First Nation regarding the Project began in May 2013 and is ongoing. This engagement is consistent with the principles and policies described in the Aboriginal Consultation Plan.

FortisBC has held meetings with Kwikwetlem First Nation to discuss the Project since the filing of the EAC Application and has had email communications, telephone calls, and exchanged letters relating to the Project. FortisBC had previously signed agreements with Kwikwetlem First Nation regarding the Project and are in the process of updating the Capacity Funding Agreement for continued involvement in the Project, including the proposed amendments.

FortisBC has continued engagement with Kwikwetlem First Nation throughout the COVID-19 pandemic at comparable levels as prior to the pandemic. FortisBC understands that COVID-19 may continue to impact Kwikwetlem First Nation's capacity to respond or participate in engagement regarding the proposed amendments and continues to seek ways to accommodate the capacity challenges in a considered and sensitive approach.

Past Engagement

FortisBC's engagement activities that relate to the proposed amendments include:

- On June 3, 2019 FortisBC sent a letter to congratulate newly elected Chief Ed Hall as well as flag FortisBC's interest in continuing dialogue on the Project. These activities included review of the CMP, permit applications and this Amendment Application, and to propose a Capacity Funding Agreement to assist with the review.
- On February 10, 2020 FortisBC emailed Kwikwetlem First Nation to give updates on the proposed amendments and upcoming discussions with Indigenous groups and stakeholders.
- On February 23, 2020, FortisBC had a conference call with the Kwikwetlem First Nation to discuss Project updates.
- On February 24, 2020. FortisBC emailed Kwikwetlem First Nation to provide a summary of the topics discussed during the conference call held on February 23, 2020.
- On April 7, 2020, FortisBC emailed Kwikwetlem First Nation a draft agenda for the conference call and the Skype information and then had a conference call with Kwikwetlem First Nation to discuss updates on the Project, previous Kwikwetlem First Nation involvement, and the 2020 work plan.
- On April 9, 2020, FortisBC emailed Kwikwetlem First Nation to thank them for participating in the conference call and to provide some correspondence from last year, noting that some of the activities were delayed, but FortisBC's commitment to work with the Nation is the same.
- On April 20, 2020, FortisBC emailed Kwikwetlem First Nation to inquire if they would like to connect and see if there were any follow-up items related to the Project.
- On April 23, 2020, FortisBC had a conference call with Kwikwetlem First Nation to discuss the Project. FortisBC emailed Kwikwetlem First Nation with the action items on April 24, 2020.
- On May 8, 2020, FortisBC emailed the Kwikwetlem First Nation to provide information on the OGC permit applications for V1 and the 3 km Loop.
- On June 8, 2020, Kwikwetlem First Nation emailed FortisBC to provide a letter regarding the V1 Compressor Station and 3 km Loop.
- Kwikwetlem First Nation emailed FortisBC to provide a letter regarding the Eagle Mountain Compressor Station and Coquitlam Twinning proposed amendments.
- On June 8, 2020, Kwikwetlem First Nation emailed FortisBC to provide FortisBC with a letter outlining economic objectives for their traditional territory.
- On June 8, 2020, June 16, 2020, and June 19, 2020, FortisBC emailed the Kwikwetlem First Nation to follow-up on coordinating a time to touch base regarding project updates, the CMPs and EA Amendment.
- On June 24, 2020 and June 25, 2020, FortisBC called Kwikwetlem First Nation to discuss capacity funding.
- Between June 26, 2020 and July 9, 2020, FortisBC and Kwikwetlem First Nation exchanged emails regarding a Project meeting via teleconference meeting. The meeting was held on July 10, 2020.
- On July 16, 2020, FortisBC and Kwikwetlem First Nation had a teleconference meeting regarding the Project.
- On July 17, 2020, FortisBC emailed Kwikwetlem First Nation to provide and seek feedback on the Amendment Application. To date, FortisBC has not received feedback from Kwikwetlem First Nation's on the Amendment Application.
- On July 20, 2020, July 24, 2020, August 12, 2020, August 13, 2020, August 18, 2020, August 19, 2020, August 25, 2020, August 28, 2020, and September 9, 2020, FortisBC emailed Kwikwetlem First Nation regarding one or more of several topics, including Project updates, procurement, communication protocols, capacity funding, contracting and employment opportunities, the geotechnical program, and the EAC Extension.

- On August 17, 2020, August 18, 2020, September 22, 2020, FortisBC and Kwikwetlem First Nation exchanged emails regarding the Project schedule, proposed amendments, and the potential for scheduling a future meeting.
- On October 6, 2020, FortisBC emailed Kwikwetlem First Nation regarding Project updates.

Planned Engagement

Kwikwetlem First Nation have expressed interest in being engaged further on the development of the Project; however, Kwikwetlem First Nation has experienced staff turnover in the referral department in recent years and the Nation's first step is to build a general understanding of the project including geographic location and work completed to date as part of the EAC Application. Kwikwetlem First Nation are determining the extent to which they wish to be involved in the review, and together with FortisBC are updating the Capacity Funding Agreement (which provided funding to the Nation to participate in the review of the EAC Application and other Project-related activities) to verify the Nation's involvement at its preferred participation level.

18.2.4.2 Kwikwetlem First Nation Issues and FortisBC Responses

At the time of filing of this Amendment Application, Kwikwetlem First Nation had not raised issues relating to the proposed amendments. FortisBC will continue to engage Kwikwetlem First Nation to understand and respond to potential issues.

18.3 Assessment of Effects on Section 35 Rights

This section provides an update to the Indigenous groups effects assessment previously presented in Section 19.0 Aboriginal Interests, of the EAC Application (Volume 1, Part C) for each proposed amendment.

Since the filing of the EAC Application, the *2018 Act* and some of its associated regulations were brought into force on December 16, 2019. The *2018 Act* includes additional assessment matters and Indigenous engagement requirements that were not previously included in the *2002 Act* under which the Project was approved. Section 25 of the *2002 Act*, Required Assessment Matters, specifies that "the effects of a project on Indigenous nations and rights recognized and affirmed by Section 35 of the *Constitution Act, 1982* must be assessed in every assessment" (Section 35 rights). Therefore, this assessment of the proposed amendments includes past and future uses of the areas that are known to FortisBC and may be potentially affected by the construction for and operation of the proposed amendments. Note that the assessment of effects to Indigenous Interests under the Act must also include the identification of positive effects. See subsection 1.6 of the EAC Application for discussion of Project benefits, which includes anticipated positive effects for Indigenous groups.

The spatial boundaries used in the assessment of Aboriginal Interests in the EAC Application were the Project Footprint; LSA; and RSA. The LSA spatial boundary was established based on the zone of influence (ZOI) within which Aboriginal Interests were expected to interact with the proposed Project. The Aboriginal Interests LSA for the Project included the LSA boundaries of the VCs that interact with Aboriginal Interests including: Wildlife and Wildlife Habitat, Vegetation, Wetland, Air Quality, Acoustic Environment, Surface Water, Ecological Health, Acid Rock Drainage, Transportation Infrastructure, Land and Resources Use, Fish and Fish Habitat and Heritage Resources. The Aboriginal Interests LSA for the assessment of the proposed amendments was expanded in accordance with the alteration of these VCs LSAs. See Figures 18-1 through to 18-4 for the Aboriginal Interests LSA in relation to the proposed amendments. Note that since the EAC Application uses an Aboriginal Interests LSA, the same LSA name is used in this Amendment Application.

As described in Section 19.0 of the EAC Application (Volume 1, Part C), FortisBC has assumed that Indigenous groups continue to use land and resources within the Aboriginal Interests LSA for subsistence or cultural purposes, which may include use in and around the proposed amendments. The Aboriginal Interests LSA includes the LSA boundaries of the VCs that interact with Aboriginal Interests are:

- Acid Rock Drainage (subsection 4.2.3)
- Air Quality (subsection 5.4)

- Acoustic Environment (subsection 5.3)
- Surface Water (subsection 6.3)
- Fish and Fish Habitat (subsection 7.3)
- Vegetation (subsection 7.4)
- Wetlands (subsection 9.3)
- Wildlife and Wildlife Habitat (subsection 10.2)
- Transportation Infrastructure (subsection 13.5)
- Land and Resources Use (subsection 15.3)
- Heritage Resources (subsection 16.3)
- Ecological Health (subsection 17.3)

The following subsections describe changes, if any, to the assessment of potential adverse effects on Section 35 rights as a result of the proposed amendments that were originally assessed in the EAC Application.

18.3.1 Squamish Nation

During discussions with Squamish Nation in 2014 through 2015, Squamish Nation identified to FortisBC that they felt the *2002 Act* did not enable a sufficiently comprehensive understanding of Section 35 rights to support a meaningful effects assessment. The Squamish Nation Process, and resulting Squamish Nation EAA with FortisBC, was in part a remedy for that stance. Consideration of effects on Section 35 rights of the proposed amendments, relative to the Project as defined in the Squamish Nation EAA, referenced in this subsection is reflective of the Squamish Nation Process.

The four proposed amendments, or the associated Aboriginal Interests LSA, are within the boundaries of the traditional territory of Squamish Nation. The Squamish Nation Process precludes the inclusion of certain information regarding the Squamish Nation in the Amendment Application.

As part of the Squamish Nation Process for the EAC Application, Squamish Nation conducted its own EA (the Squamish Nation EA) on the potential effects on the Project and prepared a report that provided the results and conclusions of the Squamish Nation Process, including an analysis of the potential effects of the Project on Squamish Nation's Aboriginal Interests. Squamish Nation chose not to share the results of the Squamish Nation Process, or the Squamish Nation EA with FortisBC. Instead, Squamish Nation used the results to create the Squamish Nation conditions, which it believed were required that the Project meet in order to mitigate the effects identified in the Squamish Nation EA report. These conditions and the corresponding VCs, as well as the proposed mitigation, were included in the Section 13 Report, which was filed after the EAC Application at the request of the BC EAO.

Squamish Nation and FortisBC subsequently negotiated an agreement to detail how FortisBC could implement the Squamish Nation conditions, called the Squamish Nation EAA, which was signed on June 22, 2016. FortisBC has agreed to meet the conditions in the Squamish Nation EAA. The Squamish Nation EAA also includes Squamish Nation's agreement not to amend or modify the Squamish Nation Environmental Certificate unless by agreement with FortisBC.

Squamish Nation has also clarified to FortisBC that the development and oversight of the Squamish Nation EAA is an expression of self-governance. It is Squamish Nations view that in not being Participating Indigenous Nation under the EAO process, the Squamish Nation EAA mitigates impacts on Squamish Nation governance rights. The Squamish Nation EAA was specific to the Project as defined in in the EAC. Consequently, in keeping with the Squamish Nation EAA, FortisBC is seeking to have Squamish Nation consent to the proposed amendments.

Table 18-2 describes the conditions that apply to the proposed amendments, the associated VCs, and relevance to the proposed amendments. FortisBC remains committed to fulfilling all of Squamish Nation's conditions in the Squamish Nation EAA through the FSE, some of which are delegated to the technical members of the FSE and others to various Squamish Nation departments or delegates. Squamish Nation

continues to review FortisBC's response to these conditions as outlined in Table 18-2 to ensure the proposed amendments meet the relevant conditions.

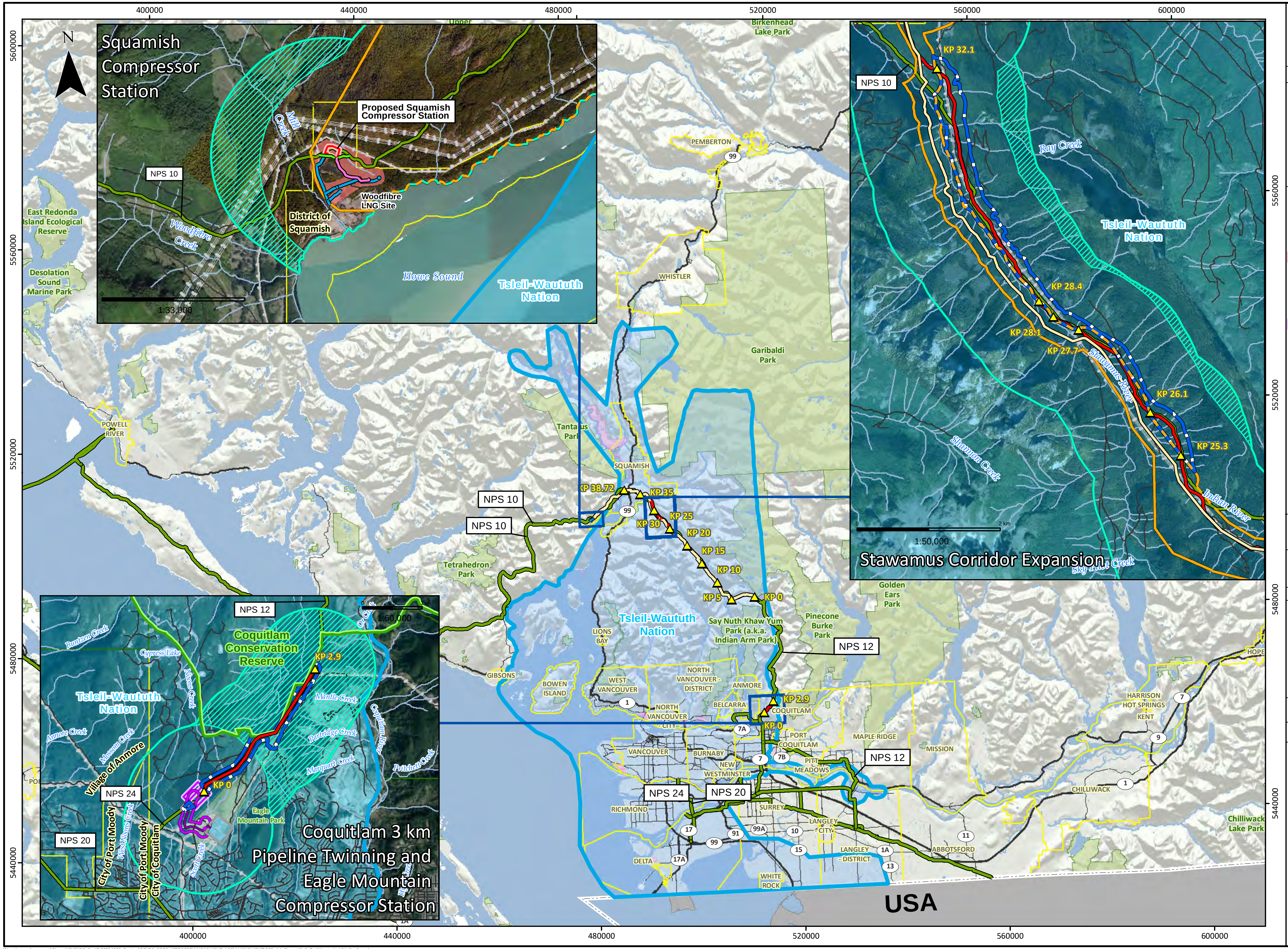
Table 18-2. Squamish Nation Conditions in Relation to the Proposed Amendments

Condition	Valued Component	Relevance to Proposed Amendments
Condition #15: "FortisBC will relocate the Project's new compressor station from the location originally proposed in the [EAC] Application to another location near Squamish that is approved by the Squamish Nation. FortisBC agrees to not begin construction of the Project with Squamish Nation Territory until an alternate location is approved by both the Squamish Nation and the EAO."	• Traditional Land and Resource Use	• An alternative location option for the Squamish Compressor Station is proposed at the northeast portion of the WLNG project site
Squamish Condition #16: "FortisBC will route the Project to avoid the following sites of cultural importance to the Squamish Nation which have been legally designated under the Agreement on Land Use Planning between Squamish Nation and the Province, dated July 26, 2007: (i) Monmouth Creek; (ii) Stawamus Creek; and (iii) Indian River. FortisBC will consult with and seek to reach consensus with the Squamish Nation through the FortisBC-Squamish Environmental Working Group in setting reasonable buffer areas around each of the cultural sites listed in section 4.4(a) which FortisBC will avoid in Project routing."	• Wildlife and Wildlife Habitat, Vegetation, Surface Water, Groundwater, Fish and Fish Habitat, Wetlands, Traditional Land and Resource Use	The Stawamus Corridor Expansion is being proposed by FortisBC in part due to feedback received from Squamish Nation (via the FortisBC-Squamish Nation Environmental Working Group) that multiple crossings and visual impacts along Stawamus River were a concern. This proposed amendment by FortisBC would: • provide flexibility to address potential construction challenges associated with the Certified Pipeline Corridor (such as, two crossings of the Stawamus River); • reduce impacts; and • realize operational efficiencies (as it is located adjacent to the existing FortisBC NPS 10 pipeline).

Note: The VCs listed in Table 18-2 are those assessed in the EAC Application and this Amendment Application.

18.3.2 Tsleil-Waututh Nation

The four proposed amendments are within or in close proximity to the boundaries of the Tsleil-Waututh Nation Consultation Area. Figure 18-2 identifies the Tsleil-Waututh Nation Consultation Area in relation to the proposed amendments. FortisBC's assessment of the potential effects of each of the proposed amendments on Tsleil-Waututh Nation's Section 35 rights is described in subsections 18.3.2.1 to 18.3.2.4



FORTIS BC

October 2020

FIGURE 18-2

EAGLE MOUNTAIN – WOODFIBRE GAS PIPELINE PROJECT AMENDMENTS IN RELATION TO TSLEIL-WAUTUTH NATION CONSULTATION AREA

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Lateral Pipeline
- Proposed Relocation Pipeline
- Proposed 25 kV Electrical Transmission Line
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Meridian Substation
- Existing FortisBC Pipeline
- Tsleil-Waututh Consultation Area
- Aboriginal Interests Local Study Area
- Aboriginal Interests LSA Expansion
- Provincial Boundary
- First Nation Reserve
- Municipality
- Existing Electrical Transmission Line
- Road
- Highway
- Waterbody
- Coquitlam Conservation Reserve
- Park & Protected Areas

SCALE: 1:700,000
0 10 20 Kilometers
(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Pipeline Corridor; CH2M 09-11-2015; Certified NPS 24 Pipeline: UPI 03-07-2016 (Route 1017); Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Electrical Transmission Corridor: CH2M 30-07-2014; Certified Electrical Substation: Primary Engineering and Construction 01-28-2020; Proposed Application Corridor: Jacobs 8-30-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 05-28-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line: Integrated Cadastral Information Society 03-24-2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Meridian Substation: DBS Energy Services 03-04-2014; Tsleil-Waututh Consultation Area: Derived from Tsleil-Waututh Nation Consultation Area Map 2008 (accessed online 20-03-2014); Coquitlam Conservation Reserve: Morgan Stewart and Company 1995, MetroVancouver 2017;LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Mapped By: SL	Checked By: DJN

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18.3.2.1 Stawamus Corridor Expansion

The Indian River Watershed is a core area for Tsleil-Waututh Nation cultural expression, and the Nation has developed the Indian River Watershed Integrated Stewardship Plan (Tsleil-Waututh Nation 2014a) to verify the cultural, ecological, and hydrological integrity of the watershed. As part of its ongoing efforts to protect Tsleil-Waututh Nation's areas of specific concern in the Indian River Watershed, the Nation continues to focus on the WAZ as its key interest areas.

Although the proposed Stawamus Corridor Expansion does not overlap with a WAZ, it is located in the Indian River Watershed, and a report received from Tsleil-Waututh Nation during engagement for the EAC Application identified four plant gathering, eight fishing, and two deer kill sites within or close to the Stawamus Corridor Expansion (Tsleil-Waututh Nation 2014b).

The proposed pipeline centreline within the Stawamus Corridor Expansion parallels existing linear disturbances for 6.4 km (94 percent of length, compared to 2.1 km [30 percent]) for the equivalent segment within the Certified Pipeline Corridor.

See Tables 19.5-2 and 19.5-3 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Tsleil-Waututh Nation's subsistence activities and use of cultural areas. See Tables 19.5-4 and 19.5-5 of the EAC Application for the characterization of potential residual adverse effects on Tsleil-Waututh Nation's subsistence activities and cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Tsleil-Waututh Nation since the EAC Application regarding its Aboriginal Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Tsleil-Waututh Nation's Indigenous Interests, including Section 35 rights of hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places for the proposed amendment are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on the above mentioned Section 35 rights and does not change the characterization and assessment of potential adverse effects on Tsleil-Waututh Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous population and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, that these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Tsleil-Waututh Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC is negotiating an agreement with Tsleil-Waututh Nation that aligns with the Nation's governance structures, and that will support capacity-building initiatives and programs.

18.3.2.2 Coquitlam Twinning

The assessment of potential adverse effects of the Project on Tsleil-Waututh Nation's Aboriginal Interests is provided in subsection 19.5 of the EAC Application (Volume 1, Part C). Tsleil-Waututh Nation have not provided any additional information to FortisBC regarding its Indigenous Interests in the area of the

proposed amendment; therefore, the assessment may change if Tsleil-Waututh Nation does provide new information.

See Tables 19.5-2 and 19.5-3 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Tsleil-Waututh Nation's subsistence activities and use of cultural areas. See Tables 19.54 and 19.5-5 of the EAC Application for the characterization of potential residual adverse effects on Tsleil-Waututh Nation's subsistence activities and cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Tsleil-Waututh Nation regarding its Indigenous Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Tsleil-Waututh Nation's Indigenous Interests, are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on subsistence or cultural Section 35 rights including hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places as related to the proposed amendments, and does not change the characterization and assessment of potential adverse effects on Tsleil-Waututh Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Tsleil-Waututh Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC is negotiating an agreement with Tsleil-Waututh Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.2.3 Eagle Mountain Compressor Station

The assessment of potential adverse effects of the Project on Tsleil-Waututh Nation's Aboriginal Interests is provided in subsection 19.5 of the EAC Application (Volume 1, Part C). Tsleil-Waututh Nation have not provided any additional information to FortisBC regarding its Indigenous Interests in the area of the proposed amendment; therefore, the assessment may change if Tsleil-Waututh Nation does provide new information.

See Tables 19.5-2 and 19.5-3 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Tsleil-Waututh Nation's subsistence activities and use of cultural areas. See Tables 19.5-4 and 19.5-5 of the EAC Application for the characterization of potential residual adverse effects on Tsleil-Waututh Nation's subsistence activities and cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Tsleil-Waututh Nation regarding its Indigenous Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Tsleil-Waututh Nation's Indigenous Interests, including Section 35 rights of hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places for the proposed amendment are comparable to those provided in the EAC

Application. It is anticipated that the proposed amendment would have no discernable effects on subsistence or cultural Section 35 rights and does not change the characterization and assessment of potential adverse effects on Tsleil-Waututh Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Tsleil-Waututh Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and mitigations. FortisBC is negotiating an agreement with Tsleil-Waututh Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.2.4 Squamish Compressor Station

The assessment of potential adverse effects of the Project on Tsleil-Waututh Nation's Aboriginal Interests is provided in subsection 19.5 of the EAC Application (Volume 1, Part C). Tsleil-Waututh Nation have not provided any additional information to FortisBC regarding its Indigenous Interests in the area of the proposed amendment; therefore, the assessment may change if Tsleil-Waututh Nation does provide new information.

See Tables 19.5-2 and 19.5-3 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Tsleil-Waututh Nation's subsistence activities and use of cultural areas. See Tables 19.5-4 and 19.5-5 of the EAC Application for the characterization of potential residual adverse effects on Tsleil-Waututh Nation's subsistence activities and cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Tsleil-Waututh Nation regarding its Indigenous Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Tsleil-Waututh Nation's Indigenous Interests, including Section 35 rights of hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places for the proposed amendment are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on subsistence or cultural Section 35 rights and does not change the characterization and assessment of potential adverse effects on Tsleil-Waututh Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Tsleil-Waututh Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC will also continue to engage with Tsleil-Waututh Nation regarding these potential effects and

mitigations. FortisBC is negotiating an agreement with Tsleil-Waututh Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.3 Musqueam Nation

The proposed Eagle Mountain Compressor Station, Coquitlam Twinning, and Stawamus Corridor Expansion amendments are within the boundaries of the traditional territory of Musqueam Nation. Figure 18-3 identities the Musqueam Nation Traditional Territory in relation to the three proposed amendments.

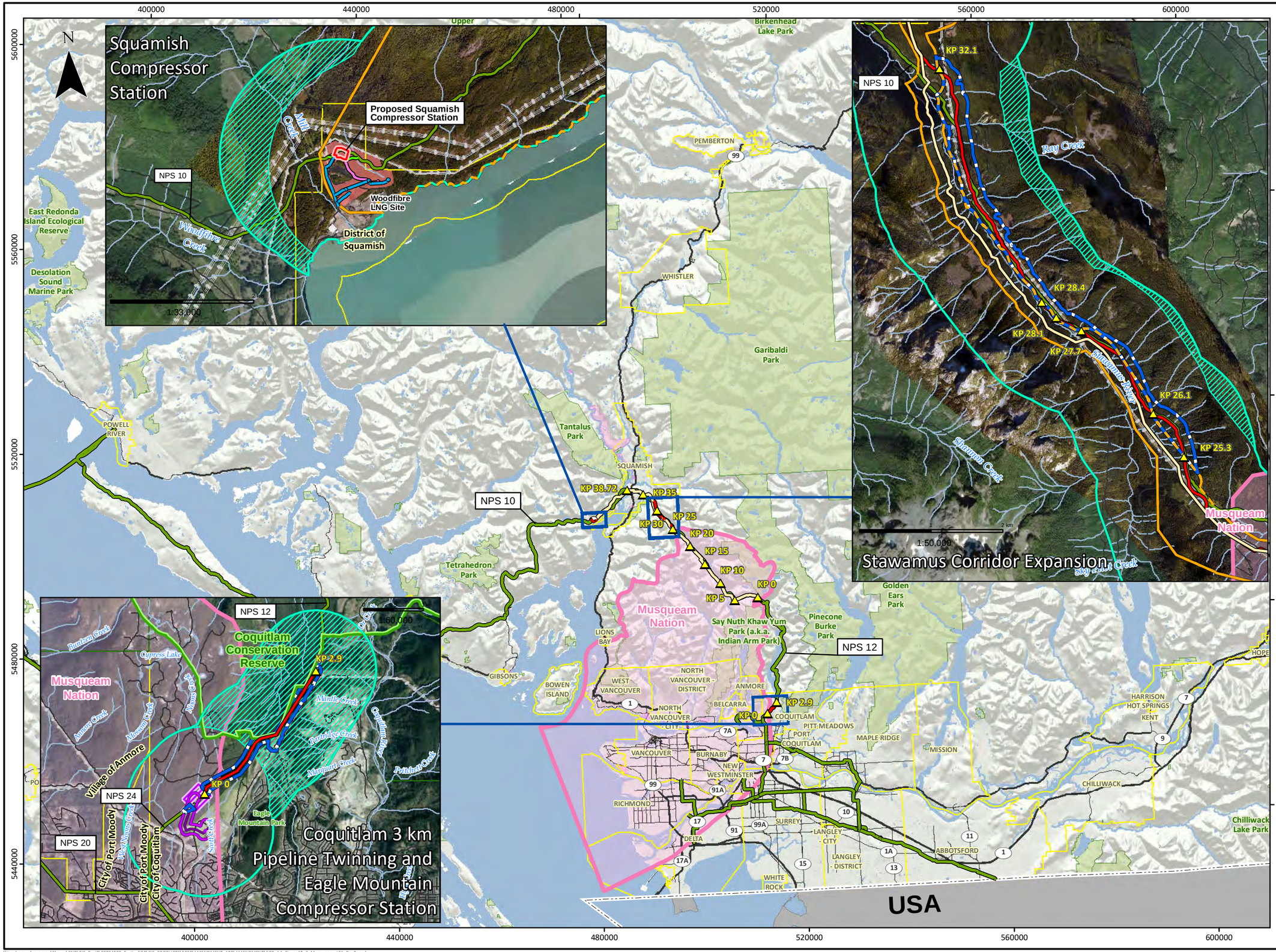

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FIGURE 18-3

EAGLE MOUNTAIN – WOODFIBRE GAS PIPELINE PROJECT AMENDMENTS IN RELATION TO MUSQUEAM NATION CONSULTATION AREA

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Squamish Compressor Station
- Proposed Squamish Compressor Station Siting Area

Project (EAO Certified)
- Certified Pipeline Corridor
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Meridian Substation
- Existing FortisBC Pipeline
- Musqueam Nation Consultation Area*
- Aboriginal Interests Local Study Area
- Aboriginal Interests LSA Expansion
- Provincial Boundary
- First Nation Reserve
- Municipality
- Road
- Highway
- Waterbody
- Coquitlam Conservation Reserve
- Park & Protected Areas

*Draft - to be confirmed

SCALE: 1:700,000

0 10 20 Kilometers

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 102b/4001b); 26 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline: Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 03-07-2020; Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Eagle Mountain Electrical Substation: Primary Engineering and Construction 01-28-2020; Pipeline Application Corridor: Jacobs 8-20-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 04-20-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line, Parcel: Integrated Cadastral Information Society 03-28-2014; First Nation Reserve: Government of Canada 2014; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrographic Text: NRCan 2007-2011; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995; MetroVancouver 2017; LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

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18.3.3.1 Stawamus Corridor Expansion

Based on the boundaries of the Musqueam Nation Traditional Territory as available to FortisBC, the Stawamus Corridor Expansion proposed amendment is within or on the boundary of their traditional territory (Figure 18 3). The assessment of potential adverse effects of the Project on Musqueam Nation's Aboriginal fishing interests is provided in subsection 19.8 of the EAC Application (Volume 1, Part C). See Table 19.8-2 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Musqueam Nation's subsistence fishing activities. See Table 19.8-3 for the characterization of potential residual adverse effects on Musqueam Nation's subsistence fishing activities. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

Musqueam Nation have not provided any additional information to FortisBC regarding its Indigenous fishing interests in the area of the proposed Stawamus Corridor Expansion; therefore, the assessment in this subsection may change if Musqueam Nation does provide new information. The change in the corridor as a result of the proposed amendment does not alter or add new potential adverse effects for any of the VCs; therefore, there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Musqueam Nation regarding its Indigenous Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Musqueam Nation's Indigenous fishing interests, including Section 35 fishing rights are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on Musqueam Nation's Section 35 fishing rights and does not change the characterization and assessment of potential adverse effects on Musqueam Nation's Aboriginal fishing interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Musqueam Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Musqueam Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC will also continue to engage with Musqueam Nation regarding these potential effects and mitigations. FortisBC is negotiating an agreement with Musqueam Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.3.2 Coquitlam Twinning

The assessment of potential adverse effects of the Project on Musqueam Nation's Aboriginal fishing interests is provided in subsection 19.8 of the EAC Application (Volume 1, Part C). See Table 19.8-2 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Musqueam Nation's subsistence fishing activities. See Table 19.8-2 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Musqueam Nation's subsistence fishing activities. See Table 19.8-3 for the characterization of potential residual adverse effects on Musqueam Nation's subsistence fishing activities of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

Musqueam Nation have not provided any additional information to FortisBC regarding its Aboriginal fishing interests in the area of the proposed amendment; therefore, the assessment in this subsection may change if Musqueam Nation does provide new information. Although there is an additional 3 km of pipeline within Musqueam Nation's traditional territory as a result of the proposed amendment, the routing

of the pipeline directly beside FortisBC's existing right-of-way is anticipated to reduce potential adverse effects. In addition, the change as a result of the proposed amendment does not alter or add new potential adverse effects for any of the VCs; therefore, there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Musqueam Nation regarding its Aboriginal Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Musqueam Nation's Indigenous fishing interests, including Section 35 fishing rights are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on Musqueam Nation's Section 35 fishing rights and does not change the characterization and assessment of potential adverse effects on Musqueam Nation's Aboriginal fishing interests provided in the EAC Application.

