Diane Roy
Vice President, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
www.fortisbc.com

January 13, 2021

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Ms. Marija Tresoglavic, Acting Commission Secretary

Dear Ms. Tresoglavic:

Re: FortisBC Energy Inc. (FEI)

Application for Approval of a Certificate of Public Convenience and Necessity (CPCN) for the Okanagan Capacity Upgrade (OCU) Project (Application)

Updated Application

On November 16, 2020, FEI filed the above referenced Application seeking approval from the British Columbia Utilities Commission (BCUC), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), for a CPCN for the OCU Project. On December 16, 2020, the BCUC issued Order G-335-20, establishing the regulatory timetable for review of the Application. Directive 5 of Order G-335-20 directed FEI to provide the following information inserted into an updated version of the Application:

a. A detailed description of the peak demand forecasting methodology which supports the need for the OCU Project, including but not limited to: an explanation of the 1 in 20 year weather event forecast and its application to customer demand, the duration of the peak period (e.g. peak hour, peak day), the applicable geographic area, assumptions for growth in different rate classes including changes in peak use per customer (as applicable) and number of customers, any known or probable impacts on peak demand incorporated into the forecast, and whether the forecast includes interruptible demand;

b. An explanation of the assumptions used to determine the current system capacity under peak winter conditions, including but not limited to a description of the current compression capabilities of the Interior Transmission System and any local capacity constraints;

c. The forecasted system capacity under peak winter conditions if the OCU Project is constructed; and

d. A more fulsome description of the short-term mitigation measures outlined in section 4.1.1 of the Application, including the potential capacity increases, the capability of the measures to address system capacity constraints, the limitations of such measures, an estimate of the length of time such measures can remain in place and the costs if any associated with such measures

FEI hereby attaches its updated Application in compliance with Order G-335-20. For ease of referencing on the record of this proceeding, the attached updated Application replaces the original Application and Appendices in its entirety. FEI has updated Section 3.3 to provide further information related to its peak demand forecasting methodology, system capacity assumptions and constraints, and forecasted system capacity. Also, a new Section 4.2 is inserted to provide more fulsome description of the short-term mitigation measures. In addition, updates have been made to section, table, and figure references which were necessary to accommodate the new material. No other revisions to the Application or Appendices have been made as compared to the original filing dated November 16, 2020.

FEI also intends to providing detailed account forecast information and other inputs used by FEI to determine its peak day demand forecast to supplement the Updated Application. FEI expects to file this additional forecast information in a new Appendix L to the Application on Monday, January 18, 2021.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Interveners in the FEI Annual Review for 2020 and 2021 Delivery Rates proceeding

FORTISBC ENERGY INC.

Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project

Updated Application

January 13, 2021

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1. APPLICATION

1.1 *INTRODUCTION*

FortisBC Energy Inc. (FEI or the Company) applies to the British Columbia Utilities Commission (BCUC), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), for a Certificate of Public Convenience and Necessity (CPCN) for the Okanagan Capacity Upgrade Project (referred to as the OCU Project or the Project) as described in this application (the Application). FEI also applies for approval of a deferral account, entitled the "OCU Application and Preliminary Stage Development Costs Deferral Account", pursuant to sections 59 to 61 of the UCA, to record the costs of preparing the Application, the regulatory review process and developing the OCU Project prior to approval of the Application.

As explained in Section 3 of the Application, the population of the Okanagan region has continued to increase, mainly focused around urban centres such as Kelowna and Penticton. This population growth has led to a corresponding increase in natural gas demand, and FEI forecasts a shortfall in its existing Interior Transmission System (ITS) capacity, which needs to be addressed prior to the winter peak of 2023/2024. The OCU Project would add adequate capacity to FEI's existing ITS so that FEI can continue to provide long-term safe and reliable gas[1] service to its customers in Okanagan region.

In summary, as further described in Section 5.2, FEI requests that the BCUC grant a CPCN for the construction and operation of a new approximately 30 km section of 406 mm pipeline and associated facilities. The estimated total cost of the Project in as-spent dollars is $271.3 million, which includes an Allowance for Funds Used During Construction (AFUDC).

FEI plans to initiate the detailed design and procurement activities in parallel with the Application review process throughout 2021. If the Project is approved, FEI will commence construction of the Project in Q1 of 2022. The new pipeline and stations are scheduled to be in service by Q3 of 2023, with Project completion and close-out activities to be completed by Q1 of 2024.

A draft Procedural Order and draft Final Order are included in Appendices J-1 and J-2 respectively.

[1] For the purposes of the Application, gas means natural gas (from ground source methane), renewable gas or other forms of gas supply such as hydrogen, liquefied natural gas (LNG) and compressed natural gas (CNG).

1.2 *EXECUTIVE SUMMARY*

1.2.1 FEI Needs More System Capacity to Meet Expected Increase in Load Growth

FEI has experienced increased customer load growth in the central and north Okanagan regions and expects that peak demand in these regions will exceed existing system capacity. This increase in the peak demand is driven by the continued population increase that the Okanagan region has experienced over the last two decades, mainly focused around urban centres such as Kelowna and Penticton. With a population of over 140 thousand (including its surrounding area), Kelowna is the largest urban centre in the British Columbia interior. Kelowna has been one of the fastest growing cities in Canada during the past decade[2]. During the 20-year period from 1996-2016, Kelowna's population increased by over 37 percent, with an average annual growth rate of 1.6 percent. Kelowna is forecast to grow at a similar rate in the subsequent 20 year period to 2036. The population growth in this area has led to a corresponding increase in the demand for natural gas, and thus an increased demand on the ITS. Increasing industrial load, including new CNG (Compressed Natural Gas) fuelling stations, greenhouse expansions and winery operations, along with other industrial customers on the system, has also contributed to the increase in demand.

A long term practical solution[3] is required to increase the ITS capacity so that FEI can meet the forecasted peak demand and continue to provide natural gas service to customers safely and reliably. Specifically, without adding more delivery capacity to the existing ITS, FEI will be required to curtail customers in these regions, shedding load from the system in order to maintain pressure and preserve supply to remaining customers. In a worst-case scenario, during cold winter days, should it become impossible to shed sufficient load through the curtailment of large interruptible service customers, core customers (i.e., firm supply customers) in these areas may be impacted by a loss of gas supply resulting in these customers being left without gas for heat, hot water, and cooking, which could last for few days depending on the extent of the capacity shortfall.

1.2.2 FEI Evaluated Three Feasible Alternatives

After a thorough investigation of potential solutions (as explained in Section 4), the Company identified three feasible alternatives to increase the capacity of ITS:

- Alternative 1 - ITS Upgrades to VER PEN 323: Involves upgrades along approximately 36 km of the Vernon to Penticton 323 mm pipeline (VER PEN 323) in the form of pipeline replacement and revalidation hydrotests. This alternative is further described in Section 4.2.1 of the Application;

[2] Statistics Canada, Table 17-10-0135-01, Population estimates, July 1, by census metropolitan area and census agglomeration, 2016 boundaries. July 1, 2018 data.
[3] FEI discusses the existing short-term mitigation measures and their limitations in Section 4.1.1.

- Alternative 2 - Modified ITS Upgrades to VER PEN 323: Involves modifications to the VER PEN 323 pipeline similar to Alternative 1. However, this alternative involves the installation of a 6 km extension of the 406 mm OLI PEN pipeline around the City of Penticton. The 6 km long extension proposed under this alternative eliminates the requirement to replace and/or retest multiple segments from the southern end of Alternative 1, and replaces them with a pipeline extension. This alternative is further described in Section 4.2.2 of the Application; and
- Alternative 3 - OLI PEN 406 Extension: Addition of approximately 30 km of 406 mm pipeline running from OLI PEN 406 pipeline east of Ellis Creek near Penticton to Chute Lake northeast of Naramata. This alternative is further described in Section 4.2.3 of the Application.

FEI evaluated these three feasible alternatives using both non-financial and financial criteria as shown in Table 1-1 below and specified in detail in Section 4.4.

Table 1-1: Alternatives Evaluation Criteria with Weightings

Evaluation Criteria	Weighting
Non-Financial • Asset Management Capability • Project Execution and Lifecycle Operation	40% 30%
Financial • Levelized Delivery Rate Impact	30%

1.2.3 FEI Selected a Preferred Solution to Address Load Growth

After comprehensively evaluating the three feasible alternatives, FEI selected Alternative 3, to construct and install approximately 30 km of new 406 mm pipeline extension running from OLI PEN 406 east of Ellis Creek near Penticton to Chute Lake northeast of Naramata, as the preferred solution. Alternative 3 best addresses the Project need and objective to ensure that FEI continues to maintain safe and reliable gas service to its customers by increasing the ITS capacity to meet peak demand in the central and north Okanagan regions prior to the winter of 2023/2024.

The evaluation of the feasible alternatives and selection of the preferred solution is discussed in detail in Sections 4.4 and 4.5.

As will be described in detail in Section 5 of the Application, the OCU Project consists of the following:

- The construction and installation of approximately 30 km of new 406 mm pipeline that will operate at a Maximum Operating Pressure (MOP) of 7,826 kPa at kilometre point 30.8;

- The construction and installation of a new Chute Lake Pressure Control Station at kilometre point 60.8 with a 406 mm pig barrel and pressure regulated tie in to the existing VER PEN 323 pipeline set at 5,171 kPa for gas flowing north to Kelowna and 4,826 kPa for gas flowing south to Penticton;
- The construction and installation of a new above ground 406 mm Block Valve Station at kilometre point 36.1; and
- Deactivation of a 1,200 m section of the existing OLI PEN 406 pipeline between the tie in location at kilometre point 30.8 and the Ellis Creek Pressure Control Station.

A detailed description of the OCU Project is provided in Section 5 of the Application.

1.2.4 FEI Has Estimated the Project Costs and Rate Impact in Accordance with the BCUC CPCN Guidelines

A summary of the total forecast capital costs and average cost of service, is as follows:

- Total Capital Cost (as-spent dollars) is $271.3 million (including AFUDC and tax offset credit of $0.7 million); and
- Average Annual Delivery Rate Impact over the Project duration is $0.026 / GJ.

For a typical FEI residential customer consuming 90 GJ per year, this would equate to approximately $9.00 per year.

1.2.5 FEI Will Account for Environmental and Archaeological Considerations

FEI has assessed the environmental and archaeological impacts for the OCU Project. Based on the assessments undertaken, FEI expects that the Project will have minimal environmental and archaeological impacts. FEI anticipates that potential environmental impacts of the Project can be mitigated through the implementation of FEI's standard environmental protection and mitigation measures.

As described in Section 7, impacts to construction timelines and costs as a result of encountering species at risk, fish habitat, or contaminated soil or groundwater can be minimized through additional investigations during the detailed engineering phase prior to construction.

FEI assessed the three feasible alternatives for archaeological potential, and Archaeological Impact Assessments have been recommended for areas assessed as having moderate to high archaeological potential along the preferred alternative.

Draft versions of both the Environmental Overview Assessment and Archaeological Overview Assessment were provided to Indigenous groups who requested them for their review and comment. FEI plans to address any comments or issues it receives during the detailed engineering phase of the Project.

1.2.6 FEI's Public Consultation and Indigenous Groups Engagement Efforts to Date are Sufficient and Will Continue

Consultation, engagement and communication with public, local government, residents, landowners, businesses, Indigenous groups and other stakeholders are important components of FEI's development plan for the OCU Project. Accordingly, as described in Section 8, FEI created a Consultation and Engagement Plan[4] that sets out the general approach to engagement, consultation and communications activities with respect to the work on the OCU Project. Due to COVID-19, FEI continued to assess its consultation and engagement approach and changed activities as necessary. These are further discussed in Section 8.

FEI has identified a number of Project stakeholders including residents, landowners, businesses, government entities and Indigenous groups. Communications and consultations with respect to the Project have already begun and are outlined in Section 8 (Consultation).

Throughout this consultation and engagement, FEI has tracked issues and concerns that have been raised and will continue to address any outstanding items with respect to the preferred alternative. These issues are summarized in Sections 8.2.6 and 8.3.4 of the Application. Further consultation and engagement activities will continue prior to and throughout construction to help inform the public, customers, residents, impacted landowners, local government, other stakeholders and Indigenous groups about construction activities in their area in an effort to minimize impacts.

To date, FEI has adequately consulted and engaged with key stakeholders including Indigenous groups. FEI will continue to consult with stakeholders regarding routing, the Project schedule (including construction timelines), temporary construction space, Right of Way requirements, mitigation of traffic disruptions and public safety. The consultation and engagement activities to the time of filing the Application have been sufficient, appropriate and reasonable to meet the requirements of the BCUC CPCN Guidelines.

1.2.7 Conclusion

Based on the information in the Application, which is summarized above, FEI believes it has demonstrated that the Project is in the public interest and should be approved as set out in the Application.

1.3 *SUMMARY OF APPROVALS SOUGHT*

1.3.1 CPCN for the OCU Project

Pursuant to sections 45 to 46 of the UCA, FEI requests that the BCUC grant a CPCN for the construction and operation of the OCU Project as described in the Application. In granting a

[4] Filed as Appendix H-1, Consultation and Engagement plan includes Community Engagement, Indigenous Relations, and Communications Plan.

CPCN for the OCU Project, FEI requests that the BCUC approve the components of the Project as listed below and described in detail in Section 5 of the Application:

- Construction, installation and operation of a new approximately 30 km 406 mm gas pipeline extension to the Oliver to Penticton 406 mm gas pipeline, that will operate at an MOP of 7,826 kPa from a takeoff location near Ellis Creek near Penticton to a new pressure control station near Chute Lake south of Kelowna starting at kilometre point 30.8;
- Construction, installation and operation of the Chute Lake Pressure Control Station at kilometre point 60.8 with a 406 mm pig barrel and pressure regulated tie-in to the existing Vernon to Penticton 323 mm gas pipeline set at 5,171 kPa for gas flowing north to Kelowna and 4,826 kPa for gas back flowing south to Penticton;
- A 406 mm Block Valve Station above ground valve station at kilometre point 36.1; and
- Deactivation of a 1,200 m section of the existing OLI PEN 406 pipeline between the tie-in location at kilometre point 30.8 and the Ellis Creek Pressure Control Station.

1.3.2 OCU Application and Preliminary Stage Development Costs Deferral Account

Pursuant to sections 59 to 61 of the UCA, FEI is also seeking approval of a new non-rate base deferral account, titled the "OCU Application and Preliminary Stage Development Costs Deferral Account", for deferral treatment of the costs of preparing this Application and Preliminary Stage Development Costs. These deferred costs would be included in Rate Base and amortized over a three year period commencing January 1, 2022.

1.3.3 Confidential Filings Request

Certain sections and appendices of the Application contain operationally and commercially sensitive information, including detailed information that, if disclosed, could impede FEI's ability to work safely and reliably operate its gas system assets and could risk the safety of both its workers and the public. FEI is still completing negotiation for land rights acquisition and public disclosure of associated payments, costs and strategies could hinder the ability to negotiate fair and reasonable agreements. As well, the Confidential Appendices contain market sensitive information that should be kept confidential so as not to influence the construction contractor selection process for the Project. FEI will mark confidential information as such, where applicable.

In accordance with the BCUC's Rules of Practice and Procedure established by Order G-15-19, regarding Confidential Documents, FEI requests that the interveners requesting access to confidential information execute an Undertaking of Confidentiality. A sample of the Undertaking of Confidentiality is included in Appendix J-3.

1.4 PROPOSED REGULATORY REVIEW OF CPCN APPLICATION

The information presented in this Application accords with the guidelines set out in the BCUC's 2015 Certificate of Public Convenience and Necessity Application Guidelines (the CPCN Guidelines).

FEI believes that a written hearing process with two rounds of information requests (IRs) from the BCUC and interveners will provide for an appropriate and efficient review of the Application.

FEI proposes the regulatory timetable set out in Table 1-2 below and believes that this regulatory timetable will allow FEI to complete construction prior to winter of 2023/2024 as required to meet the expected increase in load growth.

Table 1-2: Proposed Regulatory Timetable

ACTION	DATE (2020)
BCUC Issues Procedural Order	Week of December 21
ACTION	**DATE (2021)**
FEI Publishes Notice by	Week of January 18
Intervener Registration	Tuesday, January 28
BCUC Information Request No. 1	Thursday, January 28
Intervener Information Request No. 1	Thursday, February 4
FEI Response to Information Requests No. 1	Thursday, February 25
BCUC and Intervener Information Request No. 2	Thursday, March 18
FEI Response to Information Requests No. 2	Thursday, April 15
FEI Written Final Submission	Thursday, June 3
Intervener Written Final Submission	Thursday, June 24
FEI Written Reply Submission	Thursday, July 9

1.5 ORGANIZATION OF THE APPLICATION

The Application provides detailed information in support of the Project. The remainder of the Application is organized into the following sections:

- Section 2 provides an overview of the Company, and provides information on FEI's financial and technical capabilities for the Project;
- Section 3 provides an overview of the existing ITS, the need and justification for the Project;

- Section 4 includes a review of the Project objectives, describes the alternatives considered, sets out the evaluation criteria, and details the technical and financial evaluation of each of the feasible alternatives;
- Section 5 provides a detailed description of the Project, including route selection, design, construction, resource planning and management, and project schedule, sets out a risk analysis, and discusses potential Project impacts;
- Section 6 provides details on the Project cost estimate, the assumptions upon which the financial analysis is based and the rate impacts;
- Section 7 provides an overview of the Project environment, including a discussion of the environmental and archaeological impacts the Project may have and FEI's plans to mitigate those potential impacts;
- Section 8 discusses FEI's communication efforts and consultation with the public and stakeholders regarding the Project, including FEI's engagement with Indigenous groups potentially impacted by the Project; and
- Section 9 describes how the Project supports BC's energy objectives and its inclusion within FEI's most recent long term resource plan.

2. APPLICANT

2.1 NAME, ADDRESS AND NATURE OF BUSINESS

FEI is a company incorporated under the laws of the Province of British Columbia and is a wholly-owned subsidiary of FortisBC Holdings Inc., which in turn is a wholly-owned subsidiary of Fortis Inc. FEI maintains an office and place of business at 16705 Fraser Highway, Surrey, British Columbia, V4N 0E8.

FEI is the largest natural gas distribution utility in British Columbia, providing sales and transportation services to residential, commercial, and industrial customers in more than 100 communities throughout British Columbia, with more than 1 million customers served throughout British Columbia. FEI's distribution network provides more than 95 percent of the natural gas energy delivered to customers in British Columbia.

2.2 FINANCIAL CAPACITY

FEI is regulated by the BCUC and is capable of financing the Project. FEI has credit ratings for senior unsecured debentures from DBRS Morningstar and Moody's Investors Service of A and A3, respectively.

2.3 TECHNICAL CAPACITY

FEI has designed and constructed a system of integrated high, intermediate and low-pressure pipelines, and operates approximately 50,000 kilometres of natural gas transmission and natural gas distribution mains and service lines in British Columbia. FEI has completed other large natural gas projects, and has the technical capacity to complete the Project.

2.4 COMPANY CONTACT

Diane Roy
Vice President, Regulatory Affairs
FortisBC Energy Inc.
16705 Fraser Highway
Surrey, B.C. V4N 0E8

Phone:	(604) 576-7349
Facsimile:	(604) 576-7074
E-mail:	diane.roy@fortisbc.com
Regulatory Matters:	gas.regulatory.affairs@fortisbc.com

2.5 LEGAL COUNSEL

Christopher Bystrom and Tariq Ahmed
Fasken Martineau DuMoulin LLP

2900 – 550 Burrard Street
Vancouver, B.C. V6C 0A3
Phone: (604) 631-4715
Facsimile: (604) 631-3232
E-mail: cbystrom@fasken.com and tahmed@fasken.com

3. PROJECT NEED AND JUSTIFICATION

3.1 *INTRODUCTION*

The objective of the OCU Project is to ensure that FEI has adequate pipeline capacity in its Interior Transmission System (ITS) to meet the increase in peak demand throughout the central and north Okanagan regions forecast to occur over the next 20 years. The gas distribution systems in the central and north Okanagan are supplied by the ITS, which consists of approximately 1,515 km of transmission pipeline with a variety of diameters, operating pressures, and in-service dates. FEI's ITS interconnects the gas supply from the Enbridge-owned Westcoast Energy System in the west (Westcoast system) and the TC Energy-owned Foothills Pipeline in the east (TC Energy pipeline). Under typical conditions, gas is taken from the Westcoast system at the Savona Compressor Station to supply FEI's customers in the Thompson and north Okanagan Regions, while FEI's customers in the south and central Okanagan Regions are supplied primarily by the Southern Crossing Pipeline (SCP) supplying Oliver, which, in turn, supplies pipelines delivering gas through the Penticton area.

Over time, development in the Thompson, Okanagan, and Kootenay regions of the province has led to significant population growth in the urban centres in the Okanagan, such as Vernon, Kelowna, West Kelowna, and Penticton. The demand for gas has increased along with the growing population, prompting FEI to upgrade parts of the ITS multiple times over the years. More recently, demand on the system has continued to grow, but no major upgrades were required to increase the ITS capacity because the existing capacity has been sufficient. However, recent FEI gas load and system capacity forecasts indicate that the system will approach its maximum capacity and a major upgrade is required to maintain secure and reliable supply to the central and north Okanagan regions prior to the winter of 2023/2024.

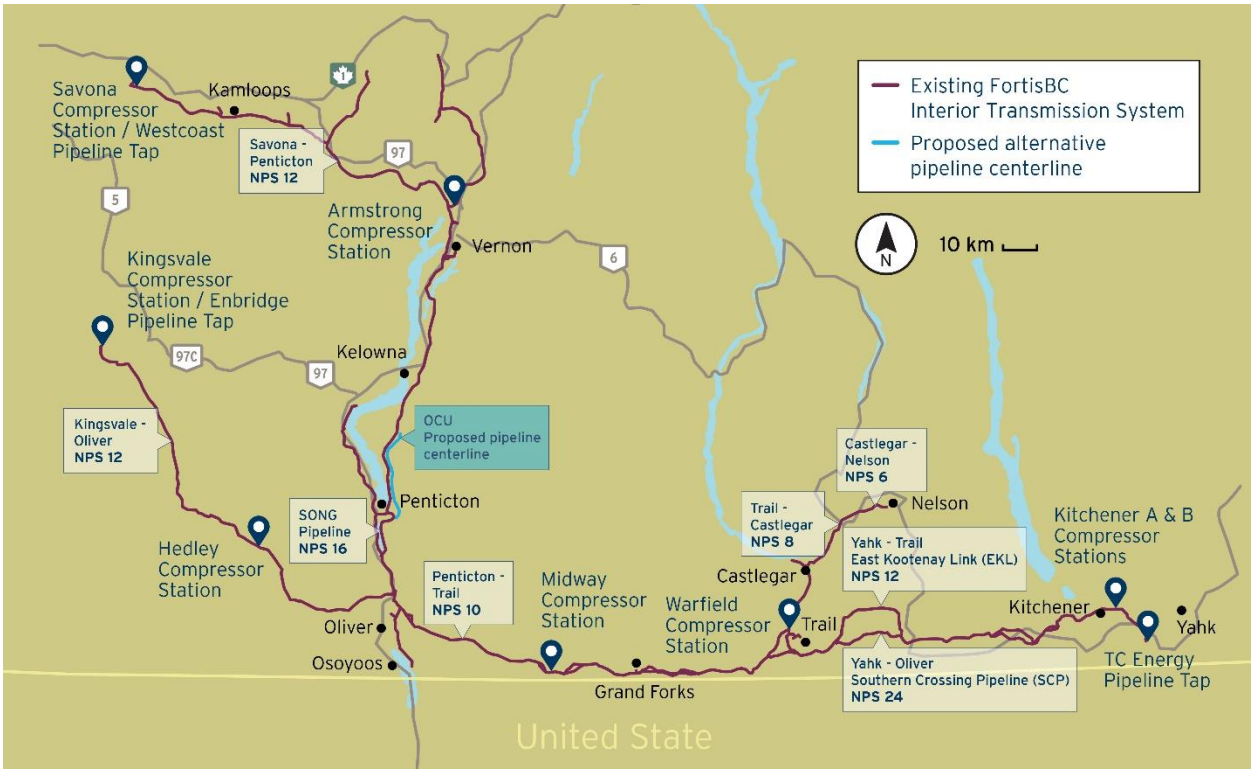
The OCU Project will address this shortfall by increasing the capacity of the ITS in the Okanagan region. In the following sections, FEI explains the Project need and justification, as follows:

- Section 3.2 describes the history of the ITS including major system upgrades undertaken in the past to meet rising peak demand.
- Section 3.3 provides the forecast increase in peak demand, which results in an upcoming ITS capacity shortfall. Within this section:
    - Section 3.3.1 explains the impact of a system capacity shortfall on FEI's customers; and
    - Section 3.3.2 explains that the Project is necessary despite uncertainty with respect to the impact of COVID-19 on FEI's peak demand forecast.
- Section 3.4 describes FEI's responsibility to provide reliable long term gas service to its customers and the action FEI should take to address the Project need.
- Section 3.5 summarizes the Project need and justification.

3.2 *OVERVIEW AND HISTORY OF EXISTING ITS CAPACITY*

A simplified layout of the current configuration of the ITS is shown in the figure below. The diameter of each main segment of pipeline is labelled with a nominal pipe size (NPS) in inches.

Figure 3-1: Overview of Interior Transmission System



The ITS was constructed in sections over approximately 50 years, as the population in the Okanagan and the Kootenay regions increased. In 1957, the original mainline backbone of the ITS was constructed from Savona to Nelson to serve communities including Kamloops, Vernon, Kelowna, Penticton, Trail, and Castlegar. As these communities developed, demand for gas on the ITS increased, prompting multiple upgrades to the system to increase both system capacity as well as provide additional supply lines to enhance security of supply in the event that the normal source of supply was unavailable. The first upgrades occurred in the 1970s and consisted of the following:

1. Between 1971 and 1973, an NPS 12 pipeline was installed from Kingsvale to Oliver, providing a second feed into the ITS from the Westcoast system.

2. In 1975, FEI constructed an NPS 12 pipeline from the TC Energy pipeline near Yahk to the ITS near Trail, which is now known as the East Kootenay Link (EKL). This tied the entire ITS into the TC Energy pipeline, diversifying the supply of the region.

These upgrades were sufficient to support the needs of the region for the subsequent 20 years. By the mid-1990s, the population had grown significantly in the Thompson and Okanagan regions. Therefore, to continue to meet peak demand, system capacity upgrades were completed over the next 6 years. These capacity upgrades consisted of the following:

1. In 1994, the existing Savona, Kingsvale, and Trail compressor stations were upgraded and two new compressor stations were added at Midway and Kitchener, along with a NPS 16 loop between Oliver and Penticton to increase the capacity of the ITS by bringing additional gas from the TC Energy pipeline into the Central Okanagan.[5] This pipeline is also referred to as the South Okanagan Natural Gas (SONG) pipeline.

2. In 1997, the NPS 12 pipeline from the Westcoast system tap to the Savona Compressor Station was replaced with an NPS 20 pipeline to further build system capacity by enhancing the throughput capability of the Savona compressor station in order to increase the gas flow from the Westcoast system into the Thompson and north Okanagan regions.

3. The most recent major upgrade to the ITS was completed in 2000, when the NPS 24 SCP[6] was constructed from Oliver to the TC Energy pipeline, diversifying the area's supply and increasing the quantity of gas flowing into the ITS at Oliver from Alberta, which increased gas flow capacity into the Okanagan region.

Combined, these projects increased the delivery capacity of the ITS to the Okanagan region sufficient to avoid any further major system upgrades since the completion of the SCP.

Table 3-1 below summarizes ITS construction over the last 65 years. Over time, building developments were constructed adjacent to pipeline rights-of-way in certain urban locations, and new road crossings were built over pipelines. As this development occurred, FEI lowered the MOP of certain sections of the transmission pipelines from their original certified MOP in order to remain compliant with the class location requirements of Canadian Standards Association Oil & Gas Pipeline Systems standard CSA Z662[7] without undertaking pipeline replacement.

Table 3-1: ITS Pipeline Construction

	Pipe Segment:	Diameter:	Current Maximum Operating Pressure (kPag):	Original Maximum Operating Pressure (kPag):	Original Construction Year:	Segment Length (km):
1	Savona to SN3	NPS 12	6619	6619	1957	32.1
2	SN3 to SN8-1	NPS 12	5171	6619	1957	145.9
3	SN8-1 to SN9-3	NPS 12	4654	6619	1957	32.5
4	SN9-3 to SN10-3 & Ellis Creek	NPS 12	5171	6619	1957	35.3
5	SN10-3 to Penticton	NPS 12	4826	6619	1957	0.9

[5] Refer to BCUC Order C-4-94 and decision associated with the Application for a Certificate of Public Convenience and Necessary for the Southern Interior System Reinforcement.

[6] Refer to BCUC Order C-11-99 and decision associated with the Application for a Certificate of Public Convenience and Necessary for the Southern Crossing Pipeline Project.

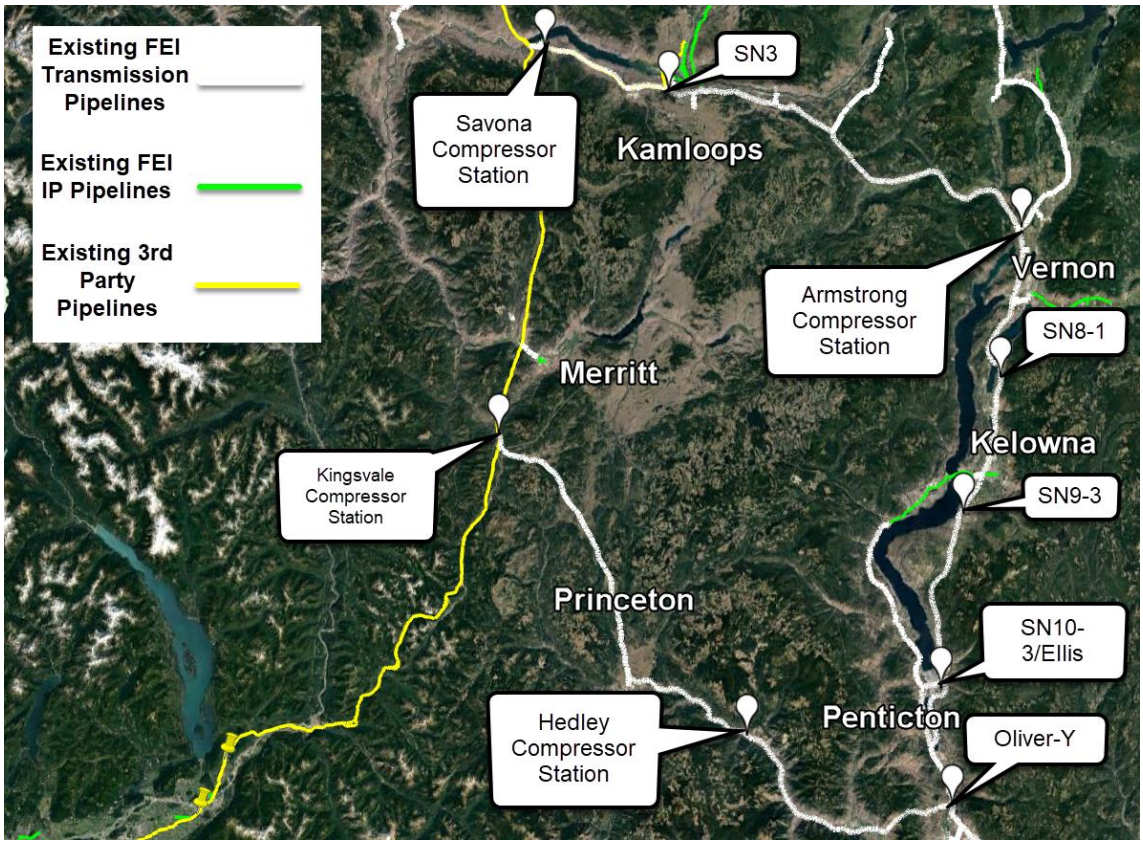
[7] CSA Z662:19 Clause 10.7 outlines processes for addressing a class location change around a transmission pipeline. This clause lists appropriate measures a pipeline operator can take to modify its system to conform to the requirements of the code based on the new class location. In clause 10.7.5, pressure deration is specified as an appropriate interim measure, which can be used until upgrades are undertaken which would allow a pipeline to be restored to its original MOP. In this case, FEI has chosen to permanently derate the pipeline MOP.

	Pipe Segment:	Diameter:	Current Maximum Operating Pressure (kPag):	Original Maximum Operating Pressure (kPag):	Original Construction Year:	Segment Length (km):
6	Penticton to Oliver-Y	NPS 10	4826	6074	1957	30.8
7	Oliver-Y to Trail @ SN17	NPS 10	5309	6074	1957	155.9
8	Trail to Castlegar	NPS 8	4757	6668	1957	23.6
9	Castlegar to Nelson	NPS 6	4757	6640	1957	37.4
10	Kingsvale to Oliver	NPS 12	7825	7825	1971	162.8
11	East Kootenay Link (Yahk to Trail)	NPS 12	7136	7150	1975	163.3
12	Oliver to Penticton Loop (SONG Pipeline)	NPS 16	7825	7825	1994	31.8
13	Westcoast Savona Pipeline Tap to Savona Compressor Station	NPS 20	6619	6619	1997	2.5
14	SCP (Yahk to Oliver)	NPS 24	9930	9930	2000	302.5

Pipeline endpoints designated as SN-X in the table are not all shown on the overview map of the ITS, but are shown in the enlarged region graphics below. These are points at which pipeline MOP and/or diameter change.

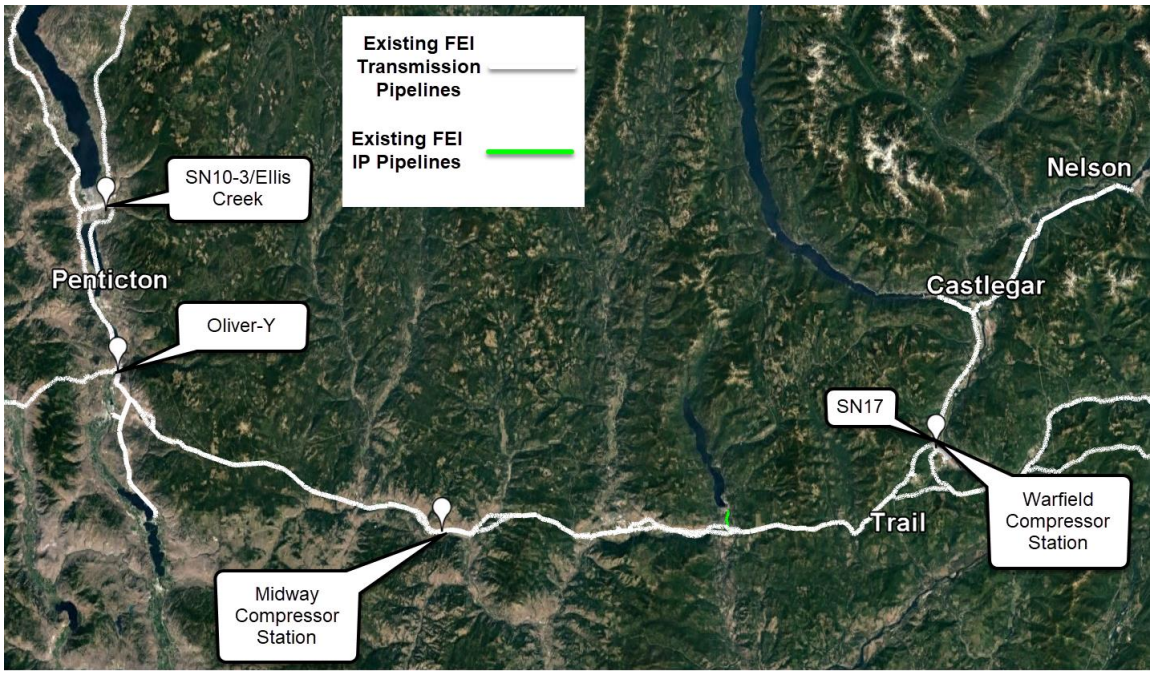
The Figures 3-2 through 3-4 below show the pipeline endpoints listed.

Figure 3-2: Savona – Penticton Region Pipeline Endpoints



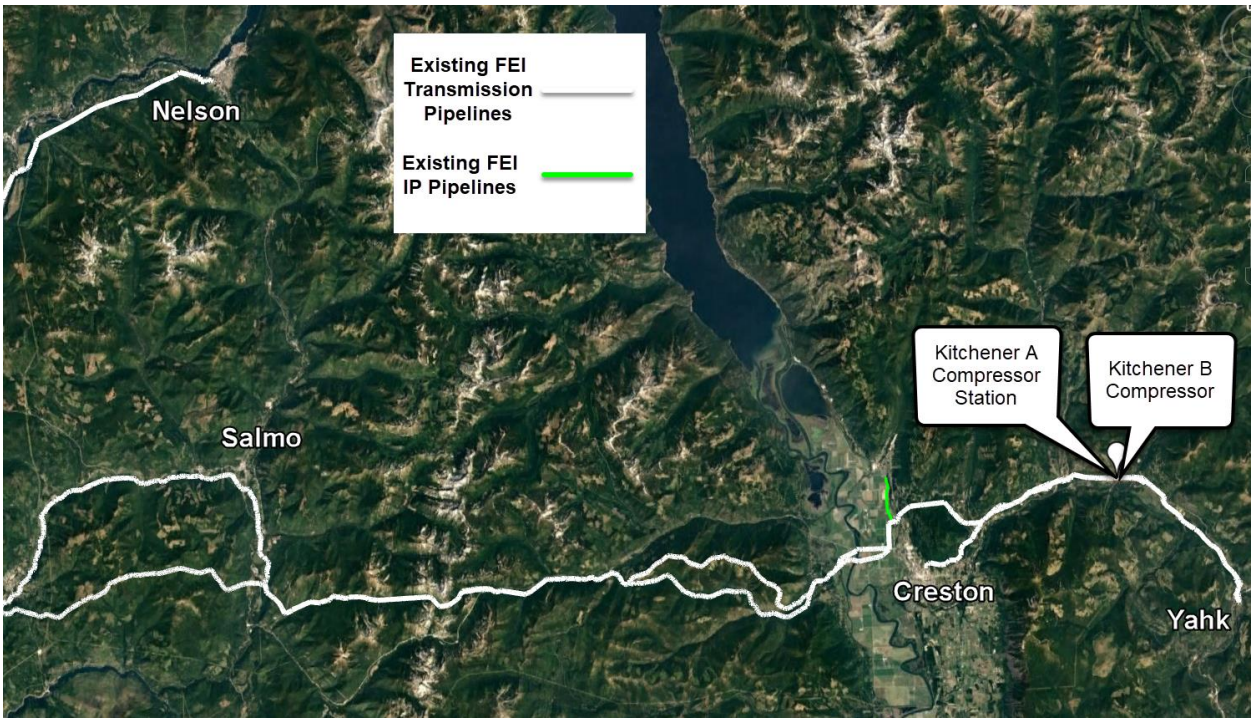
Source: Google Earth overlaid with FEI transmission pipeline location data (10/19/2020)

Figure 3-3: Penticton – Nelson Region Pipeline Endpoints



Source: Google Earth overlaid with FEI transmission pipeline location data (10/19/2020)

Figure 3-4: Nelson - Yahk Region Pipeline Endpoints



Source: Google Earth overlaid with FEI transmission pipeline location data (10/19/2020)

3.3 PEAK DEMAND IS EXPECTED TO INCREASE RESULTING IN CAPACITY SHORTFALL

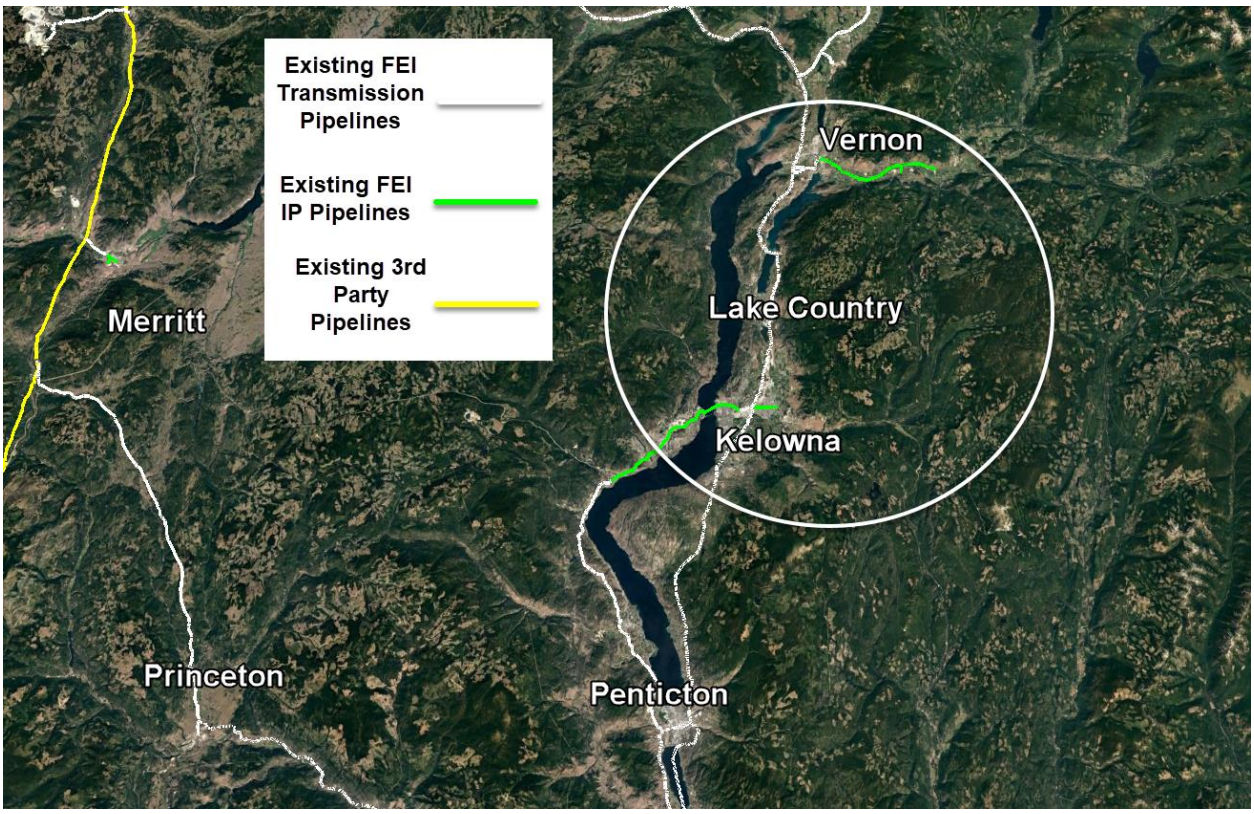
As mentioned above, since the construction of the SCP in 2000, the population in the Okanagan region has continued to increase, mainly focused around urban centres such as Kelowna and Penticton. With a population of over 140 thousand (including its surrounding area), Kelowna is the largest urban centre in the British Columbia Interior. Kelowna has also been one of the fastest growing cities in Canada during the past decade.[8] During the 20-year period from 1996 to 2016, Kelowna's population increased by over 37 percent. This represents an average annual growth rate of 1.6 percent and is forecast to continue for the next 20-year period.[9]

Currently, approximately 60 percent of the demand on the ITS is concentrated in the Okanagan region, which includes Kelowna. The population growth in this area has led to a corresponding increase in the demand for gas, and thus an increased demand on the ITS. Increasing industrial load (including greenhouse operations, winery operations, and new CNG fuelling stations, along with other industrial customers on the system) has also contributed to the increase in demand. As a result, the midpoint of the ITS, located in the North/Central Okanagan (shown within the

[8] Statistics Canada, Table 17-10-0135-01, Population estimates, July 1, by census metropolitan area and census agglomeration, 2016 boundaries. July 1, 2018 data.
[9] Population projections prepared for FBC by BC Stats.

circled region in Figure 3-5), furthest from the major gas supply points, is approaching its capacity limit.

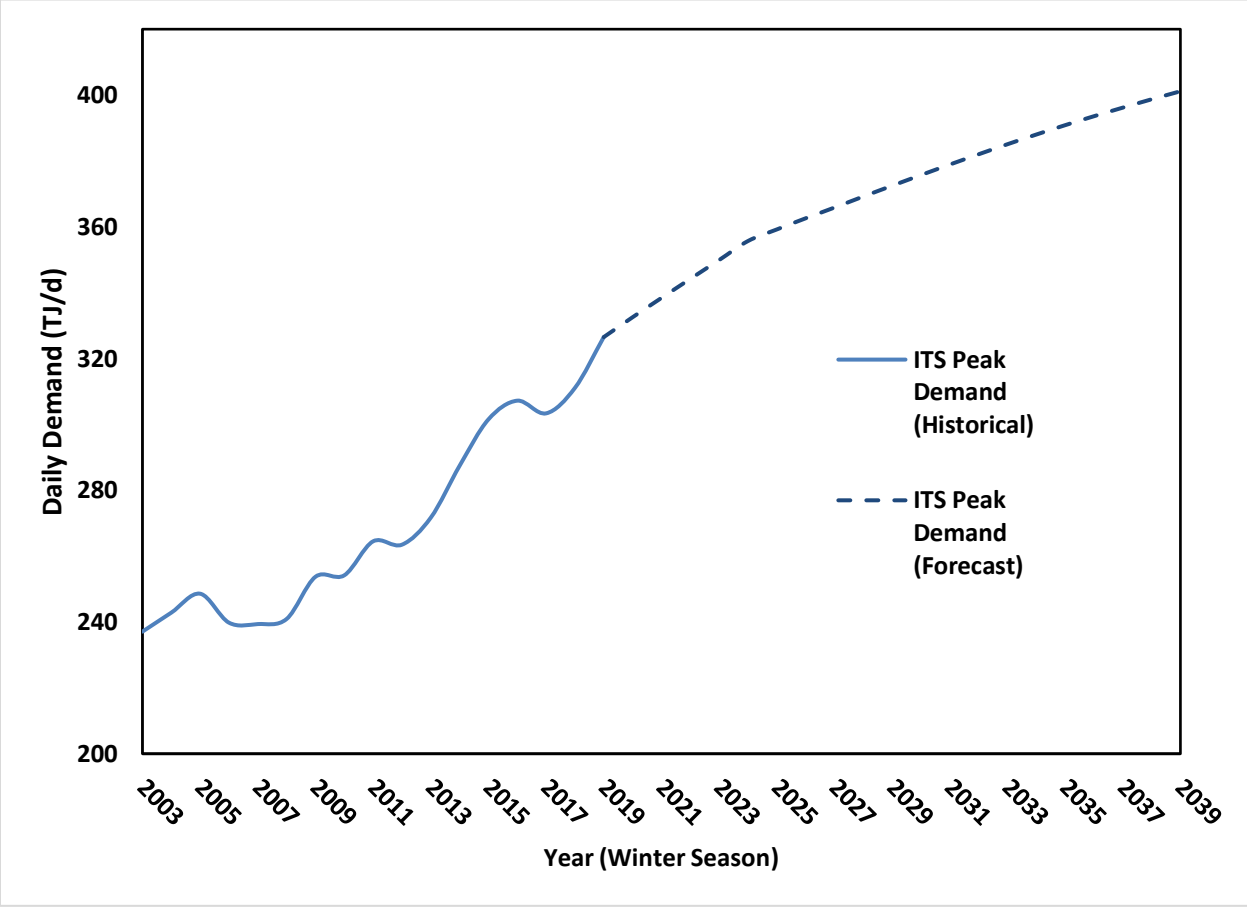
Figure 3-5: Capacity Shortfall Region



Source: Google Earth overlaid with FEI transmission pipeline location data (10/5/2020)

Figure 3-6 below illustrates the historical increase in peak demand as well as the forecast increase in peak demand on the ITS according to historical loads and the 2019 load forecast (the most recent load forecast at the time of project development).

Figure 3-6: ITS Historical and Forecast Peak Demand



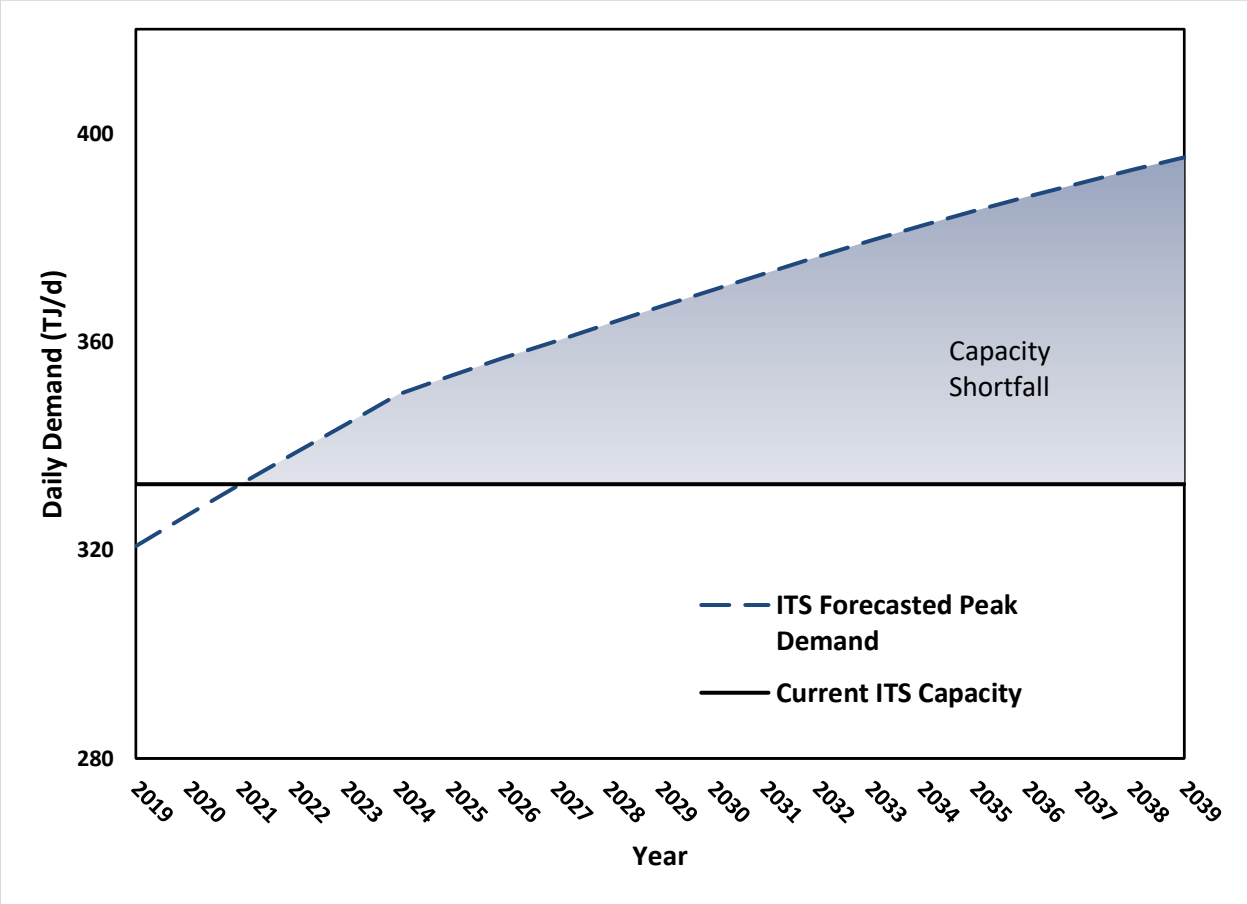
In simple terms, current peak demand is determined by extrapolating the observed variation of existing customers' daily consumption versus temperature to the region's system design temperature.[10] Peak demand is forecast by incrementally adding the peak demand of forecast customer additions in each year of the forecast to the previous year's peak demand. FEI's system capacity planning team refreshes its forecast annually, based on the most recently available customer addition and consumption data.

Figure 3-7 below illustrates the current capacity limit of the ITS under peak cold winter conditions versus the forecast increase in demand across the whole ITS (as shown previously in Figure 3-6), with the capacity shortfall shown as the shaded region under the demand curve. Note that the forecast demand curve meets the current ITS capacity line in 2021, suggesting that the ITS will reach its capacity limit in the winter of 2021/2022. However, FEI's system capacity planning group has identified short-term mitigation measures that can be used through the winter of 2021/2022 and 2022/23, if required, to manage the peak load within the available

[10] System design temperature is determined for each region by calculating the coldest day which is statistically likely to occur once in a 20-year period. FEI's system is designed to meet the peak demand which would occur during this extreme cold weather event. The statistical 20-year low is calculated using information from local weather stations, and is updated as weather trends change.

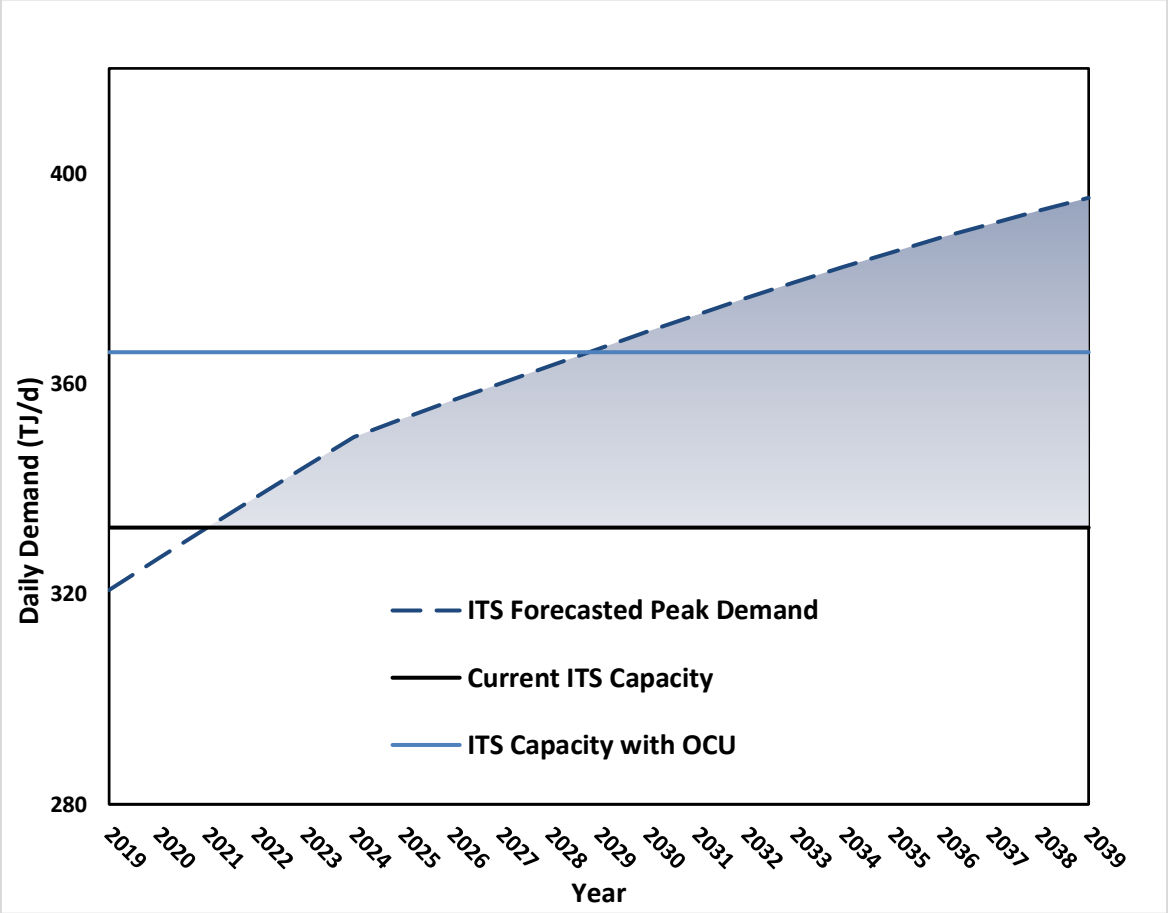
system capacity while FEI implements a practical long-term solution. These short-term mitigation measures are described further in Section 4.2 of the Application.

Figure 3-7: ITS Peak Demand vs. Capacity



For reference, Figure 3-8 below illustrates both the current capacity and the capacity of the ITS following completion of the OCU Project. The figure shows that, with the OCU Project, there will be sufficient capacity to support peak demand until the winter of 2029/2030. FEI explains in Section 3.3.2.4 below the compression upgrades that would be undertaken at that time to further support peak demand to the end of the 20 year forecast period without extending the OCU Project pipeline.

Figure 3-8: ITS Peak Demand vs. Capacity After Completion of OCU Project



FEI's methodology for calculating forecast peak demand and the assumptions used to determine the current ITS capacity are described in Sections 3.3.1 and 3.3.2 below, respectively.

3.3.1 Peak Day Demand Forecast Methodology is Consistent with Prior Applications

The peak day demand forecast methodology that FEI used to assess the need for the OCU Project is consistent with the methodology FEI has used in previous CPCN applications and long-term resource plans filed with the BCUC.

The calculation of the forecast peak day demand in any year can be described by the following formula:

$$Peak\ Day\ Demand_{(Year\ N)} = \sum_{i=1}^{3} (\sum \text{Current Accounts} \times UPC_{peak} + \sum \text{Forecasted Accounts to Year N} \times UPC_{peak})_{(rate\ schedule\ i)} + \sum \text{Industrial Customer Maximum Demand} + \sum \text{Contract Obligations for Interruptible Customers}$$

There are three main elements of this calculation:

1. **Calculation of Peak Day Demand for Residential and Commercial Customers:** FEI determines the peak demand of residential and commercial customers connected to and consuming gas on the ITS by multiplying the three-year average peak use per customer (UPC_{peak}) for each rate schedule by the number of current customers in the system in each residential and commercial rate schedule. FEI then multiplies the three-year average UPC_{peak} for each of the rate schedules by the forecast number of new customer accounts in each rate schedule for each year of the forecast, and adds this to the peak demand for current customers. FEI does not modify the UPC_{peak} values over the forecast period. Further detail on this calculation is provided in Sections 3.3.1.1 and 3.3.1.2 below.

2. **Maximum Demand from Firm Industrial Customers:** For firm industrial customers with available hourly consumption data, FEI determines the UPC_{peak} for each customer directly from the hourly data. The peak day demand is determined based on the maximum demand observed in the hourly consumption of the customer and assumes that consumption would be sustained over a day. The peak day demand is therefore equivalent to a peak day flow.

   If an industrial customer has made a contractual commitment to increase their future firm load, this incremental load is included in the peak day demand forecast. Otherwise, FEI does not include any change in industrial customer numbers or demand due to the uncertainty associated with the location and magnitude of consumption needs of future customers in industrial rate schedules.

3. **Only Contracted Firm Demand from Interruptible Customers:** For interruptible rate schedules, only the contracted firm component of the customers' daily demand (if any) is included in the peak day demand forecast. The firm demand is assumed to be sustained throughout the day at the contract amount. FEI's peak day demand forecasts do not include any the interruptible portion of the demand.

In the subsections below, FEI provides further detail on how it calculates the peak UPC and forecast growth for residential and commercial customers. Unlike FEI's industrial customers whose load does not generally fluctuate with temperature, residential and commercial customers' peak load needs to be determined considering the coldest day for which the system is designed to operate.

3.3.1.1 *Peak Use Per Customer (UPC_{peak}) Calculation for Residential and Commercial Rate Schedules*

For customers with meters that are read monthly (typically residential and commercial customers), the peak day consumption must be calculated from monthly meter readings. As part of a "load gather" process, FEI extracts each customer's monthly billing information for the preceding two-year period. Using a custom software application, the customer billing information and temperature information from the local weather zone index weather stations is reduced to a daily average demand (for the customer in each billing period) and an average mean daily

temperature for the corresponding billing period. This results in twenty-four "daily demand" versus "mean daily temperature" data points, determined based on the customers' most recent 24 months of consumption. A linear regression for each customer is performed on this data and the base load and slope (standard meters^3/day/degree Celsius) is calculated. The peak day demand for the customer equates to the customer's demand, projected using the derived base load and slope to the Design Degree Day (DDD) temperature for the weather zone where the customer resides. This results in an estimate of the daily demand on the Design Degree Day.

FEI's DDD temperature for any system operating within a region is the coldest day that is statistically likely to occur only once in any given 20 year period. In determining the DDD value, FEI uses an extreme value statistical method called the Gumbel Method of Moments. This method returns the expected extreme value for a given historical data set based on a specified return period. FEI uses a 1 in 20 return period on a data set that represents the coldest recorded daily mean temperature at the region's weather station each winter over a 60 year period.

The DDD temperature values for weather zones in the ITS range from a 46.7 Degree Day (DD) (corresponding to minus 28.7°C mean daily temperature) in the Thompson region, to a 43.9 DD (corresponding to minus 25.7°C mean daily temperature) in the North and Central Okanagan region, to a 39.1 DD (corresponding to minus 21.7°C mean daily temperature) in the South Okanagan region. The regional DDD values are based on a 60 year weather history as reported by Environment Canada at the Kamloops Airport, Kelowna International Airport, and Penticton Regional Airport weather stations, respectively.

FEI accounts for variations across the region served by the ITS by calculating average UPCs at a more local level. For the portion of the ITS most impacted by the capacity constraint addressed by the OCU Project, FEI calculates UPC_{peak} values in ten local regions, each comprising one or more municipal districts between Kamloops and Penticton. The peak demand in these locales, especially in the region circled in Figure 3-5: Capacity Shortfall Region above, is most influential on the timing of the capacity constraint.

To smooth typical annual variances in the data, FEI uses an average of the three most recent annual UPC_{peak} values for each rate class within the regional average.

As described in the formula in Section 3.3.1 above, the number of current accounts and account addition forecasts are multiplied by the three-year average UPC_{peak} values to produce peak load forecasts over a forecast period.

3.3.1.2 *Growth Forecasting Methodology for Residential and Commercial Rate schedules*

FEI's forecast of the number of residential and commercial customer accounts projects future account growth in these rate classes.

To prepare the account forecast, FEI started with actual 2019 year-end customer counts for all residential and commercial rate schedules for each municipality. These customer totals are associated with a municipality, a local health authority (LHA) and a region.

FEI then prepares a 20-year account forecast for all residential and commercial rate schedules at the municipal, LHA, and FEI region level. The forecast uses the 20-year household[11] formation (HHF) forecast prepared by BC Stats at the LHA level. The HHF forecast is the forecast of household formations in each LHA. The HHF forecast is provided in terms of year-over-year growth rates for each LHA.

FEI applies the relevant LHA growth rates to the customer counts in each municipality to develop a 20 year customer forecast for each municipality. These forecasts are aggregated to the FEI regional level (Lower Mainland, Inland, Columbia, Vancouver Island, Whistler, Revelstoke, or Fort Nelson).

To maintain consistency with FEI's rate setting forecast, FEI "trues up" each year of the more granular BC Stats/LHA forecast to the regional rate-setting forecast. For residential customers, the rate-setting forecast uses the single family/multi-family growth rates from the Conference Board of Canada (CBOC) forecast. The CBOC forecast is applied province-wide and does not provide the regional granularity of the BC Stats/LHA method. The commercial rate-setting forecast uses a three-year average of customer additions. To "true up" the forecast, FEI factors the municipal forecasts up or down so that the aggregate sum by region matches the CBOC method, but the differences by LHA remain. This has the advantage of maintaining consistency with FEI's rate-setting aggregate forecast, while also providing a granular forecast that is reflective of the growth patterns forecast by the BC Stats/LHA method.

The following high level example demonstrates the method.

Municipality	FEI Region	LHA #	LHA Growth Rate (2020)	Municipality 2019 Actual RS 1 Customers	Aggregate Inland Customer Additions, 2020, CBOC Method	Aggregate Inland Customer Additions, 2020, LHA Method
Kelowna	Inland	23	1.29%	38,852	2,450	1,993

$$Kelowna\ 2020\ Customers\ Additions = 2019\ Customers\ X\ LHA\ Growth\ Rate$$

$$Kelowna\ 2020\ Customers\ Additions = 38{,}852\ X\ 1.29\% = 500$$

$$True\ Up\ Factor = \frac{CBOC\ Inland\ Aggregate\ Forecast\ Additions}{LHA\ HHF\ Inland\ Aggregate\ Forecast\ Additions} = \frac{2{,}450}{1{,}993} = 1.23$$

$$Kelowna\ 2020\ Customer\ Additions = 500\ X\ 1.23 = 614$$

The method described is applied to all municipalities for the duration of the LHA and CBOC forecasts (both 20 years in duration).

[11] BC Stats uses the Statistics Canada definition of a household as follows: "Household refers to a person or group of persons who occupy the same dwelling and do not have a usual place of residence elsewhere in Canada or abroad. The dwelling may be either a collective dwelling or a private dwelling. The household may consist of a family group such as a census family, of two or more families sharing a dwelling, of a group of unrelated persons or of a person living alone. Household members who are temporarily absent on reference day are considered part of their usual household. A household formation is the formation of a new household."

The commercial method is the same as the above example, except that the three-year average method for commercial customer additions is used instead of the CBOC forecast.

The resulting account forecast provides a more detailed estimate of account growth in municipalites with the regions that is not available with using the CBOC forecast alone. The forecasted account additions each year are combined with the UPC_{peak} values to determine the incremental increase in peak demand in each community across the ITS.

3.3.2 Assumptions Relevant to Determination of Current ITS Capacity

As shown in Figure 3-7, the available capacity of the ITS in the central Okanagan will exceed the demand in the winter of 2021/2022 if FEI does not take any mitigation measures. The capacity of the ITS to support forecast peak demand in the Okanagan is defined by assumptions FEI makes about minimum supply pressure available at the boundaries of the system, and assumptions about the minimum acceptable delivery pressure at critical points along the system under peak demand. Based on these assumptions on supply pressures, FEI models the capacity of the pipe and compression facilities, considering the effect of local capacity constraints and system line pack, to meet the minimum delivery pressure at these critical points. The following sections provide additional details on these key components to determining the system capacity.

3.3.2.1 *Minimum Supply Pressure and Minimum Delivery Pressure*

Under peak demand conditions, gas flows into the central Okanagan from the north from the Westcoast system at Savona where FEI assumes[12] a minimum delivery pressure of 4135 kPa (600 psig) and from the south from gas supplied originally from TC Energy at Yahk where FEI assumes a minimum delivery pressure of 4480 kPa (650 psig). Gas from Yahk is transported via the SCP and the SONG pipeline north to Penticton and into the NPS 12 Savona to Penticton mainline. The gas supplies from the north and south converge at the lowest pressure point within this portion of the ITS, typically near the Polson Gate Station on the south side of Vernon.

FEI designs the ITS to deliver a minimum inlet pressure of 2415 kPag (350 psig) into the major gate stations serving downstream Intermediate Pressure (IP) systems on a peak day. This minimum pressure is the parameter that defines the ITS capacity limit. This minimum pressure is identified as the primary capacity constraint for this region in order to maintain a 350 kPag (50 psig) working pressure differential across Polson Gate Station and Kelowna #1 Gate Station that supply IP systems that operate at 2070 kPag (300 psig), supplying thousands of customers. This minimum delivery pressure ensures a reasonable working pressure across the station always exists to accommodate effective sizing and operation of the station regulators and other station equipment.

[12] This assumed minimum is based on historical observed minimum pressures.

3.3.2.2 *Reduced MOP Due to Class Location Changes Results in Local Capacity Constraints*

The ITS serving the Thompson Okanagan region has several regions where pressure is controlled below the original MOP to ensure pipeline safety factors associated with CSA Z662 class locations requirements. These pressure-controlled regions are identified in Table 3-1 above, with the segments most relevant to the OCU Project listed in rows 2 to 5. These portions of the pipeline can provide a local constraint on capacity. The most significant constraint on maintaining minimum pressure into the north and central Okanagan is the pressure limitation to 5171 kPag (750 psig) between Ellis Creek Control Station in Penticton and the SN9-3 Control Station south of Kelowna. The OCU Project will address this constraint by providing the ability to supply gas into the NPS 12 Savona to Penticton mainline at the maximum 5171 kPa at a point more than 28 kilometres closer to the major load centres on the ITS in the Central Okanagan.

3.3.2.3 *FEI's ITS Capacity Assessments Account for System Line Pack*

For larger transmission systems such as the ITS, FEI bases the peak demand loading on a daily demand modified by a transient factor to account for system line pack. Because of a combination of their extended length, larger diameter and higher operating pressure, transmission systems can contain a large inventory of gas within the system that can provide a capacity benefit. This inventory is commonly referred to as line pack. Line pack within a transmission system gives the system, for limited durations, the capability to deliver higher demand out of the system than may be entering the system by relying on the pipeline line pack to contribute the difference. The imbalance cannot be sustained indefinitely. The successful application of line pack to supplement the system capacity relies on sufficient periods of lower system demand to occur where input into the system can exceed current demand and rebuild the line pack within the system to be available for future periods of peak demand. The ITS experiences continuous daily cycles in demand where line pack is constantly in flux alternating between periods of depletion followed by periods of regeneration. FEI accounts for this capability by applying the transient factor to the peak demand. The transient factor adjusts the magnitude peak load used for system design to a value lower than the hourly peak demand actually experienced on the system on a peak day, reflecting that the balance can be provided by the system line pack.

3.3.2.4 *Existing Compression Capabilities Expected to Be Adequate Until 2029-30*

ITS compression facilities relevant to the OCU Project are located at two locations. For the Westcoast system supply in the north, compression is provided at Savona (west of Kamloops). The Savona compressor discharges at a maximum of 6619 kPa and has a maximum available power of 3100 HP. Under peak demand, Savona is operated at its maximum 3100 HP. For the TC Energy supply in the east, compression is provided at FEI's Kitchener B compressor facility northwest of Yahk which compresses gas into the SCP for delivery to FEI's Oliver control station. From there, gas flows north into the Okanagan. The Kitchener B facility discharges at a maximum of 9930 kPag (1440 psig), and has a maximum available power of 10,952 HP. The compression available at Kitchener to move gas from the TC Energy supply at Yahk through the

proposed OCU gas line into the Okanagan is sufficient without need for upgrade for the early part of the forecast, up to the winter of 2029-30.

Based on the current forecast, by the summer of 2029 FEI will need to upgrade the compression capability on the SCP to improve capacity into the Central and North Okanagan. FEI is currently considering several possible options to increase compression capability on the SCP to meet a variety of possible future needs. As the compression requirement to address future capacity needs in the Okanagan is several years beyond the immediate need for the OCU Project, and the optimal location and extent of required additional compression cannot yet be determined, FEI did not include a compressor upgrade in the OCU Project. Compressor requirements to satisfy the longer term capacity needs would be included, as needed, as part of any expansion project contemplated on the SCP.

With an appropriate increase in compression on the SCP by 2029, the proposed OCU Project is forecast to be sufficient to meet capacity needs for the 20-year planning horizon, with no additional major pipeline infrastructure needed. The need for compression will be addressed at a later point in the forecast period to ensure that the project is designed and scheduled appropriately to meet FEI's evolving capacity need.

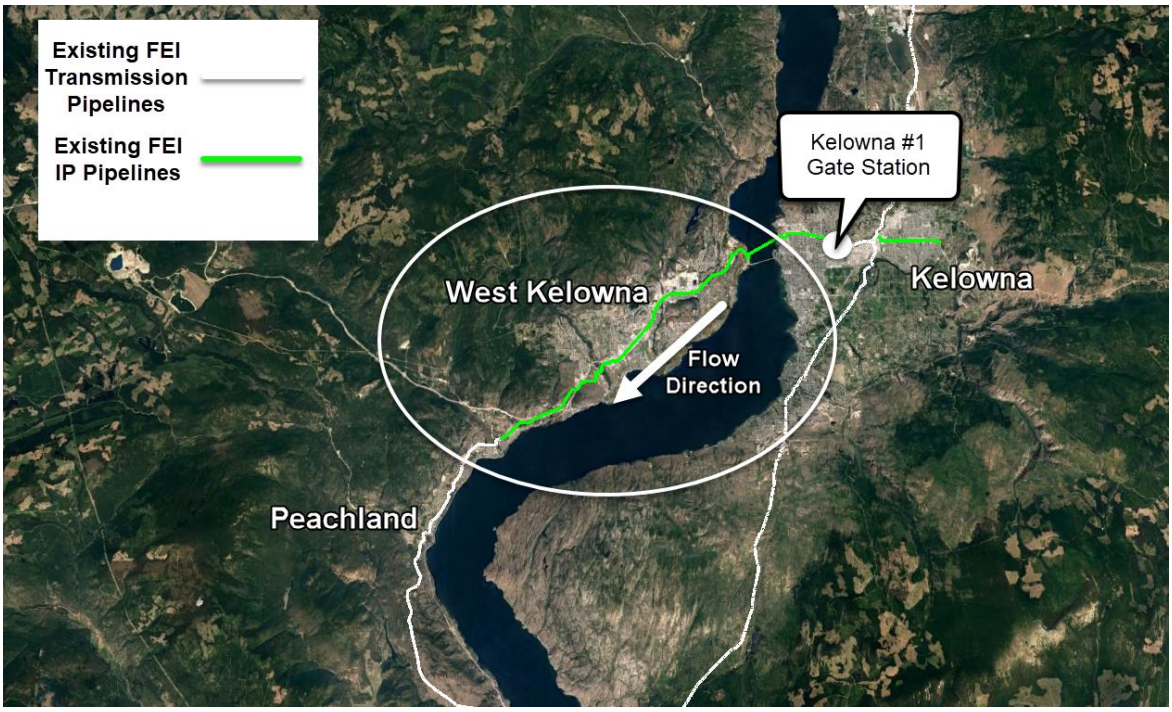
3.3.3 Capacity Shortfall Will Negatively Impact Residential and Commercial Customers

The most severe consequence of a capacity shortfall would be a loss of FEI's ability to reliably serve customers in the Okanagan region during the winter season. As temperatures drop and heating load increases, curtailment of interruptible and non-interruptible[13] commercial and residential customers becomes increasingly likely if customer demand exceeds the design capacity limits of the system.

Figures 3-9 and 3-10 below illustrate the communities which are at greatest risk of a capacity shortfall (West Kelowna, Lavington, and Lumby).