Although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, it is anticipated that these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Musqueam Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Musqueam Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC is negotiating an agreement with Musqueam Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.3.3 Eagle Mountain Compressor Station

The assessment of potential adverse effects of the Project on Musqueam Nation's Aboriginal fishing interests is provided in subsection 19.8 of the EAC Application (Volume 1, Part C). See Table 19.8-2 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Musqueam Nation's subsistence fishing activities. See Tables 19.8-3 for the characterization of potential residual adverse effects on Musqueam Nation's subsistence fishing activities. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

Musqueam Nation have not provided any additional information to FortisBC regarding its Aboriginal fishing interests in the area of the proposed amendment; therefore, the assessment in this subsection may change if Kwikwetlem First Nation does provide new information. No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Musqueam Nation regarding its Aboriginal Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Musqueam Nation's Aboriginal fishing interests, including Section 35 fishing rights are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on Musqueam Nation's Section 35 fishing rights and does not change the characterization and assessment of potential adverse effects on Musqueam Nation's Aboriginal fishing interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Musqueam Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Musqueam Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project.

FortisBC is negotiating an agreement with Musqueam Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.3.4 Squamish Compressor Station

Based on the boundaries of the Musqueam Nation Traditional Territory as available to FortisBC, the Squamish Compressor Station proposed amendment is outside of their traditional territory (Figure 18-3); therefore, it is anticipated that the proposed amendment would have no discernable effects on Musqueam Nation's Section 35 fishing rights.

18.3.4 Kwikwetlem First Nation

The proposed Eagle Mountain Compressor Station, Coquitlam Twinning, and Stawamus Corridor Expansion amendments are within the boundaries of the traditional territory of Kwikwetlem First Nation. Figure 18-3 identities the Kwikwetlem First Nation Traditional Territory in relation to the three proposed amendments.

18.3.4.1 Stawamus Corridor Expansion

Based on the boundaries of the Kwikwetlem First Nation Traditional Territory as available to FortisBC, the Stawamus Corridor Expansion proposed amendment is outside of their traditional territory (Figure 18-4); therefore, it is anticipated that the proposed amendment would have no discernable effects on Kwikwetlem First Nation's subsistence or cultural Section 35 rights.

18.3.4.2 Coquitlam Twinning

The assessment of potential adverse effects of the Project on Kwikwetlem First Nation's Aboriginal Interests is provided in subsection 19.7 of the EAC Application (Volume 1, Part C). At the time of the EAC Application, FortisBC provided funding to Kwikwetlem First Nation for a cultural heritage and archaeology study for several FortisBC projects in Kwikwetlem First Nation's territory, including the Project. The results from the study were not available during the drafting of the EAC Application or the proposed Amendment Application, and FortisBC and Kwikwetlem First Nation are focusing on current engagement activities to gather information on Kwikwetlem First Nation's interests in the proposed amendments.

Kwikwetlem First Nation have not provided information to FortisBC regarding its Indigenous Interests in the area of the Amendment Application; therefore, the assessment in this subsection may change if Kwikwetlem First Nation does provide new information.

See Tables 19.7-2 and 19.7-4 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Kwikwetlem First Nation's subsistence activities and use of cultural areas. See Tables 19.7-3 and 19.7-5 of the EAC Application for the characterization of potential residual adverse effects on Kwikwetlem First Nation's subsistence activities and use of cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

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FIGURE 18-4

EAGLE MOUNTAIN – WOODFIBRE GAS PIPELINE PROJECT AMENDMENTS IN RELATION TO KWIKWETLEM FIRST NATION CONSULTATION AREA

Project (EA Amendment)
- Proposed Application Corridor
- Proposed NPS 24 Pipeline
- Proposed Squamish Compressor Station

Project (EAO Certified)
- Certified NPS 24 Pipeline
- Certified 230 kV Transmission Line
- Certified Compressor Station Area
- Certified Electrical Transmission Corridor
- Certified Electrical Substation

Other
- Kilometre Post (KP)
- Meridian Substation
- Existing FortisBC Pipeline
- Kwikwetlem First Nation Consultation Area
- Aboriginal Interests Local Study Area
- Aboriginal Interests LSA Expansion
- Provincial Boundary
- First Nation Reserve
- Municipality
- Road
- Highway
- Waterbody
- Coquitlam Conservation Reserve
- Park & Protected Areas

SCALE: 1:700,000

0 10 20 Kilometers

(All Locations Approximate)

JACOBS

JACOBS Project Number CE777000

NAD 1983. UTM Zone 10 North.

Proposed Pipeline Route: Universal Pegasus International (UPI) 03-27-2020 (Route 1023b/4001b); 25 kV Electrical Transmission Line: Primary Engineering and Construction 04-24-2020; Existing Pipeline: FortisBC 2012; Proposed Lateral/Relocation Pipeline ,Solaris 02-19-2020; Certified 230kV Transmission Line: Primary Engineering and Construction 01-07-2020; Certified Compressor Station Area: McElhanney Associates Land Surveying Ltd 10-16-2014; Certified Eagle Mountain Electrical Substation: Primary Engineering and Construction 01-28-2020; Pipeline Application Corridor: Jacobs 8-20-2019 (Revision 15); Proposed Squamish Compressor Station: Solaris 02-25-2020; Proposed Squamish Facility Siting Area: Jacobs 04-20-2020; LSA: Jacobs 03-04-2020; Existing Electrical Transmission Line, Parcel: Integrated Cadastral Information Society 03-24-2014; Kwikwetlem Traditional Territory: Kwikwetlem First Nation 06-15-2010; Municipal Boundaries: BC Ministry of Municipal Affairs and Housing 2018; Road: BC FLNRO Digital Road Atlas, 2010; Watercourses: BC FLNRO 2004; Hydrography Text: NRCan 2007-2011; Coquitlam Conservation Reserve: Morgan Stewart and Company 1995. MetroVancouver 2017; LiDAR Imagery: Atlantic Group 2013; Base Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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Although there is an additional 3 km of pipeline within Kwikwetlem First Nation's traditional territory as a result of the proposed amendment, the routing of the pipeline directly beside FortisBC's existing right-of-way is anticipated to reduce potential adverse effects. In addition, the change as a result of the proposed amendment does not alter or add new potential adverse effects for any of the VCs; therefore, there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Kwikwetlem First Nation regarding its Indigenous Interests in the area of the proposed amendment, indicate that existing conditions and potential adverse effects on Kwikwetlem First Nation's Indigenous Interests, including Section 35 rights of hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places for the proposed amendment are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on subsistence or cultural Section 35 rights and does not change the characterization and assessment of potential adverse effects on Kwikwetlem First Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Kwikwetlem First Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Kwikwetlem First Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC is negotiating an agreement with Kwikwetlem First Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.4.3 Eagle Mountain Compressor Station

The assessment of potential adverse effects of the Project on Kwikwetlem First Nation's Aboriginal Interests is provided in subsection 19.7 of the EAC Application (Volume 1, Part C). As noted in subsection 18.3.4.2, the results of Kwikwetlem First Nation's cultural heritage study were not available at the time of the writing of the EAC Application or the Amendment Application.

See Tables 19.7-2 and 19.7-4 of the EAC Application for the potential adverse effects, mitigation measures and residual adverse effects of the Project on Kwikwetlem First Nation's subsistence activities and use of cultural areas. See Tables 19.7-3 and 19.7-5 of the EAC Application for the characterization of potential residual adverse effects on Kwikwetlem First Nation's subsistence activities and use of cultural areas. See Section 24 of the EAC Application and Section 20 of the Amendment Application for information regarding management measures, monitoring, commitments, and follow-up programs.

Kwikwetlem First Nation have not provided information to FortisBC regarding its Indigenous Interests in the area of the proposed amendment; therefore, the assessment in this subsection may change if Kwikwetlem First Nation does provide new information. No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application. These results, in combination with the absence of new information from Kwikwetlem First Nation regarding its Indigenous Interests in the area of the proposed amendment, suggests that existing conditions and potential adverse effects on Kwikwetlem First Nation's Indigenous Interests, including Section 35 rights of hunting, fishing, trapping, vegetation gathering, use of habitation sites, use of trails and travelways, use of sacred areas, and use of gathering places for the proposed amendment are comparable to those provided in the EAC Application. It is anticipated that the proposed amendment would have no discernable effects on subsistence or cultural Section 35 rights and does not change the characterization and assessment of potential adverse effects on Kwikwetlem First Nation's Aboriginal Interests provided in the EAC Application.

Under the *2018 Act* the assessment of residual effects requires characterization of affected Indigenous populations and consideration of Indigenous governance structures. This characterization was not required under the *2002 Act* and was not included in the EAC Application. It is anticipated that although affected Indigenous populations such as women, youth, and Elders may be disproportionately affected by the proposed amendment, these effects would be comparable to any such potential effects resulting from the Project. FortisBC will also continue to engage with Kwikwetlem First Nation regarding these potential effects and mitigations.

FortisBC also recognizes that amendment-related engagement, reviews or decision-making points may result in increased demands on certain governance structures within Kwikwetlem First Nation; however, it is anticipated that these effects would be comparable to any such potential effects result from the Project. FortisBC is negotiating an agreement with Kwikwetlem First Nation that aligns with the Nation's governance structures and will support capacity-building initiatives and programs.

18.3.4.4 Squamish Compressor Station

Based on the boundaries of the Kwikwetlem First Nation Traditional Territory as available to FortisBC, the Squamish Compressor Station proposed amendment is outside of their traditional territory (Figure 18-4); therefore, it is anticipated that the proposed amendment would have no discernable effects on Kwikwetlem First Nation's subsistence or cultural Section 35 rights.

18.4 Cumulative Effects

This subsection summarizes the potential cumulative adverse effects on Indigenous Interests through the interaction of cumulative adverse effects of VCs assessed in Sections 4 through to 14 of this Amendment Application. See subsection 3.3 for the likely residual adverse effects associated with the Project in combination with potential adverse effects arising from other projects and activities that have been or will be carried out in VC-specific LSAs or RSAs and that may interact with Indigenous Interests. The information identified in subsection 18.3 was used to conduct the cumulative effects assessment.

As indicated in the EAC Application, several projects are proposed within the Aboriginal Interests RSA that may potentially act in combination with the Project to adversely affect Indigenous Interests. Some previously identified future developments are now in operation, since the submission of the EAC Application, while others have been cancelled or put on hold (subsection 3.3). There have been 3 new reasonably foreseeable developments identified since the EAC Application, and when combined with those described in the EAC Application, there are 8 transportation and infrastructure developments, 16 utilities renewable energy projects, and 1 mine or quarry.

Existing and reasonably foreseeably developments were reviewed to identify any overlapping residual adverse effects from other developments and activities on Indigenous Interests. This information was used to assess the cumulative effects the proposed amendments, as indicated in subsections 18.4.1 to 18.4.4.

It is anticipated that some of the existing and reasonably foreseeable developments (including those proposed since the EAC Application) within the Aboriginal Interests RSA may overlap in both time and space with the proposed amendments' construction phase. The effects assessment for each proposed amendment is described in subsections 18.4.1 through 18.4.4.

18.4.1 Stawamus Corridor Expansion

Indigenous groups have expressed interest in the cumulative effects of developments within the Indian River Watershed. As noted in subsection 18.3.2.1, the Indian River Watershed is a key area for Tsleil-Waututh Nation's cultural expression and the Nation is working to "restore the ecological and hydrological integrity" of the watershed while supporting economic opportunities that "protect, respect and support" Tsleil-Waututh Nation's values (Tsleil-Waututh Nation 2014a). Therefore, the management of the cumulative effects with the watershed is key to ensuring the success of the Nation's future goals.

The proposed pipeline centreline within the Stawamus Corridor Expansion will reduce disturbance by paralleling existing linear disturbances for 6.8 km (92 percent of length, compared to 2.1 km [30 percent]) for the equivalent segment within the Certified Pipeline Corridor. By paralleling the existing disturbance, FortisBC is able to reduce the amount of new cut access required for the proposed amendment. Although new reasonably foreseeable developments have been identified in the Aboriginal Interests RSA, they are all within the City of Delta and the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Stawamus Corridor Expansion do not result in any material change to the assessment of potential cumulative adverse effects on Indigenous Interests.

18.4.2 Coquitlam Twinning

Although new reasonably foreseeable developments have been identified in the Aboriginal Interests RSA, the additional 3 km of pipeline that will result from the proposed amendment is being routed directly beside FortisBC's existing right-of-way and is anticipated to reduce potential adverse effects. In addition, the change as a result of the proposed amendment does not alter or add new potential adverse effects for any of the VCs; therefore, the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Coquitlam Twinning do not result in any material change to the assessment of potential cumulative adverse effects on Indigenous Interests.

18.4.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station is on existing developed land. The Certified Project includes installation of up to two 20,500-hp EMD compressor units in a 5-ha expanded area adjacent to the existing Eagle Mountain Compressor Station. As a result of further engineering and design, FortisBC is proposing to install two approximately 26,000-hp EMD compressor units within the existing Eagle Mountain Compressor Station. The new equipment at the Eagle Mountain Compressor Station will be accommodated within an existing facility building.

Although a 100 percent run-time is anticipated over the course of a year for both units and the compressor station upgrade will include additional discharge gas cooling, vent stack, and other auxiliary equipment, including high pressure yard piping, isolation valves, electrical, control, and gas systems, these potential adverse effects are not expected to not alter or add new potential adverse effects for any of the VCs. In addition, although TWS located outside the current facility footprint will be required during construction, TWS for construction was considered in the original EAC Application.

While new reasonably foreseeable developments have been identified in the Aboriginal Interests RSA, the assessment team determined that since the existing and reasonably foreseeable developments acting in combination with the proposed Eagle Mountain Compressor Station do not result in any material change to the assessment of the VCs, the assessment of potential cumulative adverse effects on Indigenous Interests also does not materially change.

18.4.4 Squamish Compressor Station

The Certified Project includes a compressor station to be located at Mount Mulligan on the existing NPS 10 gas pipeline. After further Project optimization studies and coordination with WLNG including discussions regarding access, site location, safe operation, and shared construction logistics led to the consideration of this site as a suitable option. The compressor station at the WLNG project site would preclude the need for a compressor station at Mount Mulligan.

Overall, the potential residual adverse effects for all VCs identified in the EAC Application have not changed as a result of the proposed amendments. Although new reasonably foreseeable developments have been identified in the Aboriginal Interests RSA the assessment team determined that the existing and reasonably foreseeable developments acting in combination with the proposed Squamish Compressor Station do not result in any material change to the assessment of potential cumulative adverse effects on Indigenous Interests.

18.5 Other Matters of Concern to Indigenous Groups [or Assessment of Effects on non-Section 35 Rights]

Section 20.0 of the EAC Application (Volume 1, Part C) provided the assessment of other matters of concern raised by Indigenous groups, as required by the Project AIR. These other matters were not assessed in Section 19 as they were not Aboriginal Interests as defined but were still issues that FortisBC felt were important to be assessed. These matters of concern were:

1) Increased access in the Indian River Valley (as expressed by Tsleil-Waututh Nation)
2) Altered access to TLU areas (as expressed by Kwikwetlem First Nation)
3) Reduction of non-urban environments (as expressed by Kwikwetlem First Nation)

These matters of concern in the context of the proposed amendments are addressed in subsections 18.5.1 to 18.5.3.

18.5.1 Increased Access to the Indian River Valley

Potential adverse effects to Aboriginal Interests from the disruption and alteration of access due to the renewed access to the Indian River Valley via the Stawamus/Indian River Forest Service Road, including increased access by recreational users and increased noise and activity, was raised as an issue of concern by Tsleil-Waututh Nation during engagement activities conducted for the EAC Application. This concern is applicable to the proposed Stawamus Corridor Expansion, and not the other proposed amendments, which are outside of the Indian River Valley.

The assessment team concluded in the EAC Application that the mitigation measures identified for this matter of concern adequately addressed the potential adverse effects (Volume 1, Part C, Section 20.2). The proposed pipeline centreline within the Stawamus Corridor Expansion will parallel existing linear disturbances for 6.8 km (92 percent of length, compared to 2.1 km [30 percent]) for the equivalent segment within the Certified Pipeline Corridor. By paralleling the existing disturbance, FortisBC is able to reduce the amount of new cut access required for the proposed amendment.

In addition, the Stawamus Corridor Expansion is located adjacent to the existing corridor and will use the access roads identified in the EAC Application. The forest service roads used for construction may require upgrades for pipeline construction, as was previously considered in the EAC Application. However, the proposed Stawamus Corridor Expansion is not anticipated to increase Project-related traffic or physical disturbance to highways and Local roads beyond what was assessed in the EAC Application. The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects for the Community Utilities and Services VC during any phase of the Project. As a result, the conclusions identified in the EAC Application with respect to transportation infrastructure remain the same.

Regarding the proposed Stawamus Corridor Expansion, access to the area is by Local and resource roads, including the Mamquam River Forest Service Road and the Stawamus-Indian River Road. Both recreational and industrial users utilize these roads. Road infrastructure and use patterns as well as rail and airport use for the Stawamus Corridor Expansion are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part B). The potential adverse effects to Indigenous Interests from the disruption and alteration of access due to the renewed access to the Indian River Valley via the Stawamus/Indian River Forest Service Road are also anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part C, Section 20.2).

18.5.2 Altered Access to Traditional Land Use Areas

Potential disruption and alteration to the access of remote areas, including increased access by non-Indigenous recreational users and reduced access due to construction or maintenance activities, and the resulting potential adverse effects to access of TLU areas was an issue of concern raised by Kwikwetlem First Nation during engagement activities for the EAC Application. The assessment team concluded that

mitigation measures identified for this matter of concern addressed the potential adverse effects (Volume 1, Part C, Section 20.3).

The proposed Coquitlam Twinning and Eagle Mountain Compressor Station amendments are within the traditional territory of Kwikwetlem First Nation. Although the proposed Coquitlam Twinning amendment includes an additional 3 km of pipeline within Kwikwetlem First Nation's traditional territory, the routing of the pipeline directly beside FortisBC's existing right-of-way is anticipated to reduce potential adverse effects, including altered access. The proposed Coquitlam Twinning amendment parallels existing disturbance for 100 percent of its length, thereby minimizing the proposed footprint. The proposed Coquitlam Twinning amendment is considered a suitable location to loop the existing NPS 12 FortisBC pipeline due its location being mostly outside of the Coquitlam Conservation Reserve (the Coquitlam Twinning pipeline centreline will overlap with the Coquitlam Conservation Reserve for approximately 160 m).

In addition, the assessment team has determined that construction for the proposed amendments will use the highways and resource roads indicated in the EAC Application. Highways, arterial, and collector roads in the surrounding area will be used to transport equipment, supplies, and workers during construction. Road infrastructure and use patterns as well as rail and airport use for the Coquitlam Twinning are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part B). While the volume of Project-related traffic is anticipated to increase on Eagle Mountain Drive, it is not anticipated that this increase will affect Kwikwetlem First Nation's TLU areas. Therefore, the assessment team concludes that altered access to TLU areas are anticipated to be consistent with what was presented in the EAC Application (Volume 1, Part C, Section 20.3).

18.5.2.1 Reduction of Non-Urban Environments

A reduction of non-urban environments due to construction and operations activities was an issue of concern raised by Kwikwetlem First Nation during engagement activities for the EAC Application. The assessment team concluded that mitigation measures identified for this matter of concern addressed the potential adverse effects (Volume 1, Part C, Section 20.4).

The proposed pipeline centreline within the proposed Stawamus Corridor Expansion amendment parallels existing linear disturbances for 6.8 km (92 percent of length), compared to 2.1 km (30 percent) for the equivalent segment within the Certified Pipeline Corridor; therefore, the reduction of non-urban environments is comparable or less than the equivalent segment of the EAC Corridor.

Although the proposed Coquitlam Twinning amendment will include an increase in the reduction of non-urban environment compared to what was assessed in the EAC Application, FortisBC is minimizing the proposed amendment footprint to the extent possible by paralleling existing disturbance for 100 percent of the total length.

The proposed Eagle Mountain amendment does not result in a change to the non-urban environment since the newly proposed compressor unit and equipment will be installed within the existing facility boundary. As well, the proposed Squamish Compressor Station amendment will be sited at a previously disturbed site that is zoned for industrial use.

With each of the proposed amendments taken into consideration as described above, it is anticipated that the proposed amendments will result in a comparable reduction of non-urban environments to that which was presented in the EAC Application; therefore, it is anticipated that the potential effects are the same as the EAC Application (Volume 1, Part C, Section 20.4).

18.6 Effects on Current and Future Generations

The *2018 Act* requires that positive and negative effects of the proposed amendments on current and future generations be assessed, including Indigenous future generations. Section 23 considers and draws on outcomes as described in the EAC Application and existing information made available during key stages of decision-making for the Project, describes potential Project-related impacts and benefits to

current and future generations, and provides an effects summary where there may be effects on future generations. Indigenous groups are inherently included in the assessment provided in Section 23. Current Indigenous generations are also inherently included in the EAC Application and in subsection 18.6.

FortisBC recognizes that Indigenous future generations may potentially be affected by a broader range of factors than those corresponding to the potential long-term duration adverse effects of the VCs described in Section 23; therefore, the analysis for Section 18.6 has been extended to other factors, including the potential effect of the loss of the IGTK to Indigenous future generations.

In the absence of information from Indigenous groups regarding anticipated future use of TLU areas, the EAC Application considered the anticipated future use of TLU areas as being the same as current use. With the Amendment Application, FortisBC had the opportunity to engage with Indigenous groups regarding the anticipated future use of the proposed amendment areas, and to consider how the proposed amendments may affect the IGTK of Indigenous groups in general.

A potential effect of the proposed amendments may be that TLU activities are altered as Indigenous members wishing to practice TLU may need to travel further afield into areas they do not prefer or did not previously visit due to distance. The greater distances also result in added expenses (such as, gasoline, maintenance of vehicles), as well as increased travel time commitment. If members are not able to practice the subsistence activities and use of cultural areas that they are accustomed to, TLU activity may decline in general, which would result in a loss of the IGTK that would have been previously practiced at those sites.

During engagement, Squamish Nation requested that the following of their comments on this issue be provided:

- Squamish Nation advised FortisBC that it is concerned about broken linkages of inter-generational knowledge transfer. This could occur in circumstances where an effect that interrupts occupational land use for a relatively short duration (for example, 1 to 5 years) but may have permanent consequence if the knowledge held by Elders is not able to be passed on passed on during that time.
- Squamish Nation advised FortisBC that IGTK is place-based. Customs, language, oral history, and ecological knowledge can be very specific to any given location. Squamish Nation also advised that while IGTK is a useful topic to address as part of EA, the Nation does not feel that the background EAC information, or the scope of the proposed amendments, would facilitate an accurate assessment of potential impacts on Squamish Nation IGTK for either the original EAC, or with the proposed amendments.
- Squamish Nation informed FortisBC that during the technical review and community engagement process for the EAC Amendment Application, it will continue to explore the potential for the proposed amendments to adversely effect IGTK, compared with the Project as currently approved. Squamish Nation emphasized to FortisBC that consideration of IGTK for this Amendment Application is limited to any marginal difference between the Project as previously approved, and the proposed amendment. Unless there are reasons to expect material IGTK differences between the Project and the proposed amendments, a detailed effects assessment is not required through the BC EAO process or Squamish Nation's internal deliberations. Squamish Nation also expressed general concern that the assessment of IGTK in the Amendment Application may be viewed as a methodological precedent for new projects, because IGTK is a new assessment topic under the *2018 Act*. FortisBC acknowledges that any Squamish Nation views expressed for this Amendment Application apply only to this Amendment Application.

Table 18-3 identifies the interests, indicators, and residual effects that were identified in Section 19.0 of the EAC Application, and how those effects may result in the loss of IGTK regarding the proposed amendments.

Table 18-3. Inter-Generational Transfer of Knowledge and Future Generations

Identified Interest and Indicators	Residual Effect (same for each indicator)	EAC Application (Section 19.0)	Amendment: Current and Future Generations
Interest: Subsistence Activities (Indicators: Hunting, Fishing, Trapping, Plant Gathering, Use of Trails and Travelways, Use of Habitation Sites)	Disruption of subsistence activities	Considered anticipated future use as being the same as current use (anticipated future use was not provided by Indigenous groups)	Subsistence activities may be altered, and Indigenous members may have to travel further afield into areas they do not prefer or did not previously visit. Additional travel results in increased expenses related to gasoline, maintenance of vehicles, and additional time commitment. If members are not able to practice subsistence activities, use trails, and use habitation sites in the immediate vicinity, it may be a deterrent to use them; therefore, the IGTK that would have occurred at those sites is disrupted.
	Alteration of subsistence sites and resources	Considered anticipated future use as being the same as current use (anticipated future use was not provided by Indigenous groups)	If Indigenous members are not able to use usual sites in the short-term, they are not able to practice IGTK as they typically would at those sites, which is a potential effect on current generations and disruption of IGTK between generations. The cumulative effects factor; if more and more sites are disrupted, there are consequently fewer areas to practice IGTK.
Interest: Use of Cultural Areas (Indicators: Use of Sacred Areas, Use of Gathering Areas)	Disruption of cultural areas use	Considered anticipated future use as being the same as current use (anticipated future use was not provided by Indigenous groups)	Cultural use areas may be altered, and Indigenous members may have to travel further afield into areas they do not prefer or did not previously visit. Additional travel results in increased expenses related to gasoline, maintenance of vehicles, and additional time commitment. If members are not able to use sacred areas or gathering places in the immediate vicinity, it may be a deterrent to use them; therefore, the IGTK that would have occurred at those sites is disrupted. In addition, the existence of these areas may not be known about in the future due to disruptions in IGTK at those sites.
	Alteration of cultural areas	Considered anticipated future use as being the same as current use (anticipated future use was not provided by Indigenous groups)	If members are not able to go to the usual sacred or gathering areas in the short-term, they are not able to practice IGTK as they typically would at those sites, which is a potential effect on current generations and disruption of IGTK between generations.

While not considered in the EAC Application, feedback from one Indigenous group on this Amendment Application indicates that potential disruption of access to or alteration of landforms that are part of creator stories may affect how those stories are passed on. This in turn affects the IGTK regarding those landforms. As well, the Indigenous group noted that place-based language and associated customs could be affected by disruption to subsistence activities and sites and resources, and by disruption of the use of cultural areas and alteration of cultural areas. Since continuity of language is a critical component of IGTK, the potential disruption of language due to disruptions and alterations of use and activities is another potential effect on IGTK.

In the absence of additional feedback or comments from Indigenous groups, the assessment team concludes that any potential effects on current and future generations are anticipated to be consistent with any such potential effects as a result of the Project, had they been assessed for the Project.

18.7 Disproportionate Effects on Distinct Human Populations Regarding Indigenous Groups

Under Section 25.2 of the *2018 Act,* consideration of disproportionate effects on distinct human populations, including Indigenous groups, is now required in environmental assessments conducted through the BC EAO process. See Section 21 for the analysis of disproportionate effects on distinct human populations, including Indigenous groups, which focusses on developing an understanding of unique socio-economic circumstances of subpopulations within the study area that may result in disproportionate effects as the result of the proposed amendments.

18.8 References

18.8.1 Personal Communications

George, Ernie. 2016. Letter from Ernie George, Director, Treaty, Lands, and Resources Department, Tsleil-Waututh Nation to the Honourable Mary Polak B.C. Minister of Environment, dated July 14, 2016.

18.8.2 Literature Cited

AMEC. 2014a. Draft Eagle Mountain – Woodfibre Gas Pipeline Project Aboriginal Consultation Plan Version 1.1. Prepared for FortisBC Energy.

AMEC. 2014b. Eagle Mountain – Woodfibre Gas Pipeline Project Aboriginal Consultation Plan, Version 1.2.

AMEC. 2015. Supplemental Aboriginal Consultation Plan Regarding the Addenda for the Proposed FortisBC Energy Inc. Eagle Mountain – Woodfibre Gas Pipeline Project.

Government of British Columbia (Government of BC). 2018. *BC Environmental Assessment Act.*

Government of British Columbia (Government of BC). 2020. BC EAO User Guide. Introduction to Environmental Assessment under the Provincial Environmental Assessment Act (2018). Version 1.01.

Tsleil-Waututh Nation. 2014a. Indian River Watershed Integrated Stewardship Plan (Draft). Spring 2014. 68pp.

Tsleil-Waututh Nation. 2014b. Tsleil-Waututh Nation Aboriginal Interests –In Relation to Fortis' Eagle Mountain Woodfibre Natural Gas Pipeline Looping Project. Treaty, Lands, and Resources Department. Vancouver, BC. 22 pp. + figures.

19. Public Consultation

The Public Consultation Plan developed for the EAC Application outlines FortisBC's principles, approach, and communication methods for public consultation. These principles and methods will be applied to the proposed amendments throughout the BC EAO amendment process, including pre-filing of the Amendment Application, BC EAO review of the Amendment Application, and post-EAC Amendment stages. Engagement on the proposed amendments before submitting this proposed amendment to the BC EAO allowed FortisBC to provide public stakeholders with information on the proposed amendments and collect feedback on key issues and concerns. In addition to meeting regulatory requirements, the Public Consultation Plan developed for the EAC Application is intended to promote long-term relationships with stakeholders that are based on mutual respect.

Through public consultation, FortisBC is committed to:

- Providing clear information about the proposed amendments and the BC EAO process
- Encouraging early information sharing
- Providing opportunities for community leaders and members to identify and document their comments or concerns
- Incorporating feedback and knowledge from stakeholders into planning the proposed amendments

19.1 Stakeholder Groups Targeted for Consultation

The following stakeholders have been identified for engagement on the proposed amendments:

- **Local Municipal Governments:** District of Squamish and City of Coquitlam.
- **Regional Districts:** includes elected officials and staff from the SLRD and Metro Vancouver.
- **Members of Legislative Assembly (MLA) and Members of Parliament (MP):** MP Patrick Weiler (West Vancouver – Sunshine Coast – Sea to Sky Country), MLA Joan Isaacs (Coquitlam – Burke Mountain), MLA Jordan Sturdy (West Vancouver – Sea to Sky), MP Ron McKinnon (Coquitlam – Port Coquitlam).
- **Residents, Business-Owners, and Landowners:** Home and business-owners who live and work near the proposed amendments, including Local community-based organizations.
- **Interest Groups:** Local interest groups directly impacted by construction of the proposed amendments.
- **General Public:** public directly impacted by construction of the proposed amendments.

Detailed stakeholder profiles can be found in the EAC Application (subsection 22.1.1).

19.2 Planned Public Consultation Activities

FortisBC will continue to tailor its approach to each group based on how they wish to be engaged on the proposed amendments. FortisBC has a variety of communications methods that will be used throughout public engagement. Table 19-1 provides a summary of each communication method.

Table 19-1. Public Engagement Communication Methods and Timing

Method	Description	Timing
Meetings	In-person communication between FortisBC and Regional Districts, Municipalities, and other Local stakeholders to provide proposed amendment information, receive feedback, and respond to questions.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Phone calls	Direct communication by FortisBC to Regional Districts, Municipalities, and other Local stakeholders to provide proposed amendment information, receive feedback, and respond to questions.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Website	FortisBC's Talking Energy webpage (talkingenergy.ca) has a section dedicated to the Project, which will include updated information on the proposed amendments, maps, and active and upcoming construction areas.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Toll-free phone line	FortisBC has a toll-free number (855-380-5784). Calls will receive a timely response from a FortisBC representative.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Email	FortisBC has an email address that is regularly monitored (talkingenergy@fortisbc.com). Emails will receive a timely response from a FortisBC representative.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Email subscriptions and digital newsletters	FortisBC's Talking Energy email bulletin provides Project updates and FortisBC-related announcements.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Social Media	FortisBC will use social media, including Twitter (@FortisBC) and Facebook to communicate Project updates, including the proposed amendments.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Notification letters	Letters will provide information on construction work.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages
Community Table Sessions	In-person discussions between FortisBC, Indigenous groups, District of Squamish, and other key District of Squamish stakeholders to share Project information, receive feedback, and discuss opportunities and mitigations.	Pre-filing of the Amendment Application BC EAO review of the Amendment Application Post-EAC Amendment stages

19.3 Overview of Stakeholder and Public Consultation

Early and meaningful consultation is an important part of the BC EAO amendment process. Stakeholder and public consultation are carried out to inform the public of the proposed amendments and provide them with an understanding of the BC EAO amendment process and allows FortisBC to incorporate the knowledge and values of interested and potentially affected public stakeholders as the BC EAO amendment process progresses.

19.3.1 Consultation to Date

This subsection provides a summary of consultation activities that have occurred.

FortisBC released a project update announcement and updated the public Project website in February 2020, introducing the proposed amendments to the public. Notifications were sent to key stakeholders, including EA Working Group members, Provincial government ministries, the District of Squamish, and the City of Coquitlam. FortisBC also distributed an info bulletin to Local media outlets and provided updated information about the proposed amendments on the Project information website Talking Energy (talkingenergy.ca).

A preliminary description of the proposed amendments was submitted to the BC EAO on February 28, 2020. The BC EAO updated the public Project registry with the information on March 6, 2020 and discussed the schedule for public launch of the Amendment Application.

FortisBC held virtual information sessions for the Project on August 12 and August 13, 2020 to re-introduce the Project to the public and solicit feedback on the preferred pipeline routing through the District of Squamish. The sessions were advertised in the Squamish Chief and Local media outlets as well as targeted phone calls and emails to key stakeholders and regulators.

The session had attendees from the general public as well as representatives from the District of Squamish, District of Squamish Councillors, the BC OGC, Squamish Chief media, local land developers, and My Sea to Sky.

The events were held virtually and included a 30-minute Project update by FortisBC, followed by a 45- to 60-minute question and answer period where the audience could submit written questions. FortisBC was able to respond verbally to over half of the approximately 90 written questions and comments that were received from both sessions. A recording of the August 13th session and copies of the presentation slides have been posted on FortisBC's website Talking Energy (talkingenergy.ca).

Table 19-2 provides a summary of consultation activities to date on the proposed amendments.

Table 19-2. Summary of Consultation Activities

Date of Contact	Stakeholder Name	Method	Description
Preliminary Meetings with Key Stakeholders			
29-Jan-2020	City of Coquitlam	Email	FortisBC emailed City of Coquitlam a request to meet regarding the proposed amendments and a draft relationship protocol.
7-Feb-2020	District of Squamish	Meeting	FortisBC met with the Mayor of Squamish to discuss the proposed amendments and upcoming Project work.
10-Feb-2020	City of Coquitlam	Meeting	FortisBC met with the City of Coquitlam to announce the proposed amendments. FortisBC provided an email the same day with a copy of the presentation that was shown and offered to answer any questions.
12-Feb-2020	District of Squamish	Email	FortisBC emailed the District of Squamish regarding the announcement timing for the Project proposed amendments.
12-Feb-2020	City of Coquitlam	Email	FortisBC emailed City of Coquitlam regarding any concerns with the proposed amendments and coordination of announcements. The City of Coquitlam responded by email the same day to express concerns regarding loss of trees and construction traffic.
13-Feb-2020	City of Coquitlam	Email	FortisBC emailed the City of Coquitlam to request time to present to council on the proposed amendments.
13-Feb-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to request time to present to council on the proposed amendments.
13-Feb-2020	City of Coquitlam	Phone Call	FortisBC called City of Coquitlam to discuss an official update to Council with a Project presentation before going out to the public to announce proposed amendments. The City Manager wants movement forward on the Coquitlam Crunch trail upgrade soon.
18-Feb-2020	City of Coquitlam	Email	FortisBC emailed the City of Coquitlam requesting any feedback on the proposed amendments and letting them know that the public announcement would be within a week.
19-Feb-2020	District of Squamish	Email	FortisBC emailed the District of Squamish an updated scheduled for the public open houses and engagement opportunities for spring 2020.
Introduction of Proposed Amendments and Consultation with all Targeted Stakeholders			
19-Feb-2020	District of Squamish, City of Coquitlam, Mayor of Gibsons, SLRD, Sunshine Coast Regional District	Phone Call and Email	FortisBC called and emailed the District of Squamish, City of Coquitlam, Mayor of Gibsons, SLRD, and Sunshine Coast Regional District with a notification about the public launch of the proposed amendments for February 20, 2020.
19-Feb-2020	City of Coquitlam	Email	FortisBC emailed the City of Coquitlam to provide information on the Project public release and provide a bulletin that will be sent out to the Local media. A presentation to the City of Coquitlam is scheduled for March 9, 2020.
20-Feb-2020	Metro Vancouver and MP Patrick Weiler	Phone Call and Email	FortisBC called and emailed Metro Vancouver and MP Patrick Weiler with a notification about the public launch of the proposed amendments for February 20, 2020
20-Feb-2020	Mayor of Gibsons	Email	The Mayor of Gibsons emailed FortisBC and indicated they had no comments to the proposed amendments at this time.

Table 19-2. Summary of Consultation Activities

Date of Contact	Stakeholder Name	Method	Description
20-Feb-2020	Vancouver Coastal Health, BC Ministry of Municipal Affairs and Housing (BC MAH), Metro Vancouver	Phone Call	FortisBC called Vancouver Coastal Health, BC MAH, and Metro Vancouver to discuss the proposed amendments.
20-Feb-2020	Metro Vancouver	Email	FortisBC emailed Metro Vancouver to provide a fact sheet that summarizes the proposed amendments.
3-Mar-2020	Central Estuary Restoration Project Working Group	Email	FortisBC emailed members of the Central Estuary Restoration Project Working Group with Project updates and the recently released proposed amendments.
4-Mar-2020 and 20-Mar-2020	Metro Vancouver	Email	Metro Vancouver emailed FortisBC to communicate that their Water Services department would like more details on the Coquitlam Twinning. FortisBC emailed Metro Vancouver to confirm that a description of the Coquitlam Twinning and maps will be shared with Metro Vancouver. FortisBC emailed Metro Vancouver to provide a link to the proposed Amendment Project Description for the Coquitlam Twinning which includes a detailed map and indicated that no construction will be conducted in 2020.
27-Apr-2020	Metro Vancouver	Email	Metro Vancouver emailed FortisBC to provide comments on the proposed amendments. FortisBC emailed Metro Vancouver to confirm receipt of their comments on the proposed amendments.
29-Apr-2020	SLRD	Email	FortisBC emailed SLRD regarding the proposed amendments SLRD emailed FortisBC regarding the proposed amendments
29-Apr-2020	District of Squamish	Email	FortisBC emailed District of Squamish regarding the Amendment Application FortisBC emailed the District of Squamish to seek preliminary feedback on the proposed amendments description documents.
29-Apr-2020	City of Coquitlam	Email	FortisBC emailed City of Coquitlam regarding the Amendment Application
29-Apr-2020	City of Coquitlam	Email	FortisBC emailed the City of Coquitlam to confirm the City's Working Group members and to provide information on the proposed amendments.
5-May-2020	SLRD	Email	SLRD emailed FortisBC regarding the proposed amendments FortisBC emailed SLRD regarding the proposed amendments
8-May-2020	District of Squamish	Email	The District of Squamish emailed FortisBC to provide feedback on the proposed amendment documents. FortisBC emailed the District of Squamish to acknowledge receipt of preliminary feedback on the proposed amendments description documents.
8-May-2020	City of Coquitlam	Email	The City of Coquitlam emailed FortisBC regarding their intentions to participate in the formal BC EAO amendment process. FortisBC emailed the City of Coquitlam to thank them for their response regarding the proposed amendments.
13-May-2020	BC OGC	Email	FortisBC emailed the BC OGC to provide response to a written submission regarding the Coquitlam Twinning application.

Table 19-2. Summary of Consultation Activities

Date of Contact	Stakeholder Name	Method	Description
13-May-2020	City of Coquitlam	Email	FortisBC emailed the City of Coquitlam to provide a response to their written submission regarding the Coquitlam Twinning application.
14-May-2020 and 15-May-2020	Metro Vancouver	Email	Metro Vancouver emailed FortisBC regarding drawings for the Coquitlam Twinning FortisBC emailed Metro Vancouver regarding drawings for the Coquitlam Twinning
1-Jun-2020	Metro Vancouver	Letter	Metro Vancouver sent FortisBC a letter regarding the project components in the Greater Vancouver Water District and their guidelines
3-Jun-2020 and 4-Jun-2020	Metro Vancouver	Email	Metro Vancouver emailed FortisBC to provide a response to the Notification of Construction for Coquitlam Twinning. FortisBC emailed Metro Vancouver regarding their response to the Notification of Construction for the Coquitlam Twinning.
10-Jun-2020	Metro Vancouver	Email	FortisBC emailed Metro Vancouver to follow-up on the draft amendment information.
15-Jun-2020 and 24-Jun-2020	Metro Vancouver	Email	Metro Vancouver emailed FortisBC to request the amendment information be forwarded to Metro Vancouver. FortisBC emailed Metro Vancouver to provide links to the amendment documents.
17-Jun-2020	Metro Vancouver	Email	FortisBC emailed Metro Vancouver to provide a response to their concerns regarding the notification of construction for the Coquitlam Twinning.
18-Jun-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to provide a notification of proposed construction for the Squamish Compressor Station and the relocation of the existing NPS 10 pipeline at the WLNG project site.
24-Jun-2020	Vancouver Coastal Health	Email	FortisBC emailed Vancouver Coastal Health to discuss the amendments.
24-Jun-2020	BC MoTI	Email	FortisBC emailed BC MoTI to follow-up on the amendments.
24-Jun-2020	BC MAH	Email	FortisBC emailed BC MAH to follow-up on the amendments.
24-Jun-2020	BC Ministry of Health	Email	FortisBC emailed BC Ministry of Health to follow-up on the amendments.
29-Jun-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to provide two notifications for upcoming BC OGC applications: water license and Squamish Compressor Station.
9-Jul-2020	District of Squamish	Phone Call	FortisBC had a call with the District of Squamish to discuss the Project: routing, public information sessions, CMPs, and council presentations.
9-Jul-2020	District of Squamish	Email	FortisBC emailed District of Squamish with meeting follow-up
10-Jul-2020 and 27-Jul-2020	District of Squamish	Email	FortisBC emailed District of Squamish regarding a council presentation
13-Jul-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to provide notes on the meeting that was held on July 9 to discuss the Project.

Table 19-2. Summary of Consultation Activities

Date of Contact	Stakeholder Name	Method	Description
15-Jul-2020	BC OGC	Meeting	FortisBC met virtually with BC OGC regarding Project updates and the action log
27-Jul-2020	District of Squamish	Email	FortisBC emailed District of Squamish Mayor Elliott with information in advance of the meeting
27-Jul-2020	District of Squamish	Meeting	FortisBC met virtually with Mayor Elliott to provide Project updates, focusing on public engagement and project timelines to construction as well as vulnerable populations and project accommodations
27-Jul-2020	District of Squamish	Email	FortisBC emailed Mayor Elliott with meeting follow-up
30-Jul-2020	District of Squamish	Meeting	FortisBC met virtually with District of Squamish and discussed workforce accommodations, routing, and permitting
31-Jul-2020	District of Squamish	Email	FortisBC emailed District of Squamish regarding temporary use, routing, and accommodations
31-Jul-2020	BC MoTI	Meeting	FortisBC met with BC MoTI on project updates and the BC Rail site
5-Aug-2020	District of Squamish	Phone Call	FortisBC called District of Squamish to discuss Project updates.
5-Aug-2020	District of Squamish	Email	FortisBC emailed District of Squamish with information for the virtual information sessions on August 12 and 13. FortisBC emailed District of Squamish with Project information. District of Squamish emailed FortisBC with Project questions, including on emissions, residences, and public facing information. FortisBC emailed District of Squamish to acknowledge that the questions were received.
10-Aug-2020	BC MoTI	Email	FortisBC emailed BC MoTI with the meeting minutes from July 31st for review
11-Aug-2020	District of Squamish	Email	FortisBC emailed District of Squamish with requests to appear before council.
11-Aug-2020	BC OGC	Email	FortisBC emailed BC OGC with meeting minutes and an updated action log
Public Information Sessions			
12-Aug-2020	Public	Virtual Information Session	FortisBC held a virtual information session with Project updates. The event included a 30-minute project update by FortisBC and a 60-minute question and answer session. This event was attended by 18 FortisBC representatives and 15 members of the public. Members of the general public attended as well as representatives from District of Squamish, BC OGC, Squamish Chief media, Local land developers, WLNG.
13-Aug-2020	Public	Virtual Information Session	FortisBC held a virtual information session with Project updates. The event included a 30-minute project update by FortisBC and a 60-minute question and answer session. This event was attended by 23 FortisBC representatives and 14 members of the public. Attendees from the general public included District of Squamish Councillors, BC OGC, Squamish Chief media, Local land developers, WLNG, My Sea to Sky, and others.

Table 19-2. Summary of Consultation Activities

Date of Contact	Stakeholder Name	Method	Description
12-Aug-2020 and 13-Aug-2020	District of Squamish	Email	District of Squamish emailed FortisBC regarding Project updates and the virtual information session. FortisBC emailed District of Squamish in response to their feedback with the Project and with the virtual information session
Continued Engagement and Consultation on the Amendments with all Targeted Stakeholders			
14-Aug-2020	BC MoTI	Email	BC Rail emailed FortisBC to confirm the July 31st meeting minutes
20-Aug-2020, 24-Aug-2020 and 25-Aug-2020	BC OGC	Email	BC OGC emailed FortisBC to inquire if there were details available on land restoration for the Coquitlam Twinning, which was a request from the Tsleil-Waututh Nation. FortisBC emailed to BC OGC to responding to their inquiry of restoration details for the Coquitlam Twinning. BC OGC emailed FortisBC to confirm that they will share the land restoration information with Tsleil-Waututh Nation.
28-Aug-2020	Squamish Lillooet Regional District	Email	FortisBC emailed the Squamish Lillooet Regional District regarding communication on the proposed amendments.
8-Sept-2020	City of Coquitlam	Email	The City of Coquitlam emailed FortisBC regarding setting up a meeting to discuss aspects of the Project in Coquitlam. FortisBC emailed the City of Coquitlam to confirm a potential date to hold a meeting. The City of Coquitlam emailed FortisBC regarding a potential meeting date. FortisBC emailed the City of Coquitlam to confirm a potential date to hold a meeting.
9-Sept-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to inquire when FortisBC is able to provide a project update to Council.
11-Sept-2020	District of Squamish	Email	District of Squamish emailed FortisBC to provide a date that FortisBC can present to Council. FortisBC emailed the District of Squamish to confirm the date for the Council presentation.
18-Sept-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to provide the draft work plan for the Amendment Application.
24-Sept-2020	District of Squamish	Email	District of Squamish emailed FortisBC to advise that FortisBC's presentation to Council has been rescheduled and to provide a date for the second application for a presentation to Council. FortisBC emailed District of Squamish to confirm that the dates for the rescheduled presentations to Council are agreeable.
25-Sept-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to provide updates on the rescheduled presentation to Council and considerations of potential rescheduling of BC EAO submissions.
30-Sept-2020	District of Squamish	Email	FortisBC emailed the District of Squamish to discuss hosting a Community Table session to discuss updates and training and employment opportunities.
30-Sept-2020	District of Squamish	Email	The District of Squamish emailed FortisBC to provide the contact for economic development at the District.
30-Sept-2020	District of Squamish	Email	FortisBC called the District of Squamish to introduce the economic officer to the project.

19.3.2 Future Consultation Activities

FortisBC plans to hold additional public information sessions in Coquitlam and Squamish in the fall of 2020 and in 2021. Information sessions will provide complete project updates including discussion of the proposed amendments. Information sessions for the community of Squamish will additionally include topics such as workforce accommodation planning and associated potential social and economic effects.

In addition, FortisBC will continue to consult the public in consultation activities throughout the course of the proposed amendment process. Future consultation activities include:

- Continuing to exchange information with interest groups and interested parties
- Continuing to engage with and update Local, Regional, and Provincial governments
- Responding to all inquiries from the public as they arise via the Project email address and toll-free line or by any other means
- Maintaining and updating the FortisBC website in regard to developments of the proposed amendments
- Issuing letters to landowners and the public living nearby the Project
- Responding to media requests for interviews and Project information

19.4 Summary of Issues and Concerns

FortisBC has been engaging with local government, stakeholders and the general public about the proposed amendments. Table 19-3 provides information on the interests, issues and concerns that have been raised to date by local governments in response to the proposed amendments.

Table 19-4 summarizes the interests, issues and concerns that were raised during the virtual public information sessions on August 12 and 13, 2020.

Table 19-3. Summary of Local Governments Interests, Issues and Concerns

Area of Interest or Concern	Stakeholders Concerned	Summary of Concerns and Issues	FortisBC Response Summary	Where Issue is Addressed in the Amendment Application
Vegetation	City of Coquitlam	Loss of trees	Tree clearing will be minimized during construction and mitigation measures employed to reduce potential impacts to wildlife and wildlife habitat.	Vegetation Management Plan, Timber Salvage Strategy
Noise	City of Coquitlam	Construction noise	FortisBC will comply with the City's *Noise Regulation* Bylaw No. 1233, 1982 during construction. FortisBC will apply for a Noise Bylaw Exemption Permit if construction activities are required outside of the time restrictions.	Table 21-3, Construction Environmental Management Plan
Traffic	City of Coquitlam	Construction traffic	Traffic Management Plans will be prepared for movement of workers, materials and equipment in consultation with the City of Coquitlam. Also, nearby residents will be informed in advance of construction activities.	Table 21-3, Traffic Management Plan
Water quality	Metro Vancouver	Maintaining water quality within the Coquitlam Conservation Reserve	FortisBC agrees to comply with Greater Vancouver Water District guidelines and procedures regarding drinking water quality during construction in Metro Vancouver.	Construction Environmental Management Plan
Detailed review	District of Squamish; City of Coquitlam; SLRD	Sufficient review time	FortisBC will continue to engage groups through the BC EAO's Technical Advisory Committee process, including review of the full Amendment Application and TDRs	The EAO process will address this comment.

Table 19-4. Summary of Interests, Issues and Concerns Raised During August 12 and 13, 2020 Virtual Public Information Sessions

Area of Interest or Concern	Stakeholders Concerned	Summary of Concerns and Issues	FortisBC Response Summary	Where Issue is Addressed in the Amendment Application
Regulatory	General Public	Asked if Fortis is applying to the BC Utilities Commission for the proposed amendments.	FortisBC is submitting the Amendment Application to the BC EAO.	Executive Summary and Introduction
Amendment Design	General Public	Question regarding expansion of the existing pipeline at the Coquitlam Twinning.	The Coquitlam Twinning is not an expansion of the existing pipe, but an additional pipe to ensure security of gas supply to Woodfibre. The existing pipeline will remain in service.	Section 1.1 Amendment Descriptions
Ongoing Engagement	General Public	Question regarding future opportunities to provide feedback.	There will be an opportunity for public feedback following the submission of the Amendment Application through the BC EAO process.	Section 19.3.2 Future Consultation Activities
GHG Emissions	General Public	Question regarding GHG emissions of the Squamish Compressor Station.	The analysis completed as part of the Amendment Application concluded that the combined approximate GHG emissions from the operation of the proposed amendments to the compressor stations are lower than what was reported in the EAC Application and past addenda.	Section 5 Atmospheric Environment
Amendment Descriptions in Coquitlam	General Public	Question regarding subject matter of the proposed amendments in the City of Coquitlam.	One is a change in hp at the proposed units to be added to the existing Eagle Mountain Compressor Station. The other is 3 km of pipe starting at the Eagle Mountain Compressor Station and stopping just before the Coquitlam Watershed.	Section 1.1 Amendment Descriptions

19.5 Environmental Management Plans and Follow-up Programs

Volume 1, Part E of the EAC Application provides information on the practices and programs FortisBC has developed to verify environment management measures and commitments made in the EAC Application are implemented throughout all phases of the proposed Project. A summary of the EMP, FortisBC's ERP, and contingency plans was included in Section 23.0 of the EAC Application, while environmental monitoring during construction, post-construction monitoring, and compliance reporting was included in Section 24.0 of the EAC Application. An EMP for the proposed Project was presented in Volume 3, Appendix 3A of the EAC Application.

This Amendment Application contains changes to the previously proposed mitigation measures and environmental monitoring described in the EAC Application. New mitigation measures and environmental monitoring relating to contaminated sites associated with the Squamish Compressor Station siting area have been proposed for the Land and Resources Use VC and related to accidents and malfunctions. The updated and new mitigation measures and environmental monitoring plans will be incorporated into the EMP that will be submitted to the BC EAO prior to construction. FortisBC will continue to engage Indigenous groups, appropriate regulators, and stakeholders to develop mitigation measures and environmental monitoring programs.

20. Disproportionate Effects on Distinct Human Populations

20.1 Regulatory and Policy Setting

The *2018 Act* was enacted in December 2019 and Section 25.2 of the *2018 Act* lists additional assessment including consideration of disproportionate effects on distinct human populations, that was not previously included in the *2002 Act* under which the Project was approved.

The BC EAO Effects Assessment Policy states: “The effects of a project may not affect all members of the population in the same way. Some individuals and subgroups may be more vulnerable to adverse effects; others may be better positioned to experience positive effects. Section 25(2)(d) of the *Act* requires that every assessment consider the disproportionate effects on distinct human populations, including populations identified by gender” (BC EAO 2020). The assessment of disproportionate effects on distinct human populations was conducted for the proposed amendments relative to the Certified Project.

20.2 Assessment Methodology

The analysis of disproportionate effects on distinct human populations is focused on developing an understanding of unique socio-economic circumstances of subpopulations within the study area that may result in disproportionate effects as the result of the proposed amendments. The study area for this analysis includes communities where it can be reasonably expected that direct and identifiable effects from the proposed amendments will occur. These communities include the District of Squamish and City of Coquitlam, as well as Indigenous groups including Squamish Nation, Tsleil-Waututh Nation, Musqueam Nation, and Kwikwetlem First Nation. As such, the study area for this analysis is focused on these communities.

The assessment used available baseline information to identify and describe potential subpopulations within the study area. The potential residual effects identified in the EAC Application that apply to the proposed amendments were also analyzed for potential socio-economic effects that may interact with distinct subpopulations. Engagement with Indigenous groups and key stakeholders was a critical component to augmenting gaps in existing data. Qualitative information collected through engagement was used to further identify existing socio-economic patterns and the potential for Project-specific interactions, as they relate to distinct subpopulations within the host communities.

This stepwise approach was guided by the following questions:

1) What anticipated adverse residual effects of the Project could interact differently with distinct populations?
2) What are the distinct populations within the study area that could experience a disproportionate effect with regard the identified residual effects?
3) Which distinct populations might experience which effects?
4) Do the effects assessment conclusions change with regard the potential residual effect when viewed through the lens of distinct populations?
5) What mitigation or management strategies are in place to address the effects as they pertain to distinct populations?

Assessment planning discussions with the BC EAO determined that a cumulative effects assessment was not required for this section.

20.2.1 Baseline Data Collection

A desktop review was conducted to provide updated baseline information relevant to distinct populations within the study area. Information was collected on population statistics including gender differentials, Aboriginal[1] identity, labour force, income, educational attainment, housing costs and vacancy rates, and crime rates using the following sources:

- Statistics Canada 2016 Census information
- Statistics Canada data tables for crime rates and severity indices
- Community Profiles for Squamish and Coquitlam
- Canada Mortgage and Housing Corporation urban rental market survey data and vacancy rates
- Metro Vancouver Housing Data Book
- Squamish Housing Needs Assessment
- Coquitlam Housing Affordability Strategy

20.2.2 Summary of Engagement

Some qualitative information (such as, populations that are more susceptible to experiencing crime and social issues), was not readily available in statistical data and publicly available reports. Engagement with Indigenous groups and key stakeholders is ongoing to address data gaps and collect community-specific information regarding the proposed amendment interactions and issues. A series of Community Table sessions were established to engage with the District of Squamish and a range of representative stakeholders. Community Table members were selected to represent a cross section of interests and included local area agencies, service providers, community business organizations, and Indigenous groups. Community Table sessions are a collaborative roundtable process designed to allow for open and exploratory discussion of social and economic issues and opportunities related to the Project, including the proposed amendments. A total of three Community Table sessions were planned, with an initial session occurring on October 22, 2019.

In addition to the first Community Table session, FortisBC hosted two virtual information sessions to provide an opportunity for the general public to ask questions and provide feedback on the Project, including the proposed amendments. The sessions were held on August 12 and 13, 2020 and participants included the general public, District of Squamish Councillors, the BC OGC, Squamish Chief media, Local land developers, WLNG, and My Sea to Sky.

FortisBC has also conducted targeted engagement with local governments to identify different interests unique to each Region.

Key feedback themes identified through engagement included:

- Workforce accommodation and transportation options
- Pressures on community services and infrastructure
- Local business and employment opportunities
- On-site security protocols
- Cultural awareness of workers

Engagement on the proposed amendments will be ongoing through the BC EAO amendment process. FortisBC will continue to solicit feedback and additional information received with respect to distinct subpopulations will be incorporated into the Amendment Application as appropriate.

[1] The term Aboriginal is used here to be consistent with terminology in the 2016 census. In the context of the District of Squamish and City of Coquitlam the term applies to Municipal residents who identified as Aboriginal in the 2016 census. The term Indigenous is used in all other contexts for consistency with the United Nations Declaration of the Rights of Indigenous Peoples. Its use refers to all Indigenous peoples and groups.

20.2.3 Identification of Distinct Human Populations Within the Study Area

In any project context, the effects of a project do not affect all parts of the human population in the same way. Some individuals and subgroups may be more vulnerable to adverse effects, while others may be better positioned to realize positive effects. This is influenced by a range of factors such as proximity/geography, socio-cultural factors (for example, gender or ethnicity) or physiological factors (such as, existing health status). In general terms, it is understood that there may be patterns of vulnerability within a given community that contribute to differential experiences of potential Project-related effects.

Indigenous populations in Canada often face disproportionate levels of socio-economic disadvantage. Historically, the process of colonization including the residential school system and introduction of legislation such as the *Indian Act*, resulted in significant decline and fragmentation of Indigenous governance, economic, health and cultural systems. The lingering effects can be seen today in disproportionate rates of poverty; substandard housing; poor health conditions (including diabetes, obesity, respiratory disease, mental health challenges and addiction); lack of food security; reduced employment and education opportunities; and violence (including domestic abuse, homicide, and suicide). Indigenous children have higher rates of child apprehension and youth detention than in non-Indigenous populations. Indigenous women and girls are much more likely to be the targets of violence in Canada than other Canadian women, even when differentiating factors are accounted for (FNHC 2011; NIMMIWG 2020; TRCC 2015).

This assessment has identified a list of socio-economic factors and potential subgroups that may interact with the proposed amendments. The subgroups identified in Table 20-1 includes Indigenous and non-Indigenous populations. Subsection 21.3 provides a summary of existing socio-economic conditions for all communities within the study area, including Tsleil-Waututh Nation, Squamish Nation, Kwikwetlem First Nation, and Musqueam Nation.

Table 20-1. Distinct Populations with the Potential to Experience Disproportionate Effects Within the Study Area[a]

Socio-Economic Factor	Potential Subgroups	Rationale
Location	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• More likely to see, hear, or otherwise experience immediate Project activities
Livelihoods or Personal Wellbeing Tied to the Natural Environment	• Individuals with land and resource-based livelihoods or personal pursuits	• Rely on natural environment for resource-based livelihoods and recreational, cultural, or other personal pursuits in areas disturbed or disrupted by Project activities
Income Level And Housing Status	• Individuals or families with low or fixed income • Individuals in core housing need • Young families • Seniors	• More likely to be adversely impacted by increased housing costs and/or reduced availability of housing • May be at increased risk if the capacity of community services become stretched due to increased Project-related demand
Skill Level	• Individuals with limited skills or experience in construction sector	• Less able to obtain Project-related employment and related income during construction
Health Status	• Individuals with pre-existing health conditions or disabilities	• Could be at increased risk if exposed to environmental contaminants • May be at increased risk if the capacity of community services become stretched due to increased Project-related demand

Table 20-1. Distinct Populations with the Potential to Experience Disproportionate Effects Within the Study Area[a]

Socio-Economic Factor	Potential Subgroups	Rationale
Susceptibility to Crime and Social Issues	• Women at risk • Youth at risk • Individuals struggling with poverty, mental health, or addiction	• Could be at increased risk to adverse community-worker interactions • May be at increased risk if the capacity of community services become stretched due to increased Project-related demand

[a] Subgroups Include Indigenous and Non-Indigenous Populations

20.2.4 Scoping of Potential Disproportionate Effects

Table 20-2 presents an overview of the potential adverse residual effects of the proposed amendments for select human-oriented VCs and their potential interactions with identified subgroups of the population. This allows for the identification of how anticipated residual effects from the proposed amendments could interact differentially with distinct human populations. The effects assessment of disproportionate effects to distinct human populations as a result of the proposed amendments is presented in subsection 21.4.

20.3 Existing Conditions

The study area for this analysis includes communities where it can be reasonably expected that direct and identifiable effects from the proposed amendments will occur. These communities include the District of Squamish and City of Coquitlam, as well as Indigenous groups including Squamish Nation, Tsleil-Waututh Nation, Musqueam Nation, and Kwikwetlem First Nation. As such, the study area for this analysis is focused on these communities.

20.3.1 District of Squamish

The District of Squamish has transitioned from being a resource-based economy to one largely based on tourism and recreation. During this transition, more young people moved to District of Squamish as they were attracted by the lifestyle and the District became a bedroom community for people who worked in Whistler or Vancouver. Over time, the District of Squamish saw an increase in young families who wanted to work there (Carrington and Stoyko pers. comm.).

District of Squamish has a young and fast-growing population, with the largest cohort (34 percent) between the ages of 24 to 44 and a median age of 37 (M'akola 2018; Statistics Canada 2017c). It also has one of the fastest growing youth populations (under the age of 14), which is growing at a rate of 8 percent (Squamish 2015). Overall, the population of the District of Squamish is growing at an estimated 2.4 percent and is anticipated to reach 29,575 by 2036 (M'akola 2018).

Among the population in District of Squamish, 4.8 percent identified as Aboriginal in the 2016 census, slightly lower than the Provincial average of 5.8 percent (Statistics Canada 2017c). On average, the Aboriginal population of the District of Squamish is more economically vulnerable than the general population. Despite higher labour force participation rates and lower unemployment rates, those who identify as Aboriginal in the District earn less income than the overall population, with Aboriginal women earning the least. The labour force participation rate for those who identified as Aboriginal in the District was 77 percent, slightly higher than for the overall population at 76.4 percent, and the Province at 63.9 percent. As well, the unemployment rate for those who identified as Aboriginal in the District was 3.2 percent, compared with 5.4percent for the District as a whole, and 6.7 percent for the Province. However, the prevalence of low income for Aboriginal people in District of Squamish was 12.6 percent, higher than the general population at 9.7 percent, but lower than the Province at 15.5 percent. Similarly, the median income among recipients in the District was $40,119, with $48,634 for men and $33,328 for women. However, for the Aboriginal population the median income among recipients was $31,524, with $35,661 for men and $28,920 for women.