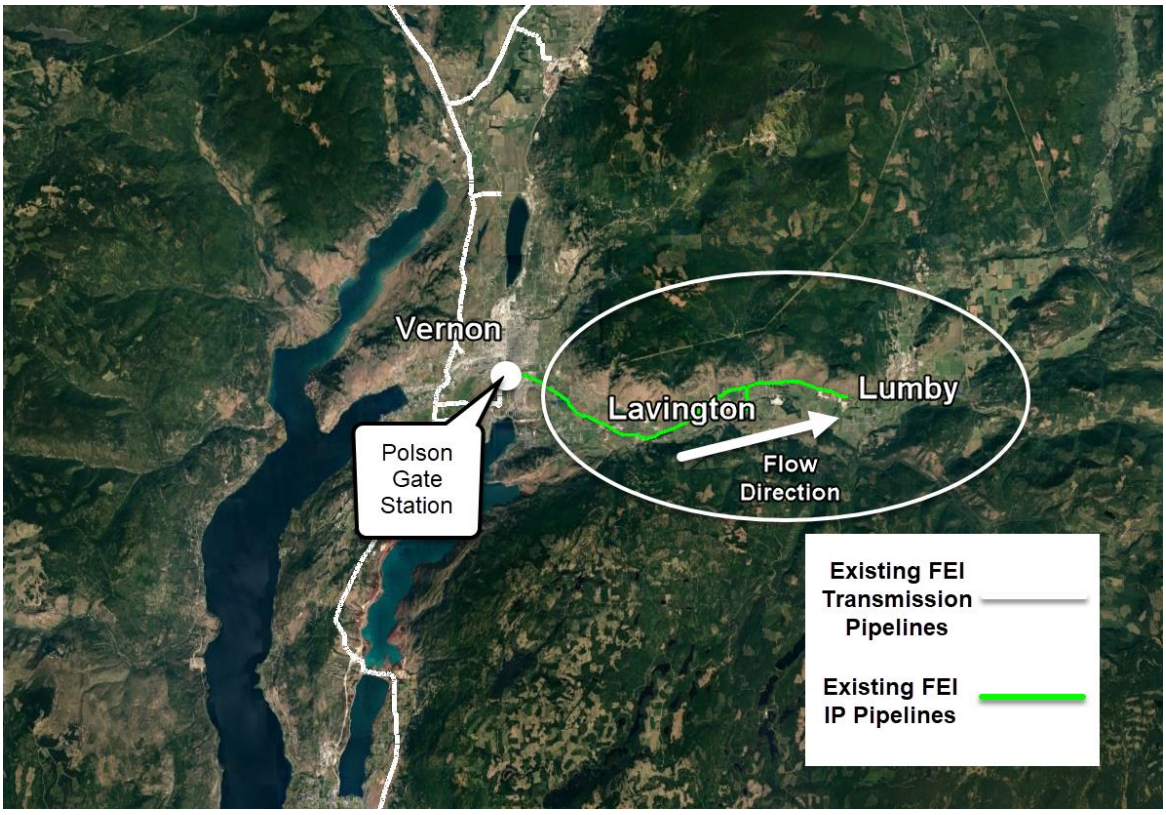
[13] Certain large industrial and commercial gas customers have elected for "interruptible" service, which means that they can be curtailed and need to stop consuming gas and switch to alternative fuels under peak weather conditions. This curtailment is necessary to free up capacity on the FEI system when the demand from firm core residential and commercial customers ramps up under peak weather conditions. These interruptible customers receive lower rates in exchange for this potential inconvenience and disruption. As previously noted, interruptible demand is not considered when determining forecasted peak demand.

Figure 3-9: West Kelowna and Peachland



Source: Google Earth overlaid with FEI transmission pipeline location data (10/5/2020)

Figure 3-10: Lavington and Lumby



Source: Google Earth overlaid with FEI transmission pipeline location data (10/5/2020)

As population growth in the area continues, the capacity shortfall will become more severe and more customers will be at risk of losing service even during lighter load periods. At the same time, the number of gate stations in the Okanagan experiencing insufficient pressure under peak demand will grow and the number of customers projected to be impacted will increase and extend to other communities in the Okanagan region.

FEI's customer profile in this region has evolved over time such that it has fewer large interruptible industrial customers like pulp mills that can be quickly curtailed in a supply emergency. This means that the necessary curtailment volumes to make a meaningful difference in load have to be obtained from a larger pool of smaller non-interruptible or firm customers. Consequently, any capacity shortfall would predominantly impact residential, commercial (e.g. restaurants and shopping malls), and institutional customers (e.g. schools, hospitals, and community centres).

The first regions to experience a capacity shortfall would be the communities of West Kelowna, Lavington, and Lumby (shown in Figures 3-9 and 3-10 above). The systems in these communities are supplied by the Kelowna #1 Gate Station and the Polson Gate Station, which require inlet pressures sufficient to maintain an adequate pressure differential between transmission inlet pressure and discharge pressure. Due to their approximate midpoint location on the ITS mainline, the inlets of both stations experience the lowest pressures experienced on the ITS, and current forecasts indicate that the inlet pressures would be insufficient to operate the stations in the case of extreme cold conditions during the winter of 2023/2024. Customers served by the Kelowna #1 Intermediate Pressure system currently number approximately 16,300 in West Kelowna and the customers served by the Polson Intermediate Pressure system in Vernon number over 2,000 in Lavington and Lumby. Should a capacity shortfall resulting in insufficient system pressures occur, FEI would be required to curtail customers in these regions, shedding load from the system in order to maintain pressure and preserve supply to remaining customers. In a worst-case scenario, should it become impossible to shed sufficient load via curtailment of interruptible customers, core customers (i.e., firm supply customers) in these areas may be impacted by a loss of their gas supply. In this case, these customers could be without gas for heat, hot water, and cooking for an extended period depending on the extent of the shortfall.

3.3.4 The Project is Necessary Despite Uncertainty in COVID-19 Impacts

FEI's peak demand forecast was prepared in 2019, before the onset of the COVID-19 pandemic. As of the date of filing, there is insufficient data to quantify the COVID-19 impact, to forecast its future impacts on energy consumption or, more importantly for system planning, its impact on peak loads. FEI acknowledges that the immediate and near-term impacts of the pandemic may be significant for some types of customers and economic sectors. However, FEI presently has insufficient information to quantify these impacts. Furthermore, there is no firm evidence to confirm that any decreases in overall gas demand will be long lasting. Due to this inability to predict what the lasting impacts may be, FEI does not believe that the execution of this critical system capacity addition project should be deferred due to the COVID-19 pandemic.

In the near term, COVID-19 may result in commercial loads declining due to business closures (in compliance with public health orders or resulting from general economic conditions). However, there are also some factors that may mitigate the economic impacts of COVID-19 as they relate to peak load forecasting. For example, FEI expects there to be some offsetting increase in residential heating loads, due to individuals working from home or spending more time at home. Further, some impacts will be temporary and may be resolved quickly, but FEI cannot forecast the timing and magnitude of full recovery. At this time, FEI has no information available to quantify the impact on other customer classes or economic sectors.

FEI noted above a number of possible factors that could act to increase load above the load forecast presented above, including expanding greenhouse operations, winery operations and new CNG fuelling stations, along with other industrial customers. Since the occurrence of COVID-19, FEI continues to receive inquiries and requests for preliminary planning for several projects. FEI cannot conclude that COVID-19 will result in the deferral or cancellation of these potential additional loads.

In summary, given the lack of firm information on COVID-19 related impacts on the peak load in 2023/2024 and future years, the continuing potential for significant new loads in urban centres like Kelowna, the limitations of existing short-term mitigation measures, and the lead time required for a project of this nature, FEI concludes that it would not be prudent to delay the addition of ITS capacity and that the OCU Project should proceed as set out in this Application.

3.4 *ITS DELIVERY CAPACITY MUST BE INCREASED TO MEET FORECAST DEMAND*

FEI is committed to providing reliable service to its customers. As such, the inability to reliably serve customers due to a shortage of capacity on the ITS during an expected 1 in 20 year weather event is considered unacceptable.

FEI must also maintain adequate system capacity such that customer additions can be accommodated. Section 28 of the UCA states that a utility must provide service upon request, should the supply line be near the property requesting service.[14] Without an increase in ITS capacity, FEI will be unable to satisfy future growth in gas demand caused by new customer additions.

The need to address a future capacity shortfall in the Okanagan area was previously identified in FEI's December 14, 2017 Long Term Gas Resource Plan (LTGRP) filing:[15]

> The ITS peak demand will reach pipeline capacity when the system cannot maintain minimum system pressures near the high load centres in the central

[14] Section 28 of the UCA provides in part: "On being requested by the owner or occupier of the premises to do so, a public utility must supply its service to premises that are located within 200 metres of its supply line or any lesser distance that the commission prescribes suitable for that purpose".
[15] 2017 LTGRP, page ES-8.

> Okanagan region. Expected load growth will cause an expansion requirement to address this constraint in 2022.
>
> For each regional system, higher or lower than expected load growth could shift the timing of system expansion requirements either ahead or further out in time. The potential for additional new, large industrial demand could create a step change in load delivery requirements and a corresponding advancement of system expansion requirements.

Further, the Project was also identified as a potential major project in Section 3.3.3.3 of the FEI 2020-2024 Multi-Year Rate Application filing. In that section it was noted that:

> FEI forecasts that by 2022 inlet pressure to Kelowna Gate Station will drop below 2400 kPa and this will result in a shortage of supply to the Kelowna distribution system and the IP pipeline serving West Kelowna.
>
> Several alternatives are currently being reviewed and estimated by FEI to evaluate the best alternative in consideration of the Okanagan capacity needs as well as FEI's long-term system integrity objectives.

A clear need exists to increase the delivery capacity of the ITS such that FEI can continue to provide reliable gas supply to the communities within its service territory during peak demand periods, now and into the future. FEI has identified options for the OCU Project which will provide the necessary additional ITS capacity to meet FEI's 20-year demand forecast[16], and this need to provide long-term safe and reliable gas service is the primary driver for the OCU Project.

3.5 *CONCLUSION*

The population and consequent development in the Okanagan region has grown since the ITS was initially constructed in the 1950s. Over time, upgrades to the system have been undertaken to maintain reliable gas supply to the surrounding communities. The most recent major upgrade was in 2000, and since then, the population has increased significantly in the major centres of Vernon, Kelowna and Penticton. FEI's recent forecasts indicate that this increase in population and the increase in gas use by all types of customers will lead to a shortfall in ITS capacity by the 2023/2024 winter peak demand period. If this situation is not addressed, capacity shortfalls and the resulting curtailment of customers will become increasingly likely and widespread.

FEI examined several alternatives to address this situation. The solution proposed in the Application to increase the delivery capacity of ITS is the appropriate response to meet the peak

[16] As noted in Section 3.3.2.4, FEI may undertake smaller projects within this period to improve compression capabilities in the region or to make upgrades to pipeline laterals as needed. These potential future projects were excluded from the OCU scope as it will be more beneficial to plan and execute these projects if and when they become necessary based on the future peak demand forecasts.

demand requirements in the central and north Okanagan regions, and to ensure that FEI maintains long-term safe and reliable gas service to meet customers' expectations.

4. DESCRIPTION AND EVALUATION OF ALTERNATIVES

4.1 *INTRODUCTION*

As outlined in Section 3, FEI is forecasting load growth in the Okanagan region, which will result in insufficient pressures in portions of the ITS unless a system upgrade is installed. The first impact expected will be the loss of sufficient winter inlet pressures to the Kelowna #1 Gate Station and the Polson Gate Station, which may occur as early as the winter of 2021/2022. With the reduction in inlet pressure, FEI would lose the capability to deliver gas to customers in portions of the Okanagan on winter days that approach system design conditions. The OCU Project therefore has the following project objectives:

1. Increase the delivery capacity of the ITS to meet peak demand requirements and to maintain safe and reliable gas service to FEI customers in the central and north Okanagan regions; and

2. Ensure all construction related activities are completed in time for the winter of 2023/2024 to avoid service interruptions to customers.

As explained in the following section, FEI has determined that short-term mitigation measures may be required to maintain sufficient capacity for the winters of 2021/2022 and 2022/2023. However, these interim measures are not viable to support projected demand in 2023/2024, and a longer-term solution must be implemented prior to this point.

4.1.1 Short-Term Mitigation Measures are Possible to Maintain Capacity for Winters of 2021/2022 and 2022/2023

All Project alternatives rely on the implementation of short-term mitigation measures to address the possibility of a capacity shortfall during the winters of 2021/2022 and 2022/2023. Short-term mitigation measures include options such as maximizing the utilization of the currently available capacity within the system by temporarily allowing lower station inlet pressures where existing stations are capable; increased pressure monitoring; increased minimum pressure from supplier; and minor station upgrades. While these measures are adequate to provide some capacity margin in the winter of 2021/2022 and 2022/2023, they do not represent a viable long-term solution, and do not provide FEI with sufficient and reliable system capacity starting from the winter of 2023/2024. A detailed description of FEI's mitigation measures and their limitations is provided in Section 4.2 below.

4.1.2 FEI Has Considered Multiple Alternatives to Address the Capacity Shortfall

In order to meet the Project's objectives, FEI identified and investigated five alternatives, including four pipeline installation options and an LNG (Liquefied Natural Gas) storage/peak shaving option. These alternatives include the following, described in detail in Section 4.3:

- Alternative 1 – ITS Upgrades to VER PEN 323

- Alternative 2 – Modified ITS Upgrades to VER PEN 323
- Alternative 3 – Extension of OLI PEN 406
- Alternative 4 – 508 mm North Loop from Savona
- Alternative 5 – LNG Peaking Plant near Vernon

FEI conducted a comprehensive evaluation of these five alternatives and concluded that Alternatives 4 and 5 do not meet the primary project objectives and are not feasible to implement within the timeframe required to meet capacity requirements. These alternatives were therefore screened out early in the project development phase. The remaining three feasible alternatives (Alternatives 1 through 3) were further analyzed and evaluated using the evaluation criteria specified in Section 4.5.1. These criteria include improving operational flexibility, minimizing impact to the environment and the public, as well as financial criteria.

The remainder of Section 4 describes FEI's alternatives analysis in more detail, including a description of each of the alternatives, the screening of alternatives considered, and the evaluation criteria and methodology used to analyze the three feasible alternatives. As described below, Alternative 3 – Extension of OLI PEN 406 was selected as the preferred solution that best meets the objectives of the OCU Project.

4.2 *DESCRIPTION OF SHORT-TERM MITIGATION MEASURES*

Each proposed Project alternative relies on the implementation of short-term mitigation measures to meet forecasted capacity shortfalls in the winters of 2021/2022 and 2022/2023.

Following recent years of high growth in customer accounts, FEI's forecasts indicate that the capacity to meet peak demand would be exhausted in the winter of 2021-22 if FEI took no interim measures. This timeframe is prior to the projected completion of the OCU Project. As a result, FEI has examined a number of measures that could assist in managing the projected shortfall and provide some capacity margin without impacting customers served by the system. FEI considered mitigation measures that could serve peak demand by:

- Improving peak day pressure at Savona into the north and central Okanagan on the NPS 12 Savona to Penticton mainline;
- Shifting load from the critical stations at Kelowna #1 Gate and Polson Gate to other areas with capacity to temporarily accept the load shift;
- Modifying stations at critical locations to enable them to operate reliably at pressures below FEI's normal design standard minimums; and/or,
- Monitoring and managing existing or new customer loads that have may be moderated or shifted out of the peak hours with low or no adverse customer impact.

Specific mitigation measures identified are described in more detail below.

4.2.1 Contractual Minimum Pressure Increase

FEI has established a working agreement with Enbridge to maintain a minimum delivery pressure into Savona of 4480 kPag (650 psig) on peak days. This is 345 kPag (50 psig) higher than FEI's normal expected minimum delivery pressure at Savona. This will improve pressure into the north and central Okanagan and is required in the winter of 2021-22 and 2022-23 in advance of the completion of the OCU Project, but is not sufficient on its own to mitigate forecast peak demand in those winters.

4.2.2 Temporary Load Shifting

FEI has some capability to temporarily shift load to other parts of the system in winter conditions.

To reduce flow into the Kelowna #1 Gate station, FEI will undertake configuration changes in the Kelowna distribution pressure (DP) system and the West Kelowna IP system served by this gate station. The Kelowna DP system interconnects the Kelowna #1 Gate station with several other nearby gate stations serving the DP system. The DP system has some capacity to shift load from the Kelowna #1 Gate station to these other gate stations by lowering the DP outlet pressure slightly (undersetting) below the outlet pressure of the surrounding gate stations. This will reduce the flow from the Kelowna #1 Gate station into the DP system and correspondingly increase the flow at the other gate stations. This has the benefit of increasing the inlet pressure at the Kelowna #1 Gate station because there is less pressure drop incurred by the reduced flow through the transmission lateral supplying the gate station.

In addition to the DP system, the Kelowna #1 Gate station serves the West Kelowna IP system. This IP system is also connected in Peachland to the Summerland to Peachland transmission system that originates from the mainline transmission system in Penticton. With some station modifications in Peachland, this lateral can temporarily serve the peak demand of the tail end station, Coldham Gate station, on the West Kelowna IP system. Shifting the load of the Coldham Gate station off the West Kelowna IP system correspondingly reduces the required peak day flow into the Kelowna #1 Gate station and improves the station inlet pressure at Kelowna #1 Gate station as well.

At the Polson Gate station in Vernon there is a similar ability with the DP system to underset the outlet pressure at the Polson Gate station and shift load to the other gate stations serving the Vernon DP system. However, the Polson IP system does not have a second supply similar to the West Kelowna IP to additionally reduce any IP system demand.

Although the load shifting above will reduce flow into the Polson Gate and Kelowna #1 Gate Stations, the differential pressure across the gate stations into the IP system will still be below acceptable levels under peak demand to maintain reliable station operation. To mitigate this, FEI will reduce the IP outlet pressure at both the Polson Gate and Kelowna #1 Gate stations in the winter of 2021-22 to maintain sufficient differential pressure across the stations at the projected lower inlet pressure while maintaining reliable operation. The IP station undersetting

reduces the available capacity of the downstream IP system. However, both systems are forecast to have sufficient capacity in the winter of 2021-22 to meet peak demand at the reduced operating pressure with some station modifications at locations within the system.

4.2.3 Station Modifications

For the winter of 2022-23, both the Kelowna #1 Gate and Polson Gate stations are projected to require additional upgrades to install full bypass capability around the stations. Full bypass capability means that a bypass with sufficiently large pipe size is installed bypassing the station regulating facility and restrictive station piping. The bypass can be manually operated to completely bypass the station regulators, avoid exceeding MOP, but minimize the otherwise large pressure drop that would occur through the station regulating equipment when inlet pressures near or below the downstream system MOP occur.

These bypasses may require manual operation by onsite FEI Operations personnel in the winter of 2022-23 to accommodate the very low inlet pressure projected to occur on a peak day. To enable the necessary system configuration changes, FEI has identified upgrades to Peachland Gate station (on the Summerland to Peachland transmission lateral), the Westbank District station (on the West Kelowna IP system), and Lavington District station (on the Polson IP system) to ensure reliable operation at those locations during the expected lower inlet pressures during peak conditions.

4.2.4 Additional Mitigation Measures

In addition, throughout the period prior to completion of the OCU Project, FEI will manage load additions within system capacity limitations, and identify and manage existing customer loads under peak conditions.

4.2.5 CNG and LNG Supplementation Considered, but Not Planned

FEI also considered portable CNG and LNG supplementation.

To mitigate the forecast capacity shortfall, 1 to 2 large truckloads of CNG per hour (up to 4 – 6 truckloads per day) would be required during a peak demand event by the winter of 2022/2023. With growing demand in the region, the capacity shortfall and corresponding amount of CNG or LNG required will increase over time.

CNG trucks would be required to travel from a filling point outside of the central Okanagan, where the system has a sufficient gas surplus to allow trucks to fill, to an effective injection point in the central Okanagan. LNG trucks would be supplied from FEI's Tilbury LNG facility in Delta, approximately 400 km from the shortfall region. This CNG/LNG truck traffic would be required during a peak demand event, which corresponds to the most severe winter weather in B.C. Transporting fuel by truck during severe winter weather is a less cost effective and reliable method of gas transportation than appropriate and adequate pipeline infrastructure. The

reliability concerns could be mitigated through staging of sufficient additional trucks, but this would come at an increased cost.

CNG and LNG supplementation would not provide a lasting improvement to FEI's system, as CNG/LNG supplementation is not a viable long-term solution to the capacity shortfall in the Okanagan and will not decrease the cost associated with this required pipeline installation. In contrast, other short-term mitigation measures discussed, such as station upgrades, will allow FEI the time needed to construct the OCU Project while providing lasting benefits to the system. Therefore, FEI does not plan to implement CNG/LNG supplementation to address the capacity shortfall in the central Okanagan.

4.2.6 Preliminary Cost Estimates

The total cost of the proposed mitigation measures is forecast to be approximately $1.5 million. There are no significant forecast costs associated with any of the mitigation measures with the exception of the required station modifications.

Table 4-1 below outlines the current cost estimates for the station upgrades required as part of the OCU Project mitigation measures. Upgrades to the two IP gate stations (Polson and Kelowna #1 Gate stations) were estimated at an AACE Class 4 level, while the smaller DP station upgrades were estimated at an AACE Class 5 level. The costs for the mitigation measures are not included in the OCU Project cost estimate, as these measures will be required to maintain system capacity prior to the approval of the OCU Project.

Table 4-1: Capacity Shortfall Mitigation Measures Cost Estimates

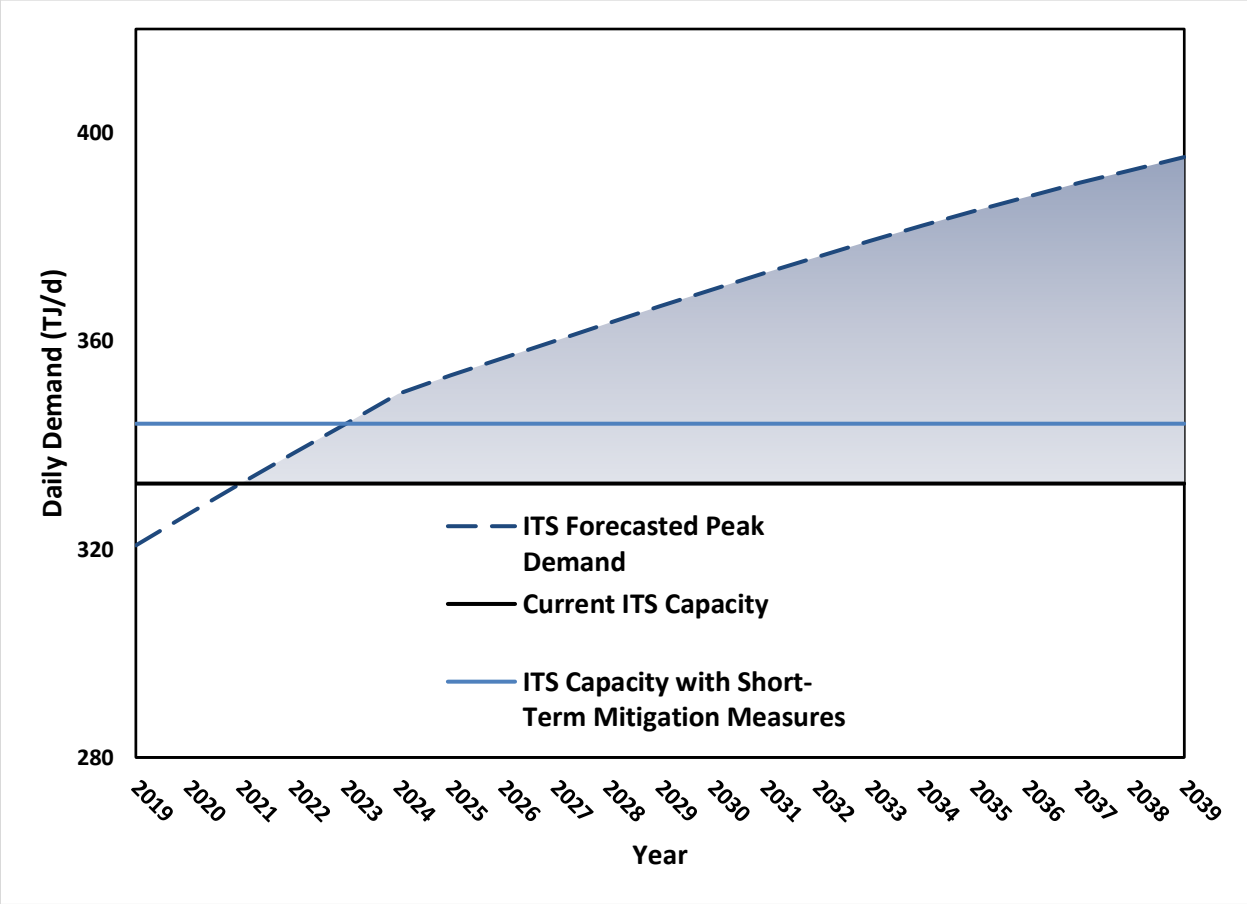
Station Modification Estimates	($000)
Polson Gate Station – Upsize Station Bypass	$57
Kelowna #1 Gate Station – Upsize Station Bypass	$586
Westbank DP Station – Upgrade Capacity	$243
Peachland DP Station – Upgrade Capacity	$316
Lavington DP Station – Upgrade Capacity	$316
Total Estimated Station Upgrade Cost:	**$1,518**

4.2.7 Conclusion

The projected need to install full bypass capability at two major gate stations in the Okanagan to enable a 2023 in service date for the OCU Project is based on FEI's forecast that transmission inlet pressures to these stations are expected to be at or below required operating pressures under peak demand conditions in the winter of 2022/2023. This is a strong indication that these measures will be inadequate to support continued growth beyond that winter, underscoring the need for OCU Project completion prior to winter 2023.

With all the proposed mitigation measures implemented as described above, the ITS capacity can be marginally increased as shown in Figure 4-1 below. These measures are not sufficient to meet projected demand for the winter of 2023/2024, and it is critical that FEI implement a long-term solution before forecast demand increases exceed FEI's system capacity.

Figure 4-1: ITS Capacity with Mitigation Measures



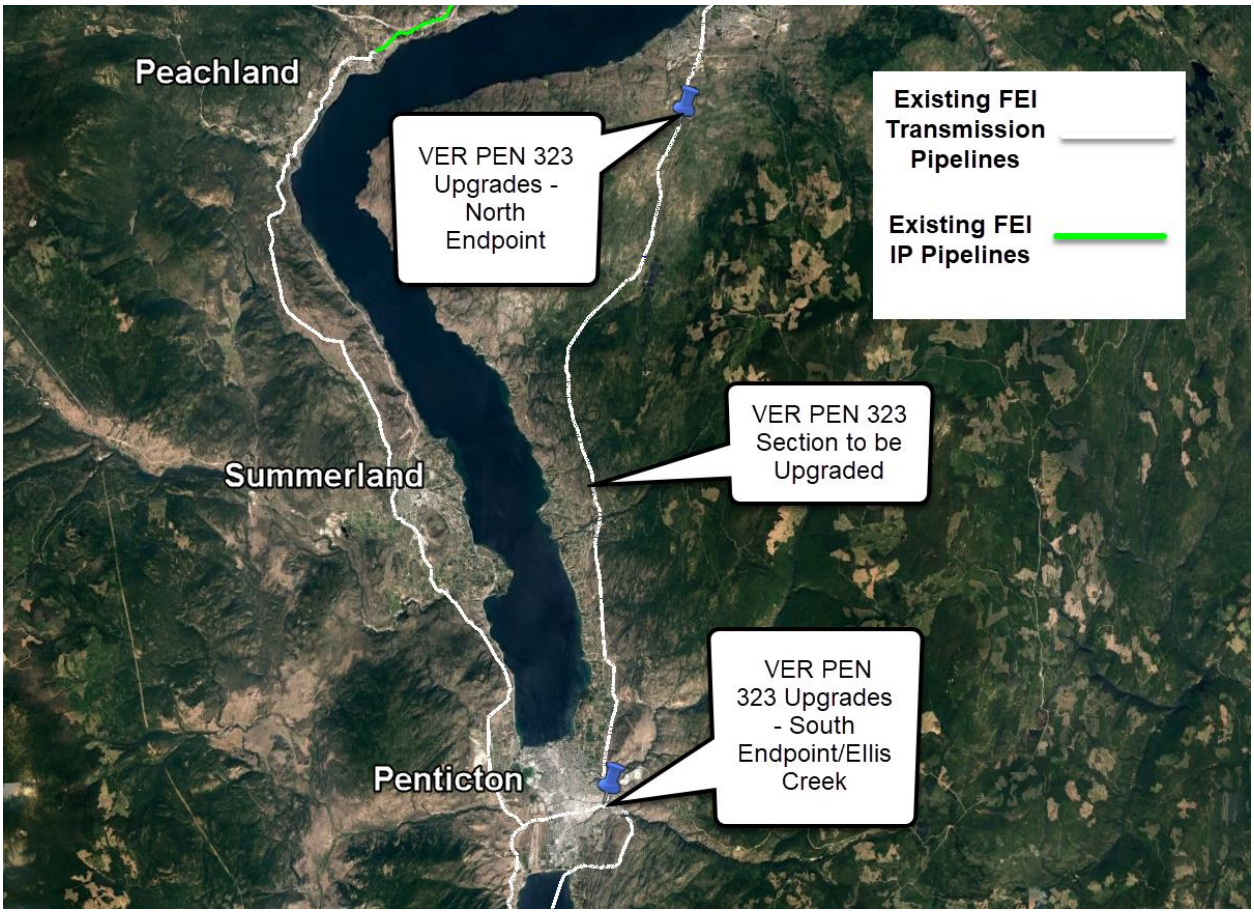
4.3 *ALTERNATIVES DESCRIPTION*

Based on the system capacity planning and hydraulic analysis, FEI identified and analyzed five alternatives (listed in Section 4.1.2 above) as the possible long term solutions to meet the objectives of the OCU Project. A description of each of the five alternatives is detailed below.

4.3.1 Alternative 1 – ITS Upgrades to VER PEN 323

Alternative 1 involves upgrades along approximately 36 km of the VER PEN 323 in the form of pipeline replacement and revalidation hydrotests. Figure 4-2, below, provides an overview of Alternative 1.

Figure 4-2: Overview Map of Alternative 1



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

As described in Section 3.2.1, the VER PEN 323 pipeline, running from Ellis Creek to Vernon, was installed in 1957 and designed to operate at a MOP of 6,619 kPa. Over the years, the MOP of various sections of this pipeline has been derated due to class location changes such that the pipeline is currently operating at a MOP of 5,171 kPa.

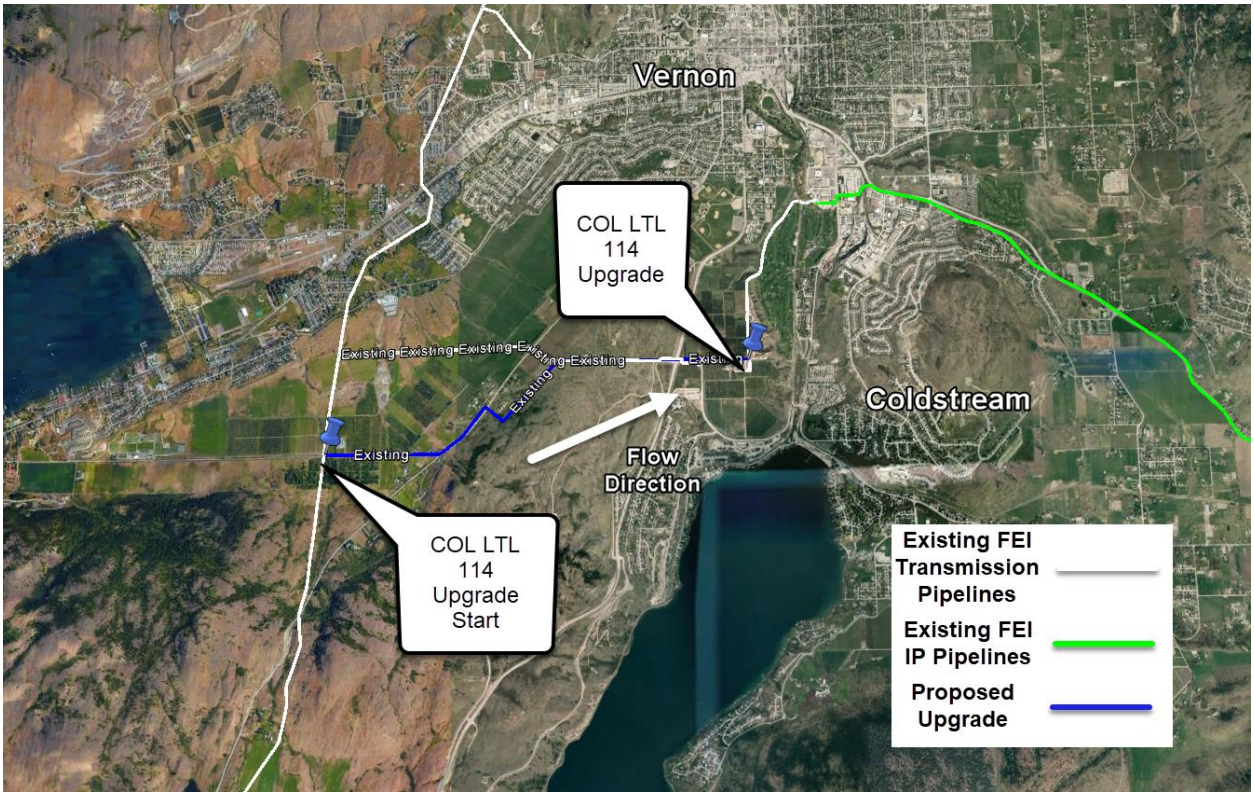
In order to meet the pressure reinforcement required to avoid capacity shortfalls currently forecast for the winter of 2023/2024, this alternative proposes the replacement of fifteen segments of the existing VER PEN 323 pipeline with new higher strength 323 mm pipeline. The replacement segments would total almost 7.6 km in length, and include multiple road crossings. All replacement segments would be designed such that they would be able to operate at a MOP of 6,619 kPa. The 7.6 km of new 323 mm pipe installation would require: (1) the exposure and removal of the existing pipe; (2) deepening of the trench where required to achieve the depth of cover and minimum clearances required by CSA Z662 and utility infrastructure owners including FEI and FortisBC Inc. (FBC); and (3) installation of the new pipe in the same trench.

Following the installation of replacement segments, the entire 35.5 km length of VER PEN 323 pipeline, starting at Ellis Creek Station in Penticton to Chute Lake in the north, would be

subjected to a hydrotest to certify the newly installed pipeline segments and the existing pipeline segments between the replacement segments to operate at an MOP of 6,619 kPa.

In order to support 20-year forecast load growth in the area, this alternative would also require an upgrade to the 114 mm Coldstream Lateral (COL LTL 114) by replacing 4.1 km of the existing lateral with 168 mm pipeline (shown in blue, below).

Figure 4-3: Coldstream Lateral (COL LTL 114)



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

This option would need to be completed in its entirety prior to the winter of 2023/2024 to meet the Project objectives and to avoid a capacity shortfall.

4.3.2 Alternative 2 – Modified ITS Upgrades to VER PEN 323

Similar to Alternative 1, Alternative 2 also involves modifications to the VER PEN 323 pipeline. However, this alternative is a modified version of Alternative 1 as described below.

This alternative proposes the installation of a 6 km 406 mm pipeline extension of OLI PEN 406 (SONG pipeline built in 1994) around the City of Penticton. The 6 km long extension proposed under this alternative eliminates the requirement to replace and/or retest multiple segments from the southern end of Alternative 1, and replaces them with a pipeline extension. The OLI PEN 406 extension would be designed to operate at a MOP of 7,826 kPa to match the existing OLI

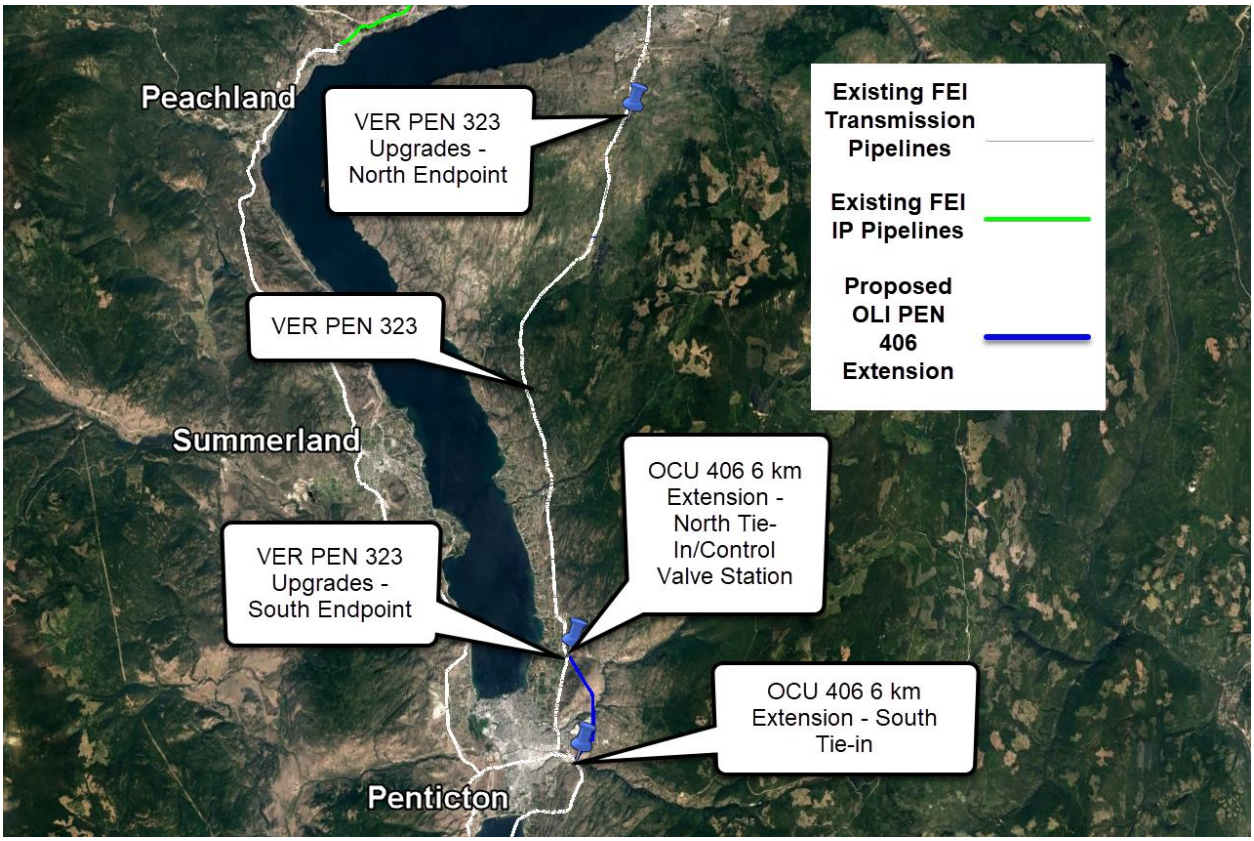
PEN 406 pipeline. This alternative would not require replacement of the 4.1 km long 114 mm Coldstream Lateral with 168 mm pipeline (Figure 4-2).