Table 20-2. Overview of Potential Residual Effects of the Proposed Amendments for Select Human-Oriented Valued Components and their Potential Interactions with Identified Subgroups of the Population

Potential Residual Effect	Population Subgroup within Study Area who may Experience the Interaction with the Proposed Amendments[a]				
	Individuals who reside, work or perform recreation activities in proximity of the proposed amendment footprint	**Individuals with land and resource-based livelihoods or personal pursuits**	**Individuals or families with low or fixed income**	**Individuals with pre-existing health conditions or disabilities**	**Women and youth at risk, individuals struggling with poverty, mental health, or addiction**
	Rationale: more likely to see, hear or otherwise experience immediate Project activities.	*Rationale: rely on natural environment for resource-based livelihoods and recreational pursuits*	*Rationale: less able to adapt issues related to increased community demands (such as, upward price pressures, community services)*	*Rationale: could be at increased risk if increased exposure to environmental contaminants*	*Rationale: could be at increased risk to adverse community-worker interactions*
Disruption of Local businesses during construction	Yes – commercial, business areas near or traversed by footprint	Yes – where footprint used for commercial recreation	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
VC: Employment and Labour Force					
No adverse potential residual effects identified. Effects on employment and the labour economy are considered positive and discussed in subsection 1.6 of the EAC Application (Volume 1, Part A)	n/a	n/a	n/a	n/a	n/a
VC: Community Utilities and Services					
Increased demand on existing emergency services, health care services and social services (during construction)	No unique interaction compared to the general population	No unique interaction compared to the general population	Yes – may be less capacity via Local social services to meet existing needs	Yes – may be less capacity via Local health care to meet existing needs	Yes – may be less capacity via Local emergency, social services to meet existing or increased needs
Increased use of recreational facilities by proposed Project workers (during construction)	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Increased demand for short-term accommodation	No unique interaction compared to the general population	No unique interaction compared to the general population	Yes – temporary influx may put upward pressure on housing costs (that is, rental housing), reduce availability of rental housing	No unique interaction compared to the general population	No unique interaction compared to the general population
Upward pressure on housing costs in select communities	No unique interaction compared to the general population	No unique interaction compared to the general population	Yes – temporary influx may put upward pressure on housing costs (that is, rental housing), reduce availability of rental housing	No unique interaction compared to the general population	No unique interaction compared to the general population

Table 20-2. Overview of Potential Residual Effects of the Proposed Amendments for Select Human-Oriented Valued Components and their Potential Interactions with Identified Subgroups of the Population

Potential Residual Effect	Population Subgroup within Study Area who may Experience the Interaction with the Proposed Amendments[a]				
	Individuals who reside, work or perform recreation activities in proximity of the proposed amendment footprint	**Individuals with land and resource-based livelihoods or personal pursuits**	**Individuals or families with low or fixed income**	**Individuals with pre-existing health conditions or disabilities**	**Women and youth at risk, individuals struggling with poverty, mental health, or addiction**
	Rationale: more likely to see, hear or otherwise experience immediate Project activities.	*Rationale: rely on natural environment for resource-based livelihoods and recreational pursuits*	*Rationale: less able to adapt issues related to increased community demands (such as, upward price pressures, community services)*	*Rationale: could be at increased risk if increased exposure to environmental contaminants*	*Rationale: could be at increased risk to adverse community-worker interactions*
Increase in solid, liquid and hazardous waste at landfills, transfer stations, hazardous waste centres and wastewater treatment facilities	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
VC: Transportation Infrastructure					
Increased proposed Project-related traffic on highways and Local roads	Yes – may experience more traffic in proximity to worksites, footprint	Yes – may experience more traffic in proximity to worksites, footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Physical disturbance to roads	Yes – may experience more disturbance in proximity to worksites, footprint	Yes – may experience more disruption of access	No unique interaction compared to the general population	Yes – may experience more disruption of access	No unique interaction compared to the general population
VC: Community					
Change in community quality of life during the construction phase	Yes – nuisance noise, dust, vibration near footprint	Yes – nuisance noise, dust, vibration near footprint	Yes – temporary influx may drive price increases of general goods and services	No unique interaction compared to the general population	Yes – temporary influx may contribute to socially-disruptive or unruly behaviour
VC: Human Health					
Noise disturbance to nearby residents during construction	Yes – nuisance noise near footprint	Yes – nuisance noise near footprint	No unique interaction compared to the general population	Yes – nuisance noise near footprint	No unique interaction compared to the general population
Noise disturbance to nearby residents during operations	Yes – nuisance noise near footprint	Yes – nuisance noise near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population

Table 20-2. Overview of Potential Residual Effects of the Proposed Amendments for Select Human-Oriented Valued Components and their Potential Interactions with Identified Subgroups of the Population

Potential Residual Effect	Population Subgroup within Study Area who may Experience the Interaction with the Proposed Amendments[a]				
	Individuals who reside, work or perform recreation activities in proximity of the proposed amendment footprint	**Individuals with land and resource-based livelihoods or personal pursuits**	**Individuals or families with low or fixed income**	**Individuals with pre-existing health conditions or disabilities**	**Women and youth at risk, individuals struggling with poverty, mental health, or addiction**
	Rationale: more likely to see, hear or otherwise experience immediate Project activities.	*Rationale: rely on natural environment for resource-based livelihoods and recreational pursuits*	*Rationale: less able to adapt issues related to increased community demands (such as, upward price pressures, community services)*	*Rationale: could be at increased risk if increased exposure to environmental contaminants*	*Rationale: could be at increased risk to adverse community-worker interactions*
Air quality effects on respiratory health during construction	Yes – nuisance dust, air emissions near footprint	Yes – nuisance dust, air emissions near footprint	No unique interaction compared to the general population	Yes – nuisance dust, air emissions near footprint	No unique interaction compared to the general population
Air quality effects on respiratory health during operations	Yes – nuisance dust, air emissions near footprint	Yes – nuisance dust, air emissions near footprint	No unique interaction compared to the general population	Yes – nuisance dust, air emissions near footprint	No unique interaction compared to the general population
VC: Ecological Health					
No residual adverse effect identified.	n/a	n/a	n/a	n/a	n/a
VC: Land and Resources Use					
Disturbance of residential use areas during construction	Yes – disturbance near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Inconsistency with land use planning objectives for the Skwelwil'em Squamish Estuary Wildlife Management Area during construction and operations	n/a	n/a	n/a	n/a	n/a
Physical alteration of areas with VQOs during construction and operations	Yes – disturbance near footprint	Yes – disturbance near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Alteration of viewsheds during construction and operations	Yes – disturbance near footprint	Yes – disturbance near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population

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Potential Residual Effect	Population Subgroup within Study Area who may Experience the Interaction with the Proposed Amendments[a]				
	Individuals who reside, work or perform recreation activities in proximity of the proposed amendment footprint	**Individuals with land and resource-based livelihoods or personal pursuits**	**Individuals or families with low or fixed income**	**Individuals with pre-existing health conditions or disabilities**	**Women and youth at risk, individuals struggling with poverty, mental health, or addiction**
	Rationale: more likely to see, hear or otherwise experience immediate Project activities.	*Rationale: rely on natural environment for resource-based livelihoods and recreational pursuits*	*Rationale: less able to adapt issues related to increased community demands (such as, upward price pressures, community services)*	*Rationale: could be at increased risk if increased exposure to environmental contaminants*	*Rationale: could be at increased risk to adverse community-worker interactions*
Disruption of recreational users and hunters, fishers and gatherers during construction and operations	No unique interaction compared to the general population	Yes – disruption near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Increased access to previously inaccessible areas during construction and operations	No unique interaction compared to the general population	Yes – disturbance near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Physical disturbance of recreational use areas during construction and operations	No unique interaction compared to the general population	Yes – disturbance on or near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Disruption of trapping activities during construction	No unique interaction compared to the general population	Yes – disturbance on or near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Disruption of commercial recreation and tourism operations during construction and operations	No unique interaction compared to the general population	Yes – disturbance on or near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Disruption to timber harvesting operations during construction	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Reduced long-term volume of merchantable timber available for harvesting (reduction to the timber harvesting land base) during construction	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population

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Potential Residual Effect	Population Subgroup within Study Area who may Experience the Interaction with the Proposed Amendments[a]				
	Individuals who reside, work or perform recreation activities in proximity of the proposed amendment footprint	**Individuals with land and resource-based livelihoods or personal pursuits**	**Individuals or families with low or fixed income**	**Individuals with pre-existing health conditions or disabilities**	**Women and youth at risk, individuals struggling with poverty, mental health, or addiction**
	Rationale: more likely to see, hear or otherwise experience immediate Project activities.	*Rationale: rely on natural environment for resource-based livelihoods and recreational pursuits*	*Rationale: less able to adapt issues related to increased community demands (such as, upward price pressures, community services)*	*Rationale: could be at increased risk if increased exposure to environmental contaminants*	*Rationale: could be at increased risk to adverse community-worker interactions*
Disruption of NTFP harvesting during construction	No unique interaction compared to the general population	Yes – disturbance on or near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Limitations to future mineral and aggregate activities during construction and operations	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population
Disruption of access to industrial use areas during construction	Yes – disturbance on or near footprint	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population	No unique interaction compared to the general population

[a] Positive effects were not assessed in the EAC Application. As such, the inequitable distribution of project benefits is not represented in this table. Refer to subsection 21.4 for a discussion of the ability to capture Project benefits by individuals with limited skills or experience in the construction sector for each proposed amendment.

NTFP = non-timber forest products

Overall, men have more training and experience specific to the construction industry and therefore may be better positioned to take advantage of employment opportunities presented by the Project. Men make up 79 percent of those with an apprenticeship or trades certificates or diplomas and 90 percent of those working in the construction industry. For the Aboriginal population of Squamish, men make up 100 percent of those working in the construction industry. For women in the labour force, the top industry was health care and social assistance, whether they identified as Aboriginal or not.

District of Squamish has been experiencing pressure in the housing market with declining affordability and limited availability in recent years. Currently, the vacancy rate sits at 0.3 percent and has been below 1 percent since 2015 (M'akola 2018; CMHC 2019). The 2016 census for District of Squamish listed a median monthly shelter cost of $1,752 for owned dwellings, 52.4 percent higher than the Provincial rate. For rented dwellings, the median monthly shelter cost was 15.9 percent higher than the Province at $1,201. Housing costs have increased rapidly over recent years, with rental rates increasing by 53 percent from 2014 to 2018 and housing prices increasing by 58.8 percent from 2015 to 2017 (Urban Matters 2020; M'akola 2018). In 2016, 36.4 percent of renter households spent 30 percent or more of their total before-tax income on housing, 9.0 percent of renter households lived in overcrowded conditions, and 7.1 percent of privately occupied dwellings needed major repairs (M'akola 2018; Statistics Canada 2017c). Currently there are 194 applicants on the Squamish Integrated Housing Solutions Group waitlist and future housing demand is estimated to be a total of 556 new housing units (M'akola 2018). However, from 2017 to 2018, a total of 267 units were constructed and 336 units were under construction in 2018 (M'akola 2018).

Given the limited availability and increasing costs of housing in the District of Squamish, people with low or fixed income will be the most disadvantaged as a result of increasing pressure on the housing market. The limited availability of housing options and housing waitlists mean that lower income people may be squeezed out of the housing market altogether. Young families looking to purchase their first home may not be able to enter the market and seniors who may have purchased their homes when prices where much lower, may find it cost prohibitive to find a new home at current rates (Urban Matters 2020).

Overall, crime rates in the District have fallen over the last 5 years (Gaudet 2018; Statistics Canada 2020b). In 2018, the District of Squamish had a crime severity index of 67.2 and a violent crime severity index of 92.0 (Statistics Canada 2020a). The crime rate in Squamish was 6,477.9 per 100,000 population, with a total of 1,425 incidents, a decrease from previous years (Statistics Canada 2020b). In 2017 the District had 123 assault incidents, of which 9 were classified as sexual assault (Gaudet 2018). There were 109 incidents of breaking and entering, 5 incidents of robbery, 11 incidents of drug trafficking, 65 impaired driving incidents, and 0 *Youth Criminal Justice Act* offences (Gaudet 2018).

20.3.2 City of Coquitlam

The City of Coquitlam is a relatively affluent and educated community. It has an older population with a majority of residents as homeowners. However, there is a missing middle class with only 6 percent of residents earning a moderate income and many people struggling to afford housing (Metro Vancouver 2019). The population of Coquitlam has a high proportion of immigrants, but a low Aboriginal population. Neighbourhood profiles were reviewed to gain an understanding of the distribution populations throughout Coquitlam. The Eagle Mountain Compressor Station and Coquitlam Twinning are located in the Westwood Plateau. As such, this section will present information on various neighbourhoods, but the focus will be on the Westwood Plateau.

The City of Coquitlam is the third fastest growing city in the Province and tenth fastest growing city in all of Canada (Coquitlam 2018). In 2016, the population was 139,284 and is anticipated to reach 224,000 by 2041 (Statistics Canada 2017a; Coquitlam 2019). The City has an older population than District of Squamish, with the largest cohort (31 percent) between the ages of 40 and 59 (Coquitlam 2020a). In Westwood Plateau, the neighbourhood closest to the Eagle Mountain Compressor Station and Coquitlam Twinning, this age group makes up 34 percent of the total population (Coquitlam 2020a). It is estimated that the proportion of seniors in Coquitlam (65 years of age and older) will increase to over 20 percent by 2030 (PHSA 2019).

The City of Coquitlam has a low Aboriginal population and a high proportion of immigrants; however, these populations do not reside in proximity to the proposed amendments. Only 2.2 percent of the population in City of Coquitlam identified as Aboriginal in the 2016 census, compared with 5.8 percent for the Province (Statistics Canada 2017a). However, 50.2 percent of residents in the City were classified as a visible minority, with 44 percent of residents born outside of Canada primarily from China, South Korea, and Iran (PHSA 2019; Coquitlam 2020a). Only 2.4 percent of both immigrants and those who identified as Aboriginal in the 2016 census reside in Westwood Plateau, the neighbourhood in which the Eagle Mountain Compressor Station and Coquitlam Twinning are located (Coquitlam 2020a).

The City of Coquitlam has a relatively high labour force participation rate and low unemployment rate, overall. While the Aboriginal population of the City of Coquitlam has a high participation rate, they also have a higher unemployment rate, particularly for men. In the 2016 census, the labour force participation rate was 65.1 percent, slightly higher than the Provincial rate at 63.9 percent. The unemployment rate was 6.1 percent, slightly lower than the Provincial rate at 6.7 percent. For men in the City of Coquitlam, the participation rate was 70.6 percent and the unemployment rate was 6.4 percent, while for women the participation rate was 60 percent and the unemployment rate was 5.8 percent. Among the population that identified as Aboriginal in the 2016 census, the labour force participation rate was 70.4 percent and the unemployment rate was 9.3 percent. For Aboriginal men, the participation rate was 74.5 percent and the unemployment rate was 13.9 percent, while for Aboriginal women the participation rate was 60 percent and the unemployment rate was 4.8 percent. The Aboriginal population of the City of Coquitlam makes up 4 percent of those working in the construction industry, 99 percent of which are men (Statistics Canada 2017a).

The City of Coquitlam has a small proportion of moderate-income earners (between $60,000 and $85,000 per year). According to the Metro Vancouver Housing Data Book, over 30 percent of the population of the City had low income in 2015 (between $35,000 and $60,000 per year) and over 20 percent had very low income (below $35,000 per year), while 44 percent had high income ($85,000 and over per year) (Metro Vancouver 2019). Overall, the median household income in Coquitlam was $74,475, with the highest median income in Northeast Coquitlam at $111,427 and the lowest median income in Austin Heights at $43,575 (Coquitlam 2020a). In Westwood Plateau the median income was $83,388 (Coquitlam 2020a). For individuals, the median income among recipients in Coquitlam was $31,835, with $39,635 for men and $26,081 for women (Statistics Canada 2017a). For the Aboriginal population, the median income among recipients was $32,307, with $41,748 for men and $26,593 for women (Statistics Canada 2017a). However, the prevalence of low income for Aboriginal people in Coquitlam was 18.3 percent, higher than the general population at 17.7 percent and the Province at 15.5 percent (Statistics Canada 2017a).

Overall, Coquitlam is an educated community. Over 70 percent of residents aged 25 to 65 in Coquitlam hold a post-secondary degree, diploma, or certificate (Coquitlam 2020a). By neighbourhood, the highest proportion of residents with post-secondary education are located in Westwood Plateau, River Heights, and Northeast Coquitlam at 64 percent, while the lowest proportion are located in Austin Heights at 49 percent (Coquitlam 2020a). In general, men have more training and experience specific to the construction industry and are therefore better positioned to take advantage of employment opportunities presented by the Project. Men make up 73 percent of those with an apprenticeship or trades certificate or diploma and 87 percent of those working in the construction industry. For the Aboriginal population of Coquitlam, men make up 99 percent of those working in the construction industry. For women, the top industry was health care and social assistance, whether they identified as Aboriginal or not.

While a majority of residents in Coquitlam own their homes, there are many in core housing need. The standards that determine core housing need are affordability (housing that costs less than 30 percent of total before-tax household income); suitability (housing that has enough bedrooms for the size and composition of the household); and adequacy (housing that does not require any major repairs) (Statistics Canada 2017b). Overall, 72 percent of residents in Coquitlam own their home, the majority of which are single family homes (Coquitlam 2020a). The Westwood Plateau has one of the highest proportions of homeownership at 84 percent (Coquitlam 2020a). However, 17.8 percent of households in Coquitlam are in core housing need and 8.3 percent of households are at risk of homelessness (Metro Vancouver 2019). In October 2019, the vacancy rate for Coquitlam was 0.9 percent (CMHC 2019). The proportion of

households spending 30 percent or more of their total income on dwelling costs was 46.6 percent in 2016, higher than the Provincial rate of 43.3 percent (Statistics Canada 2017a). It is estimated that by 2023 more than 25 percent of households in Coquitlam will be spending 30 percent or more of their total income on housing (Coquitlam 2015). In addition, Coquitlam is projected to require 6,000 new units in order to meet low-to-moderate income household needs by 2023 (Coquitlam 2015).

Overall, crime rates in Coquitlam have fallen over the last five years (Gaudet 2018; Statistics Canada 2020b). In 2018 Coquitlam had a crime severity index of 53.5 and a violent crime severity index of 42.4 (Statistics Canada 2020a). The crime rate in Coquitlam was 5,288.7 per 100,000 population, with a total of 7,904 incidents (Statistics Canada 2020b). While total crime increased in the Province by 3.2 percent in 2018, it decreased in Coquitlam by 4.5 percent (McKenna 2019). The steady decrease in crime rates in Coquitlam can be partially attributed to improved security measures and changes in attitudes (McKenna 2019). However, fraud and identity theft are becoming more common and are not always reported (McKenna 2019). Given the high proportion of seniors and high-income households, cyber crime may be more of a concern than community-worker interactions.

20.3.3 Squamish Nation

Squamish Nation has 24 reserves that are distributed from Vancouver to Gibson's Landing to the area north of Howe Sound (INAC 2020; Squamish Nation 2013). Squamish Nation has a total registered population of 4,288, with 2,081 males and 2,207 females. Of the total registered population, 2,210 members live on-reserve (primarily Mission 1), 192 members live on other reserves and 1,886 members live off-reserve. In 2016, the median age was 39, with 71 percent of the total population 15 years of age and over and 15 percent of the population was 65 years of age and older. Of the population aged 15 years and older, 37 percent had an apprenticeship, trades or other non-university certificate or diploma; 23 percent had a university certificate, diploma, or degree at or above the bachelor level; and 9 percent had a university certificate, diploma, or degree above the bachelor level. In 2016, Squamish Nation had a labour force participation rate of 56 percent, with an unemployment rate of 12 percent. Employment was distributed across a range of industries including retail trade; accommodation and food services; construction; professional, scientific, and technical services; educational services and public administration (Statistics Canada 2018c; INAC 2020).

20.3.4 Tsleil-Waututh Nation

Tsleil-Waututh Nation is located on the south shore of Burrard Inlet, north of Burnaby. Tsleil-Waututh Nation has a total registered population of 611, with 295 males and 316 females. Of the total registered population, 291 members live on-reserve (primarily Burrard Inlet 3), 49 members live on other reserves and 271 members live off-reserve. In 2016, the median age was 46, with 89 percent of the total population 15 years of age and over and 16 percent of the population was 65 years of age and older. Of the population aged 15 years and older, 43 percent had an apprenticeship, trades or other non-university certificate or diploma; 28 percent had a university certificate, diploma, or degree at or above the bachelor level; and 9 percent had a university certificate, diploma, or degree above the bachelor level. In 2016, Tsleil-Waututh Nation had a labour force participation rate of 70 percent, with an unemployment rate of 7 percent. The top industries by employment were health care and social assistance; professional, scientific, and technical services; and public administration (Statistics Canada 2018d; INAC 2020).

20.3.5 Musqueam Nation

Musqueam Nation is located near the mouth of the Fraser River, north of Sea Island and west of Vancouver. Musqueam Nation has a total registered population of 1,432, with 687 males and 745 females. Of the total registered population, 669 members live on-reserve (primarily Musqueam 2), 124 members live on other reserves and 639 members live off-reserve. In 2016, the median age was 41, with 64 percent of the total population 15 years of age and over and 18 percent of the population was 65 years of age and older. Of the population aged 15 years and older, 30 percent had an apprenticeship, trades or other non-university certificate or diploma; 29 percent had a university certificate, diploma, or degree at or above the bachelor level; and 15 percent had a university certificate, diploma, or degree above the bachelor level. In 2016, Musqueam Nation had a labour force participation rate of 61 percent, with an unemployment rate of

9 percent. Employment was distributed across a range of industries including health care and social assistance; public administration; professional, scientific, and technical services; retail trade; educational services; and arts, entertainment, and recreation (Statistics Canada 2018b; INAC 2020).

Musqueam Nation updated their CCP in 2018. It includes a situational assessment outlining their top strengths and weaknesses. Key strengths identified include cultural pride, economic development, facilities, and community programming, while the challenges identified were education, housing, governance, and administration (Musqueam 2018).

20.3.6 Kwikwetlem First Nation

Kwikwetlem First Nation is located on the west bank of the Coquitlam River, approximately 9 km south of the Eagle Mountain Compressor Station in the City of Coquitlam (Government of BC 2020). Kwikwetlem First Nation has a total registered population of 121, with 73 males and 48 females. Of the total registered population, 45 members live on-reserve (primarily Coquitlam 1), 4 members live on other reserves and 72 members live off-reserve. In 2016, the median age was 29, with 63 percent of the total population 15 years of age and over and 18 percent of the population was 65 years of age and older. Of the population aged 15 years and older, 43 percent had a trades, apprenticeship, or other non-university certificate. In 2016, Kwikwetlem First Nation had a labour force participation rate of 57 percent, with zero percent unemployment. The top industries by employment were construction, retail trade, health care and social assistance, and public administration. Income information was not available in the 2016 census. (Statistics Canada 2018a; INAC 2020).

Kwikwetlem First Nation is in the process of updating their CCP, which was completed in 2015. Since beginning the CCP process, Kwikwetlem First Nation has seen growth in many areas including population growth, increased number of on-reserve housing units, health and family support, education and employment support, and cultural programs (Kwikwetlem 2020).

20.4 Disproportionate Effects on Distinct Human Population Assessment

This section presents an assessment of disproportionate effects to distinct human populations as required in Section 25(2)(d) of the *2018 Act* (Government of BC 2018). Table 20-3 provides a summary of potential adverse effects, mitigation measures and residual adverse effects of the proposed amendments on distinct human populations. Subsections 21.4.1 to 21.4.4 present a discussion of the effects assessment for each proposed amendment. Values and interests raised during engagement that may be relevant to distinct human populations will be considered in these subsections and updated as appropriate.

Refer to Section 18 for an updated assessment of effects on Indigenous Interests and Section 35 rights, including subsistence activities and cultural use areas.

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Economy	**Coquitlam Twinning:** The Coquitlam Twinning is located within the City of Coquitlam, in proximity of Local businesses. Construction activities may interact with and disrupt Local business. **Eagle Mountain Compressor Station:** The Eagle Mountain Compressor Station is located within the City of Coquitlam, in proximity of Local businesses. Construction activities may interact with and disrupt Local business.	Disruption of Local businesses	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• Work with businesses directly affected by construction to reduce effects as a result of noise, dust, and limited access. • Communicate with Local RCMP and emergency services personnel prior to and during Project construction to inform Local businesses and residents of changes in access and construction-related vehicle traffic. • Review and adhere to the measures related to pre-construction and construction traffic in the Access Management Plan (subsection 6.1 of the EMP) and Traffic Control Management Plan (subsection 6.8 of the EMP). Contractor personnel are to adhere to applicable traffic, road use, and safety requirements. • Follow acceptable heavy truck routes and approved access routes, to the extent practical. Seek to schedule heavy construction traffic to periods of less traffic where it would reduce impacts on businesses or residences. • In selecting a route, FortisBC has sought to reduce disturbance of valued natural features with a non-traditional human use (such as, recreational trails, recreational use areas, key use areas within parks and protected areas), to the extent practical.	**Duration:** Short-term The event causing disruption to Local businesses could occur at any point in the construction phase of the proposed amendments. **Frequency:** Isolated The event causing disruption to Local businesses is only likely to occur during the construction phase of the proposed amendments. **Reversibility:** Short- to medium-term Disruption to Local businesses is only expected to occur in the construction phase, however, it is possible that some businesses may experience a loss of business which may lead to a financial loss **Magnitude:** Medium Disruption to Local businesses may cause a loss of business for individual businesses and although the disruption is temporary it may lead to financial loss for some businesses. Other businesses (such as, restaurants) may experience increased business during construction, from construction workers. **Probability:** High The probability of occurrence of the potential residual effect is considered to be likely.	No change to effects assessment conclusions compared to general population assessed in the EAC Application
Community Utilities and Services	**Stawamus Corridor Expansion:** Proposed amendments located near the District of Squamish are anticipated to contribute to increased demand on community services and infrastructure due to limited absorptive capacity in Squamish. **Squamish Compressor Station:** Proposed amendments located near the District of Squamish are anticipated to contribute to increased demand on community services and infrastructure due to limited absorptive capacity in Squamish.	Increased demand on existing emergency services, health care services and social services	• Individuals with pre-existing health conditions or disabilities • Individuals or families with low or fixed income	• Communicate the construction schedule with community representatives to determine potential capacity issues regarding social services. • Communicate the construction schedule with health agency representatives to determine potential capacity issues with emergency and health care services. • Project personnel will be made aware of the Emergency Contact information provided in the EMP. • The Project will be staffed according to WorkSafe BC standards so that sufficient numbers of emergency medical personnel with appropriate certifications, supplies and conveyance requirements based on numbers of workers, the hazard risk and proximity to medical facilities. • Adhere to WorkSafe BC standards in the Project Footprint. • Implement the FortisBC Independent Natural Gas Contractor Safety Guidelines and Substance Abuse Policy, to restrict workers to distribute, possess, consume, or use alcohol or illegal drugs on any FortisBC Project, or in any vehicle, or any other piece of equipment used for the Project.	**Duration:** Short-term The event causing increase in demand on emergency, health care and social services would occur during construction **Frequency:** Isolated The events causing increased demand on emergency, health care and social services will be confined to the construction phase. **Reversibility:** Short-term An increased demand on emergency, health care and social services would be limited to the construction phase. **Magnitude:** Medium The proposed mitigation reduces the potential residual effect to that of a moderate modification in the socio-economic environment as added strain could affect existing services. **Probability:** Low to high It is unlikely that the proposed amendments will result in an increased demand on emergency and social services during construction. However, it is likely that the proposed amendments will result in an increased demand on health care services during construction.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Community Utilities and Services (cont'd)	**Stawamus Corridor Expansion:** Proposed amendments located near the District of Squamish are anticipated to contribute to increased demand on short-term accommodation due to limited absorptive capacity in Squamish. **Squamish Compressor Station:** Proposed amendments located near the District of Squamish are anticipated to contribute to increased demand on short-term accommodation due to limited absorptive capacity in Squamish.	Increased demand for short-term accommodation	• Individuals or families with low or fixed income • Individuals in core housing need	• Communicate the construction schedule to Local operators of hotels, motels, or other temporary accommodations as well as community-based Chambers of Commerce. • Communicate with community representatives to assess the current housing availability and options for hosting workers and their families. • Continue to refine Project workforce estimates, construction schedules and construction hub locations in order to allow the community and the Contractor to plan for direct Project accommodation needs.	**Duration:** Short-term The event causing an increased demand for short-term accommodation would occur during the construction phase. **Frequency:** Isolated The event causing the increased demand for short-term accommodation is largely confined to the construction period. **Reversibility:** Short-term The increased demand for short-term accommodation is limited to the construction phase. **Magnitude:** Medium The increased demand for short-term accommodation may result in the moderate modification of the socio-economic environment. **Probability:** High During construction of the proposed amendments, workers will likely seek short-term accommodation.	No change to effects assessment conclusions compared to general population assessed in the EAC Application
	Stawamus Corridor Expansion: Proposed amendments located near the District of Squamish are anticipated to contribute to upward pressure on housing costs due to existing constraints the housing market in Squamish. **Squamish Compressor Station:** Proposed amendments located near the District of Squamish are anticipated to contribute to upward pressure on housing costs due to existing constraints the housing market in Squamish.	Upward pressure on housing costs in select communities	• Individuals or families with low or fixed income	• Communicate the construction schedule to Local operators of hotels, motels, or other temporary accommodations as well as community-based Chambers of Commerce. • Communicate with community representatives to assess the current housing availability and options for hosting workers and their families. • Continue to refine Project workforce estimates, construction schedules and construction hub locations in order to allow the community and the Contractor to plan for direct Project accommodation needs.	**Duration:** Short-term The event causing an increased demand for short-term accommodation would occur during the construction phase. **Frequency:** Isolated The event causing the increased demand for short-term accommodation is largely confined to the construction period. **Reversibility:** Short-term The increased demand for short-term accommodation is limited to the construction phase. **Magnitude:** Medium The increased demand for short-term accommodation may result in the moderate modification of the socio-economic environment. **Probability:** High During construction of the proposed amendments, workers will likely seek short-term accommodation.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Transportation Infrastructure	**Stawamus Corridor Expansion:** Construction activities associated with all proposed amendments are anticipated to contribute to increased traffic on highways and Local roads. **Coquitlam Twinning:** Construction activities associated with all proposed amendments are anticipated to contribute to increased traffic on highways and Local roads. **Eagle Mountain Compressor Station:** Construction activities associated with all proposed amendments are anticipated to contribute to increased traffic on highways and Local roads. **Squamish Compressor Station:** Construction activities associated with all proposed amendments are anticipated to contribute to increased traffic on highways and Local roads.	Increased proposed Project-related traffic on highways and Local roads	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• Notify BC MoTI if required by highway crossing agreement(s) conditions. • Acquire Road Use Agreements with road permit holders for roads potentially affected by the proposed Project. Discuss proposed Project schedules, construction timeframes necessary for access, expected traffic volumes, road maintenance, road safety issues and radio frequencies. • Review and comply with the measures related to pre-construction and construction traffic in the Traffic Control Management Plan (section 6.8 of the EMP). Contractor personnel will comply with applicable traffic, road use and safety requirements. • Follow acceptable heavy truck routes and approved access routes. To the extent practical, seek to schedule heavy construction traffic to periods of less traffic where it would reduce impacts on businesses or residences. Seek to reduce interactions with school buses and students along Project-related traffic routes. • Obtain all required bridge restriction and oversize load permits. • Communicate with RCMP, police and emergency services personnel in the vicinity of the Project Footprint to keep these organizations informed of traffic schedules and enlist their services as needed. • Establish speed limits on the Project Footprint and access roads. Post signs stating the applicable speed limits for construction traffic. Advise construction personnel to comply with applicable Provincial and Project-related traffic, road use and safety laws or requirements. • Transport workers to and from the work site by multi-passenger vehicles to the extent practical. Pick up and drop off workers at marshalling areas to limit traffic volumes and the potential for vehicle/wildlife interactions. • Notify the public in accordance with FortisBC's Communication Plan at the commencement of each stage of EGP Project developments, or when there is the potential to significantly restrict access, until the EGP Project is complete. • Place signage on access roads in the vicinity of the construction activities notifying road users that construction activities are taking place. • For construction in urban areas, establish alternate access routes for commercial or residential areas to the extent practical. Install signage to direct traffic flows to alternate access routes.	**Duration:** Short-term Construction activities such as the movement of personnel and equipment that may cause increased traffic volumes is expected to be limited to the construction phase. **Frequency:** Isolated Construction activities such as the movement of personnel and equipment that may cause increased traffic volumes is confined to the construction phase. **Reversibility:** Short-term The transport of personnel and equipment that may cause an increase in traffic volumes is limited to the construction phase. **Magnitude:** Low The implementation of mitigation measures to address the increased traffic volumes, will result in a change that is detectable but will primarily be that of an inconvenience or nuisance. **Probability:** High Daily travel will be required to and from the construction sites and this is likely to increase traffic.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Transportation Infrastructure (cont'd)	**Stawamus Corridor Expansion:** Construction activities associated with all proposed amendments are anticipated to contribute to physical disturbance to roads **Coquitlam Twinning:** Construction activities associated with all proposed amendments are anticipated to contribute to physical disturbance to roads **Eagle Mountain Compressor Station:** Construction activities associated with all proposed amendments are anticipated to contribute to physical disturbance to roads **Squamish Compressor Station:** Construction activities associated with all proposed amendments are anticipated to contribute to physical disturbance to roads	Physical disturbance to roads	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• Acquire Road Use Agreements with road permit holders for roads potentially affected by the proposed Project. Discuss proposed Project schedules, construction timeframes necessary for access, expected traffic volumes, road maintenance, road safety issues and radio frequencies. • Install appropriate protection to prevent damage at road and rail crossings when moving construction equipment across roads and rail lines. • Shovel and sweep clean any mud tracked onto paved roads following equipment crossings. • Repair damage to roads to pre-construction condition. Seek to avoid physical disturbance to any roads used for Regional access to parks and protected areas, to the extent practical. • Seek to avoid physical disturbance to any roads used for Regional access to parks and protected areas, to the extent practical. • Notify BC MoTI if required by highway crossing agreement(s) conditions.	**Duration:** Short-term Construction activities that may cause physical disturbance to roads will be restricted to the construction phase. **Frequency:** Periodic Physical disturbance to roads may occur intermittently but repeatedly over the assessment period (during construction and site-specific maintenance). **Reversibility:** Short-term The physical disturbance to roads is limited to the construction phase. Roads will be re-established post-construction. **Magnitude:** Low The implementation of mitigation measures to address physical disturbance to roads, will result in a change that is detectable but will primarily be that of an inconvenience or nuisance. **Probability:** High The proposed amendments will likely cause physical disturbance to roads.	No change to effects assessment conclusions compared to general population assessed in the EAC Application
Community	**Stawamus Corridor Expansion:** Proposed amendments located near the District of Squamish are anticipated to contribute to a change in community quality of life during construction due to limited absorptive capacity in Squamish. **Squamish Compressor Station:** Proposed amendments located near the District of Squamish are anticipated to contribute to a change in community quality of life during construction due to limited absorptive capacity in Squamish.	Change in community quality of life during the construction phase	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint • Individuals with pre-existing health conditions or disabilities • Women and youth at risk, individuals struggling with poverty, mental health, or addiction	• Notify Municipalities of the anticipated pipeline routing and construction schedules a minimum of 14 days prior to construction. • Notify Indigenous communities identified in FortisBC's Indigenous Consultation Plan, trappers, guides and outfitters, landowners and lessees, tenure holders, as well as recreational organizations of commencement of each stage of Project developments, or when there is the potential to significantly restrict access, until the Project is complete. • Notify applicable regulatory authorities (such as, BC ENV, DFO, BC MFLNRORD, BC OGC) as warranted during construction. • Consider landowners' special requests for inclusion in specific easement agreements. • Establish a Project designated phone line and/or Project offices that will field complaints or concerns expressed by community and respond appropriately. • For construction in urban areas, alternate access routes will be established for commercial or residential areas where applicable. Signage will be installed to direct traffic flows, as warranted. • Notify Local residents of blasting schedule at least 48 hours prior to blasting and provide updates to the schedule as necessary to reflect changes in overall duration and timing. • Implement the FortisBC Independent Natural Gas Contractor Safety Guidelines and Substance Abuse Policy, to restrict workers to distribute, possess, consume, or use alcohol or illegal drugs on any FortisBC Project, or in any vehicle, or any other piece of equipment used for the Project.	**Duration:** Short-term The events that may cause a change in community quality of life are confined to the construction phase. **Frequency:** Isolated The events that may cause a change in community quality of life are confined to the construction phase. **Reversibility:** Short-term A change in the community quality of life due to construction activities will be limited to the construction phase. **Magnitude:** Medium The implementation of the proposed mitigation measures to address change in community quality of life during construction will result in a moderate modification in the socio-economic environment. **Probability:** High Construction of the proposed amendments will likely cause a change in community quality of life.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Community (cont'd)				• Implement relevant mitigation measures pertaining to human habitation, visual aesthetics, as well as disruption of recreational use, guide outfitting, hunting, trapping, and fishing activities of land users identified in Volume 1, Part B of the EAC Application. • Section 13.0 of the EAC Application (Land and Resources Effects Assessment). • Implement relevant mitigation measures pertaining to the disruption of normal, daily living activities of residents and land users identified in Volume 1, Part B, Section 15.0 of the EAC Application (Health Effects Assessment). • Implement relevant mitigation measures pertaining to increased traffic on highways and Local roads and increased demand on community infrastructure and services identified in Volume 1, Part B, Sections 12.5 and 12.6 of the EAC Application (Community and Regional Infrastructure and Services Effects Assessment).		
Land and Resources Use	**Coquitlam Twinning:** The Coquitlam Twinning is located within the City of Coquitlam, in proximity of residential areas. Construction activities may interact with and disturb residential use areas. **Eagle Mountain Compressor Station:** The Eagle Mountain Compressor Station is located within the City of Coquitlam, in proximity of residential areas. Construction activities may interact with and disturb residential use areas.	Disturbance of residential use areas	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• For construction in urban areas, alternate access routes will be established for commercial or residential areas where applicable. Signage will be installed to direct traffic flows, as warranted. • Notify Indigenous communities identified in FortisBC's Indigenous Consultation Plan, trappers, guides and outfitters, landowners and lessees, tenure holders, as well as recreational organizations of commencement of each stage of Project developments, or when there is the potential to significantly restrict access, until the Project is complete. • Consider landowners' special requests for inclusion in specific easement agreements. • In selecting a route, FortisBC has sought to reduce disturbance of built features (such as, residences, cabins, campgrounds, businesses, schools, golf courses, community use areas, commercial and industrial areas), to the extent practical. • In selecting a route, FortisBC has sought to narrow the Project Footprint at key locations to avoid valued built or natural features (such as, residences, cabins, campgrounds, businesses, schools, golf courses, parks, trailhead, and community use areas), to the extent practical. • In selecting a route, FortisBC has sought to reduce the amount of land disturbed by using previously disturbed areas for stockpiles and staging areas. • In selecting a route, FortisBC has sought to reduce disturbance to ornamental trees, windbreaks, and shelterbelts on landowner property, to the extent practical. This may involve narrowing the Project Footprint at key locations or boring shelterbelts. • Coordinate blasting activities with Local authorities and comply with appropriate jurisdictional guidelines, where required. Coordinate blasting activities within the reasonable proximity to adjacent roads, railway tracks and recreational areas with Local authorities and landowners prior to commencement of activities. Place signage along areas where required during blasting activities.	**Duration:** Short-term Activities that may cause disturbance of residential areas would occur during construction phase and occasionally during site-specific maintenance. **Frequency:** Isolated to occasional The disturbance to residential areas would be largely confined to the construction period, but also occasional maintenance activities during operations. **Reversibility:** Short-term Disturbance to residential areas would be limited to the construction phase and occasional site-specific maintenance, and will be reversible in the short-term, once the activities are completed. **Magnitude:** Low Disturbance to residential areas will result in an effect that is characterized as an inconvenience or nuisance. **Probability:** High Construction of the proposed Project is likely to disturb residential areas.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Land and Resources Use (cont'd)	**Stawamus Corridor Expansion:** The Stawamus Corridor Expansion is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational users and hunters, fishers, and gatherers. **Coquitlam Twinning:** The Coquitlam Twinning is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational users. **Eagle Mountain Compressor Station:** The Eagle Mountain Compressor Station is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational users. **Squamish Compressor Station:** The Squamish Compressor Station is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational users.	Disruption of recreational users and hunters, fishers, and gatherers during construction	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint • Individuals with land and resource-based livelihoods or personal pursuits	• Notify Indigenous groups identified in FortisBC's Indigenous Consultation Plan, trappers, guides and outfitters, landowners and lessees, tenure holders, as well as recreational organizations of commencement of each stage of Project developments, or when there is the potential to significantly restrict access, until the Project is complete. • Prohibit the recreational use of all-terrain vehicles by construction personnel on the Project Footprint or at associated Project facility sites. • Maintain access to established recreation features, through the clearing, construction, and restoration period, to the extent practical. • Notify the public in accordance with FortisBC's Communication Plan at the commencement of each stage of EGP Project developments, or when there is the potential to significantly restrict access, until the EGP Project is complete. • Place signage on access roads in the vicinity of the construction activities notifying road users that construction activities are taking place. • Seek to avoid physical disturbance to any roads used for Regional access to parks and protected areas, to the extent practical. • Notify Project personnel that recreational fishing in publicly accessible lakes and rivers in the Project Footprint must comply with Provincially recommended protocols for washing fishing equipment such as waders with 100 milligrams per litre chlorine bleach or other recommended solutions before use in any watercourse to prevent the introduction and spread of pathogens (such as, whirling disease) and invasive species (such as, Didymo algae) in the Project Footprint. • Coordinate blasting activities with Local authorities and comply with appropriate jurisdictional guidelines, where required. Coordinate blasting activities within the reasonable proximity to adjacent roads, railway tracks and recreational areas with Local authorities and landowners prior to commencement of activities. Place signage along areas where required during blasting activities.	**Duration:** Short-term Activities that may cause disruption to recreational users will be restricted to the construction phase and to occasional site-specific maintenance. **Frequency:** Isolated to occasional The disruption to recreational users would be largely confined to the construction period, but also occasional maintenance activities during operations. **Reversibility:** Short-term Disruption to recreational users will be limited to the construction phase and to site-specific maintenance activities and will be reversible in the short-term, once the activities are completed. **Magnitude:** Low to medium The implementation of mitigation measures to address the disruption to recreational users, will result in a change that is low to medium in magnitude, depending on the recreational area. **Probability:** High The proposed amendments will likely cause disruption to recreational users	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Land and Resources Use (cont'd)	**Stawamus Corridor Expansion:** The Stawamus Corridor Expansion is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational use areas. **Coquitlam Twinning:** The Coquitlam Twinning is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational use areas. **Eagle Mountain Compressor Station:** The Eagle Mountain Compressor Station is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational use areas. **Squamish Compressor Station:** The Squamish Compressor Station is located in proximity of recreational land use areas. Construction activities have may interact with and disrupt recreational use areas.	Physical disturbance of recreational use areas	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint • Individuals with land and resource-based livelihoods or personal pursuits	• In selecting a route or facility site, FortisBC has sought to reduce disturbance of valued natural features with a non-traditional human use (such as, recreational trails, recreational use areas, key use areas within parks and protected areas), to the extent practical. • In selecting a route, FortisBC has sought to narrow the proposed amendment footprint at key locations to avoid valued built or natural features (such as, residences, cabins, campgrounds, businesses, schools, golf courses, parks, trailhead, and community use areas), to the extent practical. • Restore recreation trails and public use areas disturbed by the proposed amendments to the extent practical, to pre-construction condition and according to the Restoration Plan.	**Duration:** Short-term Activities that will cause physical alteration of recreational use areas will be restricted to the construction phase and to occasional site-specific maintenance. **Frequency:** Isolated to occasional Physical alteration of recreational use areas would be largely confined to the construction period, but also occasional maintenance activities during operations. **Reversibility:** Short-term The physical alteration of recreational use areas will be limited to the construction phase and site-specific maintenance activities and will be reversible in the short-term once the activities are completed. **Magnitude:** Low The implementation of mitigation measures to address the physical alteration of recreational use areas, will result in a change that is detectable but will primarily be that of an inconvenience or nuisance. **Probability:** High The proposed amendments will likely cause physical alteration of recreational use areas.	No change to effects assessment conclusions compared to general population assessed in the EAC Application
	Stawamus Corridor Expansion: The Stawamus Corridor Expansion is located within registered trapline area TR0207T001 (Government of BC 2020). Therefore, construction activities may disrupt trapping activities within the area. **Squamish Compressor Station:** The Squamish Compressor Station is located within registered trapping area TR0205T018 (Government of BC 2020). Therefore, construction activities may disrupt trapping activities within the area.	Disruption of trapping activities	• Individuals with land and resource-based livelihoods or personal pursuits	• Prohibit construction personnel from vandalizing or stealing trapper equipment or trapped animals. Report violators to the BC ENV. • Traps and snares may or may not be located within registered trap lines. Seek to avoid accidental damage where the pipeline transects a trap line by considering the following mitigation options: maintaining access to the trap line; and moving of trap line equipment by the trapper prior to construction. • Notify Indigenous communities identified in FortisBC's Indigenous Consultation Plan, trappers, guides and outfitters, landowners and lessees, tenure holders, as well as recreational organizations of commencement of each stage of Project developments, or when there is the potential to significantly restrict access, until the Project is complete.	**Duration:** Short-term Activities that may cause disruption of trapping activities will be restricted to the construction phase **Frequency:** Isolated The disruption of trapping activities will be restricted to the construction phase of the assessment period. **Reversibility:** Short-term Activities that may cause disruption of trapping activities are limited to the construction phase. **Magnitude:** Low The implementation of mitigation measures to address the disruption of trapping activities, will result in a change that is detectable but will primarily be that of an inconvenience or nuisance. **Probability:** High The proposed Project will likely cause disruption to trapping activities	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Land and Resources Use (cont'd)	**Stawamus Corridor Expansion:** Commercial recreation and tourism activities that occur near the Stawamus Corridor Expansion include mountain biking, dirt biking, hiking, trail running, and nature trips. Therefore, construction activities may interact with and disrupt commercial recreation and tourism activities within the area. **Coquitlam Twinning:** Commercial recreation and tourism activities that occur near the Coquitlam Twinning include mountain biking, hiking, trail running, and golfing. Therefore, construction activities may interact with and disrupt commercial recreation and tourism activities within the area. **Eagle Mountain Compressor Station:** Commercial recreation and tourism activities that occur near the Eagle Mountain Compressor Station include mountain biking, hiking, trail running, and golfing. Therefore, construction activities may interact with and disrupt commercial recreation and tourism activities within the area. **Squamish Compressor Station:** Many commercial recreation and tourism activities occur near the Squamish Compressor Station including guide outfitting, hiking, marine tours, cruises, sightseeing, fishing, and kayaking. Therefore, construction activities may disrupt commercial recreation and tourism activities within the area.	Disruption of commercial recreation and tourism operations	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint	• Notify Indigenous communities identified in FortisBC's Indigenous Consultation Plan, trappers, guides and outfitters, landowners and lessees, tenure holders, as well as recreational organizations of commencement of each stage of Project developments, or when there is the potential to significantly restrict access, until the Project is complete. • For construction in urban areas, alternate access routes will be established for commercial or residential areas where applicable. Signage will be installed to direct traffic flows, as warranted. • In selecting a route, FortisBC has sought to reduce disturbance of valued natural features with a non-traditional human use (such as, recreational trails, recreational use areas, key use areas within parks and protected areas), to the extent practical. • Please refer to Volume 1, Part B, Section 11.5 of the EAC Application (Economic Effects Assessment) regarding mitigation for business disruption.	**Duration:** Short-term Activities that may cause disruption of commercial recreation and tourism operations will be restricted to the construction phase and to occasional site-specific maintenance. **Frequency:** Isolated to occasional The disruption of commercial recreation and tourism operations would be largely confined to the construction period, but also occasional maintenance activities during operations. **Reversibility:** Short-term The disruption of commercial recreation and tourism operations will be limited to the construction phase and to site-specific maintenance activities, and will be reversible in the short-term, once the activities are completed. **Magnitude:** Medium The implementation of mitigation measures to address the disruption of commercial recreation and tourism operations, will result in a change that is detectable and moderate in the modification of the socio-economic environment **Probability:** High The proposed Project will likely cause disruption to commercial recreation and tourism operations	No change to effects assessment conclusions compared to general population assessed in the EAC Application
	Stawamus Corridor Expansion: The Stawamus Corridor Expansion is located near areas where gathering activities may occur. Therefore, construction activities may disrupt harvesting of NTFP. **Squamish Compressor Station:** The Squamish Compressor Station is located near areas where gathering activities may occur. Therefore, construction activities may disrupt harvesting of NTFP.	Disruption of NTFP harvesting	• Individuals with land and resource-based livelihoods or personal pursuits	• Provide forest tenure holders with information and protocols regarding time frames for approval of pipeline crossings by trucks and heavy equipment, weight restrictions, standard operating procedures and blasting restrictions. • Consult with forest tenure holders and consider specific requests for mitigation. • Communicate the proposed Project construction schedule to NTFP harvesters. • Seek to reduce the amount of disturbance to areas of High Non-Timber forest product productivity by using previously disturbed areas for stockpiles and temporary work areas, to the extent practical. • Retain non-merchantable timber where warranted for use as chips, mulch corduroy, slash berms or rollback. • To the extent practical, native groundcover and shrubs will be allowed to regenerate on the Project Footprint following construction.	**Duration:** Short-term Activities associated with the installation of the pipeline and facilities that may disrupt NTFP harvesting will primarily occur during the construction phase. **Frequency:** Isolated The proposed amendment activities that could affect NTFPs will primarily occur during the construction phase. **Reversibility:** Long-term Potential adverse effects on some NTFPs are likely to extend throughout the operations phase. **Magnitude:** Low The change in production and harvest of NTFPs will be detectable but will have a negligible effect on the socio-economic environment beyond that of an inconvenience or nuisance. **Probability:** Low Proposed amendment construction is unlikely to affect NTFPs.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

Table 20-3. Summary of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects of the Proposed Amendments on Distinct Human Populations[a]

VC	Proposed Amendment	Potential Adverse Effect	Distinct Population Affected	Proposed Mitigation Measures	Characterization of Residual Effect	Change to Effects Assessment Conclusions
Human Health	**Coquitlam Twinning:** The Coquitlam Twinning is located within the City of Coquitlam, in proximity of residential areas. Construction activities may contribute to noise disturbance to nearby residents. **Eagle Mountain Compressor Station:** The Eagle Mountain Compressor Station is located within the City of Coquitlam, in proximity of residential areas. Construction activities may contribute to noise disturbance to nearby residents.	Noise disturbance to nearby residents during construction	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint • Individuals with pre-existing health conditions or disabilities	• Use well-maintained equipment to reduce air pollution and noise. • Limit idling. • Seek to schedule heavy vehicle access for materials deliveries in areas close to residences for daytime, non-peak hours where and to the extent practical to reduce nighttime traffic near residences between the hours of 10:00 PM and 7:00 AM. • Notify potentially affected residents of any major construction activities that will be conducted at night. • Use “drive-through” site access for roads and temporary storage areas, to the extent practical, to reduce the use of vehicle backup alarms. • Comply with appropriate Provincial and Municipal regulatory guidelines related to noise during construction to reduce disturbance related to noise. • Within the District of Squamish, seek to schedule construction activities during the period 7:00 AM to 9:00 PM on Monday to Friday and 8:00 AM to 7:00 PM on Saturday, Sunday and on statutory holidays in accordance with District of Squamish Noise Regulation Bylaw No. 2312, 2014, or unless an exemption from this bylaw is obtained.	**Duration:** Short-term The event causing a noise disturbance to nearby residents would occur during the construction and decommissioning phases **Frequency:** Occasional The events causing a noise disturbance to nearby residents will occur intermittently and sporadically during the construction phase, as well as site-specific maintenance. **Reversibility:** Short-term Noise disturbance to nearby residents will be limited to the construction phase and site-specific maintenance. **Magnitude:** Low The proposed mitigation reduces the potential residual effect to that of an inconvenience or nuisance. **Probability:** High It is likely that construction activities of the proposed amendments will cause noise disturbance to nearby residents.	No change to effects assessment conclusions compared to general population assessed in the EAC Application
	Coquitlam Twinning: The Coquitlam Twinning is located within the City of Coquitlam, in proximity of residential areas. Construction activities may contribute to air quality effects on respiratory health to nearby residents. **Eagle Mountain Compressor Station:** The Coquitlam Twinning is located within the City of Coquitlam, in proximity of residential areas. Construction activities may contribute to air quality effects on respiratory health to nearby residents.	Air quality effects on respiratory health during construction	• Individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint • Individuals with pre-existing health conditions or disabilities	• Use well-maintained equipment to reduce air pollution and noise. • Use dust control measures during hot and dry weather. • Limit idling. • Use multi-passenger vehicles for the transport of crews to and from the job sites, where and to the extent practical, to reduce emissions during construction. • Seek to reduce open burning and market as much cleared timber as practical to reduce emissions of smoke (PM) and GHGs. • Implement techniques to limit smoke production including limiting pile size, reducing fuel moisture content, maintaining loose burning piles free of soil, and using burn sloops or large capacity shredders. • Avoid locating burn piles on peat-rich soils, as identified by the Environmental Inspectors, in order to limit the risk of residual fires after construction. Locate burn piles on exposed soils (that is, where topsoil salvage has been conducted) or on burning sleds or sloops. • Weld pipe connections and other fittings to the extent practical to reduce fugitive emissions during operation. • To the extent practical, seek to reduce venting to reduce emissions of methane and VOCs during regular operation.	**Duration:** Short-term The events causing air quality effects on respiratory health is limited to the construction phase. **Frequency:** Isolated The events causing air quality effects on respiratory health will be confined to the construction phase. **Reversibility:** Short-term Air quality effects on respiratory health will be limited to the construction phase and site-specific maintenance. **Magnitude:** Low The proposed mitigation reduces the potential residual effect to low magnitude. **Probability:** Low Air quality effects on respiratory health due to emissions from the proposed amendments during construction is unlikely to occur.	No change to effects assessment conclusions compared to general population assessed in the EAC Application

[a] Effects characterizations apply to all populations listed under each residual effect.

BC MoTI = BC Ministry of Transportation and Infrastructure
DFO = Fisheries and Oceans Canada
PM = particulate matter
VOC = volatile organic compound

20.4.1 Stawamus Corridor Expansion

The Stawamus Corridor Expansion is located east of the District of Squamish planning boundaries in Electoral Area D of the SLRD. It is approximately 2 km from the residential area Valleycliffe in Squamish and 3 km from the nearest commercially zoned area at KP 32.1 (Government of BC 2020; Squamish 2020). Activities that are anticipated to interact with the community in Squamish due to construction of the Stawamus Corridor Expansion are primarily related to a temporary influx of workers in the community, traffic and road use, and disruption of recreational and other land users. Distinct human populations within Squamish that may be disproportionately affected by the proposed amendments include individuals with land and resource-based livelihoods or personal pursuits, individuals or families with low or fixed income, individuals in core housing need, individuals with limited skills or experience in construction sector, individuals with pre-existing health conditions or disabilities, and individuals who are susceptible to crime and social issues.

Potential adverse effects associated with a temporary influx of workers during construction of the proposed amendment include increased demand for temporary accommodation, increased demand on services, and potential changes in community quality of life due to community-worker interactions. Individuals in core housing need, young families and those with low or fixed income may experience disproportionate impacts from increased demand for housing and upward pressure on housing costs in select communities. Squamish has many young families who may be looking to enter the housing market. Increased demand and upward pressure on housing costs may push entry level properties out of reach for this growing population, ultimately impacting the ability for the largest cohort of Squamish to establish itself. Conversely, retirees and seniors on a fixed income who bought their homes decades ago, may find it cost prohibitive to downsize their current properties and seek new housing that is appropriate to their lifestyle. Finally, low income individuals and those in core housing need would also be adversely affected by increased housing costs and decreased availability in an already tight market. If upward price pressures create rent increases, low income individuals may be displaced from the housing market. Those with both low income and core housing need may be at risk of homelessness if they are spending more than 50 percent of their total income on housing (Metro Vancouver 2019).

A temporary influx of workers during construction of the proposed amendment may also result in increased demand on existing emergency, health care, and social services, as well as increased use of recreational facilities. Project activities and workforce may require the use of community services, diverting service availability from the existing population who may rely more heavily on such services. Individuals with pre-existing health conditions or disabilities may be adversely affected by increased pressure on community services.

A temporary influx of workers during construction of the proposed amendment may also result in a change to community quality of life. Transient workers may lack attachment to the community and may not have family or regular community supports in place during their time working on construction crews. These factors can result in temporary workers being more readily drawn into socially-disruptive behaviour. Community-worker interactions are not always negative, and the outcomes greatly depend on individual choices. Individuals who may be more susceptible to crime and social issues could be disproportionately impacted by community-worker interactions. To mitigate potential adverse effects to community quality of life, FortisBC will hire locally as much as possible; all contractors will be required to adhere to FortisBC's Independent Natural Gas Contractor Safety Guidelines and Substance Abuse Policy; and a project phone line will be established to field any complaints or concerns expressed by the community.

Construction of the proposed Stawamus Corridor Expansion may disrupt land users and change access to recreational use areas. Individuals with land and resource-based livelihoods who use areas near the Stawamus Corridor Expansion for recreational, cultural or other personal pursuits may be impacted by disruption of recreational users and hunters, fishers, and gatherers during construction. Additionally, a decrease in subsistence activities may have indirect effects on personal wellbeing ties to land and resource-based livelihoods. Any decline in traditional subsistence activities may contribute to changes in diet related to reduced consumption of country foods, decreased level of time spent on the land, and subsequent health or personal wellbeing implications. It is likely that harvesters could continue to practice their traditional pursuits in areas away from the proposed amendment footprint area that is to be disturbed

during construction. Construction is not anticipated to last for an extended period of time as it will be completed sequentially along the proposed amendment footprint. Further details on the assessment of effects on Indigenous Traditional Land and Resource Use can be found in Section 18, Indigenous Groups Information Requirements.

Anticipated benefits of the Project including the proposed amendment include employment opportunities and skills training. The Project including the proposed amendment will provide short-term employment opportunities during the construction phase and a small number of permanent positions during the operations phase. Contractors and goods and service providers for the Project will provide on-the-job training and skills upgrading to entry level and apprentice workers where practical. In the District of Squamish, many residents work in other locations such as Whistler and Vancouver. During engagement, it was expressed that residents of Squamish want to see more opportunities to both live and work in Squamish on a permanent basis. In addition, young people, women and Indigenous people are often employed in minimum wage jobs and are vulnerable to lay-offs in periods of economic contraction or decline. These populations may have an interest in building skills and experience in construction trades as a means of increasing their earning potential. Employment opportunities during the construction phase may provide skills training and experience for entry level workers. All positions, whether permanent or temporary, require some level of skills and experience in the construction, operations, and maintenance industry. Individuals with limited skills or experience in construction sector may not be in position to capitalize on such opportunities. In the District of Squamish, men have more training and experience specific to the construction industry and are therefore better positioned to take advantage of employment opportunities presented by the Project. FortisBC will work with selected construction contractors to promote equal opportunity hiring and training, including job and training opportunities with Local women's resource organizations.

A further effect identified through preliminary engagement is the potential for decreased involvement in land and resource-based livelihoods or personal pursuits as a result of increased employment opportunities in construction trades. Traditional harvesting and wage employment could be regarded as competing activities. As more time is devoted to one, less time may be available for the other. As well, financial incentives associated with increased employment opportunities may encourage participation in the wage economy over traditional livelihoods. At the same time, Project-related income can be used to support the purchase of equipment required for traditional harvesting practices. Improved access to equipment used for traditional harvesting may enhance motivation to participate in land and resource-based activities. Given the co-existence of traditional and wage economic activities and interests in the Project area, it is possible that traditional land users who pursue Project-related employment would continue to harvest when possible during the tenure of their employment (such as, when off-rotation or during off hours). Overall, the effects on land and resource-based livelihoods due to changes in time and resource availability resulting from Project-related employment dependent on individual choices. Refer to Section 18 for an updated assessment of effects on Indigenous Interests and Section 35 rights, including subsistence activities and cultural use areas.

The Human Health effects assessment concluded that this proposed amendment is unlikely to be different from the Certified Project and does not result in a change in the existing conditions for the Human Health VC as examined for country foods quality (with respect to consumption by identified human receptors), noise, air quality, drinking water quality, and soil and sediment quality. Therefore, no residual Health effects are anticipated to interact uniquely with distinct subgroups of the population.

The anticipated Project-related effects are comparable to what was presented in the EAC Application. Therefore, the proposed amendment does not change the effects assessment conclusions compared to the general population assessed in the EAC Application.

20.4.2 Coquitlam Twinning

The Coquitlam Twinning is located within the City of Coquitlam, in the northwest neighbourhood of Westwood Plateau. The closest residential area is approximately 400 m to the east of KP 1.0 of the Coquitlam Twinning (City of Coquitlam 2020b). The Coquitlam Twinning crosses a mountain bike trail at approximately KP 1.2 and the mountain trail bike trail follows the existing FortisBC right-of-way for

approximately 0.5 km to KP 1.7. The Coquitlam Twinning corridor overlaps the Westwood Plateau Golf and Country Club from approximately KP 0.9 to KP 1.2 for approximately 3.5 ha. Activities that are anticipated to interact with the community in Coquitlam due to construction of the Coquitlam Twinning are primarily related to increased traffic and road use, disruption of Local business, disruption of recreational land users, and increased noise and dust near the footprint. The distinct human populations within Coquitlam that have been identified include individuals residing, working or recreating in proximity to the proposed amendment footprint; individuals with pre-existing health conditions or disabilities; and individuals with limited skills or experience in construction sector.

During construction, there will be an increase in traffic on highways and Local roads due to Project-related vehicles used to transport equipment, supplies, and workers. Individuals residing, working, or recreating in proximity to the proposed amendment footprint will be most affected by increased Project-related traffic on highways and Local roads, as well as disturbance to roads. The volume of Project-related traffic is anticipated to increase on Eagle Mountain Drive and Plateau Boulevard. This increase in traffic may disrupt existing traffic patterns, reduce safety, and increase traffic accidents. The physical disturbance to roads may also disrupt existing traffic patterns.

Construction activities may also disrupt land users and change access to recreational use areas. Individuals residing, working, or recreating in proximity to the proposed amendment footprint will be most affected by disruption of recreational uses during construction. However, construction is not anticipated to last for an extended period of time as it will be completed sequentially along the proposed amendment footprint.

The Human Health effects assessment concluded that this proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined for country foods quality (with respect to consumption by identified human receptors), noise, air quality, drinking water quality, and soil and sediment quality. Therefore, no residual Health effects are anticipated to interact uniquely with distinct subgroups of the population.