This alternative would require a new regulating station with a 406 mm receiving barrel to be built at the northern end of the extension where the new 406 mm pipeline would tie-in to the existing VER PEN 323, as the two pipelines do not operate at the same MOP. All upgrades that are part of Alternative 1 which are located north of the tie-in would still be required under Alternative 2; this equates to replacement of 3.9 km of existing VER PEN 323 with new higher strength 323 mm pipeline followed by hydrotesting of the VER PEN 323 located north of the tie-in location to the proposed end point of upgrades so that the pipeline can be recertified to operate at a MOP of 6,619 kPa.

Implementation of this alternative would allow for the deactivation of 1.2 km of the existing 406 mm OLI PEN 406 pipeline between the south tie-in point of the proposed loop and the south tie-in point of the existing VER PEN 323 pipeline.

Figure 4-4 below provides an overview of Alternative 2.

Figure 4-4: Overview Map of Alternative 2



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

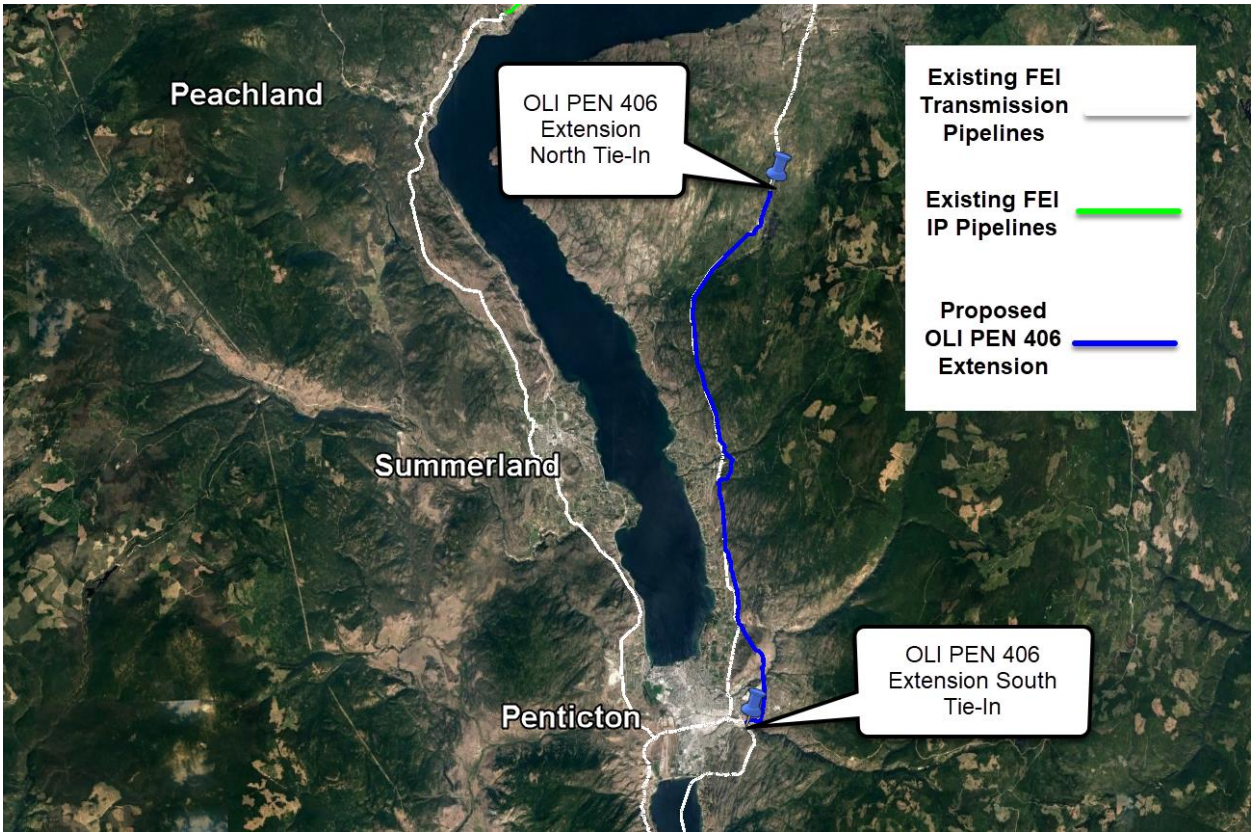
This option would need to be completed in its entirety prior to the winter of 2023/2024 to avoid a capacity shortfall.

4.3.3 Alternative 3 – OLI PEN 406 Extension

The third alternative to address the capacity constraint proposes the addition of approximately 30 km of 406 mm pipeline running from OLI PEN 406 (SONG pipeline built in 1994) east of Ellis Creek near Penticton to Chute Lake northeast of Naramata. Figure 4-5 below provides an overview of Alternative 3.

The proposed extension of OLI PEN 406 would primarily follow a combination of the existing VER PEN 323 route and FBC 73L power transmission corridor. None of the upgrades involving the VER PEN 323 outlined in Alternative 1 and Alternative 2 would be required for this alternative. Upgrades to the 114 mm Coldstream Lateral (Figure 4-3) would also not be required as part of this alternative.

Figure 4-5: Overview Map of Alternative 3



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

The OLI PEN 406 extension would be designed to operate at MOP of 7,826 kPa to match the existing OLI PEN 406 pipeline. A new control valve station with a 406 mm receiving pig barrel would be required at Chute Lake end where the new pipeline would tie-in to the existing VER PEN 323. Similar to Alternative 2, this alternative would also result in the deactivation of approximately 1.2 km of existing 406 mm OLI PEN 406 pipeline, between the south tie-in point of the proposed OLI PEN 406 extension and the south tie-in point of the existing VER PEN 323 pipeline.

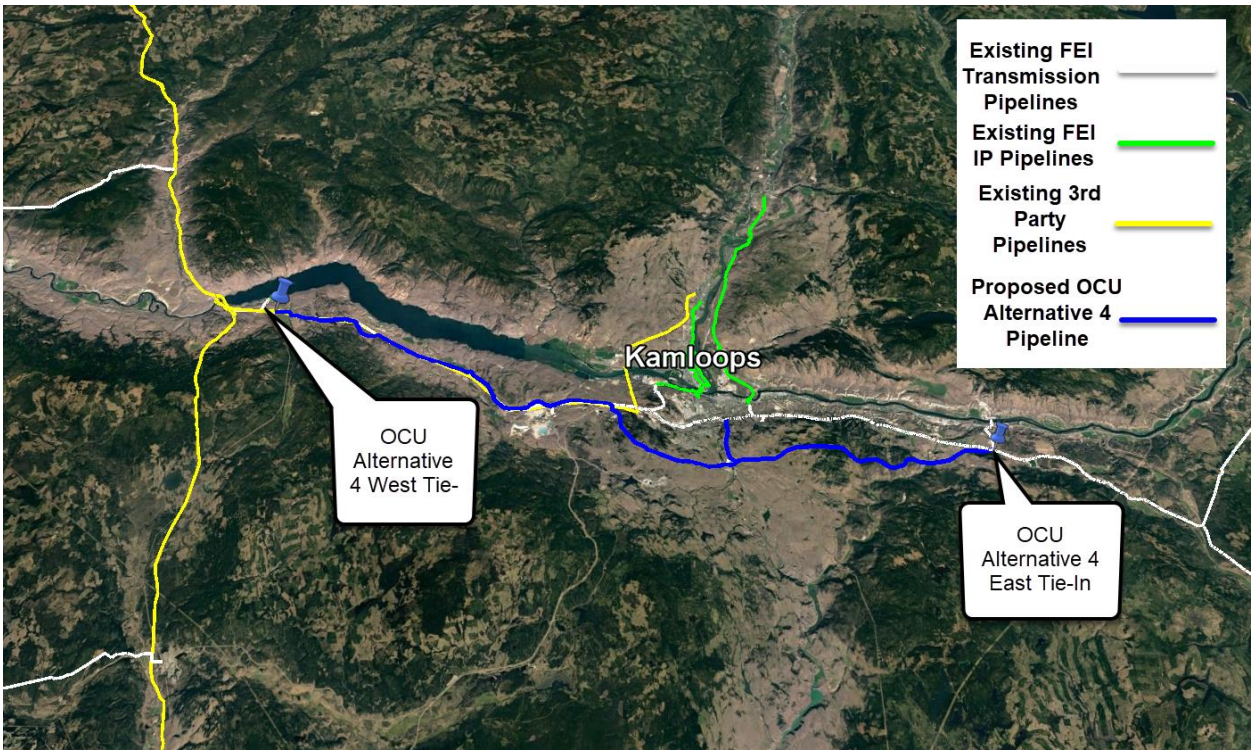
This option would need to be completed in its entirety prior to the winter of 2023/2024 to meet the Project objectives and to avoid a capacity shortfall.

4.3.4 Alternative 4 – 508 mm Loop from Savona

The fourth alternative to address the capacity constraint involves the installation of a 508 mm loop starting at the Savona Compressor Station and running eastward for approximately 68.4 km before terminating east of Kamloops.

This pipeline looping would increase gas supply delivered via the Enbridge pipeline at Savona. This alternative would also require an upgrade to the 4.1 km 114 mm Coldstream lateral in Vernon to a 168 mm pipeline. Figure 4-6 below provides an overview of Alternative 4.

Figure 4-6: Overview Map of Alternative 4



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

The new pipeline would be designed such that it could be operated at a MOP of 6,619 kPa to match the outlet pressure of the Savona Compressor Station.

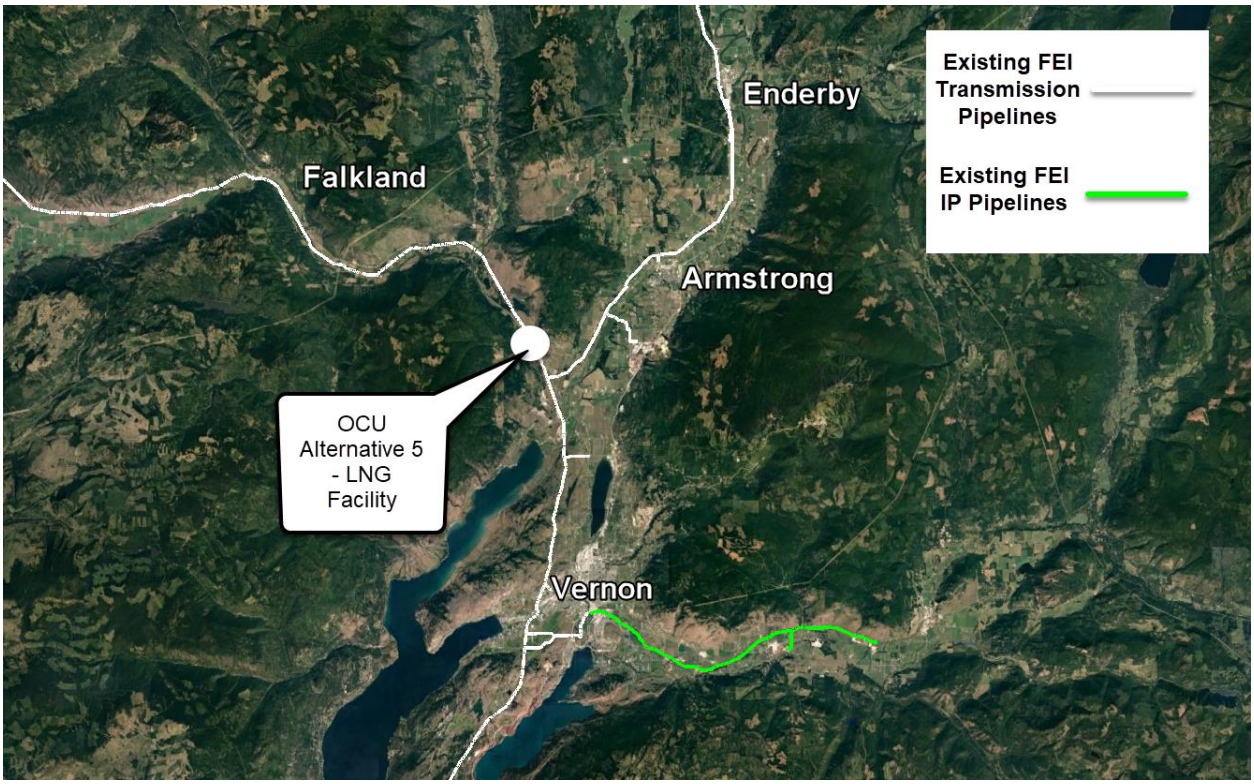
Only the first 52.4 km of this loop would be required to be in-service by winter of 2022/2023 to avoid the forecast shortfall. However, the preliminary route chosen for this loop bypasses the City of Kamloops which does not allow for a tie-in to the existing ITS at the 52.4 km mark. Therefore the entire loop would need to be built before it could be tied into the existing system.

4.3.5 Alternative 5 – LNG Facility Near Vernon

The fifth alternative proposes setting up an LNG storage and peak shaving facility located between Westwold and Grandview Flats northwest of Vernon. Such facilities located closer to the load centre allow gas to be moved into storage in times of low gas demand when excess pipeline capacity is available, and provide on-system delivery during periods of high demand.

In addition to the LNG storage and peak shaving facility, this alternative would also require an upgrade to the 114 mm Coldstream Lateral similar in nature to Alternative 1 and Alternative 4. Figure 4-7 below shows the location of the proposed facility.

Figure 4-7: Overview Map of Alternative 5



Source: Google Earth overlaid with FEI Transmission Pipeline Data (Image taken 10/5/2020)

This alternative was based on the following facility capacity requirements:

- Storage capacity: 0.31 Bcf (8800 x 10^3 m3)
- Liquefaction capacity: 1.55 mmscfd (44 x 10^3 m^3/d)
- Vaporization capacity: 51.44 mmscfd (1450 x 10^3 m^3/d)

This option would be required to be in service prior to the winter of 2023/2024 to avoid a capacity shortfall.

4.4 *SCREENING OF ALL IDENTIFIED ALTERNATIVES*

FEI evaluated all five alternatives on their technical merits and on the basis of high level cost estimates, to screen out those that did not accomplish the objectives of the OCU Project as identified in Section 4.1.

4.4.1 Alternatives 1, 2, and 3 are Feasible

4.4.1.1 *Alternatives 1, 2, and 3 Discussion and Analysis*

Completion of Alternative 1 meets FEI's objective to increase ITS capacity such that the increased demand in the Okanagan can be met. There is, however, a high risk of not meeting the project schedule. Should revalidation hydrotesting be completed with a 100 percent success rate, it is possible that this alternative could be constructed in time to mitigate the risk of a capacity shortfall. However, there is significant uncertainty surrounding the results of this revalidation hydrotesting, which may prevent this alternative from being completed on schedule. FEI determined that this alternative may meet primary project objectives, and that it should be investigated further.

Similar to Alternative 1, completion of Alternative 2 meets FEI's objective to increase ITS capacity such that the increased demand in the Okanagan can be met; however, the project schedule for this alternative also carries a high degree of risk. Should revalidation hydrotesting be completed with a 100 percent success rate, it is possible that this alternative could be constructed in time to mitigate the risk of a capacity shortfall. There is significant uncertainty surrounding the results of this revalidation hydrotesting, which may prevent this alternative from being completed on schedule. FEI determined that this alternative may meet primary project objectives, and that it should be investigated further.

Alternative 3 meets both project objectives: (1) to increase ITS capacity such that the increased demand in the Okanagan can be met; and (2) to ensure all construction related activities are completed in time by winter of 2023/2024 to avoid service interruptions to customers. In this case, as the VER PEN 323 line will remain fully operational during construction, short-term mitigation measures can be put in place to address the capacity shortfall in the winters of 2021/2022 and 2022/2023. Because this alternative does not require sections of the existing ITS to be subjected to revalidation hydrotesting, a significant schedule risk, which is very high for Alternatives 1 and 2, is removed. As discussed in Section 4.6, FEI believes that this alternative carries a moderate degree of schedule risk which can be mitigated.

4.4.2 Alternatives 4 and 5 are Not Feasible

4.4.2.1 *Alternative 4 Discussion and Analysis*

Alternative 4 would meet one of the objectives for this project: to increase the capacity of ITS. However, the length and diameter of this pipeline would trigger an environmental assessment (EA)[17]. The anticipated timeline for completion of an EA is three years. Due to this delay, it is highly unlikely that construction of this pipeline could begin prior to 2024. Pipeline installation is likely to take approximately three years due to the length and complexity of this pipeline route, indicating a completion date of 2027 or later. A capacity shortfall which requires significant, lasting mitigation is expected to occur in the winter of 2023/2024; this shortfall will increase each year during the EA and construction phases, as demand on the ITS continues to grow. As discussed in Section 4.1.1, measures such as CNG injection, which can be used to mitigate a small, short-term capacity shortfall such as the shortfall projected for 2021/2022 and 2022/2023, are costly and inefficient in the long term when compared to standard gas supply methods such as pipelines. Relying on such measures to mitigate a large and extended capacity shortfall, such as the one which would occur during implementation of Alternative 4, represents an unacceptable level of risk for FEI's customers. For this reason, FEI does not consider Alternative 4 to meet the primary project objectives as it does not mitigate the risk of capacity shortfall within an acceptable timeframe.

4.4.2.2 *Alternative 5 Discussion and Analysis*

Alternative 5 would meet the capacity objective for this project. However, preliminary research indicates that this alternative would be significantly too complex to design and construct prior to the winter of 2023/2024. An estimated minimum of five years is required to design and execute construction of such a facility following CPCN approval, pushing the completion date to 2027, or likely later. As detailed in the discussion of Alternative 4, this represents an unacceptable level of risk to FEI and does not meet the project objective to reliably meet demand on the ITS by the winter of 2023/2024. Therefore, it was rejected in the early development phase of the project.

4.4.2.3 *Alternatives 4 & 5 Capital Costs are Expected to be Significantly Higher as Compared to All Other Alternatives*

As shown in Table 4-2 below, preliminary high level cost estimates[18] for Alternatives 4 and 5 are significantly higher as compared to other alternatives. Because neither alternative met the schedule requirements of the project, FEI did not believe that producing more detailed estimates for these alternatives would be a prudent use of funds. Instead, these two alternatives were screened out, while Alternatives 1, 2, and 3 were investigated in more detail to select a preferred alternative.

[17] A pipeline EA is triggered by a combination of factors including pipeline diameter and length, and pressure; FEI's environmental department has confirmed that this option would require an EA.

[18] Preliminary high level cost estimate at an AACE Class 5+ level was used to compare all alternatives.

Table 4-2: Preliminary Cost Estimates of All Alternatives

Alternative	Description	Total Pipe Installed (km)	Capital Cost Estimate Range (2019$ millions)
1	ITS Upgrades to VER PEN 323	15	40 – 100
2	Modified ITS Upgrades to VER PEN 323	19	50 – 130
3	OLI PEN 406 Extension	30	100 – 250
4	508 mm Loop from Savona	54	200 – 500
5	LNG Facility Near Vernon	n/a	250 - 600

4.4.3 Conclusion: Screening of Alternatives

As discussed above, FEI's alternatives screening process concluded that Alternative 4: 508 mm North Loop from Savona and Alternative 5: LNG Peak Shaving Facility near Vernon could not be completed in time to address capacity shortfalls forecast for 2023/2024, and therefore do not meet the primary objectives of the project. Preliminary high level cost estimates also indicated that both Alternative 4 and Alternative 5 would be significantly more costly as compared to other alternatives considered for the Project. As these two alternatives would not achieve the OCU Project objective to eliminate the capacity shortfall in Okanagan region by winter of 2023/24, they were deemed not feasible and were not considered further in the evaluation process. Alternatives 1, 2, and 3 do meet the primary project objectives, and were therefore evaluated in more detail as discussed below.

4.5 *FEASIBLE ALTERNATIVES EVALUATION METHODOLOGY*

FEI developed a weighted scoring methodology and applied it to each of the remaining three feasible alternatives to determine their performance in relation to the evaluation criteria defined for the Project. The evaluation criteria and their associated weightings are described in the sections below.

4.5.1 Evaluation Criteria

Evaluation criteria were grouped into three primary categories:

- Asset Management Capability;
- Project Execution and Lifecycle Operation; and
- Financial.

These categories, and the evaluation criteria within them, are listed and defined below.

4.5.1.1 *Asset Management Capability*

Criteria within this category measure the success of the alternative in achieving the technical goals of the project now and into the future. As this category assesses the efficacy of the solution in meeting the project objectives, FEI considers this category to be relatively more important, which is reflected in the weighting discussed below.

The factors evaluated within this category are as follows:

- **System Capacity Increase:** Ability of an alternative to increase capacity in the ITS such that supply can be maintained to the Okanagan region under peak demand conditions. Alternatives that provide the greatest capacity increase will score the highest. If two or more alternatives provide a similar capacity increase, the same score is assigned.
- **Operational Flexibility:** Ability of a project to provide FEI with greater operational flexibility to perform inspection and repair work on its system assets. Projects which extend the window during which FEI can complete such work on sections of the ITS will score the highest.

4.5.1.2 *Project Execution and Lifecycle Operation*

Criteria within this category measure risks to project completion, and the impact a project will have during construction and over its lifetime on the communities and environment it affects.

- **Schedule Risk:** Ability for an alternative to be completed on schedule, with few identified risks to achieve the scheduled in-service date. Alternatives which can be completed on time will score the highest. Other alternatives are scored lower.
- **Environmental, Public and Indigenous Impacts:** Ability of an alternative to minimize impacts to the environment, the public (i.e., residents, landowners, customers, local government) and Indigenous communities, both during construction and over the lifetime of the project. Alternatives which effectively mitigate environmental and public safety hazards and which reduce negative impacts on the public, Indigenous communities and other stakeholders during project execution will score the highest.

4.5.1.3 *Financial*

The sole criterion within this category measures the financial impact of the project on FEI's customers. FEI considered the long term rate impact to FEI's non-bypass customers in order to financially compare all three feasible alternatives. This was completed by evaluating the present value of the incremental revenue requirement as well as the levelized delivery rate impact over the 70 year analysis period for each alternative based on the estimated capital cost and operating cost.

- **Rate Impact:** Ability for an alternative to be completed with the lowest possible rate impact. The alternative which minimizes the rate impact to FEI's customers will score the highest.

4.5.2 Scoring and Weighting

Each feasible alternative was scored against each of the evaluation criteria using a scale from 1 to 5. These scores are defined as shown in Table 4-3.

Table 4-3: Alternative Evaluation Scoring Definitions

Score	Impact Evaluation*
5	Best choice: very low risk, or; very high opportunity for positive impact
4	Good choice: low risk, or; high opportunity for positive impact
3	Acceptable choice: neutral or moderate risk, or; opportunity for medium positive impact
2	Poor choice: high risk, or; low opportunity for positive impact
1	Worst choice: very high risk, or; no opportunity for positive impact

**For evaluation criteria such as System Capacity Increase, which provides a net positive, extent of positive impact is ranked. For others such as Schedule Risk, in which FEI seeks to minimize negative impact to the public, the extremity of this negative impact is ranked.*

Weightings were assigned to the overall categories of evaluation criteria as shown in Table 4-3. Asset Management Capability was weighted the most heavily to reflect the importance of meeting FEI's overall technical objectives. Weighting was split evenly between the other two categories. Both are considered important as they measure various types of impact to the communities affected by the OCU Project. Weightings were also assigned to the criteria within each category, also as summarized in Table 4-4.

Table 4-4: Evaluation Criteria Weighting

Evaluation Criteria - Category	Weight (Overall)	Evaluation Criteria - Specific	Weight (Within Category)
Asset Management Capability	40%	System Capacity Increase	50%
		Operational Flexibility	50%
Project Execution and Lifecycle Operation	30%	Environmental, Public, and Indigenous Impacts	45%
		Schedule Risk	55%
Financial	30%	Rate Impact	100%

4.6 *EVALUATION OF REMAINING THREE FEASIBLE ALTERNATIVES*

FEI retained Solaris Management Consultants Inc. (SMCI), a company based in British Columbia and experienced in designing, estimating, and managing oil and gas pipeline projects,

as an engineering consultant on the OCU Project. The first phase of SMCI's work was to evaluate preliminary routing (where applicable), prepare preliminary engineering deliverables, compete construction planning and scheduling, and prepare AACE Class 4 cost estimates. This information was used when evaluating the feasible alternatives for the OCU Project (Alternatives 1, 2, and 3). SMCI was then further engaged to assist FEI in developing an AACE Class 3 base estimate for the preferred alternative.

FEI applied a scoring methodology to evaluate all three feasible alternatives. The score assigned for each alternative was based on information provided by SMCI, and validated by FEI internal subject matter experts. The components of the evaluation methodology are described in the subsections below.

4.6.1 Asset Management Capability Evaluation

Alternatives 1, 2, and 3 were assessed and scored from 1 to 5 against each of the evaluation criteria within the category of Asset Management Capabilities:

a) System Capacity Increase; and

b) Operational Flexibility.

A summary of the resulting weighted scores is provided in Table 4-9, and the discussion below provides a rationale for this scoring.

4.6.1.1 *Evaluation Summary: Asset Management Capability*

Table 4-5 summarizes the scoring assigned to Alternatives 1 through 3 against the evaluation criteria in the Asset Management Capability category, as per the discussion below.

Table 4-5: Asset Management Capability Alternative Evaluation

Criterion	Weighting	Alternative 1: ITS Upgrades Score	Alternative 2: Modified ITS Upgrades Score	Alternative 3: OLI PEN 406 Extension Score
System Capacity Increase	50%	5	5	5
Operational Flexibility	50%	2	3	4
Weighted Total:*	**100%**	**3.5**	**4.0**	**4.5**

**Weighted total is calculated for each alternative by multiplying the score for each criterion with its associated weighting, and then summing these scores. The maximum possible weighted total is 5.*

4.6.1.2 *Alternative 1: ITS Upgrades to VER PEN 323*

Alternative 1 provides a significant positive capacity impact, fully meeting system capacity requirements, and was therefore awarded a score of 5 for System Capacity Increase (best choice; very high positive impact).

Construction of Alternative 1 will not have a positive impact on operational flexibility, as no additional sections of pipeline will be constructed. The system configuration will remain unchanged. A score of 2 was assigned to reflect this (worst choice, low positive impact).

4.6.1.3 *Alternative 2: Modified ITS Upgrades to VER PEN 323*

Alternative 2 provides a significant positive capacity impact, fully meeting system capacity requirements, and was therefore awarded a score of 5 for System Capacity Increase (best choice; very high positive impact).

Construction of Alternative 2 will have some positive impact on operational flexibility. The proposed 6 km of pipeline extension will allow a greater weather window in which the segment of the VER PEN 323 pipe running from Ellis Creek to the north tie-in point of the proposed 6 km extension can be shut in for inspection, emergency response, or repair. Therefore, a score of 3 (acceptable choice, medium positive impact) was assigned as the improvement to operational flexibility is limited to a small portion of the ITS.

4.6.1.4 *Alternative 3: OLI PEN 406 Extension*

Extension of the OLI PEN 406 pipeline further north by 30 km provides a significant positive capacity impact, fully meeting system capacity requirements, and was therefore assigned a score of 5 for System Capacity Increase (best choice; very high positive impact).

Construction of Alternative 3 will have a positive impact on operational flexibility. For a portion of the year, it will be possible to shut in sections of the VER PEN 323 line between Ellis Creek and the north tie-in point of the proposed 30 km pipeline extension for inspection, emergency response or repair. As this is a much longer segment of pipeline than the small section affected by Alternative 2, Alternative 3 received a score of 4 (good choice; high positive impact).

4.6.2 Project Execution and Lifecycle Operation Evaluation

Alternatives 1, 2, and 3 were assessed and given a score from 1 to 5 against each of the evaluation criteria within the category of Project Execution and Lifecycle Operation, which include the following:

1. Schedule Risk; and
2. Environmental, Public and Indigenous Impacts.

A summary of the resulting scores is provided in Table 4-9, and a discussion below provides the rationale for this scoring. In this case, Alternatives 1 and 2 are discussed together as they have similar strengths and weaknesses.

4.6.2.1 *Evaluation Summary: Project Execution and Lifecycle Operation*

Table 4-6 summarizes the scoring assigned to Alternatives 1 through 3 against the evaluation criteria in the Project Execution and Lifecycle Operation category, as per the discussion below.

Table 4-6: Project Execution and Lifecycle Operation Alternative Evaluation

Criterion	Weighting	Alternative 1: ITS Upgrades Score	Alternative 2: Modified ITS Upgrades Score	Alternative 3: OLI PEN 406 Extension Score
Schedule Risk	55%	1	1	3
Environmental, Public and Indigenous Impacts	45%	2	2	3
Weighted Total:*	**100%**	**1.45**	**1.45**	**3**

**Weighted total is calculated for each alternative by multiplying the score for each criterion with its associated weighting, and then summing these scores. The maximum possible weighted total is 5.*

As Alternatives 1 and 2 are similar in their overall strengths and weaknesses, they are discussed together below.

4.6.2.2 *Alternative 1 (ITS Upgrades) and Alternative 2 (Modified ITS Upgrades)*

The existing VER PEN 323 was installed in 1957 and was designed to operate at 6,619 kPa. At the time of installation, this pipeline was pressure tested to 110 percent of its design MOP (7,281 kPa), in accordance with the industry standard in 1957. Since its installation, the areas surrounding this pipeline have experienced population growth, changing the class location[19] and requiring the MOP to be reduced to 5,171 kPa to comply with the requirements of CSA Z662. As described in Sections 4.2.1 and 4.2.2 of this Application, Alternative 1 and Alternative 2 involve the replacement of certain pipeline segments to meet CSA Z662 Class location requirements. In addition, FEI has concluded that, to meet current industry best practices, the existing portions of the VER PEN 323 pipeline that are not replaced in Alternative 1 or Alternative 2 must be requalified by retesting. Retesting would be in accordance with CSA Z662:19 at a minimum of 1.25 times the desired MOP of 6,619 kPa (i.e., 8,274 kPa) prior to recommissioning the pipe at its original MOP of 6,619 kPa.

For Alternative 1 and Alternative 2, SMCI established the boundaries of test segments and the number of test segments required, the time it would take to complete a test, and the risks that are associated with the pressure testing process. Due to limitations on allowable elevation difference on a test section, thirty-three requalification tests would be required in addition to six tests for the replacement segments.

The completion of construction and testing required for Alternatives 1 and 2 is complicated by the fact that VER PEN 323 is a critical portion of the ITS and there are nine months of the year when it cannot be taken out of service. It can only be temporarily shut down between June 1 and September 1, leaving little time to carry out the required testing. Using multiple crews working simultaneously during the three month outage, all work required for either alternative

[19] The class location of a pipeline is related to the population density in the surrounding area. As population in an area increases, the class location can change, and a pipeline operator must take action to ensure the pipeline meets the requirements of the new class location. This can mean reducing MOP or modifying the pipeline.

can feasibly be performed in two three-month periods (i.e., two years) provided that all activities go ahead smoothly. However, FEI has significant concerns regarding its ability to successfully complete the requalification tests of the existing segments of the VER PEN 323 pipeline, as discussed below.

All replacement segments of pipeline would be designed, manufactured and installed to modern standards. However, the existing pipe that would be subjected to testing for requalification was installed in 1957. Prior to the late 1960s, all electric resistance welded (ERW) pipe was manufactured using the low frequency induction weld process to complete the longitudinal seam welds. A search of FEI records was conducted to find purchasing documents and, preferably, a purchasing specification for the pipe installed in 1957 for the VER PEN 323 pipeline to determine what pressure the pipe was tested to in the mill. No original purchasing documentation could be found. The original drawings for the ITS reference API 5LX as the pipe standard for all pipe installed at that time. A literature search was conducted to determine steel pipe strength verification testing standards that were in use in the industry in 1956/1957. The following excerpt provides insight into steel pipe used for pipeline construction in 1957:

> In the 1950s, there were significant advances in pipe manufacturing and testing. High strength grades of line pipe (42,000 psi to 52,000 psi minimum yield strengths) became available. These new grades were covered by a new API Standard, which also required the manufacturer to test each segment to 90 percent of its specified minimum yield strength.[20]

The new standard mentioned in the excerpt above is the first edition of API 5LX Specification for High Strength Line Pipe, the standard referenced in the ITS drawings. According to the same source, mill hydrostatic testing to 90 percent of the specified minimum yield strength (SMYS) was introduced in the first issue of API 5LX in 1956. It can therefore be inferred that the pipe installed in the ITS in 1957 was pressure tested in the mill to 90 percent of its SMYS.

The requalification tests are to be performed in accordance with the requirements of CSA Z662:19. These requalification strength tests per the current requirements of chapter 8 of CSA Z662 require a minimum test pressure of 125 percent of the MOP but are limited to a maximum test pressure that results in stresses equivalent to 110 percent SMYS for pipe installed in areas of class location 1 or 2. Similarly, for pipe installed in areas of class location 3 or 4, CSA Z662:19 requires a minimum test pressure of 140 percent of the desired MOP, but are limited to a maximum test pressure that results in stresses equivalent to 110 percent SMYS. However, as the pipe installed in 1957 was subjected to requalification testing only up to 90 percent SMYS at the time of manufacture, FEI's subject matter experts have recommended a maximum test pressure corresponding to pipe stresses of no more than 95 percent SMYS.

[20] Oil Pipeline Characteristics and Risk Factors: Illustrations from the Decade of Construction, John F. Kiefner and Cheryl J. Trench, December 2001, Page 16.

Testing this pipe to a significantly higher level of stress than in 1957 leads to uncertainty about FEI's ability to successfully carry out the requalification tests. This presents a significant scheduling risk to the implementation of Alternative 1 or Alternative 2. Retesting promotes opening of existing cracks that are near failure so that they fail during the test and can be removed from the system. However, to complicate matters, it may also promote growth of small cracks that would have otherwise been acceptable, resulting in a new set of critical cracks left in the system after completion of the repairs. These new critical cracks may fail during the subsequent attempt at a successful test, resulting in a cycle of leak detection, repair and testing. It is therefore difficult to estimate how much additional time may be required to complete Alternative 1 or Alternative 2, should initial testing fall short of a 100 percent success rate. As this represents an unacceptably high level of schedule risk, a score of 1 was assigned to both Alternative 1 and Alternative 2 for Schedule Risk (worst choice; very high negative impact and risk).

In addition, and more serious than jeopardizing a tight schedule for requalification, a failure during testing of the existing pipe poses a risk of significant disturbance to the general public and the environment. Sections of the VER PEN 323 pipeline are located within urbanized regions of Penticton where the pipeline right of way has been significantly encroached upon by development since the pipeline was installed. The photographs below are illustrative of the scale of development since 1957. FEI would be required to implement disruptive mitigation strategies, such as evacuation of residents of the nearby developments in the case of test failures, in order to safely complete testing in these densely populated areas. Failures in these areas would result in extensive excavation within public properties, causing an even more significant disturbance. It is preferable not to perform this testing in such sensitive areas at all. Accordingly, a score of 2 was assigned for both Alternative 1 and Alternative 2 for Environment and Public Impact (poor choice; high negative impact and risk).

Figure 4-8: Photographs of Proximity of Residential Development to VER PEN 323 in Penticton

4.6.2.3 *Alternative 3: OLI PEN 406 Extension*

If all activities proceed as planned, Alternative 3 will meet the capacity demand requirements on schedule. However, the lack of flexibility in the schedule for this alternative means that

unforeseen risks may delay project completion. A score of 3 was accordingly assigned for Schedule Risk (acceptable choice; neutral or moderate negative impact and risk).

The route chosen for Alternative 3 results in a comparatively lower impact on the public and the environment by paralleling existing infrastructure (the VER PEN 323 transmission pipeline and the FBC 73L transmission powerline) wherever possible. This routing reduces the necessity to clear a new right of way, thereby reducing the long-term visual impact to the public in Naramata and Penticton as well as the impact to the environment. FEI anticipates acquiring some new land rights should this alternative be selected. As discussed in detail in Section 8.2 of the Application, FEI is committed to negotiating fair agreements with all landowners along the route and will continue to engage with landowners post CPCN filing to acquire the requisite land rights. If FEI is unable to come to agreement with landowners, it does reserve the right to proceed with expropriation of the required land rights.

Also, as mentioned in Section 7 of the Application, some environmental risk does exist as there are multiple water crossings along the proposed pipeline route, and existing infrastructure right of ways will require widening in many locations to accommodate the new pipeline. Some inconvenience to the public is expected, as portions of the route pass through or adjacent to vineyards and other developed areas. As a result, a score of 3 was assigned for Environment and Public Impact (acceptable choice; neutral or moderate negative impact and risk).

4.6.3 Financial Evaluation

Alternatives 1, 2, and 3 were assessed and given a score from 1 to 5 against the evaluation criterion of Rate Impact. A summary of the resulting scores is provided in Table 4-7, and the discussion below provides the rationale for this scoring.