Anticipated benefits of the Project including the proposed amendments include employment opportunities and skills training. The Project will provide short-term employment opportunities during the construction phase and a small number of permanent positions during the operations phase. Contractors and goods and service providers for the Project will provide on-the-job training and skills upgrading to entry level and apprentice workers where practical. Employment opportunities during the construction phase may provide skills training and experience for entry level workers. All positions, whether permanent or temporary, require some level of skills and experience in the construction, operations, and maintenance industry. Individuals with limited skills or experience in construction sector may not be in position to capitalize on such opportunities. In Coquitlam, men have more training and experience specific to the construction industry and are therefore better positioned to take advantage of employment opportunities presented by the Project. FortisBC will work with selected construction contractors to promote equal opportunity hiring and training, including job and training opportunities with Local women's resource organizations.

The anticipated Project-related effects are comparable to what was presented in the EAC Application. Therefore, the proposed amendment does not change the effects assessment conclusions compared to the general population assessed in the EAC Application.

20.4.3 Eagle Mountain Compressor Station

The Eagle Mountain Compressor Station involves an increase in hp of the additional compressor units from the EAC Application and no change in the size of the Certified Compressor Station Area. It is located within the City of Coquitlam, in the northwest neighbourhood of Westwood Plateau. The closest residential area is located approximately 650 m to the southeast of the existing Eagle Mountain Compressor Station (Coquitlam 2020b). Eagle Mountain Municipal Park is located just south of the Eagle Mountain Compressor Station and there is a walking trail nearby. Activities that are anticipated to interact with the community in Coquitlam due to construction are primarily related to increased traffic and road use, disruption of Local business, disruption of recreational land users, and increased noise and atmospheric emissions near the footprint. The distinct human populations within Coquitlam that have

been identified include individuals who reside, work, or perform recreation activities in proximity of the proposed amendment footprint and individuals with limited skills or experience in construction sector.

During construction, there will be an increase in traffic on highways and Local roads due to Project-related vehicles used to transport equipment, supplies, and workers. Individuals residing, working, or recreating in proximity to the proposed amendment footprint will be most affected by increased Project-related traffic on highways and Local roads, as well as disturbance to roads. The volume of Project-related traffic is anticipated to increase on Eagle Mountain Drive and Plateau Boulevard. This increase in traffic may disrupt existing traffic patterns, reduce safety, and increase traffic accidents. The physical disturbance to roads may also disrupt existing traffic patterns.

Construction activities may also disrupt land users and change access to recreational use areas. Individuals residing, working, or recreating in proximity to the proposed amendment footprint will be most affected by disruption of recreational users during construction. However, construction is not anticipated to last for an extended period of time as it will be completed sequentially along the proposed amendment footprint.

The Human Health effects assessment concluded that this proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined for country foods quality (with respect to consumption by identified human receptors), noise, air quality, drinking water quality, and soil and sediment quality. Therefore, no residual Health effects are anticipated to interact uniquely with distinct subgroups of the population.

Anticipated benefits of the Project including the proposed amendments include employment opportunities and skills training. The Project will provide short-term employment opportunities during the construction phase and a small number of permanent positions during the operations phase. Contractors and goods and service providers for the Project will provide on-the-job training and skills upgrading to entry level and apprentice workers where practical. Employment opportunities during the construction phase may provide skills training and experience for entry level workers. All positions, whether permanent or temporary, require some level of skills and experience in the construction, operations, and maintenance industry. Individuals with limited skills or experience in construction sector may not be in position to capitalize on such opportunities. In Coquitlam, men have more training and experience specific to the construction industry and are therefore better positioned to take advantage of employment opportunities presented by the Project. FortisBC will work with selected construction contractors to promote equal opportunity hiring and training, including job and training opportunities with Local women's resource organizations.

The anticipated Project-related effects are comparable to what was presented in the EAC Application. Therefore, the proposed amendment does not change the effects assessment conclusions compared to the general population assessed in the EAC Application.

20.4.4 Squamish Compressor Station

The Squamish Compressor Station is located within the District of Squamish at the WLNG project site. The WLNG project site overlaps the ancestral Squamish Nation Village of Swíyat and is 7 km southwest of the Squamish Nation reserve of Stawamus Indian Reserve 24. However, there are no permanent residents in proximity of the site as the nearest occupied location is 5.5 km east directly across Howe Sound at Darrell Bay. The WLNG project site has known contamination but is not accessible by public road and there are no land-based commercial businesses in proximity of the Squamish Compressor Station siting area. An updated Human Health assessment were conducted for the Squamish Compressor Station and have concluded that the proposed amendment does not result in a change in the existing conditions for the Human Health VC as examined for country foods quality (with respect to consumption by identified human receptors), noise, air quality, drinking water quality, and soil and sediment quality. Therefore, no residual Health effects are anticipated to interact uniquely with distinct subgroups of the population.

Activities that are anticipated to interact with the community in Squamish due to construction of the Squamish Compressor Station are primarily related to a temporary influx of workers in the community.

Distinct human populations within Squamish that may be disproportionately affected by the proposed amendment include individuals or families with low or fixed income, individuals with limited skills or experience in construction sector, and individuals who are susceptible to crime and social issues. Refer to subsection 21.4.1 for the discussion of disproportionate effects to distinct populations in Squamish as a result of a temporary influx of workers in the community.

The anticipated Project-related effects are comparable to what was presented in the EAC Application. Therefore, the proposed amendment does not change the effects assessment conclusions compared to the general population assessed in the EAC Application.

20.5 Conclusion

The disproportionate effects on distinct human population assessment conducted for the proposed amendments identified a list of socio-economic factors and potential subgroups that may interact with the proposed amendments. The assessment reviewed the potential adverse effects, mitigation measures, and residual adverse effects of each proposed amendment on the identified distinct human populations. The assessment found no change to effects assessment conclusions compared to general population assessed in the EAC Application.

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21. Biophysical Factors that Support Ecosystem Function

21.1 Regulatory and Policy Setting

Biophysical factors that support ecosystem function was added as a required assessment matter in the *2018 Act* (Government of BC 2018). The *2018 Act* was adopted subsequent to the submission of the EAC Application but prior to the submission of this Amendment Application. The assessment draws from reported information in the EAC Application and this Amendment Application (specifically, Sections 4 to 10). The assessment of biophysical factors that support ecosystem function is focused on the proposed amendments and summarizes the existing conditions and assessment of Project-level effects of each VC. No positive effects on biophysical factors that support ecosystem function were identified.

The Effects Assessment Policy includes the following descriptions for the ten categories of biophysical factors that support ecosystem function (BC EAO 2020).

1) **Habitats Supporting Ecosystem Function** - At a landscape or Regional level, unique or Critical Habitats that disproportionately support ecosystem function and are of special value, especially areas that integrate the flow of water, nutrients, energy, and biota such as wetlands, and tend to be biodiversity hotspots.
2) **Habitat Patches** - Pattern, quantity, size, and connectivity of habitat patches that support the movement of species and the transfer of materials. Fragmentation of habitat into disconnected and isolated patches can disrupt ecological integrity. Edge effects can further reduce the ecological function of habitat patches.
3) **Natural Disturbance Regime** - The type, magnitude, and frequency of disturbances that could occur within a landscape in the absence of human intervention. Disruption of the natural disturbance regime could be through activities like controlling stream water levels, fire suppression in grasslands or forests, or forest clearing, and can result in impacts to the natural disturbance regime by suppressing disturbances or causing abnormally large disturbances.
4) **Structural Complexity** - Physical features that increase structural complexity and provides for a greater variety of unique niches for species, such as snags and multiple layers in a forest or coarse woody debris in a stream. Examples that may result in a change in structural complexity are clearcutting of a forest or channelization of a stream.
5) **Hydrologic or Oceanographic Patterns** - Movement of freshwater, groundwater, and saline waters within and through ecosystems. Examples that may lead to a change in these patterns include a change in water availability for organisms, changes in physical structures for habitats, and the change in transfer of biotic and abiotic materials through an ecosystem.
6) **Nutrient Cycling** - Nutrient flow in and out of an ecosystem (that is, nitrogen, phosphorus, carbon). Examples of this are project inputs of nutrients into the natural nutrient cycle through waste discharges, or the loss of future nutrients into soils through the removal of vegetation.
7) **Purification Services** - Physical, chemical, and biological mechanisms of removing, sequestering, assimilating and changing chemicals in an ecosystem. An example of a change in purification services is waste discharges that are beyond the ability of an ecosystem to manage and that leads to an accumulation of waste or chemicals in an ecosystem.
8) **Biotic Interactions** - Antagonistic or symbiotic interactions among organisms, which can include competition for resources, predation, parasitism, and mutualism. Keystone and foundation species have strong interactions with other organisms and often provide vital functions in the ecosystem. Examples of effects on biotic interactions are:
   - a disruption of predator-prey dynamics
   - disruption to pollinators or seed distributors, or plants that support pollinators or seed distributors
   - impacts to species that modify habitat that may lead to a reduction in habitat modifications that support entire communities
   - an introduction or facilitation of invasive species

9) **Population Dynamics** - Populations and subpopulations are the units for species success in an area. For example, changes in habitat for a critical life stage or on a population behaviour may affect the success of a wildlife population to the point where it can no longer sustain itself.
10) **Genetic Diversity** - Genetic diversity enables a population to respond to natural selection, helping it adapt to changes in selective regimes. An example of potential effects on genetic diversity might include an increase in mortality of a distinct fish population leading to the potential reduction in the species' genetic diversity.

21.2 Approach

The development of this chapter follows guidance provided by the BC EAO Draft Effects Assessment Policy (BC EAO 2020). Some exceptions to the process were necessary because the Draft Effects Assessment Policy was developed subsequent to the filing of the EAC Application but prior to the filing of this proposed amendment. The steps followed to assess effects on biophysical factors that support ecosystem function is described as follows.

21.2.1 Scoping

The Ecosystem Function Scoping Tool was completed as part of this proposed amendment and focused on potential interactions between the proposed amendments and biophysical factors that support ecosystem function. Through consultation with the BC EAO it was confirmed that the scope of the assessment for biophysical factors that support ecosystem function only applies to the proposed amendments. The BC EAO confirmed that a re-assessment of the Certified Project for biophysical factors that support ecosystem function is not expected.

21.2.1.1 Identification of Valued Components and Key Indicators

The Ecosystem Function Scoping Tool was completed subsequent to the identification of the Project VCs, KIs and subsequent to the completion of the EAC Application. Therefore, the VCs, KIs, and assessment approaches previously approved by the BC EAO in the AIR, were relied on to scope Project interactions with biophysical factors that support ecosystem function.

21.2.2 Assessment of Biophysical Factors that Support Ecosystem Function

All biophysical VCs and KIs, including their potential and residual effects from the EAC Application and proposed amendments were reviewed to inform a summary of biophysical factors that support ecosystem function. A combination of existing VCs, KIs, and residual effects was chosen to best inform each of the ten ecosystem function categories. A summary is provided of each VC for each ecosystem function category at the Project scale since this was not included in the EAC Application. Changes from each proposed amendment are then considered to inform whether they may affect the interpretation of ecosystem function.

Biophysical factors that support ecosystem function were interpreted at the ecosystem, landscape, or watershed scale. Generally, this was informed using information from each VC at the RSA scale.

21.3 Scoping

This subsection reviews how the proposed amendments may interact with biophysical factors that support ecosystem function and identifies which of previously determined VCs and KIs relate to ecosystem function.

21.3.1 Ecosystem Function Scoping Tool

The Ecosystem Function Scoping Tool (Table 21-1) was developed by the BC EAO in their Draft Effects Assessment Policy (BC EAO 2020). According to the BC EAO guidance, the Ecosystem Function Scoping Tool can be used to identify the topics that may be relevant for an effective assessment of

biophysical factors that support ecosystem function. The tool is organized around the ten biophysical factors identified listed in subsection 22.1. For each of the ten biophysical factors, the Project team evaluated whether there was potential for an interaction with the proposed amendments.

Table 21-1 addresses Objective 1 in subsection 5.3.1 of the Draft Effects Assessment Policy (BC EAO 2020), namely: “Identify how the project interacts with biophysical factors that support ecosystem function using the Ecosystem Function Scoping Tool.”

Where there is potential for the proposed amendments to interact with ecosystem function, the response provided is “yes” and is described further in subsection 22.4. Where an interaction is unlikely, justifications are provided in Table 21-1 and is not carried through for further consideration.

Table 21-1. Ecosystem Function Scoping Tool

Possible Interaction	Key Considerations	Examples of VCs and Indicators	Potential Interaction – Stawamus Corridor Expansion	Potential Interaction– Coquitlam Twinning	Potential Interaction– Eagle Mountain Compressor Station	Potential Interaction– Squamish Compressor Station
Habitats Supporting Ecosystem Function						
☒	Could the project cause impacts to ecosystems that provide unique or critical habitats that support ecosystem function? (such as, wetlands, old forest)	**Vegetation** • Ecosystems of interest • Terrestrial, wetland, river/stream, and lake ecosystems **Geology and Terrain** • Ecological resource features	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment is located in a disturbed industrial site. No effects to habitats that support ecosystem function are anticipated.
☒	Could there be abiotic components affected as a result of the project, such as hydrologic patterns or nutrient cycling?	**Surface Water** • Surface water quality • Surface water flow/hydrology **Soil** • Soil quality and quantity • Erosion features	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
☒	Could the project make an ecosystem more susceptible to change?	**Vegetation** • Terrestrial, wetland, river/stream, and lake ecosystems **Geology and Terrain** • Ecological resource features	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Habitat Patches						
☒	Could the project result in barriers to species movement? Or could species be inhibited from moving between habitat patches?	**Vegetation** • Areal extend and distribution • Fragmentation **Wildlife** • Habitat	Yes	No. The proposed amendment parallels an existing disturbance and is not expected to result in barriers that affect the movement of species.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment is located in a disturbed industrial site and is not expected to result in barriers that affect the movement of species.
☒	Is there the potential for habitats to be isolated and/or fragmented by the project?	**Vegetation** • Areal extend and distribution • Fragmentation • Ecosystem condition **Wildlife** • Habitat	Yes	No. The proposed amendment parallels an existing disturbance and is not expected to result in the isolation or fragmentation of habitat patches.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment is located in a disturbed industrial site and is not expected to result in the isolation or fragmentation of habitat patches.
☒	Will there be project effects to ecological corridors or key habitats in a migration route?	**Vegetation** • Areal extend and distribution • Fragmentation **Wildlife** • Habitat	Yes	No. The proposed amendment parallels an existing disturbance and is not expected to result in effects to ecological corridors or key habitats in migration routes.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment is located in a disturbed industrial site and is not expected to result in effects to ecological corridors or key habitats in migration routes.
Natural Disturbance Regime						
☒	Could natural disturbance regimes be altered as a result of the project (such as, fire suppression, flood control, forest clearing)?	**Surface Water** • Quantity **Vegetation** • Ecosystem condition	Yes	No. The proposed amendment parallels an existing disturbance and is not expected to result in changes to fire suppression, flood control or forest clearing regimes.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment is located in a disturbed industrial site and is not expected to result in changes to fire suppression, flood control or forest clearing regimes.

Table 21-1. Ecosystem Function Scoping Tool

Possible Interaction	Key Considerations	Examples of VCs and Indicators	Potential Interaction – Stawamus Corridor Expansion	Potential Interaction– Coquitlam Twinning	Potential Interaction– Eagle Mountain Compressor Station	Potential Interaction– Squamish Compressor Station
☒	Could there be a change in project effects in the future due to natural disturbance regimes changing as a result of future climate?	**Vegetation** • Ecosystem condition	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Structural Complexity						
☒	Are there potential project effects to specific features within an ecosystem that are important for the life stage of a species?	**Vegetation** • Ecosystem condition **Geology and Terrain** • Ecological resource features	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
☒	Could the project cause a reduction in the structural complexity of an ecosystem?	**Vegetation** • Ecosystem condition	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed siting area consists of disturbed areas and pole/sapling to young and maturing forest cover. No material change to structural complexity at the ecosystem-level is anticipated,
☒	As a result of the project, will an ecosystem be managed to a certain seral stage (such as, transmission line corridor)?	**Vegetation** • Ecosystem condition	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Hydrologic or Oceanographic Patterns						
☒	Could the project alter hydrologic or oceanographic patterns and/or flow?	**Surface Water** • Surface water flow/hydrology **Marine Water Quality** • Marine hydrology	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Nutrient Cycling						
☒	Will the project result in an input of nutrients into the ecosystem (such as, waste discharges)?	**Air Quality, Surface Water, Soil** • Acidification and eutrophication on air quality, surface water quality and soils	No. The proposed amendment will not result in a material change in discharges relative to the EAC Application.	No. The proposed amendment will not result in a material change in discharges relative to the EAC Application.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	No. The proposed amendment will not result in a material change in discharges relative to the EAC Application.
☒	Will the project cause a change in the flow of nutrients through an ecosystem (such as, land clearing, possible erosion)?	**Surface Water** • Surface water flow/hydrology **Soil** • Soil quality and erosion features	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes

Table 21-1. Ecosystem Function Scoping Tool

Possible Interaction	Key Considerations	Examples of VCs and Indicators	Potential Interaction – Stawamus Corridor Expansion	Potential Interaction– Coquitlam Twinning	Potential Interaction– Eagle Mountain Compressor Station	Potential Interaction– Squamish Compressor Station
Purification Services						
☒	Could project discharges lead to accumulation of waste or chemicals in an ecosystem?	**Air Quality** • CACs • VOCs **Surface Water** • Water quality	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Biotic Interactions						
☒	Could the project have effects to keystone or foundation species that have the potential to alter ecosystems?	**Vegetation** • Ecosystem indicator species **Wildlife** • Wildlife population, health, and behaviour	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
☒	Could project effects allow for invasive species to change ecosystem function?	**Vegetation** • Change in abundance or condition	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
☒	Will there be species impacts that could change predator-prey dynamics?	**Wildlife** • Wildlife population, health, and behaviour	Yes	Yes	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Population Dynamics						
☒	Could the project impact wildlife species at a population level?	**Wildlife** • Wildlife population, health, and behaviour	Yes	No. All wildlife KIs considered in the EAC Application have populations that are adequate to avoid an impact at the population level.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes
Genetic Diversity						
☒	Will there be the possibility of reducing the genetic diversity of wildlife populations?	**Wildlife** • Wildlife population, health, and behaviour	Yes	No. All wildlife KIs considered in the EAC Application have populations that are adequate to avoid an impact at the population level.	The newly proposed equipment at the Eagle Mountain Compressor Station will be accommodated within the existing facility. The proposed amendment does not result in a material change to the assessment of potential residual effects for any VC that could that support ecosystem function.	Yes.

21.3.2 Valued Component and Key Indicator Selection

This subsection addresses subsection 5.3.1 Objective 2 of the Draft Effects Assessment Policy (BC EAO 2020), namely “Consider relevant biophysical factors in the selection of VCs and KIs, which will be reflected in the Application Information Requirements.”

As described in subsection 22.2, VCs and KIs for the Project were previously approved by the BC EAO in the AIR and formed the basis of the EAC Application and this Amendment Application. This review found that all ten categories of biophysical factors that support ecosystem function could be appropriately mapped to an existing VC and KI. No new VCs or KIs were determined to be required to assess potential ecosystem function since the ten categories of biophysical factors are appropriately represented by the existing VCs and KIs.

21.4 Biophysical Factors that Support Ecosystem Function Effects Assessment

This subsection addresses Objective 3 in subsection 5.3.1 of the Draft Effects Assessment Policy (BC EAO 2020), namely “Assess the biophysical factors that support ecosystem function, as appropriate under the relevant VC, which should also consider potential effects on landscapes, watersheds and ecosystems”. Biophysical factors that support ecosystem function are addressed in VC chapters (Table 21-2). Each subsection provides a summary of biophysical factors that support ecosystem function for each proposed amendment. This addresses Objective 4 in subsection 5.3.1 of the Draft Effects Assessment Policy (BC EAO 2020), namely “Develop a summary of biophysical factors that support ecosystem function chapter that collectively describes how these factors were assessed in the EA, what the potential effects on biophysical factors that support ecosystem function, and any new mitigation that has been proposed.”

Table 21-2. Summary of VCs and KIs Informing Assessment of Biophysical Factors Supporting Ecosystem Function

Biophysical Factor Supporting Ecosystem Function	VCs	KIs	Amendment Application Section
Habitats Supporting Ecosystem Function	Soil Capability	• Reclamation, including Soil and Sediment Quality	Section 4. Geophysical Environment
	Terrain Integrity	• Terrain Stability • Erosion	Section 4. Geophysical Environment
	Surface Water	• Surface Water Quality • Surface Water Quantity	Section 6. Water
	Groundwater	• Groundwater Quality • Groundwater Quantity	Section 6. Water
	Vegetation	• Native Vegetation • Invasive Plant Species	Section 8. Vegetation
	Wetlands	• Habitat Function • Hydrologic Function • Biogeochemical Function	Section 9. Wetlands
	Wildlife and Wildlife Habitat	• Mature/old forest birds (including northern goshawk) • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians	Section 10. Wildlife

Table 21-2. Summary of VCs and KIs Informing Assessment of Biophysical Factors Supporting Ecosystem Function

Biophysical Factor Supporting Ecosystem Function	VCs	KIs	Amendment Application Section
Habitat Patches	Fish and Fish Habitat	• Fish Species of Management Interest and Their Habitat	Section 7. Fish and Fish Habitat
	Wildlife and Wildlife Habitat	• Grizzly Bear • Furbearers • Ungulates • Bats • Mature/Old Forest Birds • Early Seral Forest Birds • Grassland/Shrubland Birds • Riparian and Water Birds • Peregrine Falcon • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians • Coastal Tailed Frog	Section 10. Wildlife
Natural Disturbance Regime	Surface Water	• Surface Water Quantity	Section 6. Water
	Vegetation	• Native Vegetation	Section 8. Vegetation
	Wetlands	• Hydrologic Function	Section 9. Wetlands
Structural Complexity	Fish and Fish Habitat	• Fish Species of Management Interest and Their Habitat	Section 7. Fish and Fish Habitat
	Vegetation	• Native Vegetation	Section 8. Vegetation
	Wetlands	• Habitat Function	Section 9. Wetlands
	Wildlife and Wildlife Habitat	• Grizzly Bear • Furbearers • Ungulates • Bats • Mature/Old Forest Birds • Early Seral Forest Birds • Grassland/Shrubland Birds • Riparian and Water Birds • Peregrine Falcon • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians • Coastal Tailed Frog	Section 10. Wildlife
Hydrologic or Oceanographic Patterns	Surface Water	• Surface Water Quantity	Section 6. Water
	Groundwater	• Groundwater Quantity	Section 6. Water
	Wetlands	• Hydrologic Function	Section 9. Wetlands
Nutrient Cycling	Air Quality	• CACs: – CO – NOx – SSO_2 – PM_{10} and $PM_{2.5}$ – VOCs	Section 5. Atmospheric Environment
	Soil Capability	• Reclamation, including Soil and Sediment Quality	Section 4. Geophysical Environment
	Wetlands	• Biogeochemical Function	Section 9. Wetlands

Table 21-2. Summary of VCs and KIs Informing Assessment of Biophysical Factors Supporting Ecosystem Function

Biophysical Factor Supporting Ecosystem Function	VCs	KIs	Amendment Application Section
Purification Services	Air Quality	• CACs: – CO – NOx – SO_2 – PM_{10} and $PM_{2.5}$ • VOCs	Section 5. Atmospheric Environment
	Surface Water	• Surface Water Quality	Section 6. Water
	Wetlands	• Hydrologic Function	Section 9. Wetlands
Biotic Interactions	Vegetation	• Native Vegetation • Invasive Plant Species	Section 8. Vegetation
	Fish and Fish Habitat	• Fish Species of Management Interest and Their Habitat	Section 7. Fish and Fish Habitat
	Wildlife and Wildlife Habitat	• Grizzly Bear • Mature/Old Forest Birds (Including Northern Goshawk)	Section 10. Wildlife
Population Dynamics	Wildlife and Wildlife Habitat	• Grizzly Bear	Section 10. Wildlife
Genetic Diversity	Wildlife and Wildlife Habitat	• Grizzly Bear	Section 10. Wildlife

Notes:
VCs and KIs were selected based on those identified in the AIR and assessed in the EAC Application and this Amendment Application.
NOx = nitrogen oxides

21.4.1 Habitats Supporting Ecosystem Function

Habitats that are limited at the landscape scale or provide unique or critical functions are important for maintaining ecosystem function. Examples include wetlands, old forest, and riparian communities, which provide habitat critical for life stages of various species. Several biophysical factors contribute to maintenance of these habitats including soil, freshwater and groundwater and vegetation. VCs included in the interpretation of habitats supporting ecosystem function include Soil Capability, Terrain Integrity, Surface Water, Groundwater, Vegetation, Wetlands, and Wildlife and Wildlife Habitat VCs (Table 21-3).

At the Project scale, short-term localized effects are anticipated resulting from changes in soil texture, reduction in soil sensitivity and resilience, mixing of topsoil with less productive subsoil and alteration of landscape contours and drainage programs. Mitigation measures addressing soil handling methods, erosion control and restoration are expected to reduce these effects to allow for vegetation development.

A decrease in terrain stability and an increase in erosion potential is expected to temporarily reduce capacity for vegetation growth. This will be limited to areas within and directly adjacent to the proposed amendment footprint. Effects are expected to be low in magnitude and short-term.

There is a low probability of a short-term increase in groundwater turbidity during construction that is expected to be limited to areas within and directly adjacent to the proposed amendment footprint and dissipate shortly after construction. Groundwater quantity will be permanently diverted within the proposed amendment footprint, but the scale of the change is considered negligible. Temporary increases in surface water turbidity are anticipated but will be short-term in duration and reduced to low or no magnitude within 100 m downstream of construction. No change in surface water quantity is anticipated following construction.

Table 21-3. Habitats Supporting Ecosystem Function Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments: Stawamus Corridor Expansion	Changes from Proposed Amendments: Coquitlam Twinning	Changes from Proposed Amendments: Squamish Compressor Station
Soil Capability	• Reclamation, including Soil and Sediment Quality	• Decrease in reclamation capability due to degradation of soil structure through compaction and rutting • Decrease in reclamation capability due to localized loss of productive surface soil • Decrease in reclamation capability due to mixing of surface soil with less productive subsoil during topsoil salvage and replacement and soil decompaction activities • Alteration of landscape contours and drainage patterns due to trench subsidence or a remnant crown	Ecosystem	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.
Terrain Integrity	• Terrain Stability • Erosion	• Instabilities in cut and fill materials • Erosion of excavated materials	Ecosystem	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.
Groundwater	• Groundwater Quality • Groundwater Quantity	• Elevated turbidity in groundwater as a result of sedimentation • Local diversion of groundwater flow beneath the pipeline • Increase in groundwater recharge of major rivers	Aquifer	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Surface water	• Surface Water Quality • Surface Water Quantity	• Reduction in surface water quality due to suspended solids during instream construction of trenched crossings or vehicle crossings • Reduction in surface water quality due to erosion from banks or approach slopes • Alteration or contamination of surface water as a result of the release of hydrostatic test water • Reduction in marine water quality due to suspended solids during installation and removal of barge landings • Localized alteration of natural surface drainage patterns until trench settlement is complete • Disruption and alteration of natural stream flow from instream activities	Watershed	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Vegetation	• Native Vegetation • Invasive Plant Species	• Alteration of native vegetation components (mature and young upland forests; riparian and flood plain communities; and shrubland and graminoid communities) • Alteration of old forests • Introduction and spread of invasive plant species	Ecosystem	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.

Table 21-3. Habitats Supporting Ecosystem Function Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Wetlands	• Hydrologic Function • Habitat Function • Biogeochemical Function	• Alteration or loss of hydrologic function until natural flow regime is re-established • Alteration or loss of habitat function until natural flow regime is re-established • Alteration or loss of biogeochemical function until natural flow regime is re-established	Watershed	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.
Wildlife and Wildlife Habitat	• Mature/old forest birds (including northern goshawk) • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians	• Combined residual adverse effect of the proposed Project on mature/old forest birds resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on marbled murrelet resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on spotted owl resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on pond-dwelling amphibians resulting from changes in habitat, movement, and mortality risk.	Ecosystem	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

Direct and indirect effects to unique vegetation communities at the RSA scale are predicted to be low to zero, depending on community type, with a maximum of about 3.3 percent affected within the RSA. Recovery of all vegetation communities is anticipated within the lifespan of the Project, with the exception of mature and old forest, which would require approximately 80 and 250 years, respectively, to recover.

Full recovery of wetland function is expected in the medium-term after construction. Effects to unique habitat for wildlife species at risk are predicted to be less than 1 percent at the RSA scale for KI wildlife species.

Collectively, these residual effects indicate a short-term reduction in habitats that support ecosystem function. These effects are expected to be limited to their respective LSAs and full recovery is expected over the medium-term following construction. Therefore, they are not expected to have a negative effect on habitats supporting ecosystem function at the ecosystem scale.

21.4.2 Habitat Patches

Habitat patchiness can affect ecosystem function by altering movement corridors for species. Reducing contiguous habitat to isolated patches can reduce the movement of species and material and cause edge effects that reduce the value of remaining habitat. Contiguous habitat is important to both fish and wildlife species; therefore, potential effects to habitat patches supporting ecosystem function can arise from changes to the Fish and Fish Habitat and Wildlife and Wildlife Habitat VCs (Table 21-4). Project development has the potential to fragment habitat by reducing available habitat, reducing habitat size and connectivity, and creating habitat isolation through obstructions to movement. Potential Project effects to habitat patches included consideration of residual effect to fish and wildlife habitat and movement.

A short-term loss of fish habitat will occur within the proposed amendment footprint at trenched watercourse and NCD crossings during construction. The duration of this disturbance will be short-term as crossings will be remediated following construction and no permanent loss of fish habitat is anticipated. Similarly, temporary watercourse and NCD crossings may create barriers to fish movement during construction but will be removed directly following construction. Trenchless crossings will be used at high sensitivity sites such as the Squamish River if technically feasible. No permanent obstructions to fish habitat are expected as a result of Project construction and operation.

The Wildlife and Wildlife Habitat RSA contains valuable migration corridors and stop-over habitat within Fries and Echo Creeks and the Pitt-Addington Marsh Wildlife Management Area. These areas are located within the Wildlife and Wildlife Habitat RSA but outside of the LSA. The proposed Project is located within the Ducks Unlimited Canada Level 2 Priority Landscape (BC Coastal Areas and Estuaries) and provides important wintering and migration habitat for waterfowl. A portion of the proposed route crosses the Skwelwil'em Squamish Estuary WHA and the Squamish River Area IBA, which is considered globally significant. Project design changes since the submission of the EAC Application will result in the avoidance of the WHA and IBA via the use of underground tunneling through this subsection. As a result, no direct effects to important migratory routes are anticipated.

Effects on wildlife movement will vary by species. Many species will avoid active construction sites. Following construction, the right-of-way may attract some species and while it may act as a filter or barrier to other species (Table 21-4). Effects on movement are expected to be of higher magnitude at wider sections of the proposed amendment footprint. For example, gaps less than 30-m-wide have been found to have little effect on bird movement (EAC Application subsection 10.5.3.3).

The EAC Certified Pipeline Corridor parallels existing linear corridors for approximately half of the proposed pipeline route. This reduces effects to habitat fragmentation and wildlife movement. The creation of additional edge habitat will reduce habitat effectiveness in remnant old forest patches for northern goshawk, which tends to avoid nesting near edges but will also provide habitat for some species (such as, bats) that are often associated with higher levels of foraging near edges.