FEI considered the long term rate impact to FEI's customers to compare the financial impact of the three feasible alternatives. This was completed by evaluating the present value of the incremental revenue requirement as well as the levelized delivery rate impact over the 70-year analysis period for each alternative based on the estimated capital cost and operating cost. For a fair comparison, future incremental sustainment capital and operating expenditures over the 70-year analysis period for each feasible alternative were included in the analysis.

4.6.3.1 *Financial Comparison (All Alternatives)*

The financial analysis indicates that Alternative 2 has the highest incremental cost for ratepayers; this is the result of having a higher capital cost which results in a higher Levelized Rate Impact. Table 4- below summarizes the present value (PV) of incremental annual revenue requirement and levelized rate impact for all three feasible alternatives.[21] The third row of Table 4-7 summarizes the scoring assigned to Alternatives 1 through 3 against the evaluation criteria

[21] The incremental revenue requirements have been discounted at the after tax cost of capital for FEI based on the 2021 Test Year, capital structure, rates of return, and income tax rate as per the FEI's Application for its Annual Review for setting 2020 and 2021 Delivery Rates Application filed August 12, 2020.

in the Financial category. Alternative 1 has the lowest PV of the Annual Revenue Requirement and Levelized Rate Impact, then Alternative 3 has the next highest impact and finally Alternative 2 had the highest impact.

Table 4-7: PV of Incremental Annual Revenue Requirement and Rate Impact

	Alternative 1	Alternative 2	Alternative 3
PV of Annual Revenue Requirement $000s	$199,969	$213,780	$203,973
Levelized Rate Impact $/GJ	$0.057	$0.061	$0.059
Financial / Rate Impact	4	2	3

The following Table 4-8 summarizes the incremental capital costs, annual operating and maintenance and property tax costs for the three alternatives. For Alternative 3 the incremental integrity capital related to running crack detection tools for in line inspection and the resulting operating costs (i.e., the integrity digs) that occur on a once per seven-year cycle are also provided.

Table 4-8: Capital, O&M, Property Taxes ($000s)

Particulars	Alternative 1	Alternative 2	Alternative 3
Capital Cost (2019$) (**excl. AFUDC**)	$195,113	$206,623	$188,149
Capital Cost As Spent (**incl. AFUDC**)	$220,215	$232,927	$212,906
In-Line Inspection Capital (2019$)	N/A	N/A	$828
Retirement / Removal Costs As Spent	$1,569	$692	Nil
Incremental Annual O&M (2019$)[22]	Nil	$9	$24
Incremental O&M - Integrity Digs (2019$)[23]	N/A	N/A	$140
Incremental Annual Property Taxes (2019$)	$6	$78	$337

Although Alternative 3 has higher operating and maintenance (O&M) expense and Property Taxes[24], it has the lowest capital cost which result in lower costs for depreciation expense,

[22] For Alternatives 2 and 3 the incremental O&M for the new station is $4 thousand, the balance of the O&M increase is related to the additional transmission pipe (i.e., approximately 6 km for Alternative 2 and 30 km for Alternative 3).

[23] Incremental O&M costs related to Integrity Digs occurs every 3rd and 4th year of a 7 year cycle starting in 2026. These costs are only applicable to Alternative 3.

[24] The Confidential Appendix E-1.1, E-1.2 and E-1.3, Schedule 2 shows the as-spent costs for O&M expense and for Property Taxes. As Alternative 3 requires addition of approximately 30 km pipeline to the ITS as compared to approximately 6 km for Alternative 2 and no additional pipeline for Alternative 1, the incremental O&M and property taxes are higher for Alternative 3. The 2019$ costs have been escalated by the BC CPI 5 year average from 2015 to 2019 or 2.02% rounded to 2%.

income tax and earned return and therefore lower cost of service as compared to Alternative 2. Please see Appendix E-1 for detailed financial analysis of all three feasible alternatives.

4.6.4 Summary of Feasible Alternatives Evaluation

The following Table 4-9 provides a summary of FEI's assessment of Alternatives 1, 2, and 3 against all evaluation criteria, based on the discussion above.

Table 4-9: Overall Alternative Evaluation

Criterion	Weighting	Alternative 1: ITS Upgrades Weighted Score	Alternative 2: Modified ITS Upgrades Weighted Score	Alternative 3: OLI PEN 406 Extension Weighted Score
Asset Management Capability	40%	3.5	4.0	4.5
Project Execution and Lifecycle Operation	30%	1.45	1.45	3
Financial / Rate Impact	30%	4	2	3
Weighted Total:*	**100%**	**3.04**	**2.64**	**3.60**

**Weighted total is calculated for each alternative by multiplying the weighted score for each criterion with its associated overall weighting, and then summing these scores. The maximum possible weighted total is 5.*

Alternative 3 has the highest total weighted score at 3.60 out of 5 points and is therefore the preferred alternative.

4.7 *CONCLUSION*

FEI analyzed the five alternatives to address the issue of an upcoming capacity shortfall in the central and north Okanagan regions. Of these five alternatives, two were eliminated as part of the preliminary evaluation, as they were deemed to be not feasible. The remaining three feasible alternatives were assessed on a technical basis against specified evaluation criteria, as well as on a financial basis.

A technical (non-financial) evaluation of Alternatives 1 through 3 demonstrated that Alternative 3 scores the highest against the non-financial criteria defined to evaluate the project alternatives. This was primarily due to significant schedule risks associated with Alternatives 1 and 2, as well as the significant impact to the public associated with re-hydrotesting in urban areas. Alternative 3 also provided the greatest positive impact to operational flexibility.

The financial evaluation of the three feasible alternatives indicated minimal differences in rate impacts between all three alternatives. Alternative 2 (Modified ITS Upgrades to VER PEN 323) has the highest incremental cost for ratepayers as a result of its higher cost, and resulting higher levelized rate impact. However, there is only a difference of $0.002 / GJ in the rate impact between Alternative 1 and Alternative 3.

As the non-financial evaluation indicated that Alternative 3 would provide the best technical solution, and a financial evaluation indicated that Alternative 3 would also be cost effective as it provides a lower rate impact than Alternative 2 and a small difference in the rate impact to Alternative 1, it is clear that Alternative 3 (i.e., a 30 km extension of the OLI PEN 406 pipeline to Chute Lake, with a new control station to tie into the existing VER PEN 323 pipeline) is the preferred solution.

5. PROJECT DESCRIPTION

5.1 *INTRODUCTION*

In this section, FEI describes the OCU Project in more detail. As explained in Section 3, FEI needs to increase its ITS capacity prior to the winter of 2023/2024 so that FEI can meet the forecast increase in the peak demand due to load growth in the central and north Okanagan regions. FEI is therefore proposing the OCU Project, which includes construction of a new approximately 30 km extension of the OLI PEN 406 transmission line from a takeoff location from Ellis Creek near Penticton to its terminus at a new pressure control station near Chute Lake south of Kelowna, along with other associated facilities.

In the following sections, FEI describes the OCU Project in detail as follows:

- Section 5.2 provides an overview of the required Project components to address the OCU Project need;
- Section 5.3 describes FEI's route selection process which includes the evaluation criteria used by FEI to assess the feasible route options considered by FEI;
- Section 5.4 provides the basis of design and engineering, which are conducted in accordance with British Columbia Oil and Gas Commission (BCOGC) regulations and the industry standards;
- Section 5.5 explains FEI's approach to construction management for the OCU Project;
- Section 5.6 describes the timing of key Project activities that FEI will undertake to complete the OCU Project prior to winter peak of 2023/2024;
- Section 5.7 outlines FEI's assessment of the required resources to complete the Project;
- Section 5.8 explains how FEI has identified key Project impacts and is taking a reasonable and appropriate approach to mitigate those impacts;
- Section 5.9 explains that FEI has identified the key permits and regulatory approvals that are required to construct the Project; and
- Section 5.10 provides the basis of the cost estimate, and the processes undertaken to validate the estimate including risk assessment, contingency and management reserve determination.

5.2 *FEI HAS IDENTIFIED NECESSARY PROJECT COMPONENTS*

The Project scope will include the routing, design, construction and commissioning of a new 30 km section of 406 mm pipeline and associated facilities. The main Project components include:

- OLI PEN 406 mm pipeline extension that will operate at a MOP of 7,826 kPa starting at kilometre point 30.8;

- New Chute Lake Pressure Control Station with a 406 mm pig barrel and pressure regulated tie in to the existing VER PEN 323 pipeline set at 5,171 kPa for gas flowing north to Kelowna and 4,826 kPa for gas flowing south to Penticton at kilometre point 60.8; and
- New 406 mm Block Valve Station above ground valve station at kilometre point 36.1.

A 1,200 m section of the existing OLI PEN 406 will be deactivated between the tie in location at kilometre point 30.8 and the Ellis Creek Pressure Control Station.

5.3 *FEI HAS APPROPRIATELY EVALUATED AND SELECTED A ROUTE FOR THE PREFERRED ALTERNATIVE*

FEI's route selection process for the OCU Project follows industry practice and specific consideration has been given to the recommendations of the Canadian Standards Association standard CSA Z662:19 Oil & Gas Pipeline Systems, which is the standard specification for the design, construction, operation, and maintenance of Canadian pipelines.

Pipeline routing is an iterative process which starts with a wide 'corridor of interest' and then narrows down to a more defined route at each design stage as more data is acquired, resulting in a final alignment. The process has been tailored to meet the challenges associated with development, land use, terrain, watercourses, infrastructure, local permits and regulations, the environment, archeology as well as impacts to communities, stakeholders and Indigenous groups. Based on these considerations, FEI has determined that the final route selected must meet the following objectives:

- Safe (to construct and to operate);
- Minimize impacts to the community, stakeholders and Indigenous groups;
- Minimize environmental impacts;
- Maximize the use of modern standard pipeline construction techniques; and
- Mitigate rate impacts to customers.

The sections below outline how FEI applied and evaluated the routing objectives, including the two step route selection process which includes an assessment of the feasible options to determine the final route. More details on FEI's route selection process are contained in the Pipeline Routing Criteria and Evaluation Report, P-00760-PIP-REP-0005, included in Appendix A-1.

5.3.1 Step One: Route Corridor Identification

The initial step in the routing process is a "desktop study" to identify a suitable corridor between the start and end points of the pipeline that can meet the routing objectives. Natural terrain conditions along with current and planned infrastructure development are next identified to

assist in determining the width of the corridor and the degree of complexity expected with regard to environmental, permitting, engineering and constructability aspects. The corridor width is then adjusted to ensure all feasible route options within the corridor are captured.

Figure 5-1 shows a map of the identified corridor shaded in blue with the existing FEI VER PEN 323 in yellow and the FBC 73 Line (a 230-kilovolt electric transmission line) in purple.

Figure 5-1: Step One – Identified Corridor

5.3.2 Step Two: Feasible Route Options Determination and Evaluation

The second step, after a route corridor is identified, involves gathering data pertaining to feasible route options within the corridor. The route options are refined through examination of aerial photography, mapping data, survey, environmental studies and major crossing constraint assessments as well as feedback from consultation and engagement with stakeholders, and Indigenous groups.

At the end of step two, two routes were further evaluated against the routing criteria and objectives (as described in detail in Section 5.3.2.2) and the preferred route was selected. FEI considered an alternate route alignment outside the existing FEI and FBC's ROW. However, this route option was dismissed at an early stage as it would be more impactful, resulting in an increased environmental footprint as compared to route options paralleling existing ROWs as described in the evaluation criteria included in Section 5.3.2.2 below.

5.3.2.1 *Assessment of Feasible Route Options*

Following the identification of the feasible route options, evaluation criteria were established to select the preferred route. The assessment process included both quantitative and qualitative elements that analyzed each route option based on the evaluation criteria.

5.3.2.2 *Evaluation Criteria*

Three broad categories of principles and considerations which were taken into account during the route options evaluation are listed and defined in Table 5-1.

Table 5-1: Pipeline Route Evaluation Criteria Definitions

Category 1: Community and Stakeholder Criteria	
Health and Safety	Considers the risks to the community, stakeholders, employees, and contractors during construction and during the life of the pipeline.
Socio-Economic	Considers the effect of the Project on the cultural values, economic well-being, and daily life for Indigenous groups, local stakeholders and citizens during construction and during the life of the pipeline.
Land Ownership and Use	Considers the restrictions put on land use across any property. Wherever possible, utilize existing utility corridors. Where not possible, expand existing corridors before obtaining new corridors.
Category 2: Environmental Criteria	
Ecology	Considers the impact during construction and during the life of the pipeline to the environment including environmentally sensitive areas along the Project corridor.
Cultural Heritage	Considers the impact during construction and during the life of the pipeline to known archaeological and culturally sensitive areas at the Project site.
Human Environment	Considers the impact of the Project to the human environment including noise, local emissions, aesthetics, nuisance factor and the short and long-term visual effects that may be observed by residents and visitors in the Project area.
Category 3: Technical Criteria	
Engineering	Considers the engineering and design effort to meet all statutory codes and regulations to result in the optimum pipeline system.
Construction	Considers the existing above and below ground constraints in terms of pipeline construction activities, pipe-laying productivity, requirement for non-standard higher risk construction techniques and construction footprint.
Operation	Considers long-term impacts including those to employees and contractors to maintain the pipeline integrity and the ability to conduct maintenance and repairs. Also considers impacts to adjacent development and third-party land ownership and use.
System Interface	Considers the challenges with interconnecting the new pipeline and facilities into the existing gas system infrastructure.
Adjacent Infrastructure	Considers the potential impacts on adjacent (existing and planned) facilities and buried or above ground utility infrastructure and risk to longevity and safe operation of the gas pipeline and facilities from adjacent infrastructure.
Natural Hazards	Considers the vulnerability during operation of the pipeline and built facilities to natural hazards including seismic impacts, ground contamination, tree root encroachment, etc.

5.3.2.3 *Weighting and Methodology*

Each of the evaluation criterion was given a weighted score as outlined in Table 5-2, in order to quantify the relative merits of each option.

Table 5-2: Pipeline Route Evaluation Weighting[25]

Criteria	Weighting	Evaluation Considerations
Category 1: Community and Stakeholder Criteria Weighting		
Health and Safety	15	Assessment of the construction zone environment, nature of the planned construction activities and proximity to vulnerable entities.
Socio-Economic	15	Proximity to populated areas, roadway usage impacts, number of commercial accesses impacted, agricultural impacts, etc.
Land Ownership and Use	5	Properties directly impacted during construction and nature of impacts.
Sub-total:	***35***	
Category 2: Environmental Criteria Weighting		
Ecology	5	Natural and environmentally sensitive areas impacted.
Cultural Heritage	5	Culturally sensitive areas impacted.
Human Environment	15	Nature and proximity of visual, noise and vibration impacts, residential accesses impeded, etc.
Sub-total:	***25***	
Category 3: Technical Considerations Weighting		
Engineering	5	Areas of construction difficulty requiring engineering solutions identified.
Construction	10	Type of construction required, pipe installation productivity quantified, length of pipeline and overall construction footprint etc.
Operation	10	Areas of potential operational difficulty identified.
System Interface	5	Complexity of interface and length of pipeline laterals quantified.
Adjacent infrastructure	5	Type of adjacent infrastructure, proximity and spacing, planned infrastructure, using wider road allowance to maximize proximity, etc.
Natural Hazards	5	Preliminary evaluation of the surrounding natural and man-made environment and potential hazards along the route corridor.
Sub-total:	***40***	
Total	***100***	

[25] Please refer also to the criteria definitions in Table 5.1.

A five point ranking score was used for scoring the route options. The scoring is outlined in Table 5-3.

Table 5-3: Route Evaluation Scoring

Score	Impact Evaluation
5	Very low (negligible) impact, best choice
4	Low impact, better choice
3	Moderate impact, good choice
2	High negative impact, poor choice
1	Very high negative (unacceptable) impact, unviable choice

Cost was implicitly considered within the Community and Stakeholder, Environmental and Technical evaluation criteria. In general, it is considered that routing which minimizes impacts to all criteria without adding extensive length would result in the lowest cost.

5.3.2.4 *Feasible Route Evaluation*

The route corridor was further sectionalized into eight segments based on geographic features and construction constraints as presented in Figure 5-2.

Figure 5-2: Step Two – Feasible Route Sectionalization

As noted in the "Land Ownership and Use" criterion of Table 5-1, FEI attempts to align new infrastructure with existing utility route corridors where possible. Consistent with this, two route options were analyzed for each segment using the following definitions:

- Option 1: The route parallels the existing FBC 73 Line.
- Option 2: The route parallels the existing VER PEN 323 pipeline.

The length of ROW for each option within each segment for the pipeline extension to be parallel, or adjacent to, is detailed in Table 5-4.

Table 5-4: OCU Project Selected Pipeline Route Details

Segment	Segment Name	Option 1 Length parallel to 73L (m)	Option 2 Length parallel to VER PEN 323 (m)
1	Takeoff to Penticton Creek	1,880	No Alignment within Corridor
2	Penticton Creek	Refer to Section 5.3.2.6	
3	Campbell Mountain	1,840	No Alignment within Corridor
4	Vineyard Segments	3,040	3,180
5	Riddle Road to Arawana Creek	4,960	4,850
6	Arawana Creek and Naramata Creek	1,980	1,980
7	Naramata Creek to Chute Creek	10,570	10,570
8	Chute Lake	No Alignment within Corridor	3,170

For Segments 1 and Segment 3, the existing VER PEN 323 pipeline alignment is not within the OLI PEN 406 extension route corridor, therefore only the FBC 73 Line (Option 1) was considered in these segments. For Segment 8 the existing FBC 73 Line alignment is not within the OLI PEN 406 extension route corridor, therefore only the VER PEN 323 pipeline (Option 2) was considered for this segment. Segment 7 is the only portion of the OLI PEN 406 extension route alignment where both the VER PEN 323 pipeline and FBC 73 Line are adjacent and parallel for the entire segment.

The feasible route options are illustrated in the Route Selection Maps - Overview, P-00760-PIP-MAP-0013 to P-00760-PIP-MAP-0021, included in Appendix A-1.

5.3.2.5 *Overall Route Evaluation (for All Segments Except Segment 2)*

Applying the evaluation criteria developed in Section 5.3.2.2 with the weighting and scoring developed in Section 5.3.2.3, resulted in individual segment scores shown in Table 5-5.

Table 5-5: Segment Evaluation Scores[26]

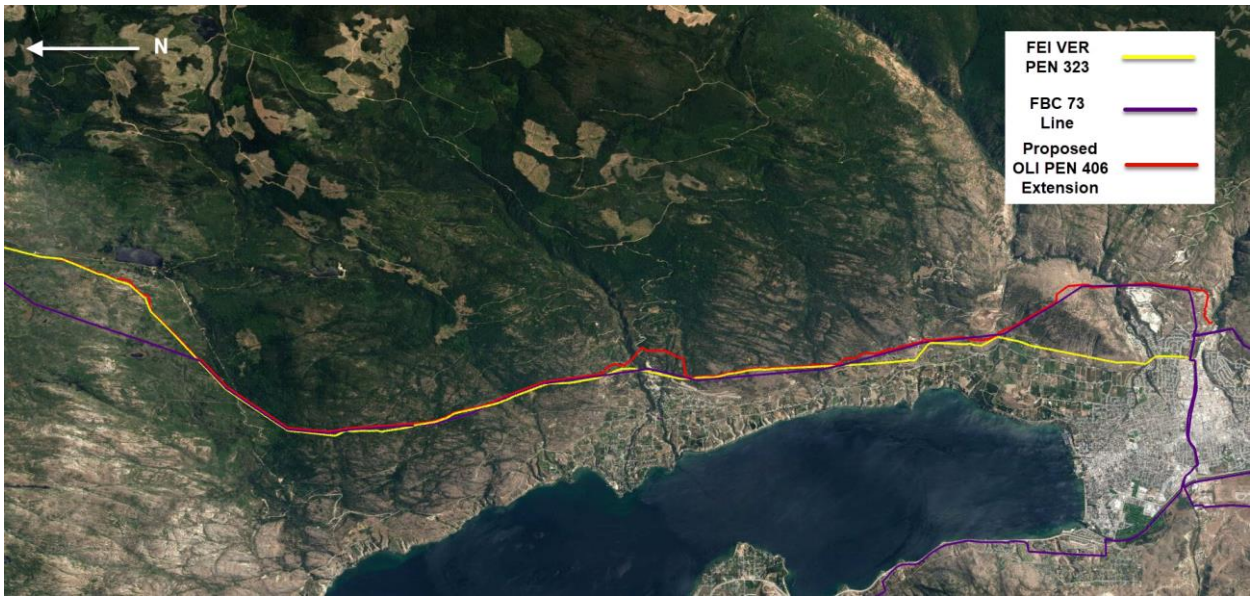
Segment	Option 1 Parallel to 73L	Option 2 Parallel to VER PEN 323
1	307	N/A
2	Refer to Section 5.3.2.6	
3	385	N/A
4	338	271
5	322	308
6	313	219
7	389	389
8	N/A	382

The routing process and routing ranking indicated that the preferred route option was Option 1 for all segments except Segment 8, where Option 2 is preferred. Details of the scoring of each evaluation criterion for all options are provided in the Route Selection Report, P-00760-PIP-REP-0009, included in Appendix A-1.

After determining the segment alignments relative to existing infrastructure, further route optimization was conducted to review the alignment for constructability and analyze route deviations for natural features or man-made obstructions, and based on stakeholder feedback. Figure 5-3 presents the preferred route in relation to the VER PEN 323 and 73 Line alignments.

[26] The segment evaluation scoring was based on maximum of 500 points.

Figure 5-3: Preferred OLI PEN 406 Extension Alignment



Project alignment sheets of the preferred route are provided in drawings 12264-P-200-1000-R0 to 12264-P-200-1039-R0, in Appendix A-1.

5.3.2.6 *Segment 2 – Penticton Creek*

FEI determined that Section 2 required special consideration in the vicinity of Penticton Creek, which is located within a steep valley and is likely to have the most significant engineering/construction challenges during Project execution. There is also a residential development located adjacent to the top of the south side of the valley. Considering the potential technical and construction challenges with this crossing, three route alternatives/construction methods were evaluated for this segment:

- Option A: Full Horizontal Directional Drill (HDD). This construction method is a long distance horizontal directional drill to install a 1,640 m segment of pipe across Penticton Creek.
- Option B: Complete Open Trench. The proposed construction would utilize open trench excavation and installation for the entire length. The pipeline segment length for comparison is approximately 2,300 m.
- Option C: Partial Open Trench. The partial open trench is similar to the complete open trench method, except for a 250 m segment along the side slope at the top of the south crest where HDD would be used.

Evaluation of the crossing alternatives identified the full HDD as the preferred alignment and construction method for Penticton Creek. See Table 5-6 for the Segment Evaluation Score.

Table 5-6: Penticton Creek Selection Evaluation Score

Segment	Option A Full HDD	Option B Complete Open Trench	Option C Partial Open Trench
2	353	235	250

Further details of the alignments and evaluation are available in the Penticton Creek Crossing Memo, P-00760-PIP-MEM-0001, included in Appendix A-1.

5.3.3 Final Route Development

The next and final stage of the routing process will involve detailed field investigation of the route and the environment in which the pipeline is to be constructed.

Pipeline detailed engineering, geotechnical engineering, and environmental specialist review, with appropriate agreements from Indigenous groups, landowners and stakeholders will confirm the locations for mainline pipe, station sites, cathodic protection (CP) sites and main line valve sites.

Municipalities, stakeholders and third parties will be contacted to obtain further details of any known or expected development or encroachments along the route, the location of underground obstructions, pipelines, services and structures and all other pertinent data. Traffic impact assessments will be completed as required in consultation with the City of Penticton and the Ministry of Transportation and Infrastructure. Stakeholder, local jurisdiction and government approval will be obtained in accordance with statutory requirements.

The outcome of the final stage of the routing process will comprise a confirmed pipeline route and complete list of the affected landowners and stakeholders which will facilitate preparation of the construction scope of work and detailed construction execution plans.

5.4 *BASIS OF DESIGN AND ENGINEERING*

In this section, FEI demonstrates how industry practice and external standards have been considered and incorporated into the Project design to ensure that the assets will operate safely and reliability throughout their intended lifespan.

5.4.1 Standards and Specifications

The OCU Project comprises of a new pipeline, block valve assembly, and a pressure reducing station and will be developed in accordance with all applicable external codes and industry standards including FEI's internal standards and specifications. A list of applicable standards can be found in the Project Design Basis Memorandum, P-00760-PIP-DBM-0001, in Appendix A-1.

5.4.2 Pipeline Design

The proposed OLI PEN 406 pipeline extension will operate at 7,826 kPa and be able to provide sufficient capacity to the existing ITS mainline pipeline to support forecast peak demand for the next 20 year period. The proposed OLI PEN 406 pipeline will traverse approximately 30 km in a south to north alignment from Ellis Creek near Penticton to Chute Lake south of Kelowna.

5.4.2.1 *Design Parameters*

This section specifies the pipeline design parameters and requirements that are taken into account in the pipeline design. Table 5-7 provides the broad design specifications which inform the pipeline design.

Table 5-7: OLI PEN 406 Pipeline Specification Details

Detail	Value
Pipeline Length	29,989 m
Pipeline Outside Diameter/Nominal Pipe Size	406 mm/NPS 16
Maximum Operating Pressure (MOP)	7,826 kPa (1,135 psi)
Pipeline Material Grade/Specified Minimum Yield Strength (SMYS)	414 MPa (X60)
Pipeline Buried Depth (min, to top of pipe)	Minimum 0.6m in rock, Minimum 1.2m in soil
Maximum Design Temperature	50 degC
Pipe External Coating	CSA Z245.20-18 Fusion Bond Epoxy

5.4.2.2 *Pipe Specification*

The pipe specification process for the proposed pipeline followed accepted industry practices, and meets all relevant code requirements, specifically those in CSA Z662 Oil and Gas Pipeline Systems. The wall thickness selection criteria for the OLI PEN 406 pipeline are based on several factors outlined in CSA Z662. The wall thickness selection was based on the following:

- Consideration of any proposed crossings and minimum wall thickness requirements for the specific crossing type; and
- Consideration of pipe thinning during the induction bending process.

A consistent wall thickness was selected in order to better accommodate pipeline Inline-Inspection (ILI) operations, ease constructability (through minimization of transition pieces and welds), and to maximize cost saving opportunities during the pipe production.

The design parameters for the new pipelines are presented in Table 5-8 below.

Table 5-8: New Pipeline Design Parameters

Parameter	Value	
Pipeline Product	Sweet Natural Gas	
Design Flow Rate	OLI PEN 406	115 mmscfd
Maximum Operating Pressure (MOP)	OLI PEN 406	7826 kPag
	VER PEN323	5171 kPag
Certified Operating Pressure (COP)	VER PEN323	6619 kPag
Maximum Operating Temperature	All New Pipes	49 degC
Minimum Design Metal Temperature	Above Grade	-45 degC
	Below Grade	-5 degC
Minimum Design Restraint Temperature	Above Grade	5 degC
	Below Grade (non-winter installation)	5 degC
	Below Grade (winter installation)	-5 degC

Pipe for the Project will comply with the CSA Z245.1 Steel Pipe standard and have an outside diameter of 406 mm, a wall thickness of 9.5 mm, and use Grade 414 steel. The pipe will be designed for an operating hoop stress in the range of 30 to 50 percent of SMYS to meet all CSA Z662 Class 3 location conditions. The conservative steel grade and wall thickness is subject to a thorough fracture control analysis which will take place during detailed design. The fracture control analysis may result in lower wall thickness being selected in detailed design.

5.4.2.3 *South Tie-in*

The proposed South tie-in to the new pipeline is located on the southeast edge of Penticton municipal limits, along Carmi Avenue. This location is at kP 30.8 along the existing OLI PEN 406 pipeline. The access to the proposed tie-in is on Carmi Ave. The South tie-in to the new pipeline will be an underground butt-weld into the existing OLI PEN 406 pipeline.

5.4.2.4 *Block Valves*

A block valve serves as a means to isolate individual sections of pipeline and stop the flow of gas if required during normal operation and maintenance or in case of emergencies. If two or more of these valves are closed simultaneously, the resulting pipeline 'shut-in' stops the flow of gas through that section of pipeline.

There will be one block valve that will be installed in the OLI PEN 406 pipeline extension. The new block valve will be installed at kP 36.1, near Reservoir Road in Penticton. The proposed area is relatively flat with the valve set back approximately 30 m from the road. The block valve station will be an approximate 27 m x 12 m fenced site. For further details see the Pipeline Valve Sectionalization report, P-00760-PIP-REP-0001 in Appendix A-1.

There are existing block valves on the OLI PEN 406 near Oliver and FEI also plans to install a block valve at the new Chute Lake Station.

5.4.2.5 *In-line Inspection*

ILI is a process that utilizes the pipeline gas flow and pressure to propel an inspection tool within the pipeline. There are a number of types of ILI tools which are used to detect and size a variety of pipeline anomalies, including corrosion, mechanical damage and cracking.

FEI has determined that due to the longevity of steel pipelines, it is appropriate to design the new OLI PEN 406 extension with ILI capability. This will enable cost effective and targeted mitigation of specific pipeline hazards (i.e., corrosion) over the service life of the new asset. Consequently, a receiver at the pipeline outlet (to receive the ILI tool) will be provided during the design and construction. The OLI PEN 406 has an existing launcher at the pipeline inlet (for tool insertion and to control the propulsion) at kilometre point 0.0. For further details see the Project Design Basis Memorandum, P-00760-PIP-DBM-0001, in the Appendix A-1.

To facilitate ILI, the OCU Project pipeline design must incorporate certain features and mechanical components such as avoiding use of tight radius pipe bends, wall thickness transitions, and ensuring that all fittings and appurtenances (e.g. valves, tees) allow for consistent and reliable passage of ILI tools to maximize data collection.

5.4.2.6 *Corrosion Protection and Mitigation*

External Coating

External coatings provide the first level of defence against external corrosion of buried steel piping, and are required by the CSA Z662 standard. Coating protection involves the application of a layer of factory applied high electrical resistance material to the outside of the pipe to create a barrier between the steel pipe surface and the soil. Protective coatings are applied after pipe manufacture and prior to delivery for construction. There are different coating materials available depending on the specific operating requirements. Fusion Bonded Epoxy (FBE) has been selected as the most appropriate coating for the new OLI PEN 406 pipeline. FBE is factory applied under strict quality control practices as required by CSA Z245.20 Plant Applied External Fusion Bond Epoxy Coating for Steel Pipe. FBE coatings are considered “fail safe” as they will not shield CP current in the case of potential coating damage, deterioration, or loss of adhesion. For further details, see the Coating Selection Report, P-00760-PIP-REP-0006 in the Appendix A-1.

Cathodic Protection

CP is required and applied as a secondary defense against external corrosion and is used in conjunction with external coatings. Primary corrosion control of the new OLI PEN 406 pipeline will be achieved via the protective external coating described previously. CP design will be in accordance to CSA Z662:19 Clause 9.5 and applicable FEI specifications. It is expected that the

existing CP system could be used to provide protection to the new OLI PEN 406 extension; this will be confirmed during detailed design.

Integrity Monitoring

Consistent with the existing pipeline, the integrity of the new OLI PEN 406 pipeline extension will be managed within FEI's Integrity Management Program (IMP). The IMP is a corporate-level management system for identifying and mitigating hazards to system assets that have the potential to result in a failure with significant consequences. Activities include:

- Monitoring of the CP system in accordance with CSA Z662 and CGA OCC-1 standards, and industry practice. These monitoring programs are established and documented within Company standards;
- Periodic inspection using ILI as described in Section 5.4.2.5 above; and
- Third-party damage prevention activities, including a permits and inspection process and public safety awareness programs.

5.4.2.7 *Land Requirements*

New statutory right of way and temporary work space land requirements have been generated and are summarized in Table 5-9.

Table 5-9: Pipeline Land Requirements

Item	Site Dimensions (metre x metre)	Additional ROW (metre x metre)	Additional Temporary Work Space (metre x metre)
Pipeline Corridor - Open Cut	N/A	18 m width	5 m – 10 m
Pipeline Corridor -Trenchless	N/A	18 m width	N/A
Block Valve Site	27 x 12	0	0
Conventional Crossing	N/A	10 x 8	10 x 5
Access Road (total)	N/A	N/A	8 x 11,200
Deck Sites - open cut (each)	N/A	N/A	40 x 40
Deck Sites – Trenchless (each)	N/A	N/A	30 x 100

Installation of the pipeline will require an approximately 18 metre wide ROW regardless of whether it is located adjacent to the existing VER PEN pipeline or FBC 73 Line, or not located near either existing corridor. Additional temporary work space will be required to facilitate construction (including temporary accesses, construction workspace, laydown areas, and deck sites).

5.4.2.8 *Crossings*

All pipeline crossings within the Project will be constructed using open cut methods with the exception of Penticton Creek. In general, the types of crossings identified along the proposed OLI PEN 406 pipeline route include:

- Road Crossings;
- Water Crossings; and
- Pipeline and Utility Crossings.

For further details on the general crossing methodology, please refer to the Crossing Methodology Selection Report, P-00760-PIP-REP-0011, in Appendix A-1 as well as the full crossing list. Details of the Right of Way and Construction Strategy Report can be found in P-00760-PIP-REP-0010 with construction details for each crossing type in Appendix A-1.

5.4.3 Stations (Facilities) Design

The proposed OLI PEN 406 pipeline will operate at a higher pressure than the existing VER PEN 323, therefore pressure control and overpressure protection to interconnect with the existing pipeline are required. The proposed Chute Lake Control Station will be located approximately 1.5 km north of Chute Lake, BC on the west side of Chute Lake Road. For more details regarding the siting of the station, see the Facility Site Selection Report, P-00760-PIP-REP-0003 in Appendix A-1.

5.4.3.1 *Design Parameters*

This section specifies the station design parameters, and requirements, that are taken into account in the station design. Table 5-10 lists the key process parameters considered in the design of the stations.

Table 5-10: Process Design Parameters

Parameter	Value
Peak Hour Station Inlet Gas Flow	173 mmscfd
Minimum Station Inlet Gas Pressure	6,164 kPa
Station Inlet Gas Temperature Range	5 to 20 degC
Gas Molecular Weight	17.16
Peak Flow to SN9-3	142.66 mmscfd
Station Discharge Gas Pressure to SN9-3	5,171 kPa
Peak Flow to SN10	30.76 mmscfd
Station Discharge Gas Pressure to SN10	4,826 kPa
Maximum Gas Velocity	30 m/s

For further details on the design parameters of the Chute Lake Control Station, see Design Basis Memorandum, P-00760-PIP-DBM-0001 in Appendix A-1.

5.4.3.2 *Equipment Specification*

Equipment selection and sizing was completed utilizing the design parameters and operating requirements associated with each piece of major equipment at the station. It also took into consideration the function, processes, operating philosophy and maintenance requirements.

Major equipment for the station includes:

- NPS 16 pig receiving barrel
- Main gas filter (see Section 5.4.3.3)
- Pressure control and overpressure protection system (see Section 5.4.3.3)
- Power gas supply system
- Fuel gas supply system
- Catalytic heaters
- Telemetry system (see Section 5.4.3.4)
- Thermo-electric generators (see Section 5.4.3.5)

For further details on the major equipment selection for the Chute Lake Control Station, see Major Equipment Selection and Evaluation Report, P-00760-MEC-REP-0001 in Appendix A-1.

5.4.3.3 *Pressure Control and Overpressure Protection*

Two 100 percent capacity pressure regulator runs will be installed to control pressure north of the tie in (one working run and one back up) operating at 5,171 kPa. One pressure regulator run will be installed south of the tie in for south flow operating at 4,827 kPa. A normally closed manual, gear-operated ball valve will be installed on the VER PEN 323 pipeline to isolate the north flow from the south flow.

Main pressure regulators will have set point adjustment capability from FEI Gas Control to allow remote set point adjustment.

Gas filtration provides a secondary form of overpressure protection by removing any solid and/or liquid contaminants from the OLI PEN 406 gas stream that may damage the pressure control equipment. A common main gas filter will be installed upstream of the pressure regulator runs prior to gas entering the Chute Lake Control Station equipment and the VER PEN 323 pipeline.

5.4.3.4 *RTU/SCADA and Communication*

The Remote Telemetry Unit (RTU) will monitor the station and provide two-way communication with FEI Gas Control. Two 100 percent capacity pressure regulator runs will be installed at the Chute Lake Control Station. The main pressure regulators will have set point adjustment capability from FEI Gas Control to allow remote set point adjustment. The pressure monitoring signals will be wired to the RTU. The RTU will communicate to Supervisory Control and Data Acquisition (SCADA) using cellular and radio communication. The programming and configuration of these systems will be executed by FEI Electrical, Controls and Instrumentation (EC&I) group.

5.4.3.5 *Power Supply*

Power to the Chute Lake Control Station will be supplied by Thermo-Electric Generator (TEG) units. The use of existing FBC power lines was considered and determined to not be practical or cost-effective. The TEG units will use gas as the supply energy source and feed a DC/AC inverter, providing 120VAC for main power distribution through the distribution panel. There will be redundant TEG units installed for reliability and maintenance.

5.4.3.6 *Land Requirements*

The site for the Chute Lake Control Station is located on the west side of Chute Lake Road, which is the main access road to the proposed facility. The Chute Lake Control Station will be an approximately 41 m x 35 m fenced site.

5.4.4 Pipeline Deactivation

A 1,200 m section of the existing OLI PEN 406 will be deactivated between the Ellis Creek tie-in point and the existing Ellis Creek Pressure Control Station.

This will include removing a section of pipe at the tie-in location, welding a cap onto the deactivated section, installing a blind at the inlet to the Ellis Creek Pressure Control Station, purging the line and maintaining a low pressure blanket with nitrogen.

Deactivation of this section of OLI PEN 406 was chosen over abandonment[27] to minimize ecological and socio-economic disturbance to the area and allow re-establishment of gas supply to the Ellis Creek Pressure Control Station if required in the future to support forecast peak demand beyond the 20 year planning window. Deactivation will follow all regulatory and code requirements.

[27] Abandonment of a line implies permanent removal from service and would include excavation, cutting and capping every 200 m along the abandoned pipeline section, and possible grout fill at crossing locations. Additionally, FEI might release its rights under the Right of Way agreements, preventing future reactivation.

5.5 *CONSTRUCTION MANAGEMENT*

As discussed in the sections below, FEI will maintain appropriate control and oversight throughout construction to ensure the work is completed in accordance with FEI's Environmental, Archaeological and Safety requirements and to ensure that appropriate measures are taken for noise and traffic control during construction.

Reporting to the Project Manager, FEI will retain a qualified consultant to provide construction management and inspection services for the Project. The consultant will be responsible for overseeing the daily construction activities and providing/coordinating the inspection activities required for the Project.

5.5.1.1 *Safety and Security*

FEI will retain the services of a qualified safety inspection and monitoring firm to be present during the construction of the pipeline. Construction site safety and security will be maintained during the course of the Project including working and non-working hours inclusive of weekends to ensure the contractor is adhering to the contractual requirements, WorkSafeBC legislation and FEI requirements. The pipeline contractor will be required to develop a comprehensive safety plan after it is awarded the construction contract.

5.5.1.2 *Environmental Management*

FEI will employ the services of a qualified environmental inspection and monitoring firm to be present during the construction of the pipeline. The environmental inspector will be familiar with pipeline construction techniques and applicable guidelines and standards. The environmental inspector will provide inspection of contractor environmental mitigation measures and respond to any environmental issues that may develop during pipeline construction.

The primary objective of environmental inspection is to determine compliance with pertinent environmental legislation, regulations, industry standards, and project permit conditions, including any notification requirements or conditions set by the regulator.

The purpose of environmental monitoring during construction is to oversee the natural and social environments to monitor for any adverse effects and to verify that the construction site is returned to pre-construction conditions as soon as possible.

The purpose of post-construction monitoring is to ascertain the success of the restoration effort and mitigation measures.

5.5.1.3 *Archaeological Management*

FEI will retain a qualified archaeological consulting firm to conduct archaeological monitoring during all archaeologically sensitive aspects of the work program in the course of construction. The archaeologist will monitor activities to identify any previously unrecorded archaeological features or artefacts. The primary objectives of archaeological monitoring are to determine

compliance with pertinent archaeological legislation, regulations, industry standards, and project permit conditions, including any notification requirements or conditions set by the regulator, and to mitigate potential impacts to archaeological resources.

5.5.1.4 *Noise Control*

In some areas, the construction site is located close to populated areas. Noise monitoring and control will comply with local guidelines. Construction activities will be carried out in compliance with municipal bylaws with respect to noise and construction equipment usage. General noise control measures will be implemented during construction, including but not limited to:

- Scheduling construction at noise-sensitive locations during non-sensitive times, to limit disruption to sensitive receptors, including wildlife;
- Maintaining equipment prior to use and ensuring equipment is in good working order;
- Using noise abatement equipment including mufflers that are in good working order;
- Turning off equipment when not in use;
- Enclosing noisy equipment and use noise barriers, where warranted, to limit the transmission of noise beyond the construction site;
- Locating stationary equipment, such as compressors and generators, away from noise receptors;
- Replacing or repairing equipment parts generating excessive noise;
- Informing truck drivers and mobile equipment operators that the use of engine retarder brakes will not be permitted in previously identified noise-sensitive locations;
- Maintaining access roads to limit vehicle noise and noise from vibration; and
- Advising municipalities and the community of construction periods.

5.5.1.5 *Traffic Control*

Although the majority of the construction activities will take place in remote areas away from the public, there are locations where construction will occur across roads and in close vicinity to cycling paths. This may entail taking temporary occupation of sections of roads or restricting access to sections of roads which will vary in length depending upon the specific site conditions and road configurations. In order to reduce impact on the public, traffic management plans will be prepared in consultation with the local municipalities to assist in maintaining traffic flow. These plans will conform to municipal requirements for traffic management during construction. Where appropriate, efforts will be made to limit construction during peak traffic periods and to stage construction to reduce the impacted areas of the road rights-of-way. FEI and the construction contractor will work with municipalities to manage traffic delays and inform local residences and businesses of temporary traffic delays as appropriate. Clean-up and restoration

of roadways will be undertaken immediately upon completion of construction to support the commencement of regular traffic flow.

5.6 PROJECT SCHEDULE

The preliminary Project execution schedule is based on receiving CPCN approval by November 2021 and an assumed construction start of Q1 2022. The schedule considers performance of the site work primarily during winter months outside of the bird nesting windows and the forest fire season.

The Project schedule after obtaining CPCN approval is divided into five main phases as shown in Table 5-11.

Table 5-11: Project Schedule and Milestones

Activity	Date
Contractor/Consultant Selection and Award	
Procure Engineering Services	Nov 2020 – Mar 2021
Contractor Tendering and Contract Negotiation – HDD Contractor	Jul 2021 – Oct 2021
Contractor Selection and Contract Negotiation – Mainline Contractor	Aug 2021 – Nov 2021
Detailed Engineering Design and Land Acquisition	
Engineering Detailed Design	Mar 2021 – Sept 2021
Preliminary Land Negotiation - Option to Purchase	Jun 2020 – Oct 2021
Land Acquisition	Nov 2021
Procurement	
Procure Long Lead Items	August 2021
Permitting	
BCOGC Permits	May 2021 - Jan 2022
BCOGC Post Permit Notices	Jan 2022 - Oct 2023
BCOGC Deactivation Notice of Intent	August 2023
Indigenous Communities Consultation	Jun 2019 - Dec 2023
Federal Permits (Department of Fisheries and Oceans, Species at Risk Act)	Jan 2021 - Jan 2022
Ministry of Transportation and Infrastructure Permits	Jan 2021 - Jan 2022
Municipal Permits	Jan 2021 - Jan 2022
Utility Permits	Jan 2021 - Jan 2022
Environmental and Archaeological Permits	Jan 2021 - Jan 2022
Early Works Construction	
Early Works Mainline Contractor Mobilize to Site (Clearing and ROW Prep)	Jan 2022
HDD Contractor Mobilize to Site	Mar 2022
HDD Construction Complete	Apr 2022
Early Works Complete	May 2022
Demobilization for Early Works	Jun 2022

Activity	Date
Mainline Construction	
Mainline Construction Mobilization	Sep 2022
Mainline Construction Complete	Jul 2023
Restoration and Demobilization	Sep 2023 - Oct 2023
Project Close Out	Mar 2024

5.6.1 Contractor/Consultant Selection and Award

Given the scale and scope of the Project, FEI will use a project delivery method that utilizes separate contracts for engineering design, construction management and inspection, and construction. The engineering design will be completed using a services contract for the complete design and development of bid packages. These bid packages will then be used to seek competitive pricing from contractors for the construction of the works.

Selection criteria will be developed and used to select contractors and consultants that will participate in the various procurement processes. The selection criteria will consider but not limited to items such as previous project experience, project references, Indigenous engagement, performance ability, financial stability, and WorksafeBC standing. Evaluation criteria will be developed and used to award each of the procurement contracts. Evaluation criteria will be unique to each of the contracts, but will generally include key personnel, experience and qualifications, performance ability and understanding of the scope requirement, and cost.

5.6.2 Detailed Engineering Design and Land Acquisition

A consulting engineering firm will complete the engineering detailed design activities. Detailed design activities encompass all engineering calculations, validations, preparation of drawings and bid packages required to cover the Project needs. Detailed design will commence prior to obtaining CPCN approval due to the anticipated durations required for permitting and procuring long lead materials such as valves and pipe that are required in order to meet the proposed construction schedule. Engineering activities will be organized in order of priority, in relation to the fabrication/procurement lead times and the construction schedule.

The Project will require new and expanded ROW, temporary construction working space and access rights. FEI has developed a land acquisition plan to assess the required properties and prioritize the acquisitions based on risk and impacts to the schedule. Further details of the land acquisition are found in Section 8.2.5.3.

5.6.3 Procurement

Material required for the Project which have long lead times to fabricate and deliver include items such as line pipe and block valves. Prior to the receiving CPCN approval, FEI will procure

all of the long lead material required in order to commence the early works construction in Q1, 2022. Where applicable, FEI will secure the remaining long lead material required for the Project through the contracts established for the early works.

5.6.4 Permitting

Permits including federal, provincial (including the BCOGC, Agricultural Land Commission and Ministry of Forests, Lands, Natural Resource Operations & Rural Development Permits), municipal and utility permits, are identified and application processes/durations are accounted for in the Project schedule.

The permits required for the Project are explained in further detail in Section 5.9.

5.6.5 Early Works Construction

The main objective of the early works construction phase is to complete the HDD work. While the feasibility study concluded that HDD is a feasible option to cross Penticton Creek, there is still a risk that the HDD installation could be unsuccessful. FEI plans to address the risk as soon as possible in the Project to allow adequate time to implement the contingency plan of using an open trenching method across the drainage within the mainline contractor's scope of work.

To prepare for the HDD, the ROW must first be developed and graded to allow adequate land/space for both of the 820 m long pipe sections to be built. The ROW prep crew will first develop the area around Penticton Creek for the HDD and will then move to the north end of the project (Chute Lake) and begin clearing and developing the ROW working south. This early work is being advanced and is planned to be completed around the bird nesting season and prior to the 2022 wildfire season.

5.6.6 Mainline Construction

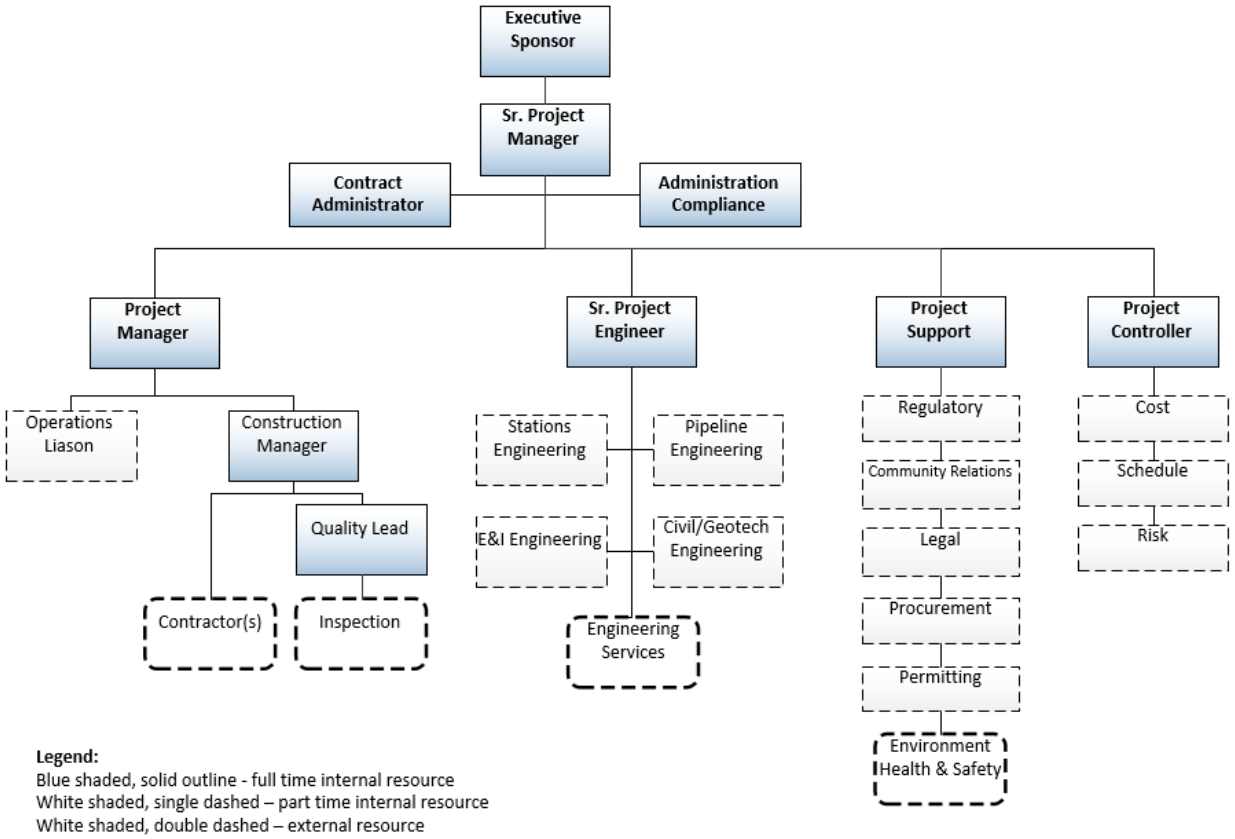
After the forest fire season of 2022 is over, the mainline contractor will again mobilize to site and commence ROW clearing and preparation. By this point in the Project a large portion of the ROW will have already been prepared from the early works, and the mechanical works (installing the pipeline) can commence and follow behind the ROW preparation crew. Typical pipeline activities will be utilized to build the pipeline and the work is scheduled to be complete prior to the forest fire season of 2023.

5.7 *PROJECT RESOURCES*

5.7.1 Project Management and Human Resources

Figure 5-4 outlines a functional organization chart for the execution of the Project. The Project will be managed by FEI's project management team and will include both internal and external personnel along with external engineering resources as required.

Figure 5-4: Proposed Resources and Organizational Chart



The Executive Sponsor for the execution of the Project is the Vice President, Major Projects.

5.8 *PROJECT IMPACTS OR EFFECTS IDENTIFIED*

5.8.1 Environmental Impacts Assessment

Site-specific environmental management plans will be developed prior to construction to manage potential environmental risks associated with the proposed construction activities and site conditions. Following is a discussion of the potential impacts expected as a result of the Project. Details of environmental and archaeological components are discussed in detail in Section 7.

5.8.1.1 *Physical Environment*

Possible impacts to the physical environment include the potential for discharge of deleterious substances to water and soil during the installation of the HDDs, and directional boring or open cuts for shorter crossings. Hazardous and non-hazardous wastes generated will be managed appropriately including storage, containment, labelling, transport and disposal.

5.8.1.2 *Ecological Environment*

The proposed alignment of the preferred alternative is located within or directly adjacent to existing rights of way as much as possible. The proposed route overlaps with watercourses, patches of mature trees, and areas with potential for plant communities at risk. Habitat for wildlife or plant species at risk was identified along the proposed alignment of the preferred alternative and surrounding area. Invasive plants are present in the vicinity of the proposed alignment.

The proposed alignment of the preferred alternative was assessed for potential impacts or effects on the ecological environment. Final routing will be selected to minimize disturbance to sensitive environmental features. Best management practices will be applied to minimize any remaining potential negative impacts or effects on the environment. Invasive plant management will be applied throughout construction to minimize the potential spread or introduction of invasive plants. Some vegetation removal will be required during site preparation and construction.

Contaminated sites may be present along the proposed alignment of the preferred alternative. Preliminary studies identified the location and nature of potential contaminated sites. Further studies will be completed prior to construction to identify appropriate handling and disposal techniques.

5.8.1.3 *Cultural Resources*

Archaeological potential for the preferred alternative ranges from low to high potential. The Archaeological Overview Assessment identified three registered archaeological sites and two registered historic heritage sites overlapping the project study area. The preferred alternative crosses variable terrain and mapped areas of moderate to high archaeological potential are scattered along the length of the proposed route.

The proposed alignment of the preferred alternative was assessed for potential impacts to archaeological resources and Archaeological Impact Assessments will be completed prior to construction. Archaeological monitoring will take place during construction where there is moderate to high potential for deeply buried cultural deposits to minimize the potential impact to archaeological resources.

5.8.2 Socio-Economic Impacts Overview

FEI reviewed the proposed Project route and identified adjacent communities, First Nations land, small businesses, and farmland (see Sections 8.2 and 8.3). The work will take place in a mostly rural landscape with low population density alongside existing ROWs. Short-term disruptions from the Project are expected to be temporary and generally minor. FEI does not anticipate long-term negative impacts as a result of the Project. FEI considered the importance of the local, tourist-based economy in its route selection, specifically the importance of the Naramata Bench as the winemaking hub in BC and the Kettle Valley Railway as a national historic site and tourist travel route.

There are over 40 wineries along the Naramata Bench. FEI has included these considerations in its route selection process, and as such, has proposed a route that runs alongside FEI's existing VER PEN 323 right-of way and FBC's existing 73 Line right-of way where possible, to minimize the creation of additional right-of-way lands.

The Kettle Valley Rail Trail (KVR) is a national historical site located in Naramata and runs in parallel with some sections of the OCU Project route. The KVR is a popular among cyclists who want to bike from Naramata to Kelowna. As such, FEI has recognized the importance of this historical site in its Project planning.

FEI's plans to mitigate, manage and minimize potential short-term adverse effects and monitor Project impacts as construction proceeds. The mitigation measures will be based on industry best practices and applicable requirements of local regulations. To mitigate short-term adverse socio-economic impacts of Project construction, FEI will require the contractor to develop a Public Impact Mitigation Plan. Mitigation measures will include, for example, complying with municipal noise bylaws and limiting traffic access restrictions to businesses and residents during construction.

FEI will also work with Indigenous and local leaders and organizations to identify and mitigate issues, and to connect local workforce and businesses to Project opportunities. Throughout the Project, FEI will endeavor to track the following: Project investment in local Indigenous communities, Project investment in municipalities/regional districts, local employment opportunities, and other community investment activities.

The Project is expected to result in an overall positive impact to residents and businesses through the creation of additional employment, the procurement of local materials, and the use of local services, such as lodging and dining. Further, the Project will benefit the Okanagan region, by helping to meet long-term capacity requirements for a reliable and safe gas system, as population is forecast to increase for the next 20-year period as described in Section 3.3 of the Application.

5.9 *REQUIRED PERMITS AND APPROVALS*

5.9.1 Federal

Federal permits, notifications and approvals may be required to comply with the provisions of the *Fisheries Act*, *Species at Risk Act* (SARA), and *Explosives Act*.

Notifications and authorizations to comply with the provisions of the *Fisheries Act* may be required for works associated with geotechnical investigation and construction activities. Fisheries and Oceans Canada is responsible for permitting any federally-regulated waterbody where there is potential for fish and fish habitat alteration disruption and destruction.

The construction of the Project will require SARA permits review or notification. Permits under section 73 of SARA may be required for works associated with the alteration of critical habitat

within the project footprint. Environment and Climate Change Canada administers the *SARA* and is also responsible for any impacts to migratory birds through the *Migratory Birds Convention Act*.

Permits and certificates under section 7 of the *Explosives Act* may be required for works associated with transportation and temporary storage of explosives construction. Natural Resources Canada, Explosives Safety and Security Branch administers the *Explosives Act*.

Review of federal permit and authorization requirements will continue during detailed Project design.

5.9.2 Provincial

5.9.2.1 *BC Oil and Gas Commission*

The construction and operation of the Project are governed by the *Oil and Gas Activities Act.* The Project will require a new pipeline application which FEI plans to file in Q3 of 2021. A pipeline application involves considerable technical scrutiny by the BCOGC. Public and Indigenous consultation, ROW acquisition, land acquisitions, land or access rights, archaeological requirements, design reviews, and environmental permits/approvals for work in and around fish bearing streams are all components of the pipeline application. Each component must receive BCOGC approval prior to the start of construction. Since the proposed pipeline will generally follow existing pipeline and power line routes, the current schedule assumes a 5-month approval period from the time of filing.

The Project will impact Crown land and in some areas will require additional ROW on Crown land. These Crown land requirements will be developed as part of the BCOGC pipeline application during the detailed design stage.

5.9.2.2 *Ministry of Transportation and Infrastructure Permits*

The British Columbia Ministry of Transportation and Infrastructure (MoTI) governs transport infrastructure throughout BC and administers permits for works on highway ROW. Project work using, or crossing roads in the Regional District of Okanagan Similkameen (RDOS) is subject to approval through the BC *Transportation Act*, regulated by MoTI. FEI currently holds a blanket permit in the region for standard work activities. Review of MoTI permit and authorization requirements will continue during detailed Project design.

5.9.2.3 *Other Provincial Permits*

Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) maintains authority to administer general wildlife permits and some aspects of the *Heritage Conservation Act* (HCA); however, the BCOGC administers others. A section of the Project will require authorization by the Recreation Sites and Trails BC branch of FLNRORD. The authorization would be provided under section 16 of the Forest Recreation Regulation under the *Forest and*

Range Practices Act. The Okanagan Shuswap Natural Resource District of FLNRORD also administers works proximal to or crossing forest service roads under the *Forest Act* and regulations.

The construction of the Project is expected to require the following provincial permits:

- *Wildlife Act*, general wildlife permit (amphibian salvage);
- *Wildlife Act*, fish collection permit;
- *Wildfire Act,* BC wildfire service exemption;
- *Heritage Conservation Act*, section 12.2 & 12.4 permits;
- *Forest Act* and regulations, Forest Service Road Works permit *;*
- *Water Sustainability Act* permits;
- *Land Act* - section 39 licence of occupation;
- *Environmental Management Act* Oil and Gas Waste Regulation water discharge authorization and permits.

5.9.3 Municipal

The Project intersects with one municipality and one regional district in BC. They are responsible for administering land use regulations.

The municipal government identified for the Project scope is the City of Penticton. To ensure construction and installation meets municipal bylaws and guidelines, pipeline construction will take place under the 2002 Operating Agreement between the City of Penticton and FEI, through the City of Penticton Schedule F Permit Application Notification process. During construction of the Project, FEI will adhere to Terms and Conditions outlined in the Operating Agreement.

The regional district identified for the Project scope is the RDOS. There is no existing operating agreement in place between FEI and the RDOS and as such review of RDOS permit and authorization requirements will continue during detailed Project design.

5.9.4 Utilities

The Project will result in construction activities in proximity to existing adjacent utilities. Liaisons with each stakeholder, combined with onsite investigations, will address stakeholders concerns during detailed design and engineering. The following utilities have been identified:

- FBC;
- City of Penticton; and
- TELUS.

5.9.5 Safety and Construction Permits

The Project will result in construction activities in proximity to existing adjacent utilities. Prior to ground disturbance and construction, the contractor or consultant conducting the work must obtain all applicable safety permits. These may include WorkSafeBC and BC One Call for confirmation of other utilities and requirements within the area of work.

5.9.6 Other Pending or Anticipated Applications/Conditions

A qualified environmental professional working in conjunction with FEI's Environmental Affairs group will assist the Project team in identifying permits/approvals required in the development of an Environmental Management Plan for the Project. FEI expects the Project will not require an Environmental Assessment Certificate under the BC *Environmental Assessment Act*. During construction of the Project, FEI will adhere to the terms and conditions outlined in the notifications, permits and approvals.

5.10 *BASIS OF PROJECT COST ESTIMATE AND RISK ASSESSMENT*

5.10.1 Base Cost Estimate

FEI, in conjunction with SMCI, developed the Project base cost estimate using AACE International Recommended Practices Nos. 18R-97 and 97R-18 as guides. The AACE Class 3 cost estimate is based on quantities developed from designs and material take-offs completed by SMCI. SMCI then used these quantities as the basis to develop the direct and indirect costs.

The SMCI estimate includes:

- Pipeline and stations construction costs;
- Construction sub-contracts; and
- Engineering services.

FEI completed a portion of Project's base cost estimate which includes the following:

- Owner's costs
    - Project management and engineering;
    - Land acquisition
    - Permits and approvals;
    - Consultation; and
    - Environmental and archaeological monitoring;
- Inspection services and additional construction costs associated with alternating current (AC) mitigation, cathodic protection and pipeline deactivation.

FEI's portion of the base cost estimate is attached in Confidential Appendix B.

The total base Project cost estimate includes the sum of SMCI's estimate and FEI's portion of the base estimate, and is estimated to be $187.9 million in 2020 dollars. The base cost estimate excludes GST but includes 7 percent PST on materials. FEI, as a GST registrant, is entitled to recover the GST it pays on its taxable purchases. As such, the tax does not represent a net cost to FEI. FEI provides the summary of total Project cost estimate in Table 6-1 in Section 6 of the Application.

5.10.2 Basis of Estimate

The SMCI Basis of Estimate is attached in Confidential Appendices A-3. This document details the following:

- Estimate background:
  - Purpose and objective of the estimate;
- Basis of estimate:
  - Scope of the estimate;
  - Assumptions; and
- Quantity derivation and cost basis:
  - Material and equipment cost basis;
  - Labour rates;
  - Contractors indirect costs;
  - Estimate allowances;
  - Other costs and indirect costs;
  - Engineering services; and
  - Freight.

The OCU Project base cost estimates are outlined in Confidential Appendices A-3 and B. These documents present the following details with respect to estimate scope, procurement, construction and engineering assumptions:

- Work breakdown structure;
- Direct and indirect costs;
- Estimate pricing;
- Construction costs:
  - Labour costs;
  - Direct labour;

- Employer contributions;
- Productivity;
- Equipment; and
- Other construction costs;

- Unit price items, engineering and materials costs;
- Construction:
  - Detailed construction assumptions;
  - Watercourse crossings;
  - Mobilization and demobilization (equipment);
  - Maintenance and services;
  - Key sub-contracts; and
  - Construction and productivity assumptions; and
- Design assumptions, and exceptions:
  - Roads;
  - Utilities and foreign pipelines;
  - Watercourse;
  - Trenchless crossings;
  - Induction bends;
  - Launcher and receiver barrels; and
  - Valves.

5.10.3 Cost Verification and Validation

Cost estimate quality assurance and validation were completed as follows:

- Internal SMCI reviews that included peer reviews, document quality checks, and independent review;
- Validation reviews involving both SMCI and FEI team members throughout the estimate development process to confirm that the estimate assumptions were valid; and
- External independent review completed to verify and validate that the estimate as well as schedule criteria and requirements were met, comparing estimate to the appropriate cost metric and a credible estimate and schedule have been developed for the full construction scope of the Project.

Any material discrepancies or risks identified during the cost validation process were considered during the risk analysis.

5.10.4 Risk Analysis

FEI engaged Yohannes Project Consulting Inc. (YPCI), a company specializing in risk management, to conduct a qualitative risk analysis to identify all of the risks associated with the Project. YPCI conducted multiple workshops with the Project team to develop a risk register for the Project to identify risks that could likely occur.

FEI also retained Validation Estimating LLC, USA (Validation Estimating), a company that provides services in estimate validation, risk analysis and contingency estimation. Validation Estimating completed an escalation estimate and a quantitative analysis using an integrated parametric and expected value methodology based on AACE 42R.

FEI will hold contingency[28], management reserve[29] and escalation funds in addition to the Project base cost estimate as outlined in Section 5.10.1 to address all foreseeable risks. The following sections (5.10.4.1 – 5.4.10.7) outline the methodology used to understand the risks inherent with the Project and the funding required to address the risks.

5.10.4.1 *Risk Identification Planning*

The risk identification and qualitative analysis conducted by YPCI was completed using the AACE International Recommended Practice 62R-11: *Risk Assessment: Identification and Qualitative Analysis* (AACE 62R-11, Revision May 11, 2012) as a guide. First, the risks were identified through collaborative discussions between YPCI and FEI through a series of risk workshops facilitated by YPCI. Next, the team developed the risk response actions and the risk likelihood and consequence scales.

The risk likelihood and consequence scales used for the Project are based on the 5 by 5 risk assessment matrix recommended in AACE 62R-11 which is illustrated in Figure 5-5.

[28] Contingency is defined in AACE International Recommended Practices 10S-90: *Cost Engineering Terminology* as: An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, and/or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs. Typically estimated using statistical analysis or judgment based on past asset or project experience." Contingency by AACE definition is expected to be spent.

[29] Management Reserve is defined in AACE International Recommended Practices 10S-90: *Cost Engineering Terminology* as: "An amount added to an estimate to allow for discretionary management purposes outside of the defined scope of the project, as otherwise estimated. May include amounts that are within the defined scope, but for which management does not want to fund as contingency or that cannot be effectively managed using contingency.

Figure 5-5: Risk Assessment Matrix

	Risk Impact Category (Cost, Schedule, Performance/Quality/Scope)				
	IMPACT				
Likelihood (Probability)	Very Low	Low	Medium	High	Very High
Very High (>50%)	Moderate	Moderate	Major	Major	Major
High (5 - 50%)	Minor	Moderate	Major	Major	Major
Medium (1-5%)	Minor	Moderate	Moderate	Major	Major
Low (0.1-1.0%)	Minor	Minor	Moderate	Moderate	Moderate
Very Low <0.1%	Minor	Minor	Minor	Minor	Moderate

5.10.4.2 *Risk Register, Qualitative Assessment and Action Plan*

The risk identification process identified a number of risks which were tabulated in the risk register included in Appendix 4 to YPCI's Risk Report (Confidential Appendix C-1). The risk response actions to deal with the identified risks were also recorded in the risk register. Once the risks were identified, a qualitative analysis was completed to prioritize or rank the risks so that the Project team could focus on risk response actions and recommendations. Through this qualitative process, a likelihood and consequence rating was assigned to each identified risk using the risk assessment matrix noted above.

5.10.4.3 *Quantitative Risk Analysis - Contingency*

Following the completion of the YPCI Risk Report, Validation Estimating completed a quantitative analysis to evaluate the impact of Project specific risks and systemic risks. A Monte Carlo simulation was completed by Validation Estimating to determine a distribution of possible cost outcomes associated with the existing scope of the Project at different levels of confidence. The analysis was conducted using the base Project cost estimate of $187.0 million as outlined in section 5.10.1 above and derived a risk adjusted P50 cost of $213 million representing a contingency of approximately 13 percent. Please refer to Confidential Appendix C-2 for further details on Validation Estimating's contingency methodology and results.

The output of the Monte Carlo simulation, is shown in tabular form in Figure 5-6:

Figure 5-6: Quantitative Risk Analysis - Monte Carlo Simulation

Base Estimate:	$187,960	Currency:	$CAN
Probability of Underrun	Indicated Funding Amount	Contingency Costs (thousands)	Contingency Percent of Base Est.
5%	171,500	(16,500)	-9%
10%	179,500	(8,500)	-5%
15%	185,200	(2,800)	-1%
20%	190,100	2,100	1%
25%	194,800	6,800	4%
30%	198,700	10,700	6%
35%	202,400	14,400	8%
40%	206,100	18,100	10%
45%	209,700	21,700	12%
50%	213,100	25,100	13%
55%	217,000	29,000	15%
60%	220,400	32,400	17%
65%	224,400	36,400	19%
70%	228,400	40,400	21%
75%	233,200	45,200	24%
80%	238,600	50,600	27%
85%	244,700	56,700	30%
90%	252,900	64,900	35%
95%	265,000	77,000	41%

5.10.4.4 *Quantitative Risk Analysis - Management Reserve*

Risks with low probabilities and high consequence are not appropriately funded through contingency as they overwhelm the cost and schedule allotments. The cost associated with these types of risks are typically identified and managed as management reserves that the project team cannot spend without the Company's management's approval. Validation Estimating identified two risks which have low probability and high consequence; failed HDD across Penticton Creek, and market costs.

The preliminary feasibility assessment completed by TerraHDD, a company specializing in HDD concluded that the Project could drill a path under Penticton Creek. HDD at this location minimizes stakeholder and environmental impacts and is the lowest cost option for the Project. Significant geotechnical work was undertaken to evaluate the feasibility of HDD but there is always uncertainty remaining as most of the subsurface conditions along the drill path cannot be fully assessed. Therefore, the success of HDD is not realized until the drilling is complete and the pipe is pulled into the hole. As such there is a high risk to the Project should the HDD fail, as the contingency plan consists of attempting a subsequent drill, and failing that the plan is to open trench across a very steep ravine. FEI and SMCI have identified an open trench route across Penticton Creek and this option is currently under evaluation. FEI will proceed with the design and permitting of both the HDD and the open trench options to minimize delays should the HDD prove not feasible. Table 5-12 outlines the range of possible outcomes stemming from an unsuccessful HDD across Penticton Creek.

During the cost validation process outlined in Section 5.10.3, FEI identified that there is a market risk to the Project due to factors such as contractor capacity, the availability of qualified pipeline contractors in 2022 and 2023 and market risk where bids are uncompetitive. FEI considered market prices as a risk that could impact the Project cost and undertook additional analysis. The results of the market risk analysis indicate that there is a possible uplift in the

price to be quoted by a contractor and FEI retained Validation Estimating to conduct an analysis of the possible uplift in actual bids versus estimate. Table 5-12 outlines the range of possible outcomes resulting from market risk. Please refer to Confidential Appendix C-2 for further details on Validation Estimating's management reserve methodology and results.

Table 5-12: Summary of Management Reserve Monte Carlo Simulation (2020$)

Probability of Underrun	Indicated Risk Funding	
	HDD Failure	Market Risk
5%	10,300	1,300
10%	11,200	2,600
15%	11,900	4,100
20%	12,500	5,600
25%	12,900	7,000
30%	13,400	8,500
35%	13,700	10,000
40%	14,100	11,700
45%	14,500	13,500
50%	14,900	15,300
55%	15,300	17,200
60%	15,700	19,200
65%	16,000	21,300
70%	16,500	23,600
75%	16,900	26,200
80%	17,400	28,800
85%	18,100	32,000
90%	18,800	35,400
95%	19,900	40,200

5.10.4.5 *Quantitative Risk Analysis Conclusion – Contingency and Management Reserve*

Contingency is typically expected to be spent and is used as an allocation for risks that are known and likely to be encountered during Project execution. Contingency is normally funded at the P50 confidence level. Based on FEI's risk tolerance, the Project contingency will be $25.1 million (13 percent) at the P50 confidence level.

The probability of both management reserve risks occurring is low, therefore, FEI will hold one reserve fund to cover the impact should either of the risks occur. Given there are two risks covered by a single management reserve, FEI has chosen to fund the P70 value of the larger risk or $23.6 million.

5.10.4.6 *Escalation Risk*

Validation Estimating conducted a cost escalation estimate for the Project. Escalation per AACE is "a provision in costs or prices for uncertain changes in technical, economic, and market conditions over time. Inflation (or deflation) is a component of escalation." The base estimate was developed using 2020 pricing data and conditions and does not inherently account for escalation. Price increases/decreases beyond 2020, including contingency, must be covered by the escalation estimate. As outlined in Section 5.10.4.5, FEI will fund contingency at the P50

confidence level, therefore the escalation estimate is calculated using the risk adjusted P50 cost of $213 million as outlined in section 5.10.4.3 as the basis.

The AACE "by-period" method was applied to develop the cost escalation estimate. This method uses price indices by cost account applied to the annual cash flow by cost account. The base indices are forecasts provided by the economic consulting firm IHS Markit. These indices are used to develop weighted indices that match the cost types (pipeline material, construction labour, etc.). The indices are further adjusted for forecast global and regional capital spending market conditions (i.e., adjusts for bid mark-up behaviour as well as productivity trends in hot or cold markets).

The IHS Markit Q3 2020 forecast is showing minimal cost escalation through 2022 (with the exception of pipe steel) with a slight decrease forecast for the remainder of 2020. However, global and regional capital spending is forecast to rebound by 2022 with the weighted annual price increase forecast to peak at 2.8 percent. The probabilistic analysis, which takes into account the historical standard deviation in price changes from the mean, results in a significant range as shown in Table 5-13. Please refer to Confidential Appendix C-3 for further details on Validation Estimating's escalation methodology and results.

Table 5-13: Summary of Escalation Monte Carlo Simulation (2020$)

Base Estimate	$213,059,800	
Probability of Underrun	**Escalation**	Percent of Base
5%	(9,636,420)	-4.5%
10%	(5,672,540)	-2.7%
15%	(2,685,690)	-1.3%
20%	(146,230)	-0.1%
25%	2,084,160	1.0%
30%	4,198,420	2.0%
35%	6,114,320	2.9%
40%	7,932,070	3.7%
45%	9,716,200	4.6%
50%	**11,611,240**	**5.4%**
55%	13,473,460	6.3%
60%	15,393,410	7.2%
65%	17,470,720	8.2%
70%	**19,522,520**	**9.2%**
75%	21,858,100	10.3%
80%	24,311,300	11.4%
85%	26,931,670	12.6%
90%	30,395,630	14.3%
95%	35,610,570	16.7%

FEI will fund escalation at $11.6 million which corresponds to the P50 level of confidence.

5.10.4.7 *Risk Funding Appropriateness*

As risk funding is dependent on FEI's risk tolerance levels, FEI engaged Validation Estimating to provide an external opinion on FEI's chosen funding levels. Validation Estimating reports that FEI chose funding which was appropriate and prudent without being overly cautious. Please

refer to Confidential Appendix C-4 for further details on Validation Estimating's position on FEI's risk funding levels.

5.11 *CONCLUSION*

In this section, FEI described the OCU Project in detail, including information on the Project components, route selection process, basis of design and engineering, project schedule and resource requirements, project impacts, and permitting and approval requirements. FEI has provided the basis of project cost estimate and has appropriately completed cost validation and risk assessment. FEI's planned risk mitigation activities are in place to mitigate the overall cost and schedule risk of the Project.

6. PROJECT COST ESTIMATE

6.1 INTRODUCTION

This section provides a breakdown of the Project cost estimate, summarizes the financial analysis, details the accounting treatment of capital costs and Application and preliminary stage development costs, and finally provides the rate impact. As set out below in Section 6.3.2, FEI is requesting approval of deferral treatment of the Application and Preliminary Stage Development Costs for the Project.