Table 21-4. Habitat Patches Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments
				Stawamus Corridor Expansion
Fish and Fish Habitat	• Fish Species of Management Interest and Their Habitat	• Direct and indirect alteration of instream habitat within the ZOI at trenched crossings during construction • Temporary blockage of fish movements during isolated watercourse and NCD crossings	Watershed	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.
Wildlife and Wildlife Habitat	• Grizzly Bear • Furbearers • Ungulates • Bats • Mature/Old Forest Birds • Early Seral Forest Birds • Grassland/Shrubland Birds • Riparian and Water Birds • Peregrine Falcon • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians • Coastal Tailed Frog	• Combined residual adverse effect of the proposed Project on KIs resulting from changes in habitat, movement, and mortality risk.	Ecosystem	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

In general, the amount of available habitat is more important than habitat arrangement when retention is at least 30 percent (EAC Application subsection 10.5.1.1). Overall retention levels at the landscape scale relative to pre-disturbance are not estimable due to the disturbed nature of the RSA but the reduction in habitat availability in the RSA for wildlife KI species as a result of Project construction is generally less than 3 percent. Habitat loss for species that are sensitive to habitat fragmentation such as spotted owl, northern goshawk, marbled murrelet and pond-dwelling amphibians is all less than 1 percent of that available within the RSA. As a result, it is unlikely the Project will cause available habitat for KI species to decline below 30 percent retention and habitat fragmentation should not play a large role in habitat suitability at the ecosystem scale.

Overall, the Project is expected to have a low magnitude effect on habitat patchiness. It is located within an area of historic disturbance from industrial logging, residential, energy, and other development and is not expected to have a meaningful effect on the distribution of habitat patches across the landscape. Movement for some species will be affected, especially during construction, but these effects will be short-term for most species, with movement returning to pre-construction levels shortly after the completion of construction. Further, retention of effective habitat at the RSA scale for KIs species is 97 percent or greater. As a result, no effects to ecosystem function associated with habitat patches is expected as a result of Project construction and operation.

21.4.3 Structural Complexity

The Project has the potential to reduce structural complexity through the removal of structurally complex habitats and replacement with less complex types. For example, the structural complexity of fish habitat can be compromised if components such as large woody debris or overhanging vegetation are removed; forest structural complexity can be reduced through the removal of mature and old forest and replacement with earlier seral stages. Structural complexity is an important habitat component for some fish and wildlife species. Further, structural complexity at the landscape scale helps to support biodiversity. VCs from the EAC Application that inform potential changes to structural complexity include Fish and Fish Habitat, Vegetation, Wetlands and Wildlife and Wildlife Habitat (Table 21-6). Fish species such as westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) benefit from complex habitat including undercut banks, pool-riffle habitat, and riparian vegetation. Construction at trenched watercourse crossings will cause a loss of these habitat elements during construction. Restoration of fish habitat following construction will include considerations of elements of structural complexity such as large woody debris and overhanging vegetation. These elements will be included in fish habitat restoration as recommended by a Fish Biologist. As a result, no long-term loss of structural complexity in fish habitat is anticipated.

Project construction will cause the loss of some structurally complex vegetation, including mature and old forest, shrubland and graminoid communities, and riparian areas (Table 21-6). Temporarily disturbed areas will be recovered with vegetation while permanent disturbances will be maintained in a non-vegetated or graminoid and shrubland communities. Mature and old forest will not be restored over the lifespan of the Project; however, incursions into Old Growth Management Areas will be compensated by protection of forest stands with similar structural attributes, where necessary and as determined through consultation with BC MFLNRORD. As approximately 97 to 98 percent of each vegetation community will be retained at the RSA scale, effects to vegetation structural complexity are considered to be of low magnitude at the ecosystem scale and reversible over the lifespan of the Project, with the exception of mature and old forest.

Some wetland habitat function will be decreased during and shortly after construction of the Project, but it will be restored following construction. As less than 1 percent of wetland habitat will be affected at the RSA scale, no ecosystem-level effects to structural complexity are anticipated.

Habitat for wildlife species that require structurally complex habitat such as northern goshawk, marbled murrelet, spotted owl, and pond-dwelling amphibians will be reduced during construction (Table 21-6). Since they rely on well-developed mature or old forest, habitat for northern goshawk, spotted owl and marbled murrelet will not be restored during the lifespan of the Project; however, loss of effective habitat for each of these species is estimated at less than 1 percent relative to available habitat within the RSA. As a result, no effect on structural complexity relative to wildlife habitat is expected at the ecosystem scale.

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Table 21-5. Natural Disturbance Regime Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Surface Water	• Surface Water Quantity	• Localized alteration of natural surface drainage patterns until trench settlement is complete • Disruption and alteration of natural stream flow from instream activities	Watershed	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Vegetation	• Native Vegetation	• Alteration of native vegetation components (mature and young upland forests; riparian and flood plain communities; and shrubland and graminoid communities)	Ecosystem	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.
Wetlands	• Hydrologic Function	• Alteration or loss of hydrologic function until hydrologic regime is re-established and substrate recovers	Watershed	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

Table 21-6. Structural Complexity Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Fish and Fish Habitat	• Fish Species of Management Interest and their Habitat	• Direct and indirect alteration of instream habitat within the ZOI at trenched crossings during construction • Direct and indirect alteration of instream habitat within the ZOI at trenched crossings during operations	Watershed	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.
Vegetation	• Native Vegetation	• Loss or alteration of native vegetation components (mature and young upland forests, riparian and flood plain communities, and shrubland and graminoid communities)	RSA	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.
Wetlands	• Habitat Function	• Alteration or loss of habitat function until hydrologic regime is re-established and substrate recovers	Watershed	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.
Wildlife and Wildlife Habitat	• Mature/old forest birds (including northern goshawk) • Marbled Murrelet • Spotted Owl • Pond-Dwelling Amphibians	• Combined residual adverse effect of the proposed Project on mature/old forest birds resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on marbled murrelet resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on spotted owl resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on pond-dwelling amphibians resulting from changes in habitat, movement, and mortality risk.	RSA	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.4 Hydrologic or Oceanographic Patterns

Construction and operation of a project could have the potential for effects on hydrologic or oceanographic patterns if infrastructure alters groundwater, stream, or ocean flow. For example, alteration of stream flow through road construction could have an effect on hydrologic patterns at the watershed scale. The Surface Water, Groundwater, and Wetlands VCs were considered for interpretation of potential effects on hydrologic patterns (Table 21-7). No effects to oceanographic patterns are expected as a result of Project construction or operation.

A short-term alteration to surface drainage patterns is expected from trenched watercourse and NCD crossings during construction and potentially during maintenance activities such as integrity digs. Disruption of surface water flow is expected during construction and maintenance activities at instream sites and alteration until trench settlement is complete following construction.

A small amount of groundwater flow will be permanently diverted within the proposed amendment footprint to mitigate against differential head on either side of the pipeline. The magnitude is considered negligible since the Project is located within an area of abundant rainfall and groundwater flow. Further, there is no water withdrawal so effects to groundwater flow are expected to be minimal to non-detectable.

Wetland hydrology function will be altered at trenched watercourse crossings during Project construction and potentially for maintenance activities during operation. Effects are expected to be limited to the area within and directly adjacent to the proposed amendment footprint. Full restoration of wetland hydrologic function is expected within three to ten years following construction.

At the Project scale, effects to hydrological patterns associated with changes to surface water, groundwater and wetland hydrologic function are expected to be limited primarily to their respective LSAs, with the potential for some surface water effects to be detectable at the RSA scale. Given the short-term duration of these effects and the limitation to primarily the proposed amendment footprint and LSAs, no effect to hydrologic patterns are expected at the watershed scale.

Table 21-7. Hydrologic or Oceanographic Patterns Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Surface Water	• Surface Water Quantity	• Localized alteration of natural surface drainage patterns until trench settlement is complete • Disruption and alteration of natural stream flow from instream activities	Watershed	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Groundwater	• Groundwater Quantity	• Local diversion of groundwater flow beneath the pipeline • Increase in groundwater recharge of major rivers	Aquifer	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Groundwater VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Wetlands	• Hydrologic Function	• Alteration or loss of hydrologic function until hydrologic regime is re-established and substrate recovers	Wetlands RSA	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.5 Nutrient Cycling

A project could affect nutrient cycling through changes to nutrient flows into or out of the ecosystem. This could occur through interactions with air, soil, and water. The Air Quality, Soil Capability, and Wetlands VCs were used to inform an assessment of potential changes to nutrient cycling (Table 21-8).

Air quality effects are not expected to be measurable above background effects. A minor amount of soil mixing within the proposed amendment footprint is expected to temporarily reduce nutrients available for vegetation growth, but this effect is expected to be reversed within 1 year following construction. Within wetlands, phosphorous storage is expected to be relatively unaffected but a return of carbon storage to baseline conditions may take 20 years or more.

With the exception of carbon storage, all residual effects related to nutrient cycling are expected to be non-detectable or limited to the proposed amendment footprint and short-term in duration. Changes to carbon storage within wetlands is expected to be limited to the proposed amendment footprint. As a result, no effects to nutrient cycling that affect ecosystem function are expected as a result of Project construction and operation.

Table 21-8. Nutrient Cycling Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Air Quality	• CACs: – CO – NOx – SO_2 – PM_{10} and $PM_{2.5}$ • VOCs	• Elevated concentrations of CAC emissions from the use of equipment and vehicles • Elevated concentrations of CAC emissions, particularly PM, from burning associated with land clearing • Elevated concentrations of CACs during operations due to fugitive, nonCH_4 VOC emissions associated with venting and leaks	RSA	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.
Soil Capability	• Reclamation, including Soil and Sediment Quality	• Decrease in reclamation capability due to mixing of surface soil with less productive subsoil during topsoil salvage and replacement and soil decompaction activities	RSA	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.	The proposed amendment does not result in a material change to the EAC Application since geophysical environment conditions are the same or comparable. Further detail is provided in Section 4.
Wetlands	• Biogeochemical Function	• Alteration or loss of biogeochemical function until hydrologic regime is re-established and substrate recovers	RSA	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.6 Purification Services

Alteration of purification services as a result of Project construction and operation may occur through changes to the emissions of wastes, potential for bioaccumulation or alteration of ecosystem services such as flood attenuation or water filtration. The Air Quality, Surface Water, and Wetland VCs were considered for the consideration of potential effects on purification services (Table 21-9).

Air quality effects are not expected to be measurable above background levels. Residual effects to surface water quality are expected as a result of instream construction at trenched watercourse crossings, erosion from banks or approach slopes and release of hydrostatic test water. These activities are expected to have no contamination or alteration of surface water (hydrostatic test water release) or be limited to about 100 m from the proposed amendment footprint (instream construction and bank and slope erosion) (Table 21-9).

Wetland hydrology function will be altered at trenched watercourse crossings during Project construction and potentially for maintenance activities during operation. Effects are expected to be limited to the area within and directly adjacent to the proposed amendment footprint. Full restoration of wetland hydrologic function is expected within 3 to 10 years following construction. No ecosystem-level effects to wetland hydrology are anticipated since changes to hydrologic function are expected to be limited to those areas within and directly adjacent to the proposed amendment footprint.

No ecosystem-level effects to purification services are expected as a result of Project construction and operation because air quality effects will not be measurable above background levels and surface water quality and wetland hydrology effects will be limited to areas within about 100 m of the proposed amendment footprint.

Table 21-9. Purification Services Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Air Quality	• CACs: – CO – NOx – SO_2 – PM_{10} and $PM_{2.5}$ • VOCs	• Elevated concentrations of CAC emissions from the use of equipment and vehicles • Elevated concentrations of CAC emissions, particularly PM, from burning associated with land clearing • Elevated concentrations of CACs during operations due to fugitive, non-CH_4 VOC emissions associated with venting and leaks	RSA	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.	The proposed amendment does not result in a change to existing conditions, the characterization of residual effects, identification of new mitigation measures or conclusions of the EAC Application. Further detail is provided in Section 5.
Surface Water	• Surface Water Quality	• Reduction in surface water quality due to suspended solids during instream construction of trenched crossings or vehicle crossings • Reduction in surface water quality due to erosion from banks or approach slopes • Alteration or contamination of surface water as a result of the release of hydrostatic test water	Watershed	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.	The proposed amendment results in a change to existing conditions for the Surface Water VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 6.
Wetlands	• Hydrologic Function	• Alteration or loss of hydrologic function until hydrologic regime is re-established and substrate recovers	Watershed	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment results in a change to existing conditions for the Wetlands VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.	The proposed amendment does not result in a change to existing conditions for the Wetlands VC and does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 9.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.7 Biotic Interactions

Project construction and operation could affect biotic interactions if there are impacts to species that play a key role in the ecosystem, such as a keystone or foundational species. These could be expressed through changes to predator/prey dynamics or increased spread of invasive species. Consideration of potential effects on biotic interactions that effect ecosystem function included interpretation of the Vegetation, Fish and Fish Habitat, and Wildlife and Wildlife Habitat VCs (Table 21-10).

Clearing of vegetation cover has the potential to increase the spread of pests if there is an increase in damaged or dead wood, which can provide conditions for pest outbreaks. It can also create conditions for the spread of invasive species by providing suitable growing conditions. Further, construction machinery and personnel can facilitate the introduction of invasive species. Both forest pests and invasive species have the potential to spread beyond the proposed amendment footprint to the RSA. The probability of an increase in the spread of pests is considered low with the use of industry-standard mitigation. The probability of introduction or spread of invasive species is considered high but with the implementation of mitigation measures, including post-construction reclamation, monitoring and control, the magnitude of residual effects is considered low.

Project construction and operation has the potential to increase fish mortality through a number of activities (Table 21-10). In coastal BC, salmonids play an important role in ecosystem function as both predator and prey in freshwater and salt water ecosystems. An increase in mortality among these species could affect dynamics with other species.

Project design and mitigation measures consider the sensitivity of fish species of management interest and their habitat to reduce potential harm where high-value habitat or priority species are known to occur. For example, crossing techniques, including timing within the least risk biological windows. for watercourses with known salmonid populations (such as, the Stawamus and Squamish River and its tributaries, Scott Creek Sub-basin) are designed to reduce potential effects to salmonid populations. With the implementation of mitigation measures, no ecosystem-level effects to fish and fish habitat affecting biotic interactions are anticipated.

Among terrestrial wildlife species, northern goshawk and grizzly bear are considered important predators in coastal ecosystems. Residual effects to northern goshawk are expected to result primarily from the loss of effective nesting habitat, totalling about 9 percent of that available at the LSA scale and estimated at about 2 percent at the RSA scale (Table 21-10).

BC delineates grizzly bear populations into 56 GBPUs used for conservation and management. The Project crosses two GBPUs, including the Garibaldi-Pitt and Squamish-Lillooet. The most recent population estimate estimated populations within those GBPUs at 2 and 59, respectively; both are considered threatened populations (BC MOE 2012).

Effective habitat loss for grizzly bear from Project construction is similar to northern goshawk (Table 21-10) but mortality risk, primarily through human-wildlife interaction, is considered the key effect pathway. Any effect to grizzly bear populations may have an ecosystem-level effect since populations in the Squamish-Lillooet and Garibaldi-Pitt GBPUs are currently low. Mitigation measures designed to minimize human-bear conflict are expected to adequately reduce this risk to prevent grizzly bear mortality. With the effective application of mitigation measures, ecosystem-level effects to biotic interactions supporting ecosystem function are not expected.

Table 21-10. Biotic Interactions Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments		
				Stawamus Corridor Expansion	Coquitlam Twinning	Squamish Compressor Station
Vegetation	• Native Vegetation • Invasive Plant Species	• Spread of forest pests • Introduction and spread of invasive plant species	RSA	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.	The proposed amendment results in a change to existing conditions for the Vegetation VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 8.
Fish and Fish Habitat	• Fish Species of Management Interest and Their Habitat	• Fish mortality or injury due to construction activities • Fish mortality or injury due to operation activities • Fish mortality or injury due to increase in suspended solids within the ZOI during construction of trenched and vehicle crossings • Fish mortality or injury due to increase in suspended solids within the ZOI due to operations • Fish mortality or injury due to increase in suspended solids at temporary Squamish barge landing sites • Increased fish mortality or injury due to a potential increase in access by the public during operations	Watershed	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.	The proposed amendment results in a change to existing conditions for the Fish and Fish Habitat VC but does not result in a change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 7.
Wildlife and Wildlife Habitat	• Grizzly Bear • Mature/Old Forest Birds (Including Northern Goshawk)	• Combined residual adverse effect of the proposed Project on grizzly bear resulting from changes in habitat, movement, and mortality risk. • Combined residual adverse effect of the proposed Project on mature/old forest birds resulting from changes in habitat, movement, and mortality risk.	RSA	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.8 Population Dynamics

Project construction and operation could affect population dynamics if there are impacts that affect a species to the point where it cannot sustain itself. Grizzly bear is the only species among KIs known to occur in the Region and has a known population low enough that mortality to an individual may affect the sustainability of a population. The Wildlife and Wildlife Habitat VCs was considered in the interpretation of effects to population dynamics that support ecosystem function (Table 21-11).

Table 21-11. Population Dynamics Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments	
				Stawamus Corridor Expansion	Squamish Compressor Station
Wildlife and Wildlife Habitat	• Grizzly Bear	• Combined residual adverse effect of the proposed Project on grizzly bear resulting from changes in habitat, movement, and mortality risk.	RSA	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.4.9 Genetic Diversity

Project construction and operation could affect genetic diversity if mortality occurs within wildlife species with very low population numbers. Grizzly bear is the only species among KIs known to occur in the Region and has a known population low enough that mortality to an individual may affect the sustainability of a population. The Wildlife and Wildlife Habitat VCs was considered in the interpretation of effects to population dynamics that support ecosystem function (Table 21-12).

BC delineates grizzly bear populations into 56 GBPUs that are used for conservation and management. The Project crosses two GBPUs, including the Garibaldi-Pitt and Squamish-Lillooet. The most recent population estimate estimated populations within those GBPUs at 2 and 59, respectively; both are considered threatened populations (BC MOE 2012).

Mortality risk, primarily through human-wildlife interaction, is considered the key effect pathway for grizzly bear. Any effect to grizzly bear populations may have an ecosystem-level effect on genetic diversity since populations in the Squamish-Lillooet and Garibaldi-Pitt GBPUs are currently low. Mitigation measures designed to minimize human-bear conflict are expected to adequately reduce this risk to prevent grizzly bear mortality. With the effective application of mitigation measures, ecosystem-level effects to genetic diversity supporting ecosystem function are not expected.

Table 21-12. Genetic Diversity Summary

VCs	KIs	Potential Residual Effects Assessed	Biophysical Factor Effect Level[a]	Changes from Proposed Amendments	
				Stawamus Corridor Expansion	Squamish Compressor Station
Wildlife and Wildlife Habitat	• Grizzly Bear	• Combined residual adverse effect of the proposed Project on grizzly bear resulting from changes in habitat, movement, and mortality risk.	RSA	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.	The proposed amendment results in a change to existing conditions for the Wildlife and Wildlife Habitat VC but does not result in any material change to the assessment of potential adverse effects, mitigation, or characterization of residual effects. As a result, conclusions identified in the EAC Application remain the same. Further detail is provided in Section 10.

[a] Scale at which biophysical factors affecting ecosystem function were considered.

21.5 Conclusion

An assessment of biophysical factors that support ecosystem function was conducted for the proposed amendments. The Ecosystem Function Scoping Tool was completed and focused on potential interactions between the proposed amendments and biophysical factors that support ecosystem function. The scoping exercise found that all the ten biophysical factors that support ecosystem function interacted with at least one of the proposed amendments. The proposed amendment for the Eagle Mountain Compressor Station did not interact with any of the ten biophysical factors that support ecosystem function since the newly proposed equipment will be accommodated within the existing facility. For all proposed amendments that interact with biophysical factors that support ecosystem function, the proposed amendment activities are not expected to have a negative effect on ecosystem function at the ecosystem scale.

21.6 References

British Columbia Environmental Assessment Office (BC EAO). 2020. Affects Assessment Policy. Accessed June 2020: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/environmental-assessments/guidance-documents/2018-act/effects_assessment_policy_v1_-_april_2020.pdf

British Columbia Ministry of Environment (BC MOE). 2012. 2012 Grizzly Bear Population Estimates and Grizzly Bear Population Unit Status in British Columbia. Environmental Reporting BC. 60 pp.

Government of British Columbia (Government of BC). 2018. *Environmental Assessment Act*. SBC 2018. Chapter 51. Accessed April 2020. http://www.bclaws.ca/civix/document/id/complete/statreg/18051.

22. Effects on Current and Future Generations

22.1 Regulatory and Policy Setting

The *2018 Act* (Government of BC 2018) was enacted in December 2019, subsequent to EAC No. E16-01 being issued for the Project in 2016. This section considers the positive and negative direct and indirect effects of the proposed amendments on current and future generations and draws on outcomes as described in the EAC Application and existing information made available during key stages of decision-making for the Project. This section tests the principles identified in the Effects Assessment Policy as they relate to this Amendment Application (BC EAO 2020).

The subsequent sections review potential Project impacts and benefits to current and future generations by providing an approach and scoping summary, identifying potential effects and interactions, and providing an effects summary where there may be effects on future generations.

22.2 Approach

The assessment of potential residual effects for the proposed amendments on VCs is included in Sections 4 to 18. This subsection will review the potential positive and negative effects on current and future generations as they relate to the Amendment Application. The Draft Effects Assessment Policy stipulates that only residual effects (that is, those effects that persist after mitigation measures are implemented) that are relevant to the consideration of effects to current and future generations will be considered in the assessment and that the scope of the discussion should be consistent with the scope of the Project assessment as well as should focus on those Project-specific issues and concerns identified through the EA.

The potential residual effects that were assessed to have a duration that extends into the “Long-term” were considered in the assessment of effects to the future generation, see Table 22-1. A “Long-term” potential residual effect is defined in subsection 3.6 of the EAC Application (Volume 1, Part B) as an “Ongoing event that is initiated during the construction phase and extends beyond the first year of the operations phase or is initiated during the operations phase and extends for the life of the proposed Project”. For VCs that have residual effects with a “Long-term” temporal characterization and have a potential interaction with future generations, an effects assessment summary that reviews the potential impact to future generations was provided.

During the scoping, AIR development and identification of potential adverse effects for the Project Application, the assessment team relied on baseline setting information from the present time to consider the current generation. Potential residual effects were described as having immediate, short- or long-term durations. The majority of potential residual effects were assessed to have immediate or short-term durations and therefore impacting the current generation. Four VCs (that is, Atmospheric Environment, Water, Land and Resources Use, and Human Health) had residual effects with long-term durations which therefore could impact future generations and were carried forward into this assessment. Once the duration of these effects on future generations were identified, reversibility (environmental and socio-economic) were then considered to identify the period of time over which the residual effect identified extends (Table 22-1).The definitions for the characterization of residual effects including duration and reversibility are described in subsection 3.6 of the EAC Application (Volume 1, Part B).

When considering the proposed amendments, it is anticipated that the Project benefits will meet or exceed those described in subsection 1.6 of the EAC Application (Volume 1, Part A). Overall, the potential residual adverse effects identified in the EAC Application have not changed as a result of the proposed amendments. A review of how these effects were determined were made are provided in the subsequent sections.

22.3 Scoping

This subsection reviews how the proposed amendments may interact with current and future generations. Subsection 1.1 of this application provides a description of Project components that are being considered for the Amendment Application. The following provides a brief summary of key proposed amendment scoping considerations as they relate to current and future generations:

- **Stawamus Corridor Expansion:** the proposed pipeline centreline within the Stawamus Corridor Expansion parallels existing linear disturbances for 6.8 km (92 percent) of length, compared to 2.1 km (30 percent) for the equivalent segment within the Certified Pipeline Corridor.
- **Coquitlam Twinning:** the Coquitlam Twinning will have a reduction of non-urban environment compared to what was assessed in the EAC Application. FortisBC is minimizing the proposed amendment footprint to the extent possible by paralleling existing disturbance for 100 percent of the total length.
- **Eagle Mountain Compressor Station:** the proposed amendment does not result in a change to the non-urban environment since the newly proposed compressor unit and equipment will be installed within the existing facility boundary.
- **Squamish Compressor Station:** the proposed site is on previously disturbed land that is zoned for industrial use and is approximately 400 m from the to the WLNG project facility, southwest of Squamish, BC.

Potential effects on Indigenous future generations regarding interactions with VCs are considered in this subsection for Tsleil-Waututh Nation, Squamish Nation, Kwikwetlem First Nation, and Musqueam Nation. A broader range of interests that may be relevant to Indigenous future generations are described in Section 19.0 of the EAC Application, Section 18 of this Amendment Application, the Tsleil-Waututh Nation's Indian River Watershed Integrated Stewardship Plan (Tsleil-Waututh Nation 2014), the Squamish Nation Environmental Assessment Agreement, and through ongoing engagement activities since 2014.

Non-Indigenous Communities being considered for this assessment include those within the identified Community Utilities and Services, Transportation Infrastructure, and Community VCs. These include those communities within Area D of the SLRD (specific to the Squamish area), Metro Vancouver, and Electoral Areas D, E, and F of the Sunshine Coast Regional District.

22.4 Potential Effects on Future Generations

This subsection will identify potential effects and interactions to future generations. Interests raised during engagement that may be relevant to future generations will also be considered in this subsection.

22.4.1 Positive Socio-Economic Effects

The Certified Project will permit FortisBC to serve the proposed WLNG facility, which would be owned and operated by WLNG. Natural gas delivered by FortisBC to WLNG will be liquefied at the WLNG facility. The planning, construction, and operation of the Certified Project will provide benefits by means of employment, government revenues, and economic development and diversification for the Region and Local communities.

FortisBC natural gas customers, including residential and commercial customers, will receive financial benefit in the form of natural gas delivery rates that are lower than they otherwise would be due to revenues generated by the delivery of natural gas to WLNG. FortisBC delivery rates for commercial and residential customers are charged on a per gigajoule basis. As the amount of natural gas throughput on the system increases, the costs of operating the delivery system are divided among more gigajoules of natural gas. As such, the charge per gigajoule declines. Although the Certified Project requires a considerable investment, WLNG will require a substantial amount of natural gas to operate. It is expected that the tax revenues received from WLNG for the increased throughput will more than offset the

additional cost of service associated with the Certified Project over its operational life, creating the potential for the delivery rates payable by residential and commercial customers to be lower than they would otherwise be in the absence of the Certified Project.

Project expenditures, government revenues or employment will meet or exceed what was stated in the Certified Project. The results of the economic analysis which formed the basis of the EAC Application are not anticipated to substantially change as a result of the proposed amendments. For information on Project expenditures, government revenues, employment and contracting strategies and social benefits of the Certified Project, see subsection 1.6 of the EAC Application. Additionally, benefits considered in the Ministers' decision for the Project include the following (Minister of Environment and the Minister of Natural Gas Development 2016):

- Project would provide Local, Regional, and Provincial benefits. FortisBC provided estimates that the total capital cost would be approximately $520 million and that total direct spending on labour in Canada from construction would be $76 million, $53 million of which would be spent in BC. Annual operational expenditures in BC would be approximately $3.7 million.
- Annual Provincial tax revenue directly associated with the Project operations would be approximately $520,000 and annual Federal tax revenue would be approximately $350,000.
- During construction, the Project is estimated to support 832 person years of direct employment. During operations, the Project would directly support ten full-time equivalent employees.

Additionally, as stated in the BC EAO Assessment Report (BC EAO 2016), the predicted community and social benefits of the Certified Project include the following:

- On-the-job training and education opportunities: Contractors and goods and service providers for the proposed Project would provide on-the-job training and skills upgrading to entry level and apprentice workers, where practical.
- Employment opportunities: The proposed Project would provide short-term employment for BC residents and other Canadians during the construction, as well as a small number of permanent positions during operations.
- Lower natural gas delivery rates: Rates for existing residential and commercial FortisBC customers are expected to be lower than they would otherwise be, thus improving affordability. The proposed Project would increase the reliability of natural gas service in District of Squamish, the RMOW, the Sunshine Coast, and Vancouver Island.
- Heritage information: Information gathered on the presence of known heritage resources, and the potential for additional finds, would advance the knowledge and understanding of heritage resources along the proposed route.
- Tax revenue: The proposed Project would generate tax revenue for Municipal, Regional, Provincial, and Federal governments. Based on the allocations determined by the specific level of government, the increased tax revenues arising from the operations phase could be used to support social programs, such as education, health care, and infrastructure.

FortisBC understands that the benefits of the Certified Project to future generations would be sustained for the life of the Project and into the future and that these economic benefits were accurately assessed in the EAC Application. Therefore, social and economic benefits will not be carried forward into the effects on future generations.

22.4.2 Changes to Residual Effects

In some instances, residual effects and long-term residual effects (duration) identified in the EAC Application are no longer applicable in the context of effects to future generations for the Amendment Application. Those instances are summarized in the following subsections for additional context.

22.4.2.1 Acoustic: 'Increase in sound levels during operations'

An increase in sound levels during operations was originally assessed as having a long-term duration (the compressor stations will emit noise throughout the operations phase of the Certified Project) and long-term reversibility (the acoustic environment will return to its original state with no residual adverse effects once compressor station operations end).

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and therefore, the residual effects characterization and conclusions of the EAC Application remain unchanged. An effects summary is as follows:

- The duration at the Eagle Mountain Compressor Station has changed as the Eagle Mountain Compressor Station is existing and being expanded (additional compressors in the same property boundary) there will be a minor increase in noise. An increase of 2 decibels at the source (that is, the facility) was determined. An increase less than 3 decibels is just perceptible to the human ear. Furthermore, based upon the estimation performed, the Project complies with the BC OGC Noise Control Best Practices Guideline.
- Squamish Compressor Station is moving from a greenfield site near the Squamish neighbourhood of Valleycliffe to the WLNG project site which is an industrial site approximately 5 km from the nearest residence. FortisBC is applying for an alternative location for the Squamish Compressor Station in response to concerns expressed by the District of Squamish and stakeholders. The operating scenario for the facility is predicted to result in compliance with the BC OGC daytime and nighttime PSLs as was the case in previous assessments. Multiple approaches to noise control have been pursued for the site, including building improvements, acoustic blankets, louvre treatments and silencers. The updated expected contribution at the LSA boundary is 37.3 dBA compared to the previous assessment of 38 dBA at the LSA boundary receptor.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Acoustic KI during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations.

22.4.2.2 Visual Aesthetics: 'Physical alteration of areas with VQOs' and 'Alterations of Viewshed'

A physical alteration of areas with VQOs was originally assessed as having a long-term duration (construction and operation will cause physical alteration of areas with VQOs as the area will be cleared during construction and maintained as a cleared right-of-way during operations) and long-term reversibility (construction and operation will cause physical alteration of areas with VQOs as the area will be cleared during construction and maintained as a cleared right-of-way during operations).

An alteration of viewshed was originally assessed as having a long-term duration (construction and operation of the facilities will cause the alteration of viewsheds [that is, by construction and operation of the permanent right-of-way and facilities] which could extend for the life of the Certified Project) and long-term reversibility (physical alterations of viewsheds due to construction and operation of the Certified Project will extend throughout the remainder of the operations phase).

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and therefore, the residual effects characterization and conclusions of the EAC Application remain unchanged. See an effects summary here:

- The Stawamus Corridor Expansion and Coquitlam Twinning do not interact with any VLI polygons (Government of BC 2019). It is anticipated that the impact to viewshed for the Coquitlam Twinning is reduced the extent practicable by paralleling existing linear disturbance (92 percent for Stawamus and 100 percent for Coquitlam).

- The proposed amendments at the Eagle Mountain Compressor Station do not overlap VLI polygons (BC MFLNRORD 2019). No anticipated impacts as compressor station is being installed within the existing property boundary as proposed in the EAC Application.
- The Squamish Compressor Station overlaps with 100 percent of VLI polygon 501, which was previously described in the EAC Application (Volume 1, Part B, Section 13.0). The VQO of VLI polygon 501 is to maintain partial retention (1.6 to 7 percent). The Squamish Compressor Station is located within the approved project site for the WLNG facility on previously disturbed land that has been historically used for industrial activities. Therefore, the footprint associated with the Squamish Compressor Station is not considered to materially alter the visual quality of VLI polygon 501.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Visual Aesthetics KI during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations.