6.2 SUMMARY OF PROJECT COSTS AND FINANCIAL ANALYSIS

The total cost estimate of the OCU Project is $271.3 million (as-spent). Table 6-1 summarizes the total Project cost estimate which includes contractor's construction costs, FEI owner's costs, Inspection Services, additional construction costs including de-activation costs, project development costs, contingency, management reserve, escalation and AFUDC. Project development costs include all of the costs associated with developing an AACE Class 3 cost estimate in accordance to AACE International Recommended Practices Nos. 18R-97 and 97R-18 as required by the CPCN Guidelines and are estimated to be $6.2 million (2020$).

Table 6-1: Summary of Forecast Capital and Deferred Costs ($millions)

Line	Item	Amount	Reference
1	Construction Cost Estimate (Contractor)	$153.4	Appendix A-3 [30]
2	Construction Cost Estimate (FEI)	$34.5	Appendix B
3	*Owner Costs ($25.1M)*		Appendix B
4	*Inspection Services ($8.6M)*		Appendix B
5	*AC Mitigation, Cathodic Protection, Deactivation ($0.7M)*		Appendix B
6	Sub-Total Construction Base Cost Estimate (2020$)	$187.9	Section 5.10.3
7	Project Development Costs (Capitalized Estimate)	$6.2	Section 6.2
8	Contingency	$25.1	Section 5.10.4.5
9	Sub-Total Cost Estimate (2020$)	$219.2	
10	Management Reserve	$23.6	Section 5.10.4.5
11	Cost Escalation Estimate	$11.6	Section 5.10.4.6
12	Sub-Total Construction Cost Estimate (As-spent)	$254.4	
13	AFUDC	$16.8	
14	Grand Total Project Cost Estimate (As-spent)	$271.3	

[30] Appendix A-3 shows a total contractor cost estimate of $155.7 million. However, $2.3 million is related to the project development costs and is captured in line 7 of the Table 6-1.

Table 6-2 below includes the financial evaluation of the Project over a 70-year period (65 years post-Project and 5 prior years during the Project)[31]. Details of the financial evaluation of the Project can be found in the Financial Schedules as included in Confidential Appendix E-2.

Table 6-2: Financial Analysis of the Project ($millions)

Item	Amount
Total Charged to Gas Plant in Service	$271.3
Total Project Deferral Credit	$(0.8)
Total Project Cost	$270.5
Incremental Rate Base in 2024[32]	$269.6
Incremental Revenue Requirement in 2024	$19.4
Rate Impact in 2024 when all assets enter Rate Base %	2.21%
Levelized Delivery Rate Impact 70 Years (%)	1.62%
Levelized Delivery Rate Impact 70 Years ($ / GJ)	$0.073
PV of Incremental Revenue Requirement 70 years ($ million)	$253.6
Net Cash Flow NPV 70 years ($000s)	$(7.1)

6.3 *ACCOUNTING TREATMENT*

6.3.1 Treatment of Capital Costs

Consistent with FEI's treatment of major projects including CPCNs, the capital costs of the Project (i.e., the costs included in the subtotal "Project Capital Budget" in Table 6-1 above) will be held in Work in Progress, attracting AFUDC[33]. Construction of the Project is scheduled to be completed in 2023 and the specific assets with construction work completed will be placed in service when they are commissioned and available for use. FEI will transfer the associated capital costs of the specific assets that have been placed into service to the appropriate plant asset accounts and include them in FEI's rate base on January 1 of the year following their in service date. Depreciation of the assets included in FEI's rate base will begin at the start of the year the assets enter rate base.

[31] The 65-year post-project analysis period is equal to the financial life for Transmission Mains as described on page 3-6 of FEI's most recently approved depreciation study. The 5 prior years are related to project development, regulatory approvals, and the construction schedule of the Project from 2022 through 2023.

[32] 2024 Rate Base is less than the Total Project costs because the 2024 Rate Base also includes the mid-year effect of Accumulated Depreciation and allowance for incremental Cash Working Capital.

[33] FEI's 2021 AFUDC rate is 5.47%, which is equal to the after-tax weighted average cost of capital.

6.3.2 Application and Preliminary Stage Development Costs

FEI is seeking BCUC approval under Sections 59-61 of the UCA for deferral treatment of the Application and Preliminary Stage Development costs. The Application costs are based on a written hearing process and include expenses for legal review, consultant costs, BCUC costs and BCUC-approved intervener costs. The Preliminary Stage Development costs are related to expenses incurred for engaging third-party consultants for feasibility evaluation, preliminary development and assessment of the potential design and alternatives as required to complete this Application. FEI is seeking approval to record these costs in a new non-rate base deferral account, the OCU Application and Preliminary Stage Development Costs Deferral Account, attracting FEI's after tax weighted average cost of capital until it enters rate base. FEI proposes to transfer the balance in the deferral account to rate base on January 1, 2022 and commence amortization over a three-year period.

Table 6-3 below shows the December 31, 2020 net-of-tax balance for the Application costs and the Preliminary Stage Development costs is forecast to be a credit of $795 thousand.

Table 6-3: Forecast Application Costs and Preliminary Stage Development Costs ($000s)

Particulars	Application Costs	Preliminary Stage Development Costs	Total
Pre-tax Costs	$400	$902	$1,302
Income Tax Recovery:			
Costs held in deferral account[34]	$(108)	$(244)	$(352)
Capitalized Costs[35]		$(1,682)	$(1,682)
Total Tax Offset	$(108)	$(1,926)	$(2,034)
Financing, WACC after tax	$10	$(73)	$(63)
Total	$302	$(1,097)	$(795)

6.4 *RATE IMPACT*

As discussed above, FEI will complete the Project in 2023. Combined with the amortization of the deferral costs beginning in 2022, the impact to customer delivery rates will change each year from 2022 to 2024[36]. Table 6-4 shows the annual delivery rate impact compared to the 2021 applied for non-bypass revenue requirement and the incremental annual delivery rate impact in percentage in 2024.

[34] Income tax recovery on the amount recorded in the deferral account which equals the $400 thousand in costs and the $902 thousand in costs times the Income tax rate of 27%.

[35] Income tax recovery on the development costs that were capitalized but are deductible for tax purposes. The amount shown is equal to the costs capitalized of $6.2 million times the income tax rate of 27%.

[36] The first two years of delivery rate impact due to the Project are 2022 and 2023 as a result of the amortization of the deferral credit balance.

Table 6-4: Summary of Rate Impact for the Project

Particulars	Impact
Incremental Revenue Requirement ($000s)	$19,448
% Increase to 2021 Applied for Revenue Requirement, Non-Bypass (August, 2020)[37]	2.21%
Delivery Rate Impact (2024) $ / GJ	$0.100
Levelized Rate Impact $ / GJ (**2019 – 2088**)	$0.073

In conclusion, the Project will result in an estimated delivery rate impact of 2.21 percent in 2024 when all construction is complete and after all assets are placed in service in 2023. For a typical FEI residential customer consuming 90 GJ per year, this would equate to an approximate average bill increase of $9.00 per year ($0.100 / GJ x 90 GJ).

[37] The BCUC Decision on FEI's application for Delivery Rates for 2020 and 2021 is still pending.

7. ENVIRONMENT AND ARCHAEOLOGY

7.1 *INTRODUCTION*

FEI is committed to delivering safe, reliable energy in an environmentally responsible manner to all the communities that it serves. Based on its preliminary assessment, FEI expects minimal environmental and archaeological impacts for the OCU Project. Potential environmental impacts of the Project can be mitigated through the implementation of standard best management practices and mitigation measures. Impacts to construction timelines and costs as a result of encountering species at risk, fish habitat, or contaminated soil or groundwater can be minimized through additional investigations during the detailed engineering phase prior to construction.

FEI assessed all three feasible alternatives for archaeological potential, and Archaeological Impact Assessments (AIA) have been recommended for areas assessed as having moderate to high archaeological potential along the preferred alternative.

Draft versions of both the Environmental Overview Assessment (EOA) and Archaeological Overview Assessment (AOA) were provided to Indigenous communities who requested drafts for their review and comment. At the time of writing, FEI has not received any comments; however, any comments that are received will be incorporated during the detailed engineering phase of the Project.

In this section, FEI will explain:

- The potential environmental impacts identified by the preliminary environmental assessment and how these impacts can be mitigated through additional assessment, the implementation of best management practices and mitigation measures, and municipal, regional, provincial and federal permitting processes (Section 7.2); and
- The potential archaeological impacts identified by the preliminary archaeological assessment and how these impacts can be mitigated through additional assessment, the implementation of standard best management practices, and standard provincial and Indigenous permitting processes (Section 7.3).

7.2 *ENVIRONMENT*

Hemmera Envirochem Inc. (Hemmera)[38] was retained to provide a preliminary environmental assessment of the three feasible alternatives and to provide a basis for the completion of detailed assessments and preparation of environmental management plans prior to construction commencement.

[38] Hemmera is a multi-discipline consulting company that provide professional expertise in environmental sciences, social sciences, and engineering.

The assessment was based on a combination of a desktop review of available information and preliminary field reconnaissance (PFR) surveys. The assessment was completed to identify and describe the potential impacts to the biophysical environment from the Project and determine recommended impact mitigation. The assessment reviewed the areas of the three feasible alternatives while the PFR was completed for the preferred alternative. Detailed descriptions of Project related biophysical impacts and recommended mitigation can be found in Section 6.0 of the EOA filed as Appendix F.

Project impacts vary by location but potentially include disturbance to environmental features such as terrestrial and aquatic resources, species at risk, and soils. In this section, FEI describes its approach and plan with respect to the identification, management, and mitigation of environmental impacts.

Based on this preliminary assessment, the overall environmental risk of the Project is low and any potential environmental impacts from the Project can be mitigated through the application of standard environmental best management practices and mitigation measures.

7.2.1 Environmental Overview Assessment

The results of the work completed by Hemmera are outlined in the EOA included as Appendix F. The following topics were reviewed as a part of the assessment:

- Land use;
- Contaminated sites (water and soil);
- Fish and fish habitat;
- Vegetation (including invasive plants); and
- Wildlife.

The EOA identifies significant natural features, such as fish, wildlife, and terrestrial habitat that could potentially be impacted by Project construction, as well as areas that could impact construction, costs, and timelines of the Project. The EOA also identifies land use and locations with potential for encountering soil, trench water or groundwater contamination which may impact Project construction, costs, and timelines. These potential impact areas are summarized in the following sections.

Section 7.0 of the EOA report (Appendix F) identifies proposed best management practices and mitigation measures to minimize impacts to significant natural features. The EOA references three study areas:

- General/project study area – a 100 m width on either side of the centreline (200 m total width);
- Wildlife study area – a 500 m width on either side of the centreline (1 km total width); and

- Contaminated sites study area – a 200 m width on either side of the centreline (400 m total width).

Some identified environmental features are within a study area, but not within the Project footprint (e.g. wildlife); these features will need consideration during the detailed engineering phase.

The significant land use, natural features, and potential contamination areas identified in the EOA as having potential to overlap with the preferred alternative for the OCU Project are described in the following sections.

7.2.1.1 *Current Land Use*

Land use varies across the Project footprint within rural areas of the City of Penticton and the RDOS. Land use is primarily associated with rural communities, industrial activities (e.g. landfill), grazing, or agriculture. Portions of the Project footprint fall within Development Permit Areas in Penticton and the RDOS. The following potentially sensitive land use areas were identified in the EOA:

- A small area of Agricultural Land Reserve lands (0.17 hectare) overlaps with a portion of the Project study area;
- One municipal park but no provincial parks or protected areas are crossed by the Project footprint, though it comes within approximately 50 m of a provincial park boundary;
- A municipal hazard area for wildfire encompasses much of the Project footprint within the boundaries of Penticton;
- Two Areas of Potential Environmental Concern (APECs) related to contaminated sites, mostly associated with historical or current industrial activities. One APEC interacts with the Project footprint for a length of approximately 565 m while the other is located approximately 50 m from the Project footprint; and
- One recreational area is crossed by the Project footprint and one is located within the project study area.

7.2.1.2 *Contaminated Sites*

Locations where there is a medium to high potential for encountering soil or groundwater contamination within the Project footprint may impact construction cost, and timelines. These areas are defined as APECs.

One high risk and one low risk APEC were identified in the contaminated sites study area. They are summarized in the EOA (Appendix F) and in Table 7-1 below. The high risk APEC is associated with an active landfill that includes operations dating back to 1972.

FEI will undertake further assessment of the high risk APEC during the detailed engineering phase of the Project to minimize the risk of this APEC on the Project costs and timelines.

Table 7-1: Registered Contaminated Sites and APECs overlapping with Project Footprint

APEC ID (Site Reg. ID)	Name	Location Relative to Project Footprint	Risk Classification
VP1	Campbell Mountain Landfill (901 Spiller Road) and associated Sites which received Notice of Off-Site Migration (750 Naramata Rd, 730 Naramata Rd, 1555 Randolph Rd,1655 Reservoir Rd)	Onsite	High
VP2	Potential Fill, Currently Residential Development (1945 Carmi Rd, Penticton) – Notice of Independent Remediation Initiation Submitted in 2010	50m West	Low

7.2.1.3 *Fish and Fish Habitat*

The EOA assessed the potential for watercourses, wetlands and fish species at risk within the Project study area and the following sensitivities were identified:

- 20 watercourses, fish-bearing or directly connected to fish-bearing waters, are crossed by, or in close proximity to, the Project footprint;
- No fish species at risk in waterways crossed by, or in close proximity to, the Project footprint;
- Three community watersheds are crossed by the Project footprint; and
- Based on information reviewed on iMapBC, there are three wetlands within the Project study area that do not overlap with the Project footprint.

7.2.1.4 *Vegetation*

The Project footprint is located in the following biogeoclimatic zones:

- Interior Douglas-fir Very Dry Hot Okanagan (IDFxh1);
- Ponderosa Pine Very Dry Hot Okanagan (PPxh1);
- Interior Douglas-fir Dry Mild Kettle Valley (IDFdm1); and
- Montane Spruce Dry Mild Okanagan (MSdm1).

The biogeoclimatic zones will be considered for vegetation selection during restoration activities after construction completion.

Plant species at risk, ecological communities at risk and invasive plant species were reviewed as a part of the EOA. The EOA identified the following:

- One plant species at risk with medium potential to occur in or adjacent to the Project footprint;
- 14 ecological communities at risk with potential to occur in or adjacent to the Project footprint; and
- 436 recorded invasive plant species occurrences of 23 species along the Project study area, including 17 invasive plant site polygons.

7.2.1.5 *Wildlife*

The wildlife study area was reviewed to determine use by known wildlife and species at risk, and to assess the species' potential presence during desktop review.

Ungulate winter ranges for mule deer, moose, and goat overlap with much of the Project footprint:

- U-8-001 for mule deer;
- U-8-006 for moose; and
- U-8-005 for mountain goat.

The EOA identified the following, including two wildlife habitat areas (WHA) for wildlife species of management concern, that overlap with the Project study area:

- WHA 8-369 for sensitive data wildlife habitat core area. The species associated with this WHA has been determined to be particularly sensitive, vulnerable, or potentially subject to persecution, and is not identified publicly by the BC Conservation Data Centre.
- WHA 8-014 for White-headed Woodpecker wildlife habitat core.
- The McTaggart-Cowan Wildlife Management area is located approximately 100 m south of the study area for the proposed south loop terminus.
- There are 19 posted critical habitat polygons for 5 at-risk wildlife species located over the wildlife study area.
- Seven wildlife species at risk have known occurrences in or close to the Project study area.

The EOA report describes the presence of other terrestrial resources on or near the Project footprint such as patches of mature forest.

7.2.2 Implementation of Best Management Practices & Mitigation Measures

Best management practices and mitigation measures to minimize and avoid potential negative effects of the Project on environmental sensitivities are described in Section 7.0 of the EOA, including but not limited to:

- Design considerations to avoid impacts where practicable;
- Apply best practices for managing invasive plants;
- Adhere to general wildlife measures;
- Complete fish and wildlife salvages;
- Minimize vegetation removal; and
- Adhere to least-risk timing windows to protect fish species, breeding birds, and sensitive periods for other wildlife species.

FEI will follow the best management practices and mitigation measures identified in the EOA as applicable to the Project during construction. A project-specific Environmental Management Plan (EMP) will be developed during the detailed design phase, as project methodologies are refined and the most appropriate mitigation measures and procedures can be selected.

7.2.3 Permitting

Based on the preliminary environmental assessment work completed by Hemmera, the Project will likely require permitting/authorization under the following legislation:

- Federal
  - *Fisheries Act*
  - *Species at Risk Act*
- Provincial
  - *Environmental Management Act*
  - *Water Sustainability Act*
  - *Oil and Gas Activities Act*
  - *Wildlife Act*
- Other
  - RDOS/municipal permits

During the detailed engineering phase of the Project, FEI will undertake further environmental assessments to confirm permitting requirements and will apply for permits as required. The permits identified at this time are based on the current level of Project engineering and may change during the detailed engineering phase.

7.2.4 Further Plans

Environmental constraints and potential environmental impacts related to the Project will be further assessed and documented during the detailed engineering phase of the Project. The

detailed engineering phase will include assessment of vegetation, fish and wildlife and their habitat, contaminated soils, and surface/ground water resources.

Site specific mitigation strategies will be developed to offset any potential negative impacts associated with the Project or from the environment on the Project. All required environmental permits and approvals for the Project will be identified and applied for during the detailed engineering phase of the Project.

A project EMP will be prepared and included in the contractor procurement documents. The EMP is also required as a part of the application to the BCOGC. Environmental Protection Plan(s) specific to the Project will be developed by successful contractor(s) prior to commencement of the Project. Environmental monitoring will be undertaken during all sensitive aspects of the work program and the designated environmental monitor will have "stop work authority" in the event that works underway have the potential to impact the natural environment.

7.3 *ARCHAEOLOGY*

Golder Associates Ltd.[39] (Golder) was retained to complete an AOA of the Project (FortisBC Okanagan Capacity Upgrade: Alternative 3 Archaeological Overview Assessment - Appendix G) to assess the potential for archaeological and/or cultural heritage resources within the Project area and to determine the necessity and, if required, the scope of additional archaeological assessment (e.g. AIA) prior to the commencement of ground disturbing activities. Golder defined two areas as a part of the AOA:

- Study Area – extends 1 km from the proposed centreline (2 km total width)
- Project Area – extends 10 m on either side of the centreline (20 m total width)

The AOA consisted of a desktop review that included examination of an existing archaeological potential model along the route of the preferred alternative. PFR work has begun and will continue throughout the detailed engineering phase of the Project. Information obtained during the PFR will be referenced during the detailed engineering phase and will inform future planned archaeological investigations.

7.3.1 Archaeology Overview Assessment

As part of the AOA, Golder reviewed a range of environmental, archaeological, cultural and historical information. The Project was assessed for archaeological potential and overlap with known archaeological and historic heritage sites.

The AOA concluded that the Project footprint includes a mix of low to high archaeological potential. Based on the AOA, the preferred alternative has less high archaeological potential

[39] Golder Associates Ltd is a multi-disciplinary engineering and consulting firm.

areas than the other two feasible alternatives. The AOA identified three registered archaeological sites and two registered historic heritage sites overlapping the project study area. The preferred alternative crosses variable terrain and mapped areas of moderate to high archaeological potential are scattered along the length of the proposed route.

Golder recommended an AIA for areas where ground disturbance activities are anticipated in areas identified as having moderate or high archaeological potential through the AOA process. Where the AOA identified potential for deeply buried cultural deposits, construction monitoring under a HCA permit will be conducted during construction. It is expected that this AIA will begin during the detailed engineering phase of the Project and continue throughout construction, especially in areas of potentially deep buried cultural deposits.

A permit will be required under Section 12.2 of the HCA in order to undertake detailed AIA activities. In addition, any Indigenous heritage investigation permits that are applicable at the time of AIA will be obtained. Currently the Indigenous communities that have permitting processes in place are Okanagan Indian Band, Upper Nicola Indian Band and Westbank First Nation. AIA work will be completed where Project works with the potential for ground disturbance occur in areas identified as moderate or high archaeological potential. The extent of AIA works will be dependent on final engineering design.

The detailed results of the work completed by Golder are outlined in the AOA (Appendix G).

7.3.2 Indigenous Community Participation

Notifications were sent to Indigenous communities prior to the onset of the AOA. The notification outlined the intended work and, as noted above, on completion of the draft AOA an opportunity to provide information or comments.

The following communities were contacted as a part of the AOA:

- Esh-kn-am Cultural Resource Management
- Lower Similkameen Indian Band
- Nooaitch Indian Band
- Okanagan Indian Band
- Okanagan Nation Alliance
- Penticton Indian Band
- Upper Nicola Band
- Westbank First Nation

During fieldwork activities to develop this application, Indigenous communities were invited to participate. Both Penticton Indian Band (PIB) and Westbank First Nation (WFN) participated in PFR activities. Prior to the AIA, Indigenous communities will be notified of the work and provided the opportunity to participate in the AIA.

7.3.3 Further Plans

Potential impacts to archaeological and historic heritage sites will be further assessed during the AIA, which will be initiated during the detailed engineering phase of the Project. The objective of the AIA will be to identify archaeological and historic heritage resources within the Project footprint and, if present, to evaluate impacts to those resources as a result of the Project and to provide recommendations to effectively manage the impacts to those resources stemming from the Project. It is anticipated that the majority of the AIA will be completed prior to construction, though it is understood that AIA of portions of the Project area may have to be conducted concurrent with construction (e.g., areas with potentially deep buried resources, access constraints or where ground conditions are not suitable for manual testing). A subsurface testing program will be undertaken, where required. The AIA will provide a detailed assessment to allow for development of site specific mitigation strategies to offset any potential impacts to archaeological and historic heritage sites associated with the Project. Archaeological permits will be obtained during the detailed engineering phase of the Project and if necessary, during the construction phase of the Project.

A project EMP which will include archaeological specifications, will be prepared and included in the contractor RFP documents. The EMP is also required as a part of the application to the OGC. Environmental Protection Plan(s) specific to the Project, including protection of archaeological, historic heritage and, cultural resources, will be developed by successful contractor(s) prior to commencement of the Project.

If required, archaeological monitoring will be undertaken during all archaeologically sensitive aspects of the work program and the designated archaeological monitor will have “stop work authority” in the event that works underway have the potential to result in unauthorized impacts to archaeological, historic heritage or cultural resources.

8. CONSULTATION AND ENGAGEMENT

FEI has consulted and engaged extensively on the Project to date and will continue to do so through the course of the Project. In the following sections, FEI explains how:

- FEI is undertaking, and will continue to undertake, appropriate public and stakeholder consultation regarding the Project (Section 8.2); and
- FEI is undertaking, and will continue to undertake, appropriate engagement with Indigenous groups regarding the Project (Section 8.3).

8.1 *INTRODUCTION*

Consultation, engagement and communication are integral components of FEI's project development process. Accordingly, FEI created a Consultation and Engagement Plan that sets out the general approach to consultation, engagement and communications activities with respect to the work on the OCU Project. This plan is included as Appendix H-1 to the Application. The focus of FEI's Consultation and Engagement Plan is to ensure that Indigenous groups and stakeholders, including residents and businesses, customers and organizations, and local governments are informed, consulted, and engaged about the Project and have opportunities to ask questions and express concerns. FEI incorporates this feedback in its Project planning.

FEI's consultation and engagement on the Project began in late 2019, with early consultation and engagement on the Project. FEI engaged early with Indigenous groups and consulted with local governments including City of Penticton, RDOS, City of Kelowna, and City of West Kelowna. In 2020, as Project planning continued, the preferred alternative was refined and FEI presented this revised route to Indigenous groups and local government officials. The Project was also introduced to the public, potentially impacted landowners, and other stakeholders, including customers, residents, businesses, stakeholder groups and organizations. Throughout this consultation and engagement, FEI tracked the issues and concerns raised. FEI will continue to work with Indigenous groups and stakeholders to address any outstanding items on the preferred alternative.

FEI presented information and encouraged feedback through a number of channels, including meetings, project notification letters, telephone calls, and telephone town hall presentations. Due to COVID-19, FEI continued to assess its consultation and engagement approach, as outlined in the Consultation and Engagement Plan[40] and adapted its approach to address COVID-19 safety requirements. For example, rather than in-person meetings, FEI engaged interested parties via telephone, including telephone town hall presentations. FEI understands the significant impact of the COVID-19 pandemic on local communities. As such, FEI continues

[40] Page 3 of the Consultation and Engagement Plan filed as Appendix H-1.

to adapt its traditional consultation methods to ensure adequate consultation opportunities are safely available for stakeholders.

In addition to the consultation and engagement activities outlined in the Consultation and Engagement Plan, FEI communicated with the public by proactively providing information to local media outlets, publicly announcing the Project in April 2020, developing a designated project webpage (with telephone number and email address), and creating bill inserts, information cards, and public advertisements.

8.2 *FEI IS UNDERTAKING APPROPRIATE PUBLIC CONSULTATION*

FEI's consultation with the public has been a crucial component in the development of the OCU Project. FEI recognizes the importance of meaningful consultation and of developing, maintaining, and enhancing strong stakeholder relationships. To support the successful approval and completion of the Project, FEI's approach is to be open, transparent and consistent in interactions with stakeholders.

In 2020, FEI focused public consultation activities on the preferred route, continued engagement with local government officials, and introduced the Project to stakeholders. During this time, FEI encouraged comments and questions, shared the preferred route information, and sought feedback on this route, including its potential impacts. FEI's log of stakeholder consultation activities to date for the proposed route is included as Appendix H-2.

The following sub-sections provide details on FEI's COVID-19 safe public consultation, which includes:

- Communication and public consultation objectives that FEI adopted in public consultation throughout the development of the Project (Section 8.2.1);
- Identification of stakeholders with an interest in the Project with whom FEI has engaged and will continue to consult (Section 8.2.2);
- Communication materials and methods used and employed by FEI to consult with stakeholders regarding the Project (Section 8.2.3);
- Community, social and environmental considerations that FEI used to guide its consultation with stakeholders (Section 8.2.4);
- Public consultation activities to date including FEI's consultation with the potentially impacted landowners, and how FEI incorporated some of their feedback to date (Sections 8.2.5);
- Issues and concerns raised about the Project by stakeholders, and how FEI responded to these issues or concerns to date (Sections 8.2.6 and 8.2.7); and
- Future consultation activities that FEI intends to undertake, which will include virtual and in-person meetings, letters/emails, and virtual information sessions (Section 8.2.8).

8.2.1 FEI Has Identified Appropriate Communication and Public Consultation Objectives

Consistent with industry best practices, FEI adopted the following objectives to guide public consultation and to solicit community feedback throughout the Project:

- Create awareness of the Project, specifically within communities directly impacted by Project activities;
- Ensure that balanced and objective information is provided to stakeholders regarding the Project;
- Provide opportunities for stakeholders to give feedback and to understand their concerns in an attempt to incorporate feedback into the Project design and construction activities to proactively mitigate impacts to the public; and
- Proactively provide information to local media outlets to help inform the broader public about the Project and construction work in the community.

8.2.2 FEI Has Identified Key Stakeholders for Public Consultation

As part of developing its Consultation and Engagement Plan, FEI identified and consulted with the following stakeholders:

1. Residents, businesses, FEI's gas customers, and stakeholder groups, all of whom are in close proximity to (and may be impacted by) the Project.
2. Landowners who are in close proximity and potentially impacted by the Project.
3. Provincial government bodies, including Members of the Legislative Assembly, the Ministry of Energy, Mines and Petroleum Resources, the Ministry of Transportation and Infrastructure, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, the Agricultural Land Commission, and the BCOGC.
4. Federal government bodies, including Fisheries and Oceans Canada, and Environment and Climate Change Canada.
5. Local governments including the Mayor, Council, Regional Board members, City Manager and/or staff within the following municipalities and regional district: City of Penticton, RDOS, City of Kelowna, and City of West Kelowna.

Based on feedback from these stakeholders, FEI will continue to refine its communication and consultation methods.

8.2.3 FEI Has Used Appropriate Communications Materials to Support Consultation

FEI developed a number of communication materials and methods (described below) to carry out consultation with identified stakeholders.

Municipal and Indigenous Engagement

In November 2019, FEI engaged early with Indigenous groups and consulted with local governments including City of Penticton, RDOS, City of Kelowna, and City of West Kelowna.

Project Public Announcement

On April 15, 2020, FEI announced the Project to the public, utilizing a number of communications channels including media and digital communications. These announcements are included in Appendix H-3.

Pre-Announcement Notifications

In advance of the Project's public announcement, FEI contacted stakeholders and organizations via email to introduce the Project and gather early feedback. In addition, notifications were provided to:

- Provincially and federally elected officials and constituency office staff; and
- Staff at the City of Penticton and the RDOS (see Appendix H-4).

Information Bulletin

FEI contacted local media in Penticton and Naramata, local Indigenous groups, the local government offices and the local MLA on April 15, 2020 to share an information bulletin introducing the Project. The bulletin enabled media to share Project details with a wide audience. The information bulletin included the following details: the reasons and need for the Project; the Project's proposed length and position; FEI's intention to apply for a CPCN; public opportunities to participate in telephone town halls; public opportunities to learn more about the Project through the Project webpage, and contact information including the Project phone number and email address. Project information bulletin is included in Appendix H-5

Project Webpage

A dedicated Project webpage (see Appendix H-6) was created at www.talkingenergy.ca/okanagan as an informational resource for communities and interested parties. The webpage also offers an avenue for public feedback and inquiries. The Project webpage includes a map of the proposed route, a Project overview, a tab for updates to include milestones and future construction, and a tab describing local community initiatives and involvement.

Bill Inserts

Natural gas customers received bill inserts in the May 2020 billing cycle. The inserts provided information about the Project including the rate impacts. The insert also directed customers to educational materials on the regulatory process (See the bill insert example in Appendix H-7).

Paid Advertisements

FEI communicated information about the Project and telephone town hall opportunities through various paid media advertisements including local print and digital ads in the communities most affected by the Project (Penticton and Naramata). These advertisements also directed audiences to the Project webpage where they could learn more and provide feedback through this additional resource. Examples of these ads can be found in Appendix H-8.

Customer Email Tile Advertisement

Natural gas customers, who receive electronic bills via email, will receive an advertisement with a link to learn more about the Project on their bill in November 2020. The tile advertisement (refer to Appendix H-9) will include a link to the Project webpage where customers can learn more about the Project, including the expectation of rate impacts, as well as provide feedback through the email and phone number provided on the webpage.

Telephone Town Hall/Virtual Information Sessions

FEI conducted telephone town hall and public information sessions (see Appendix H-10) to provide an opportunity to consult with the public and customers, answer questions and listen to feedback. Due to the COVID-19 pandemic, FEI hosted these sessions virtually in order to provide a safe and accessible consultation opportunity for the public and stakeholders. Section 8.2.5.1 below provides further details about these sessions.

Direct Notifications/Information Card

Following the public announcement, FEI directly contacted impacted residents and businesses to make them aware of the Project and give them the opportunity to provide feedback. FEI also produced information cards (Appendix H-11) to hand out to stakeholders with questions, while the FEI team was out in the field. Section 8.2.5.1 below provides further details about these notifications.

8.2.4 FEI's Consultation Approach Reflects Community, Social and Environmental Considerations

Community, social, economic, and environmental considerations have helped guide the Consultation and Engagement Plan. Compared to other areas in the southern Okanagan, the Project takes place in a largely rural landscape with a low population density. As noted in Section 5.8.2, FEI is working with individual property owners to minimize impacts to private lands and with Indigenous communities and local leaders to identify and mitigate issues, and to connect local workforce and businesses to Project opportunities.

8.2.5 FEI Has Undertaken Appropriate Public Consultation Activities to Date

To date, FEI has consulted with stakeholders, as mentioned and identified above. The following sections provide a summary of these activities, including concerns and questions that were raised throughout the process, as well as how FEI has responded to these to date and its plan

for addressing these concerns during the Project execution phase. FEI will continue to track consultation (and corresponding feedback) as the Project progresses.

FEI's public consultation to date with stakeholders is described in sections below.

8.2.5.1 *Consultation to Date with Residents, Businesses, and Customers*

Initially, FEI planned to host two public information sessions: the first at the Naramata Centre in Naramata on April 21, 2020, and a second information session at the Penticton Lakeside Resort & Conference Centre in Penticton on May 14, 2020.

Due to COVID-19, FEI conducted virtual public information sessions to provide an opportunity to consult with the public and customers, answer questions and listen to feedback. FEI hosted the two sessions on April 30, 2020 from 5:00 pm to 8:00 pm and May 6, 2020 from 3:00 pm to 6:00 pm. FEI had Project team members available and on the phone to answer questions during this time. This virtual public information structure provided opportunities for FEI to share the Project overview and to receive public feedback.

Approximately 15 people participated in the virtual public information sessions. Members of the public asked questions related to the location of the proposed route, impacts to properties, and whether FEI was twinning existing infrastructure. Participants also requested more detailed maps, and additional information on how Project impacts would be minimized.

FEI plans to schedule in-person information sessions at a later date when it is safe to do so in accordance with public health guidance. These in-person information sessions would offer an additional opportunity for stakeholders to meet with FEI staff to learn about the Project and provide feedback.

In addition to these public information sessions, FEI sent out direct notifications to residents and businesses. This included a mail-out to properties within 200 metres of the route, inviting them to the April and May information sessions. A copy of this mail-out can be found in Appendix H-12.

FEI also sent out two notification letters to the residents near Sendero Canyon and Upper Carmi on July 29 and August 28, 2020. A copy of each letter was also sent to the RDOS Board Chair & Directors in Electoral Area D and E, as well as the Development Engineer at the City of Penticton. These letters were to update the residents and municipal governments about the geotechnical work that started in September 2020 in Penticton Creek. The letters outlined the hours of work, the dates, the work site locations, as well as FEI contact information, if the residents had any questions. A copy of the letters can be found in Appendix H-13.

8.2.5.2 *Consultation to Date with Stakeholder Groups*

FEI consulted with the following stakeholder groups impacted by the Project and the consultation with these stakeholders is included in the consultation log in Appendix H-2.

- Penticton Area Cycling Association – The Three Blind Mice Trails
- Penticton Disc Golf Course
- Naramata Bench Winery Association
- Naramata Citizens Association
- South Okanagan Trail Alliance
- Hoodoo Adventure Company Ltd.
- Chute Lake Lodge
- Upper Carmi Neighbourhood Association
- Okanagan Similkameen Stewardship Society (OSS)

FEI offered to discuss the Project individually with the organizations and local stakeholder groups, and also invited them to participate in the virtual project information sessions. No significant issues were identified in our outreach and there was general support for the Project.

8.2.5.3 *Consultation to Date with Landowners*

In March 2020, FEI began consulting with landowners along the proposed route. The purpose of this initial consultation was to explain the need for the Project, provide insight into the proposed route, listen to stakeholder feedback regarding the route and other concerns with the Project, and open a dialogue to determine if there were additional ways that stakeholder impact could be minimized.

Prior to commencing consultation FEI prepared a Land Acquisition Plan, which specifies the resources and steps FEI expects to execute to achieve the necessary land rights for the OCU Project. This plan has been updated on several occasions as a result of matters identified through stakeholder engagement. A copy of the current Land Acquisition Plan can be found in Confidential Appendix H-14.

To commence communication, FEI mailed initial notification letters to 57 directly impacted landowners on March 5, 2020. A sample letter can be found in Appendix H-15. The letters provided information about the Project along with an invitation to engage with FEI about the proposed route, land use and schedule. FEI followed up on the initial letters with phone calls and emails to establish contact with landowners. Since the initial notification letters were sent, FEI engaged in detailed discussions with property owners to understand their concerns. The landowners were provided with Individual Ownership Plans (IOPs) indicating FEI's preferred route. A sample of the IOP can be found in Appendix H-16. There were several areas along the preferred route where FEI sought landowner input to optimize route selection. In these areas, FEI provided landowners with multi-property maps and additional information regarding BCOGC landowner resources to assist them in understanding each of the party's rights and obligations.

As a result of FEI's consultation with landowners, FEI was able to make adjustments to the route which ultimately decreased the number of directly impacted landowners from 57 to 38. FEI

also considered other feedback provided by landowners which is further described in Section 8.2.5.3.1.

FEI continues to exchange information with landowners through email, telephone, and mail and maintains a database of landowner information and communication. FEI will continue to provide advanced notification of work throughout the development of the Project.

8.2.5.3.1 FEI HAS APPROPRIATELY CONSIDERED LANDOWNER FEEDBACK

Of the 57 original landowners to whom FEI sent the initial notification letter, five of those landowners responded. FEI subsequently followed up with landowners that did not respond to the initial notification letter. Due to COVID-19, plans to meet face to face with landowners were largely replaced with telephone and email communications. The landowner group is diverse and the feedback ranged accordingly.

Landowners were provided with IOPs and were asked to sign access agreements to permit FEI representatives and consultants to access to their lands for purposes related to fixing the position of the gas line and land valuation. Many landowners granted FEI access to their land and provided additional details to assist FEI in designing the least intrusive route over their property. Large commercial developers along the preferred route not only provided access but also shared their plans for future subdivisions to enable FEI to consider design improvements to minimize disruption.

There were varying concerns raised by landowners which are further described in Section 8.2.6.

FEI began negotiations to acquire the necessary land rights in August and September 2020. The landowners were given a document package that included an independent real estate market appraisal of their property based on the latest IOP, the standard form of Agreement to Grant Statutory Right of Way and Temporary Work Space. An example of this standard form can be found at Appendix H-17 and an explanation of the principles that FEI used to determine compensation can be found in the Land Acquisition Plan in Confidential Appendix H-14. Landowners were given the time to review these materials and were encouraged to seek legal review. Ongoing communication with the landowners during this phase continued to inform routing decisions, and in some cases, caused alternative routes to be identified and validated. Where an alternative route was identified, it was subject to a field-based constructability review. If the alternative was found to be constructible, the IOP would be revised and negotiations would continue based on the alternative route. Landowner-specific feedback continues to evolve and the landowner consultation to date as of November 2, 2020 can be found in Confidential Appendix H-18.