22.4.2.3 Recreational use and recreational hunting, fishing and gathering: 'Increased Access to Previously Inaccessible Areas'

An increased access to previously inaccessible areas was originally assessed as having a long-term duration (Certified Project and proposed amendment activities that may increase access to previously inaccessible areas will be initiated during the pre-construction phase and will extend beyond the first year of the operations phase) and long-term reversibility (Certified Project and proposed amendment activities that may increase access previously inaccessible areas may extend throughout the remainder of the operations phase).

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Land and Resources Use VC during any phase of the Project. As a result, conclusions identified in the EAC Application with respect to the Land and Resources Use VC remain the same.

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application and no long-term disruption of existing trapping or recreational activities in the proposed amendments. See an effects summary as follows:

- **Stawamus Corridor Expansion:** Access to the Stawamus Corridor Expansion is by Local and resource roads, including the Mamquam River Forest Service Road and the Stawamus-Indian River Road. Both recreational and industrial users utilize these roads.

  The Stawamus Corridor Expansion is located within Wildlife Management Unit 2-8 and registered trapline area TR0207T001 (Government of BC 2019). As such, it is presumed that hunting activities occur within the area. This proposed amendment does not overlap with any guide outfitting territories (Government of BC 2019).
- **Eagle Mountain Compressor Station and Coquitlam Twinning:** The access routes to the Eagle Mountain Compressor Station, which is KP 0 of the Coquitlam Twinning, are owned and maintained by the City of Coquitlam. The Coquitlam Twinning crosses a mountain bike trail (known as 'lung buster') at approximately KP 1.2 the mountain bike trail follows the existing FortisBC right-of-way for approximately 0.5 km to KP 1.7. The Tri-Cities Off Road Cycling Association builds and maintains trails in the LSA (Tri-Cities Off Road Cycling Association 2019).

  The Coquitlam Twinning overlaps the Westwood Plateau Golf and Country Club from approximately KP 0.9 to KP 1.2 for approximately 3.5 ha. The construction footprint in this area overlaps with 0.23 ha of the golf course property and does not include any of the fairway or greens.

  The Eagle Mountain Compressor Station and Coquitlam Twinning are located within Wildlife Management Unit 2-8, but do not overlap with any registered traplines or guide outfitting territories (Government of BC 2019).

- **Squamish Compressor Station:** There are no public access roads within the District of Squamish to access the proposed Squamish Compressor Station siting area. As described in the EAC Application, a trail used by experienced hikers begins in the WLNG area and runs northeast to Echo Lake and on to Lake Lovely Water (Dunn pers. comm.).

  The Squamish Compressor Station siting area crosses two commercial recreation tenures: 239274 (heli skiing) and R112041 (miscellaneous). This proposed amendment is located near the Howe Sound shoreline and will have limited to no interaction with commercial heli skiing operations.

  The Squamish Compressor Station siting area is located within Wildlife Management Unit 2-5 (Government of BC 2019). A registered trapping area (TR0205T018) overlaps the entire Squamish Compressor Station siting area and a guide outfitter certificate (200696) overlaps the western portion of the siting area (Government of BC 2019).

The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for Recreational Use and Recreational Hunting, Fishing, and Gathering KI during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations.

22.4.3 Potential Residual Effects and Interactions

Table 22-1 identifies potential effects and interaction on future generations as they relate to the proposed amendment. The potential residual effects that were assessed to have a duration that extends into the "Long-term" were considered in the assessment of effects to the future generation. An effects overview as it relates to the proposed amendment is then provided with a summary of whether or not there is a potential interaction on future generations. Following Table 22-1, an effects summary will be provided where there are potential interactions with future generations, as required.

Existing conditions and potential adverse effects on Indigenous Interests, including Section 35 rights are comparable to those provided in the EAC Application. While these interests related to anticipated future use of subsistence and cultural areas were considered in the EAC Application, effects on future generations were not considered in the context of the Section 25(2)(f) of the *2018 Act* requirements (BC EAO 2020). Ongoing engagement activities will continue to identify potential interests as they relate to future generations. See Section 18 of this Amendment Application for a summary of potential effects to future generations in regard to Indigenous Interests.

Further analysis of potential effects on future generations are described below in Table 22-1, including a summary of Indigenous Interests as they relate to the proposed amendment and how they may affect future generations.

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
Atmospheric Environment: GHG Emissions			
Increase in GHG emissions associated with equipment and vehicles Increase in GHG emissions associated with land clearing activities	**Duration (short-term):** The event causing the increase in GHG emissions is limited to the construction or decommissioning phase. **Reversibility (permanent):** Due to the long atmospheric lifetime of GHGs (100+ years), the effects are not considered reversible.	The GHG Technical Report submitted in 2015 for the BC EAO Application estimated GHG emissions for operation of the proposed facilities to be 105.0 kt CO_2e annually. This estimate included 13.6 kt CO_2e of direct emissions and 91.4 kt CO_2e of indirect emissions. The Project is now designed to include additional electrical compressors at Eagle Mountain Compressor Station and building a new gas-fed compressor package compressor station at Squamish Compressor Station. The new design has estimated GHG emissions for operation of the proposed facilities to be 50.4 kt CO_2e annually. The total annual facility emissions have decreased 46 percent compared to the original application. The operational emissions from the Project are 0.18 percent of the 2030 Provincial target GHG emissions, 0.28 percent of the 2040 Provincial target GHG emissions, and 0.56 percent of the 2050 Provincial target GHG emissions. Therefore, the Project is not anticipated to have a meaningful potential effect on the Province's ability to meet its targets under the *Climate Change Accountability Act*.	**Community:** The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Atmospheric Environment VC during any phase of the Project. As a result, there are no anticipated potential effects to future generations within communities in the identified RSA to any reasonable extent. **Indigenous groups:** GHG emissions were raised as an issue by Indigenous groups during engagement activities related to the EAC Application. GHG emissions as they relate to impacts to Indigenous groups were inherently assessed in Section 5.0 of the EAC Application and the Amendment Application. GHG Emissions were not identified as interacting with the identified interests of Subsistence Activities and Use of Cultural Areas (Section 19 of the EAC Application) as it was determined that it would not adversely affect the Indigenous Interests that Indigenous groups currently exercise in the vicinity of, or in relation to, the Project area. Upon review, the existing conditions for the proposed amendment are improved or comparable to the existing conditions assessed in the EAC Application; therefore, there is no interaction with Indigenous future generations regarding the future exercise of Indigenous Interests that Indigenous future generations may exercise in the vicinity of, or in relation to, the proposed amendment areas.
Increase in indirect GHG emissions from electricity consumption during operations Increase in GHG emissions from venting during operations Increase in GHG emissions from fugitive sources during operations	**Duration (long-term):** Leaks and other fugitive emissions are expected to occur over the life of the Project. **Reversibility (permanent):** Due to the long atmospheric lifetime of GHGs (100+ years), the effects are not considered reversible.		

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
Water: Groundwater			
Local diversion of groundwater flow beneath the pipeline	**Duration (long-term):** The diversion of groundwater flow is an ongoing event that will be initiated during construction and will extend for the life of the Certified Project. **Reversibility (permanent):** The potential residual adverse effect is intended to be permanent and will not be reversed over the life of the Certified Project.	**Stawamus Corridor Expansion** The pipeline corridor of the Stawamus Corridor Expansion is within the Stawamus River Watershed located within the Howe Sound Sub-basin. The proposed Stawamus Corridor Expansion crosses tributaries to the Stawamus River including one named watercourse, Ray Creek. A total of 37 watercourses and 53 NCDs were identified and assessed along the proposed corridor within the Stawamus Corridor Expansion as presented in the Fish and Fish Habitat TDR (Figure 4-1 and Figure 4-2 of Appendix C). **Coquitlam Twinning** The proposed Coquitlam Twinning amendment results in a change to the Surface Water LSA and, therefore, a change in existing conditions. The proposed pipeline corridor of the Coquitlam Twinning overlaps with the watersheds associated with Scott Creek, Partridge Creek, Fulawka Creek, and Mantle Creek, within the Lower Coquitlam River Sub-basin. The proposed pipeline corridor also overlaps with the Coquitlam Lake Watershed by approximately 1,900 m^2. A total of 10 watercourses and 25 NCDs were identified and assessed along the proposed corridor within the Coquitlam Twinning as presented in the Fish and Fish Habitat TDR (Figure 4-2). Measured water quality and flow rates for the watercourses crossed by the Coquitlam Twinning corridor are included the Fish and Fish Habitat TDR Table 4-3 and 4-4 (Appendix C) . The Lower Coquitlam River Sub-basin is located downstream of the Coquitlam Lake Dam and is within the Fraser River Watershed. The Lower Coquitlam River Sub-basin contains at least 30 watercourses within the 79 km^2 watershed. The Coquitlam River is approximately 18-km-long from the Lake Dam (~104 masl) to the confluence with the Fraser River (~0.4 masl). Thirty percent of the Watershed is located within zoning for resource extracting (which is the predominate land use in the Mantle, Partridge and Fulawka Watersheds). The Scott Creek Watershed is described in subsection 6.4.1 of the EAC Application (Volume 1, Part B).	**Community:** The Coquitlam Twinning and Squamish Compressor Station result in a change in the existing conditions from what was described in the EAC Application for the Groundwater VC. As a result, an effects summary has been provided in subsection 23.5.3. **Indigenous groups:** The Coquitlam Twinning and Squamish Compressor Station result in a change in the existing conditions from what was described in the EAC Application for the Groundwater VC. As a result, an effects summary has been provided in subsection 23.5.2.
Increase in groundwater recharge of major rivers	**Duration (long-term):** The potential residual adverse effect is an ongoing event that will be initiated during construction and will extend for the life of the Certified Project. **Reversibility (permanent):** The potential residual adverse effect is a result of vegetation clearing and despite restoration of the right-of-way, the loss of large trees and dense vegetation will marginally reduce water uptake resulting in a permanent incremental increase in groundwater recharge of major rivers.		

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
		The watersheds associated with Mantle Creek, Partridge Creek, and Fulawka Creek drain directly to the Lower Coquitlam River. The creeks run along the southern slope of Eagle Mountain in northwest Coquitlam and flow to the east towards the respective confluence with the Coquitlam River. **Eagle Mountain Compressor Station** The proposed amendment results in no change to the Certified Compressor Station Area for the Eagle Mountain Compressor Station; therefore, there is no change in existing conditions for the Groundwater VC. **Squamish Compressor Station** The proposed Squamish Compressor Station amendment results in a change to the Surface Water LSA, and, therefore a change in existing conditions. The siting area is located within the Howe Sound Sub-basin and overlaps five watercourses and five NCDs which discharges to Howe Sound (Golder 2015) as presented in the Fish and Fish Habitat TDR (Figure 4-1 of Appendix C). Four of the watercourses and all of the NCDs converge into a single channel before draining into Howe Sound. The remaining watercourse flows into Mill Creek that discharges into Howe Sound. Additional small watercourses and NCDs that connect with the tributaries of Howe Sound and Mill Creek may be present in the siting area; however, watercourses are expected to be of similar nature to NCDs identified during assessments. The Squamish Compressor Station siting area is located on the property previously used for Woodfibre Pulp Mill operations, which operated for over 100 years until its decommissioning in 2006 (Golder 2015). The site has previously been affected by the pulp mill operations and the upstream catchments have historically been affected by logging activities (Golder 2015). The Howe Sound Sub-basin is discussed in subsection 6.4.1.1 of the EAC Application (Volume 1, Part B), and comparable existing conditions are expected in the Surface Water LSA for the Squamish Compressor Station siting area as those assessed in the EAC Application. As a result, the updated existing conditions are not expected to result in a material change to the overall surface water setting considered in the EAC Application.	

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
Land and Resources Use: Mineral and subsurface resources			
Limitations to future mineral and aggregate activities	**Duration (long-term):** The event causing a limitation to future mineral and aggregate activities will be initiated during construction and will extend for the life of the Certified Project **Reversibility (long-term):** The limitation of future mineral and aggregate activities will extend beyond the first 2 years of the operation phase as extraction activities and placement of energy infrastructure will not be permitted beneath or close to the pipeline.	The Stawamus Corridor Expansion overlaps mineral claims 1020897 and 1047217 for 17.9 ha and 6.3 ha, respectively (BC MFLNRORD 2019b, 2019c). The remaining proposed amendments do not overlap mineral tenures. Once construction is complete, the proposed amendment footprint will become a permanent feature across the land, which will limit access to areas with subsurface and extraction potential. Specifically, areas beneath, or close to where, the pipeline is buried cannot be accessed due to the risk of disturbing the pipeline. This could lead to economic implications for tenure holders and may result in economic loss for certain individuals. Reduced resource-based business income on livelihoods is assessed in Volume 1, Part B, Section 11.0 Economic Effects Assessment of the EAC Application.	**Community:** The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Land and Resources Use VC during any phase of the Project. As a result, there are no anticipated potential effects to future generations within communities in the identified RSA to any reasonable extent. **Indigenous groups:** Limitations to future mineral and aggregate activities as they relate to business was not raised as an issue by Indigenous groups during engagement activities, However, they were inherently assessed in Section 13.0 of the EAC Application and the Amendment Application. Limitations to future mineral and aggregate activities were not identified as interacting with the identified interests of Subsistence Activities and Use of Cultural Areas (Section 19.0 of the EAC Application) as it was determined that it would not adversely affect the Indigenous Interests that Indigenous groups currently exercise in the vicinity of, or in relation to the Project area. Upon review, the conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, there is no interaction with Indigenous future generations regarding the future exercise of Indigenous Interests that Indigenous future generations may exercise in the vicinity of, or in relation to, the proposed amendment areas.

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
Health: Human Health			
Noise disturbance to nearby residents during operations.	**Duration (long-term):** The compressor stations will emit noise throughout the operations phase of the Certified Project. **Reversibility (long-term):** Noise disturbance to nearby residents will extend throughout the remainder of the operations phase.	**Stawamus Corridor Expansion** The proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, soil, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Coquitlam Twinning** The proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure, and stressors (for example, noise, or COPCs in air, water, soil, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all KIs of Human Health. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Eagle Mountain Compressor Station** The proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, soil, or	**Community:** The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Health VC during any phase of the Project. As a result, there are no anticipated potential effects to future generations within communities in the identified RSA to any reasonable extent. **Indigenous groups:** Noise disturbance was raised as an issue by Indigenous groups during engagement activities related to the EAC Application. Noise disturbance relating to human health for Indigenous groups is inherently assessed in Section 5.0 of the EAC Application and the Amendment Application. Noise disturbance was not identified as interacting with the identified interests of Subsistence Activities and Use of Cultural Areas for the Tsleil-Waututh Nation, Musqueam Nation, and Kwikwetlem First Nation (Section 19.0 of the EAC Application) as it was determined that it would not adversely affect the Indigenous Interests that Indigenous groups currently exercise in the vicinity of, or in relation to the Project area. Upon review, the conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, there is no interaction with Indigenous future generations regarding the future exercise of Indigenous Interests that Indigenous future generations may exercise in the vicinity of, or in relation to, the proposed amendment areas.

Table 22-1. Potential Effects to Future Generations

Potential Residual Effect	Temporal Characterization and Rationale	Proposed Amendment Effects Overview	Potential Effects to Future Generations (Communities and Indigenous Groups)
Air quality effects on respiratory health during operations.	**Duration (long-term):** The events causing air quality effects on respiratory health will extend for the life of the Certified Project. **Reversibility (long-term):** Air quality effects on respiratory health will extend throughout the remainder of the operations phase.	sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all Human Health KIs. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC. **Squamish Compressor Station** The proposed amendment does not result in a change in the existing conditions for the Human Health VC. The desktop review of the likely receptors, pathways of exposure and stressors (for example, noise, or COPCs in air, water, or sediment) are anticipated to be similar, and not materially different from, those described in the EAC Application for all KIs of Human Health. Potential COPCs in soil are likely present in the proposed compressor station location, however as the site is subject to a CofC, potential exposures to COPCs are expected to be mitigated via risk management plans that include health and safety plans, physical barriers to the soil and administrative controls. It is anticipated that the proposed amendment will not result in a material change to the assessment of potential adverse effects, mitigation, or residual effects for the Human Health VC.	**Community:** The conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendment does not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the Health VC during any phase of the Project. As a result, there are no anticipated potential effects to future generations within communities in the identified RSA to any reasonable extent. **Indigenous groups:** Air quality effects on respiratory health was raised as an issue by Indigenous groups during engagement activities related to the EAC Application. Air quality effects on respiratory health for Indigenous groups was inherently assessed in Section 5.0 of the EAC Application and the Amendment Application. Air quality effects on respiratory health was not identified as interacting with the identified interests of Subsistence Activities and Use of Cultural Areas (Section 19.0 of the EAC Application) as it was determined that it would not adversely affect the Indigenous Interests that Indigenous groups currently exercise in the vicinity of, or in relation to the Project area. Upon review, the conditions for the proposed amendment are comparable to the existing conditions assessed in the EAC Application; therefore, there is no interaction with Indigenous future generations regarding the future exercise of Indigenous Interests that Indigenous future generations may exercise in the vicinity of, or in relation to, the proposed amendment areas.

22.5 Future Generations Effects Summary

This subsection will provide a summary of identified interactions and potential impacts to future generations. The intent of this subsection is to review the KIs from Table 22-1 that have an interaction with future generations and review the potential effects, associated cumulative effects and whether or not future generations may be impacted.

22.5.1 Water: Groundwater

The residual effects, 'Local diversion of groundwater flow beneath the proposed pipeline' and 'an increase in groundwater recharge of major rivers' still applies to portions of the Amendment Application. The Coquitlam Twinning and Squamish Compressor Station result in a change in the existing conditions from what was described in the EAC Application for the Groundwater KI. A summary of changes in existing conditions for the Coquitlam Twinning and Squamish Compressor Stations are summarized below, along with potential cumulative impacts and how those impacts could impact future generations. For a detailed summary of how all Project components interact with groundwater, see subsection 6.3 of this Amendment Application.

22.5.1.1 Effects Overview for Coquitlam Twinning and Squamish Compressor Station

As described in subsection 23.4, there is a change in the existing conditions for the Groundwater VC related to the Coquitlam Twinning as the proposed corridor is within the Coquitlam River Sub-basins of Scott Creek, Partridge Creek, and Mantle Creek 10 watercourses and 25 NCDs were identified along the proposed corridor. However, as identified in Section 6 of this Amendment Application, the proposed amendment is not expected to result in any material change to the assessment of potential adverse effects or characterization of residual adverse effects for the Groundwater VC.

As described in subsection 23.4, there is a change in the existing conditions for the Groundwater VC related to the Squamish Compressor Station siting area. The siting area overlaps with five watercourses and five NCDs within the Mill Creek Valley Watershed. As described in Section 6 of this Amendment Application, the proposed amendment does not include any diversions of watercourses or NCDs and is not expected to result in any material change to the assessment of potential adverse effects or characterization of residual adverse effects for the Groundwater VC during any phase of the Project. As a result, conclusions identified in the EAC Application with respect to the Surface Water and Groundwater VC remain the same.

22.5.1.2 Cumulative Effects Overview

Groundwater plays an important role in maintaining base flows in rivers and streams, important for fisheries and wildlife populations. In addition, groundwater supplies nutrients and inorganic ions to surface water and provides water to riparian vegetation.

Groundwater is used to meet industrial, agricultural, and domestic water needs. Of groundwater extracted in BC, industry is the largest user at 55 percent, agriculture uses 20 percent, Municipalities use 18 percent, and rural domestic use is 7 percent (Berardinucci and Ronneseth 2002). Industrial activities requiring groundwater include irrigation, pulp and paper processing, aquaculture, and mining.

The inadvertent interaction of trenching activities with groundwater flow (such as, pipeline construction) would likely be minor in comparison to industrial, agricultural, and domestic influences on groundwater flow. Consequently, the proposed Project's contribution to potential cumulative adverse effects associated with changes in groundwater flow will be minimal and with implementation of the mitigation outlined in Table 6.6-1 of the EAC Application, will limit the proposed Project's contribution to changes in groundwater flow. In addition, it is expected that other land users will implement similar measures, as recommended in Federal and Provincial guidelines, to reduce the incremental effects of their activities.

As identified in the EAC Application, since there will not be any withdrawal of groundwater associated with the proposed Project, the proposed Project's contribution to cumulative changes in groundwater quantity are predicted to be long-term in duration, permanent, but negligible in magnitude.

22.5.1.3 Potential Impact to Community Future Generations

Given the conclusions that there will not be any withdrawal of groundwater associated with the proposed amendment, will not include any material changes or diversions of watercourses or NCDs during any phase of the Project and the inadvertent interaction of trenching activities with groundwater flow (such as, pipeline construction) would likely be minor in comparison to industrial, agricultural and domestic influences on groundwater flow, potential impacts that would impact community future generations are expected to be negligible.

22.5.1.4 Potential Impact to Indigenous Future Generations

During engagement activities related to the EAC Application, Indigenous groups expressed concerns about groundwater quality and quantity and ensuring that links and interactions between surface and groundwater were considered.

Given the conclusions that there will not be any withdrawal of groundwater associated with the proposed amendment, will not include any material changes or diversions of watercourses or NCDs during any phase of the Project and the inadvertent interaction of trenching activities with groundwater flow (such as, pipeline construction) would likely be minor in comparison to industrial, agricultural and domestic influences on groundwater flow, the potential effects to Indigenous future generations is anticipated to be comparable to the potential residual effects on current generations as assessed in the EAC Application.

22.6 Conclusion

An assessment of effects on current and future generations was conducted for the proposed amendments. The majority of potential residual effects were assessed to have immediate or short-term durations and therefore impacting the current generation. The potential residual effects that were assessed to have a duration that extends into the "long-term" were considered in the assessment of effects to the future generation. Four VCs (that is, Atmospheric Environment, Water, Land and Resources Use, and Human Health) had residual effects with long-term durations which therefore could impact future generations and were carried forward into this assessment.

For all four VCs the conditions for the proposed amendments are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendments do not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the VCs during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations. The Project, including the proposed amendments will provide positive benefits by means of employment, government revenues, and economic development and diversification for the Region and Local communities. FortisBC understands that the benefits of the Certified Project to future generations would be sustained for the life of the Project and into the future and that these economic benefits were accurately assessed in the EAC Application. Therefore, social and economic benefits will not be carried forward into the effects on future generations.

22.7 References

22.7.1 Personal Communication

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22.7.2 Literature Cited

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23. Conclusion

The proposed amendments do not result in a material change to Project-related negative direct or indirect effects as described in Sections 4.0 to 15.0 of the EAC Application (Volume 1, Part B). Overall, the potential residual adverse effects identified and characterized in the EAC Application have not changed as a result of the proposed amendments.

This Amendment Application did identify two VCs with a material change to existing conditions, compared the EAC Application. For the Wildlife and Wildlife Habitat VC, the new potential western screech-owl nesting and foraging habitat not previously included in EAC Application was identified within the Squamish Compressor Station siting area and is considered a material change in existing conditions. Western screech-owl was previously identified as a key indicator and changes in habitat availability and effectiveness was assessed in the EAC Application and this potential effect now also applies to the Squamish Compressor Station. Existing mitigation developed in the EMP is considered suitable and therefore, the characterization of residual effects and conclusions identified in the EAC Application with respect to the Wildlife and Wildlife Habitat VC remain the same. The Land and Resources Use VC has identified physical disturbance of previously contaminated sites associated with the Squamish Compressor Station siting area as a potential effect. The EAC Application included physical disturbance of previously contaminated site as a potential effect however, this potential effect was not previously identified at the WLNG project site as Project components did not previously interact with known areas of contamination. Site-specific mitigation measures and environmental monitoring have been proposed and are considered sufficient to mitigate any residual effects associated with contaminated sites. Therefore, the assessment conclusions remain the same for the Land and Resources Use VC.

Table 23-1 provides a summary of changes to the assessment of potential adverse effects, residual adverse effects, proposed mitigation, and cumulative adverse effects presented in this Amendment Application.

Table 23-1. Summary of Changes to the Land and Resource Use Assessment of New Potential Adverse Effects, Residual Adverse Effects, Proposed Mitigation, and Cumulative Adverse Effects

VC	Potential Adverse Effect	Proposed Mitigation	Potential Residual Effect	Potential Cumulative Adverse Effects
Land and Resources Use	Physical disturbance of previously contaminated sites (unchanged from EAC Application)	New mitigation proposed in Table 13-2 of the proposed amendment.	None identified	None identified

As previously indicated, the site-specific mitigation measures and environmental monitoring proposed to address known contaminated sites associated with the construction and operation of the Squamish Compressor Station will be included in the ERP.

The list of reasonably foreseeable projects considered for the cumulative effects assessment in the EAC Application was updated for the purposes of this Amendment Application. Overall, most of the previously mapped developments are now operating and therefore considered part of the existing disturbance. The search conducted for this Amendment Application has identified three new reasonably foreseeable developments that were not included in the EAC Application. These are the proposed Delta Grinding Facility, the Tilbury Phase 2 LNG Expansion, and the proposed Tilbury Pacific LNG Jetty. All three are located on Tilbury Island in the City of Delta and are within the Community and Regional Infrastructure and Services RSA and Employment and Economic RSA. Activities associated with the proposed amendments acting in combination with reasonably foreseeable developments may cause potential residual effects on the identified VCs, however the assessment of effects remains consistent with the EAC Application. The assessment team has determined that existing and previously identified future developments (subsection 3.3) acting in combination with the proposed amendments do not result in any

material change to the assessment of potential cumulative adverse effects on the any of the identified VCs.

In addition to the assessment of potential adverse effects, the proposed amendments do not result in any material change effects of the environment on the Project. It is concluded that the effects of the environment on the Project identified in the EAC Application remain the same.

The potential risk of accidents or malfunctions was evaluated by examining the likelihood and consequence of an event that has the potential to adversely affect a VC. The proposed Stawamus Corridor Expansion, Coquitlam Twinning and Eagle Mountain Compressor Station amendments do not result in any material change to the risk of accidents or malfunctions assessed in Section 16.0 of the EAC Application. As a result, assessment conclusions identified in the EAC Application with respect to accidents or malfunctions for these proposed amendments remain the same.

As a result of the proposed location of the Squamish Compressor Station site and its proximity to the WLNG facility (approximately 400 m), the potential for interactions between the WLNG facility and the Squamish Compressor Station was evaluated to better understand potential for accidents or malfunctions. A new potential interaction that was identified and not assessed in Section 16.0 of the EAC Application is the potential for a fire and explosion at WLNG as a result of an uncontrolled gas release.

Table 23-2 provides a summary of changes to the assessment of updated potential adverse effects, proposed mitigation and residual adverse effects in this proposed Amendment Application.

Table 23-2. Summary of Updated Potential Adverse Effects, Mitigation Measures and Residual Adverse Effects of the Squamish Compressor Station for Accidents or Malfunctions

Potential Adverse Effect	Proposed Mitigation	Potential Residual Effect	Mitigated Likelihood, Consequences, Potential Risk, and Confidence[a]
Risk to workers at the WLNG facility	New mitigation proposed in Table 16-3 of the proposed amendment.	Fire or explosion as a result of an uncontrolled gas release could lead to injury or death of off-site human populations.	Likelihood: Rare Consequence: Severe Potential Risk: Medium Confidence: High
Loss or Damage to Adjacent Property Due to Fire		Fires or explosions could lead to a loss or damage to adjacent property.	
Adverse Effects on Local Emergency Services and Local Economies		Fires or explosions could adversely affect Local emergency services and Local economies.	

Notes:

[a] Categories of likelihood, consequence and risk used in the evaluation for each accident and malfunction scenario are defined in Section 16.

FortisBC has a favourable record for safely constructing and operating its natural gas pipeline system in BC. FortisBC has been operating gas pipelines and compressor stations in BC for over 50 years and has a strong commitment to safety in its values, policies, and practices. While major accidents and malfunctions are rare, the risks and related mitigation measures are supported by a likelihood and consequence analysis to determine a risk rating. Considering the mitigation, the potential residual adverse effects of a fire and explosion at WLNG as a result of an uncontrolled gas release was assessed to be rare and of medium risk. Considering the mitigation, the potential residual adverse effects of accidents or malfunctions are medium to low risk.

The *2018 Act* was enacted in December 2019 and Section 25.2 includes additional assessment matters that were not previously included in the *2002 Act* under which the Project was approved.

This Amendment Application assessed three additional Section 25 required assessment matters for the proposed amendments relative to the Certified Project:

- disproportionate effects on distinct human populations, including populations identified by gender
- effects on biophysical factors that support ecosystem function
- effects on current and future generations

The disproportionate effects on distinct human population assessment conducted for the proposed amendments identified a list of socio-economic factors and potential subgroups that may interact with the proposed amendments. The assessment reviewed the potential adverse effects, mitigation measures and residual adverse effects of each proposed amendment on the identified distinct human populations. The assessment found no change to effects assessment conclusions compared to general population assessed in the EAC Application.

An assessment of biophysical factors that support ecosystem function was conducted for the proposed amendments. The Ecosystem Function Scoping Tool was completed and focused on potential interactions between the proposed amendments and biophysical factors that support ecosystem function. The scoping exercise found that all the ten biophysical factors that support ecosystem function interacted with at least one of the proposed amendments. The proposed amendment for the Eagle Mountain Compressor Station did not interact with any of the ten biophysical factors that support ecosystem function since the newly proposed equipment will be accommodated within the existing facility. For all proposed amendments that interact with biophysical factors that support ecosystem function, the proposed amendment activities are not expected to have a negative effect on ecosystem function at the ecosystem scale.

An assessment of effects on current and future generations was conducted for the proposed amendments. The majority of potential residual effects were assessed to have immediate or short-term durations and therefore impacting the current generation. The potential residual effects that were assessed to have a duration that extends into the “long-term” were considered in the assessment of effects to the future generation. Four VCs (that is, Atmospheric Environment, Water, Land and Resources Use, and Human Health) had residual effects with long-term durations which therefore could impact future generations and were carried forward into this assessment. For all four VCs, the conditions for the proposed amendments are comparable to the existing conditions assessed in the EAC Application; therefore, the proposed amendments do not result in any material change to the assessment of potential adverse effects, mitigation, or residual effects for the VCs during any phase of the Project. As a result, there are no anticipated potential effects to community or Indigenous future generations. The Project, including the proposed amendments will provide positive benefits by means of employment, government revenues, and economic development and diversification for the Region and Local communities. FortisBC understands that the benefits of the Certified Project to future generations would be sustained for the life of the Project and into the future and that these economic benefits were assessed in the EAC Application. Therefore, social and economic benefits will not be carried forward into the effects on future generations.

In summary, this Amendment Application reached the following key conclusions:

- The existing conditions for all VCs in these areas are generally comparable to the conditions identified in the EAC Application.
- The potential direct and indirect interactions resulting from the proposed amendment are comparable to those identified in the EAC Application.
- No new potential adverse effects have been identified for any of the VCs and there is no change in the characterization of residual effects that are identified in the EAC Application.
- Existing and reasonably foreseeable developments acting in combination with the proposed amendments do not result in any material change to the assessment of potential cumulative adverse effects on the any of the identified VCs.

- The proposed amendments would have no discernable effects on subsistence or cultural Section 35 rights and does not change the characterization and assessment of potential adverse effects on Indigenous Interests provided in the EAC Application.
- The assessment of three additional Section 25 required assessment matters (that is, disproportionate effects on distinct human populations, effects on biophysical factors that support ecosystem function and effects on current and future generations) found that the proposed amendments do not result in new potential adverse effects.