FEI is committed to negotiating fair agreements with landowners along the route and will continue to engage with landowners post CPCN filing to acquire the requisite land rights. Should FEI be unable to reach agreement with landowners, FEI will follow the internal escalation procedure outlined in the Land Acquisition Plan, including pursuing its rights to expropriate land in accordance with applicable legislation. As at the filing date FEI has come to agreement with 13 of 38 private landowners.

8.2.5.4 *Consultation to Date with Local, Provincial and Federal Government*

FEI contacted the City of Penticton staff and the RDOS Electoral Director, Area "E" and Electoral Director, Area "D" to discuss the Project. Meetings were scheduled in late 2019 and early 2020 to provide an overview of the Project, including the need for the Project, anticipated timelines, and plans to consult with stakeholders.

A memo on the Project, including a map and a flyover video of the route, was also sent out on April 6, 2020 to the City of Penticton Mayor and Council, RDOS Directors, the City of Kelowna City Manager, the City of West Kelowna Chief Administrative Officer, the local MLA Dan Ashton, and to the Member of Parliament Richard Cannings for the South Okanagan and West Kootenay area. Appendix H-4 is the memo sent to the local governments.

FEI is currently in communication with the City of Penticton and the parties are exploring various ways to ensure that stakeholder concerns are addressed.

FEI's log of its stakeholder consultation activities to date for the Project is included as Appendix H-2.

8.2.6 FEI Has Responded to Issues and Concerns Raised by Stakeholders

FEI has been open and transparent in its consultation and communication with stakeholders regarding the Project, including proactively discussing Project details, addressing concerns, and responding to questions in a timely manner. FEI values feedback and is committed to responding to the feedback it receives from stakeholders during consultation on the Project, including its proposed route (as previously described in Section 8.2.5.3.1).

A variety of topics were discussed during these interactions and the key issues and concerns raised during engagement are detailed further in the Table 8-1 below.

Table 8-1: Issues and Concerns Raised

Issue	Description of Issue	FEI's Response
Lack of access to natural gas	Two landowners have emailed and asked why they are not able to access natural gas, as the new gas line would pass by their house.	FEI explained that the Project is a transmission gas line and not a distribution gas line. This new gas line will connect into FEI's larger Interior Transmission System, which brings energy to FEI's customers throughout the Okanagan. These landowners were also put in touch with FEI's planning department and provided cost-to-connect information.
Rate impacts	Several customers have asked questions about the potential rate impact of the Project, including during the virtual open houses.	FEI responded the Project was in the early stage of development and rate impacts would be shared as part of the CPCN application.
Community engagement	Several members of the public expressed concerns about engagement, specifically whether virtual engagement was adequate.	The Company will continue to engage with respect to the Project, including in-person engagement activities such as open houses, as public health guidelines allow.
Route	Several landowners have raised issues regarding the proposed route, including the potential impact to the future development of their lands, impact to crops and impacts to view scape (including loss of trees).	The Company has, in many cases, been able to adjust the route to minimize the potential adverse impacts to landowners. Where the route could not be adjusted, these concerns have been taken into account in the appraisals that have been completed and the amount of compensation being offered to landowners.
Past FEI/FBC Work	Several landowners have raised concerns about past utility access to their lands including access without notice and conditions left following work completion.	Concerns have been communicated to local FEI/FBC managers to ensure appropriate communications take place prior to entering private lands; ensure sites are left clean following work activities.
Compensation	Aside from route, the most significant concern raised by landowners is the amount of compensation FEI is offering as payment for the acquisition of land rights.	FEI has had independent appraisals completed by a qualified land appraisal firm and has taken into consideration all categories of compensation that would be payable in the context of an expropriation. FEI has provided landowners with access to the appraisals and has encouraged them to obtain legal advice related to the contents of the offer.

FEI has been in communication with landowners who have raised the above noted concerns to try to resolve these issues by providing additional information and rationale for the Project and FEI continues to revise route options to address landowner concerns where possible.

8.2.7 FEI Will Address or Respond to Outstanding Issues or Concerns

FEI values and is committed to responding to the feedback received from stakeholders during consultation on the Project, including with respect to the proposed route. FEI has responded to concerns raised by members of the public regarding the proposed route and has sought to address them. As noted above, there will be some landowners directly impacted by the Project who may continue to be opposed to the proposed route due to concerns about the proximity of the proposed route to their property. FEI intends to address these concerns through continued consultation with these landowners.

8.2.8 Future Consultation and Communication Plan

FEI is committed to providing advanced notice and proactive communications to help minimize inconveniences associated with construction activities. In order to understand, minimize, and mitigate impacts to stakeholders, FEI will continue to:

- Communicate with landowners through meetings, phone calls and emails throughout the course of the Project;
- Communicate with stakeholders, including pertinent government officials and agencies at the municipal and regional levels, landowners, stakeholder groups, and the general public;
- Identify opportunities to continue this engagement with local stakeholders, including through meetings, phone calls, telephone town hall/public information sessions, and informal community coffee chats; and
- Communicate broadly through paid media and advertisements, in the communities that will be most affected. This includes advertisements to inform Penticton and Naramata residents of engagement opportunities and distribution of construction notifications to nearby residents and businesses.

8.2.9 Public Consultation Efforts to Date are Sufficient and Will Continue

FEI's public consultation and communication activities as at the time of filing the Application have been sufficient, appropriate, and reasonable to meet the requirements of the CPCN guidelines. As discussed above, FEI will continue to engage with stakeholders and the public throughout the lifecycle of the Project, in order to keep them informed and to mitigate any impacts associated with the Project.

8.3 *FEI IS ENGAGING WITH INDIGENOUS GROUPS*

FEI is committed to building strong working relationships with Indigenous groups guided by FEI's Statement of Indigenous Principles (Appendix I-1). FEI recognizes that the potential impacts of the Project on the title, rights, and interests of affected Indigenous groups must be identified and avoided or mitigated as appropriate. To achieve this, FEI recognizes that its

engagement approach will need to be thorough, timely, and meaningful. FEI also endeavors to create project benefits for local Indigenous groups, through capacity building and economic opportunities.

In 2019, FEI began engaging with Indigenous groups with asserted interests in the Project area. At this time, there are no known outstanding issues or concerns with regard to the Project, which cannot be addressed through planned future engagement. FEI continues to engage Indigenous groups on the Project.

FEI discusses its engagement with Indigenous groups in more detail below. The following subsections are organized as follows:

- Section 8.3.1: FEI has adopted an approach to engagement with Indigenous groups that is thorough, timely and meaningful.
- Section 8.3.2: FEI has identified the Indigenous groups who may be potentially impacted by the Project.
- Section 8.3.3: FEI has engaged potentially affected Indigenous groups in a manner that respects COVID-19 restrictions and capacity challenges, focusing on email, regular mail and virtual meetings.
- Section 8.3.4: There are no known outstanding issues or questions which cannot be addressed through future engagement, and FEI remains committed to addressing any further issues or questions that may be raised by Indigenous groups.
- Section 8.3.5: FEI will continue to engage with potentially affected Indigenous groups through follow-up meetings, information sharing, and letters/emails, including advising of the filing of the Application.

8.3.1 FEI's Engagement Approach is Appropriate

While the constitutional duty to consult rests with Crown agencies, FEI's engagement activities with Indigenous groups will aid the appropriate Crown agency in fulfilling its responsibilities. FEI is committed to working with Crown agencies and Indigenous groups to identify, avoid, and mitigate potential impacts on Indigenous title, rights and interests.

FEI began engagement early with Indigenous groups that have an asserted interest in the Project area. The purpose of the early engagement was to provide information about the Project, describe any potential impacts from the Project, and to understand the interests of Indigenous groups, and how they may be affected by the proposed work. The introduction of the Project to the Indigenous groups was an opportunity for the communities to help shape the Project's early development.

8.3.2 FEI Has Identified Potentially Affected Indigenous Groups

A list of Indigenous groups with interests in the area of the Project was developed using the Province of British Columbia's Consultative Areas Database (CAD, found in Appendix I-2). The database was confirmed using Project mapping to create a comprehensive list of Indigenous groups whose traditional territory is located along the route. The Project is located in what is considered to be Syilx territory. The Syilx People of the Okanagan Nation are a trans-boundary community separated at the 49th parallel by the border between Canada and the United States. The specific Indigenous groups potentially affected by the Project are listed in Table 8-2 below.

Table 8-2: Indigenous Groups Potentially Affected by Project – CAD Query

Indigenous Groups	
Esh-kn-am Cultural Resource Management	Okanagan Nation Alliance (ONA)
Lower Similkameen Indian Band (LSIB)	Penticton Indian Band (PIB)
Nooaitch Indian Band	Upper Nicola Indian Band
Okanagan Indian Band (OIB)	Westbank First Nation (WFN)

8.3.3 FEI's Engagement with Indigenous Groups to Date

FEI sent a Project introduction letter to the Indigenous groups identified in Table 8-3, on November 18, 2019. The letter provided Project details, contact information, and offered to engage further, if desired by the community. A sample letter can be found at Appendix I-3 and the log of contact with Indigenous communities can be found in Appendix I-4.

FEI sent a follow-up email to the Indigenous groups on May 4, 2020 (Appendix I-3). The email advised that the preferred route should largely stay within FEI and FBC's existing rights of way to minimize impacts. The email also advised of the upcoming filing of the Application, and extended another offer to discuss the Project, if requested. FEI did not receive any requests for meetings as a result of the notification letter and received only one response deferring further engagement to PIB and WFN, as these communities are in closer proximity to the Project location.

Due to the Project's proximity to the PIB area of responsibility within the Syilx nation, discussions with the PIB Natural Resources Department began very early in the planning stage. At the recommendation of PIB Natural Resources Department leads, a meeting was scheduled with the Traditional Ecological Knowledge Keepers (TEKK) to further discuss the project scope, proposed routing, and timelines. For this project, Traditional Ecological Knowledge (TEK) refers to the evolving knowledge acquired by Indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. These early discussions supported FEI and PIB to share knowledge, and support PIB to make an informed decision that ensured the protection and preservation of Syilx interests, which include Syilx culture, heritage and protecting their traditional territory.

To gain a better understanding of the Syilx Indigenous groups, which includes the PIB and the WFN, and their decision-making processes, FEI staff attended two cultural workshops at the

En'owkin Centre in Penticton on November 28, 2019 and on March 4, 2020. The workshops provided an opportunity to learn the history of the area, and how the local TEKK, and local Syilx traditional knowledge can help inform the Project.

As shown in Appendix I-4, meetings with TEKK were held regularly and a capacity funding agreement was developed in collaboration between FEI and PIB. The intent of the agreement was to support PIB's capacity to engage with FEI, complete an assessment of the Project's impacts on Syilx interests, and communicate with their community members.

WFN has expressed interest in creating a capacity funding agreement to assess the northern portion of the Project route, which lies within WFN area of responsibility within the Syilx nation. FEI and WFN have created an agreement, which outlines their collaboration with the PIB TEKK members. WFN will complete an assessment of the Project's impacts on Syilx interests, and communicate with their community members about the Project.

Early socio-economic opportunity discussions included meeting with WFN's Employment & Training Facilitator, from the Okanagan Training and Development Council (OTDC), to discuss potential training and employment opportunities for their members in the Central Okanagan. The OTDC's mandate is to encourage self-sufficiency for Indigenous individuals by addressing local and regional labour market and community needs and priorities through the delivery of employment, training, programs, and services. FEI committed to ongoing discussions with the OTDC as the Project progresses.

To date, FEI has sent to each Indigenous group four key Project notifications/updates through regular mail and emails (Appendix I-3). Correspondence associated with the engagement that took place with the identified Indigenous groups in connection with the Project is shown in Table 8-3. The complete logs of engagement with Indigenous groups are included in Appendix I-4.

Table 8-3: Indigenous Groups Key Engagement Activities

Format	Date	Indigenous Group	Content
Penticton Indian Band			
In-Person Meeting	6-Sep-19	Penticton Indian Band • Natural Resources (NR) Project Manager	• Communicated Project scope, proposed routing, and timelines. • Natural Resources advised of PIB's interest of the community's TEKK assessment of the route. • FEI agreed – provided funding to support early assessment.
In-Person Meeting	4-Oct-19	Penticton Indian Band • NR Project Manager • TEKK members	• Discussed Phase I Assessment findings; neutral feedback.
In-Person Meeting	15-Oct-19	Penticton Indian Band • NR Project Manager • TEKK members	• Discussed Environmental and Archaeological Overview assessments. • Presented on construction methods and overview of CPCN process.

Format	Date	Indigenous Group	Content
Email	20-Nov-19	Penticton Indian Band	• Introductory information about the proposed Project
In Person Meeting	28-Nov-19	Penticton Indian Band • NR Project Manager • TEKK members	• Discussed how to incorporate traditional plants and medicines during corridor restoration to rebuild cultural picking areas and ensure animals return to the area.
Conference Call	17-Apr-20	Penticton Indian Band • NR Project Manager • NR Director	• Reviewed engagement activities, route change, and archeological work. • Discussed a proposed capacity funding agreement. • Discussed future meeting options in light of the COVID-19 restrictions.
Conference Call	28-Apr-20	Penticton Indian Band • NR Project Manager • NR Director	• Reviewed Project timelines, geotechnical work, routing and planning.
Email	4-May-20	Penticton Indian Band	• Update on the Project: Preliminary Field Reconnaissance.
Conference Call	6-May-20 12-May-20 3-Jun-20 9-Jun-20	Penticton Indian Band • NR Director	• Received confirmation that the capacity funding agreement to support PIB's engagement on the Project was received a signed the band council resolution.
Email	4-Jun-20	Penticton Indian Band	• Update on Project: Geotechnical Assessment
In-Person Meeting	17-Jun-20	Penticton Indian Band • NR Project Manager • TEKK members	• Provided information to the TEKK members on the proposed route and gave an update on construction timelines and next steps.
In-Person Meeting	10-Jul-20	Penticton Indian Band • NR Project Manager • TEKK members	• Discussed the Project's effects on plants, animals, and water. • Discussed how to protect areas along the route from construction and trespassers.
Conference Call	23-Jul-20	Penticton Indian Band • CEO, K'uL Group • CEO, ReGen Global, K'uL Platform Partner	• Discussed opportunities to learn more about K'uL Group (PIB economic development organization), businesses currently available and what is being developed for future opportunities. • Discussed an outline for more efficient procurement and construction procedures specific to the Project.
In-Person Meeting	24-Jul-20	Penticton Indian Band • NR Project Manager • TEKK members	• Reviewed the flyover video of the proposed route. • Discussed upcoming preliminary geotechnical work.
In-Person Meeting	25-Aug-20	Penticton Indian Band • NR Project Manager • TEKK members	• Discussed preliminary findings along the route and the next steps.

Format	Date	Indigenous Group	Content
Conference Call	15-Sep-20 30-Sep-20 20-Oct-20	Penticton Indian Band • NR Project Manager • NR Director	• Bi-weekly progress update meeting.
Email	15-Oct-20	Penticton Indian Band	• Update on Project: Permit Application.
Westbank First Nation			
Email	20-Nov-19	Westbank First Nation	• Introductory information about the proposed Project.
In Person Meeting	3-Mar-20	Westbank First Nation • WFN Archaeology Supervisor (AS) • WFN Archaeology Project Coordinator (APC)	• WFN identified that they would like to be involved with work and view the draft reports for their area near Chute Lake. • WFN to join PIB TEKK in their assessments. • Discussed the restoration of the corridor. • Ancestral remains and environmental issues are of primary concern.
Email	20-Apr-20 4-May-20 6-May-20	Westbank First Nation • WFN AS • WFN APC • WFN Lands Referral Officer (LFO)	• Discussed the Project and potential route. • Sent the archaeological and environmental draft overview reports, along with the KMZ file of the route. • Followed up on capacity funding agreement for the northern section of the route, which WFN has expressed interest in.
Email	4-May-20	Westbank First Nation	• Update on Project: Preliminary Field Reconnaissance.
Email	4-Jun-20	Westbank First Nation	• Update on Project: Geotechnical Assessment
Conference Call	12-Jun-20 25-Aug-20 6-Oct-20	Westbank First Nation • WFN AS • WFN APC	• Discussed project updates and progressed discussions regarding the capacity funding agreement.
Email	15-Oct-20	Westbank First Nation	• Update on Project: Permit Application.
Okanagan Indian Band			
Email	20-Nov-19	Okanagan Indian Band • Okanagan Indian Band Referrals	• Introductory information about the proposed Project.
Email	3-Apr-20	Okanagan Indian Band • Okanagan Indian Band Referrals	• The Okanagan Indian Band conducted a desk top review of the project. • The Okanagan Indian Band deferred the project to the Penticton Indian Band, Westbank First Nation and Lower Similkameen Indian Band (LSIB). No response from LSIB. (Appendix I-5)
Esh-kn-am Cultural Resources Management Services			
Email	27-Jun-20	Esh-kn-am Cultural Resources Management Services • Referral Response Team	• Received an email from Esh-kn-am CRMS which states that they have no concerns with the Project moving forward. (Appendix I-6)

Format	Date	Indigenous Group	Content
Email	20-Nov-19 4-May-20 4-Jun-20 15-Oct-20	• Esh-kn-am Cultural Resources Management Services • Lower Similkameen Indian Band • Nooaitch Indian Band • Okanagan Nation Alliance • Upper Nicola Indian Band • Okanagan Indian Band	• Introductory information about the Project 20-Nov-19 (Appendix I-3) • Update on Project: Preliminary Field Reconnaissance 4-May-20 (Appendix I-3) • Update on Project: Geotechnical Assessment 4-Jun-20 (Appendix I-3) • Update on Project: Permit Application 15-Oct-20 (Appendix I-3) • OIB only received the 20-Nov-19 letter as they deferred the project to the other nations on 3-Ap-20.

8.3.4 FEI Has Responded to Issues and Interests Raised by Indigenous Groups

FEI has conducted multiple rounds of engagement with Indigenous groups, and at the time of filing, Indigenous groups raised minimal issues or concerns. Following notification, WFN and PIB contacted FEI requesting in-person meetings and we have met with the communities to engage with them about the Project.

During early engagement with Indigenous groups, the area of the Project was identified as being historically and culturally significant. As outlined in Section 8.3.3, FEI has developed an agreement in collaboration with the PIB to identify and mitigate issues raised. Under the agreement with PIB, an interim report on its findings along the route was received on October 30, 2020, as per the agreement. FEI is currently working on a similar agreement with WFN.

Concerns raised by Indigenous groups during FEI's engagement can be broadly characterized as relating to two themes, outlined in the following table.

Table 8-4: Summary of Engagement with Indigenous Groups

Issue	Description of Issue	FEI's Response
Potential Environmental Impacts	Some Indigenous groups expressed concerns about the impacts to plants, animals and the importance of preserving ancestral remains in regards to the implementation of the route.	Both groups discussed how to incorporate traditional plants and medicines during corridor restoration, to rebuild cultural picking areas and ensure animals return to the area. We also discussed ideas around how to preserve ancestral remains and keep trespassers away from areas of significant importance. FEI discussed potential restoration solutions to their concerns such as the E-Community Garden project to grow local plants at the En'owkin Center. Next steps are to continue discussions on how these actions could be achieved.

Issue	Description of Issue	FEI's Response
Engagement Opportunities	Some communities raised interest around their involvement with the Project and the review of the AIA, AOA, and EOA documents.	These areas of interests were all included in the capacity funding agreements, as work plan items. FEI has also ensured that there is either a PIB or WFN monitor onsite for all geotechnical investigations.

8.3.5 FEI Will Continue to Engage with Indigenous Groups

In line with its Statement of Indigenous Principles, FEI remains committed to engaging with Indigenous groups in an ongoing, transparent and meaningful manner. These discussions will continue, with an emphasis on seeking consensus on the preferred route with continued engagement throughout the regulatory process, and throughout the pre construction and close out phase.

FEI will continue to provide more detailed information to the Indigenous groups for review and comment, with the ultimate goal of incorporating feedback into the Project's development. This process will include, but will not be limited to, the BCOGC's permitting processes which includes ongoing engagement as well as construction and environmental management plan reviews. FEI will incorporate feedback from Indigenous groups into the Project's procurement plans to identify socio-economic opportunities of mutual interest. FEI will garner detailed reporting on Indigenous employment and socio-economic impacts during this Project lifecycle. Follow-up meetings will be scheduled with Indigenous groups as additional information around employment opportunities, contracting and procurement becomes available. FEI will continue to engage through follow-up meetings, information sharing, and letters/emails, including advising of our filing of the Application.

8.3.6 FEI's Indigenous Engagement Process to Date Has Been Appropriate

FEI's Statement of Indigenous Principles states the importance of clear and open communication with Indigenous groups. FEI believes that its engagement process for the Project reflects these principles. Through early engagement activities, FEI has established key points of contact, preferred methods of communication and an early understanding of potential interests from Indigenous groups. As the Project develops, FEI will continue to work through these channels to resolve outstanding questions and address comments and concerns.

8.4 *CONCLUSION*

FEI has consulted and sought feedback from stakeholders during the pre-submission phase of the Project. FEI has also engaged with the potentially impacted Indigenous groups in the area of the Project. FEI's consultation and engagement has been sufficient to date, and FEI will continue to work with customers, stakeholders, and Indigenous groups to address outstanding concerns throughout the lifecycle of the Project.

9. PROVINCIAL GOVERNMENT ENERGY OBJECTIVES AND POLICY CONSIDERATIONS

9.1 *INTRODUCTION*

Section 46 (3.1) of the UCA states that in considering whether to issue a CPCN, the BCUC must consider:

(a) the applicable of British Columbia's energy objectives,

(b) the most recent long-term resource plan filed by the public utility under section 44.1, if any, and

(c) the extent to which the application for the certificate is consistent with the applicable requirements under sections 6 and 19 of the *Clean Energy Act* (CEA).

Sections 6 and 19 of the CEA, as referred to in (c) above, do not apply to FEI. FEI addresses the other two requirements below.

9.2 *BRITISH COLUMBIA'S ENERGY OBJECTIVES*

British Columbia's energy objectives are defined in section 2 of the CEA. Based on the results of the socio-economic assessment described in Section 5.8.2, the Project will support the British Columbia energy objective found in section 2(k) of the CEA "to encourage economic development and the creation and retention of jobs".

The Project will support this objective by having positive employment impacts and by contributing to the local economy in the central and north Okanagan regions. In particular, the procurement of local materials, and the use of local services, such as lodging and dining. Further, the Project will benefit these Okanagan regions, by helping to meet long-term capacity requirements for a reliable and safe gas system, as some communities are expected to grow by up to 40 percent in the next 20 years.

The work is anticipated to occur in a largely rural landscape, with low population density, and alongside existing rights-of-ways. However, FEI will develop a Public Impact Mitigation Plan, which will outline strategies to minimize community impacts. FEI will also work with Indigenous and local leaders and organizations to develop the local workforce, support local businesses, and connect them to Project opportunities.

9.3 *PROJECT IS CONSISTENT WITH FEI'S LONG TERM RESOURCE PLAN*

The Long Term Gas Resource Plan (LTGRP) filed with the BCUC in December 2017 identified four reinforcement options for the OCU Project as discussed below to meet the demand

forecast in the LTGRP. Through further exploration and analysis of alternatives in this Application, FEI updated requirements for the four options identified in the LTGRP[41]. FEI identified and explored a fifth option that was not presented in the 2017 LTGRP, referred to in Section 4 as Alternative 2. The descriptions of the alternatives presented in Section 4 also provide some revisions, updates and detail on the alternatives than what was presented in the 2017 LTGRP.

- Option 1 in the LTGRP is considered as Alternative 3 in the Application

  Option 1 involved installing approximately 28 kilometres of transmission pipeline looping just north of Penticton and adding compression facilities at Kitchener. The updated requirements for this option are discussed in Section 4.2.3 as Alternative 3 Extension of OLI PEN 406[42].

- Option 2 in the LTGRP is considered as Alternative 1 in the Application

  Option 2 involved replacing up to 9 kilometres of transmission pipeline between Penticton and Kelowna and adding similar compression as in Option 1. The updated requirements for this option are discussed in Section 4.2.1 as Alternative 1 ITS Upgrades to VER PEN 323.

- Option 3 in the LTGRP is considered as Alternative 4 in the Application

  Option 3 involved installation of approximately 52 kilometres of transmission pipeline looping near Kamloops. The updated requirements for this option are discussed in Section 4.2.4 as Alternative 4 508 mm North Loop from Savona.

- Option 4 in the LTGRP is considered as Alternative 5 in the Application.

  Option 4 was installation of an LNG peak shaving facility near Vernon to boost system delivery pressures during times of high demand. The updated requirements for this option are discussed in Section 4.2.5 as Alternative 5 LNG Peaking Plant near Vernon.

The OCU Project remains consistent with the 2017 LTGRP.

[41] OCU (referred to in the LTGRP as the Okanagan Reinforcement Project) alternatives are discussed in Section 6.3.3 of the LTGRP beginning on page 179. The LTGRP can be viewed here: https://www.fortisbc.com/about-us/regulatory-affairs/our-gas-utility/gas-bcuc-submissions/fortisbc-energy-inc.-gas-submissions/resource-plans/2017-resource-plan-for-natural-gas.

[42] As compression at Kitchener is not required until later in the 20 year forecast for LTGRP Options 1 and 2 and compressor configuration in the Kootenays is being assessed in other projects currently under consideration, adding compression facilities at Kitchener was removed for the OCU Alternatives 1 and 3.

10. CONCLUSION

The OCU Project is necessary for FEI to continue to maintain safe and reliable gas service to its existing and future customers in the central and north Okanagan regions. As discussed in Section 3, due to load growth in the region (specifically around urban centres like Kelowna and Penticton), FEI predicts that forecasted peak demand will exceed its existing capacity on the ITS. Therefore, a system upgrade is required to increase capacity. As the last major upgrade to the ITS was completed more than twenty years ago, FEI needs an acceptable, practical and long-term solution to serve the growing load in the central and north Okanagan regions that will address the expected capacity shortfall prior to the winter peak of 2023/2024.

As discussed in Section 4, based on a thorough evaluation of the three feasible alternatives, the Company selected Alternative 3 as the preferred solution as it best addresses the project need to increase ITS capacity to meet the forecasted peak demand. This includes the construction and installation of an approximately 30 km extension of the OLI PEN 406 transmission line from a takeoff location near Ellis Creek near Penticton to its terminus at a new pressure control station near Chute Lake south of Kelowna as well as the associated facilities, as discussed in Section 5 of the Application. In summary, Alternative 3 provides a necessary increase to FEI's ITS capacity to maintain safe and reliable gas service to customers.

The Company requests that the BCUC approve the Project as set out in the Application. FEI plans to initiate the detailed design and procurement of long lead items in 2021. The construction for the Project is planned to start in early 2022 with final commissioning scheduled to be completed in the fourth quarter of 2023.

Appendix A
SOLARIS FEED REPORTS

FILED CONFIDENTIALLY

Appendix A-1

FEED REPORT DOCUMENTS

FILED CONFIDENTIALLY

Appendix A-2
ENGINEERING DRAWINGS

FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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FILED CONFIDENTIALLY

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VALIDATION ESTIMATING ESCALATION REPORT

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VALIDATION ESTIMATING RISK FUNDING MEMO

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Appendix D
DETAILED SCHEDULE

FORTIS BC™

Okanagan Capacity Upgrade

FEI Level 6 Schedule

OLI PEN 406 Extension

SOLARIS MANAGEMENT CONSULTANTS INC.

Activity ID	Activity Name	Duration	Start Date	Finish Date
Total		156w	02-Nov-20	01-Jan-24
OKANAGAN CAPACITY UPGRADE - M-009		156w	02-Nov-20	01-Jan-24
Capital Cost - Execution M-009.3		156w	02-Nov-20	01-Jan-24
Project Services M-009.3.A		156w	02-Nov-20	01-Jan-24
Project Management M-009.3.A.1		155w	02-Nov-20	22-Dec-23
Internal PM-FEI M-009.3.A.1.1		155w	02-Nov-20	22-Dec-23
External PM-Consultant M-009.3.A.1.2		4w	04-Jul-22	29-Jul-22
Contract Management M-009.3.A.2		155w	02-Nov-20	22-Dec-23
Internal Contra Mgmt-FEI M-009.3.A.2.1		155w	02-Nov-20	22-Dec-23
Community Relations M-009.3.A.3		144w	02-Nov-20	29-Sep-23
Internal Comm Rel-FEIM-009.3.A.3.1		144w	02-Nov-20	29-Sep-23
External Comm Rel-Consultant M-009.3.A.3.2		144w	02-Nov-20	29-Sep-23
Indigenous Relations M-009.3.A.4		144w	02-Nov-20	29-Sep-23
Internal Ind Rel-FEI M-009.3.A.4.1		144w	02-Nov-20	29-Sep-23
External Ind Rel-Consultant M-009.3.A.4.2		73w	02-Nov-20	29-Apr-22
Communications M-009.3.A.5		152w	02-Nov-20	01-Dec-23
Internal Comm-FEI M-009.3.A.5.1		152w	02-Nov-20	01-Dec-23
External Comm-Consultant M-009.3.A.5.2		144w	02-Nov-20	29-Sep-23
Communication Materials M-009.3.A.5.3		144w	02-Nov-20	29-Sep-23
Environmental/Archaeology M-009.3.A.6		144w	02-Nov-20	29-Sep-23
Internal Env/Arch-FEI M-009.3.A.6.1		144w	02-Nov-20	29-Sep-23
External Env-Consultant M-009.3.A.6.2		111w	03-May-21	25-Jul-23
External Arc-Consultant M-093.A.6.3		30w	03-May-21	03-Dec-21
Regulatory/Permitting M-009.3.A.7		152w	02-Nov-20	30-Nov-23
Internal Reg/Per-FEI M-009.3.A.7.1		152w	02-Nov-20	30-Nov-23
External Reg/Per-Consultant M-009.3.A.7.2		69w	02-Nov-20	31-Mar-22
Property Services M-009.3.A.8		156w	02-Nov-20	01-Jan-24
Internal Prop Svcs-FEI M-009.3.A.8.1		156w	02-Nov-20	01-Jan-24
External Prop Svcs-Consultant M-009.3.A.8.2		155w	02-Nov-20	22-Dec-23
Legal M-009.3.A.9		144w	02-Nov-20	29-Sep-23
Internal Legal-FEI M-009.3.A.9.1		144w	02-Nov-20	29-Sep-23
External Legal-Consultant M-009.3.A.9.2		144w	02-Nov-20	29-Sep-23
Operations Support M-009.3.A.10		122w	02-Nov-20	28-Apr-23
Internal Ops Supp-FEI M-009.3.A.10.1		122w	02-Nov-20	28-Apr-23
Health & Safety M-009.3.A.11		144w	02-Nov-20	29-Sep-23
Internal H&S-FEI M-009.3.A.11.1		144w	02-Nov-20	29-Sep-23
External H&S-ConsultantM-009.3.A.11.2		50w	01-Mar-22	28-Feb-23
Engineering M-009.3.B		155w	02-Nov-20	22-Dec-23
Engineering Oversight M-009.3.B.1		122w	02-Nov-20	28-Apr-23
Internal Eng-FEIM-009.3.B.1.1		122w	02-Nov-20	28-Apr-23
External Eng-Consultant M-009.3.B.1.2		30w	03-May-21	03-Dec-21
Geotechnical M-009.3.B.2		115w	05-Apr-21	31-Jul-23

Remaining Work
Critical Primary
Critical Secondary
Critical Tertiary
Milestone
Summary

Data Date: 31-Oct-20 **Print Date:** 04-Nov-20

Date	Revision	Checked	Approved
04-Nov-20	G	Lewi Sadik	Darren McElhinney

Okanagan Capacity Upgrade

FEI Level 6 Schedule

OLI PEN 406 Extension

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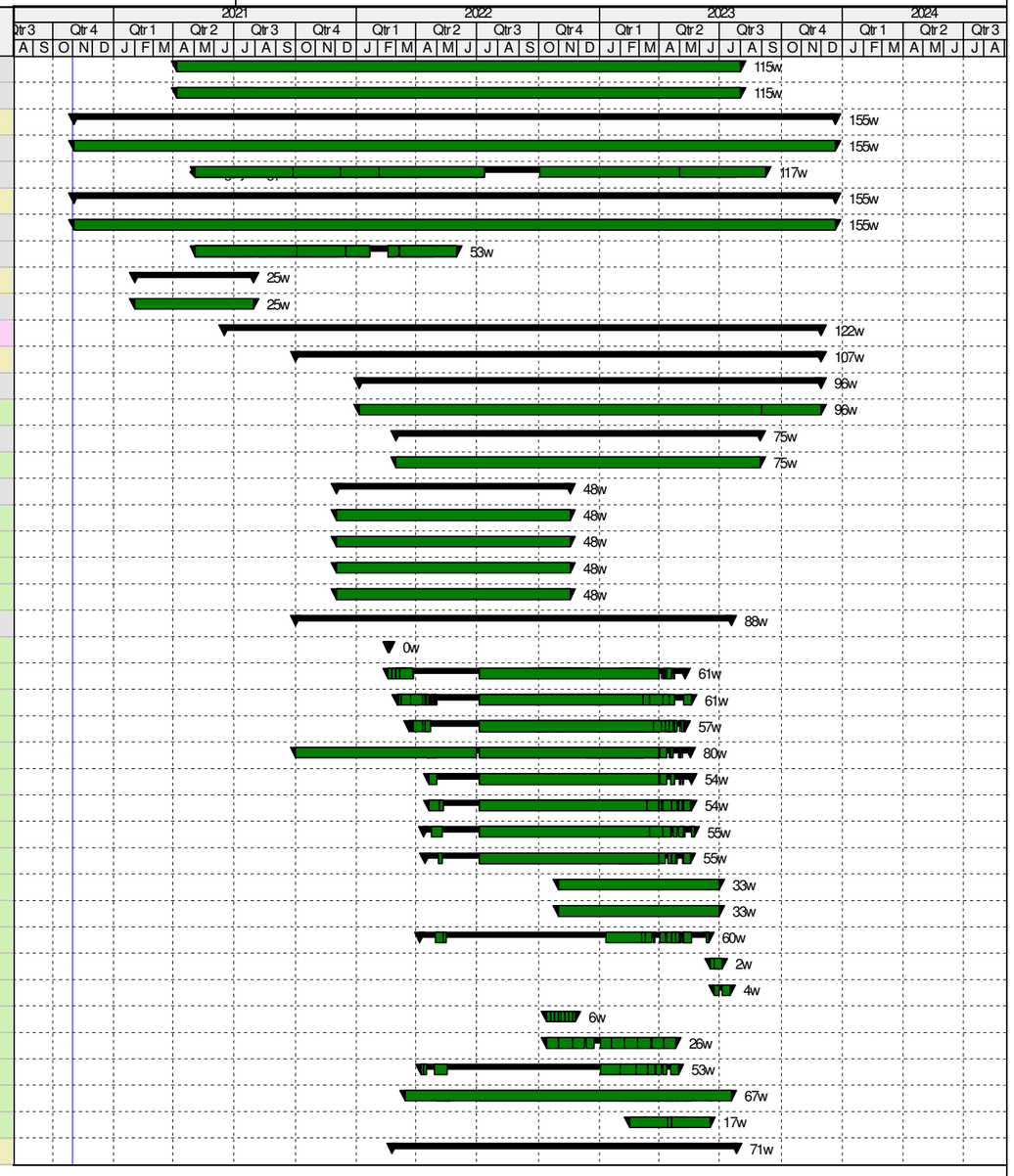
SOLARIS MANAGEMENT CONSULTANTS INC.

Activity ID	Activity Name	Duration	Start Date	Finish Date
	Internal Eng Geo-FEI M-009.3.B.2.1	115w	05-Apr-21	31-Jul-23
	External Eng Geo-Consultant M-009.3.B.2.2	115w	05-Apr-21	31-Jul-23
	Pipeline M-009.3.B.3	155w	02-Nov-20	22-Dec-23
	Internal Eng Pipeline-FEI M-009.3.B.3.1	155w	02-Nov-20	22-Dec-23
	External Eng Pipeline-Consultant M-009.3.B.3.2	117w	03-May-21	08-Sep-23
	Stations M-009.3.B.4	155w	02-Nov-20	22-Dec-23
	Internal Eng Stations-FEI M-009.3.B.4.1	155w	02-Nov-20	22-Dec-23
	External Eng Stations-Consultant M-009.3.B.4.2	53w	03-May-21	30-May-22
	Survey M-009.3.B.5	25w	01-Feb-21	30-Jul-21
	External Survey-Consultant M-009.3.B.5.2	25w	01-Feb-21	30-Jul-21
	Pipeline M-009.3.C	122w	16-Jun-21	30-Nov-23
	Pipeline (~28km) - M-009.3.C.1	107w	01-Oct-21	30-Nov-23
	FEI On-Site Construction Management M-009.3.C.1.1	96w	04-Jan-22	30-Nov-23
	Internal On-Site Const Mgmt-FEI M-009.3.C.1.1.1	96w	04-Jan-22	30-Nov-23
	FEI On-Site Inspection M-009.3.C.1.2	75w	01-Mar-22	31-Aug-23
	External On-Site Eng-Consultant M-009.3.C.1.2.2	75w	01-Mar-22	31-Aug-23
	FEI Materials M-009.3.C.1.3	48w	01-Dec-21	18-Nov-22
	Line Pipe M-009.3.C.1.3.1	48w	01-Dec-21	18-Nov-22
	Induction Bends M-009.3.C.1.3.3	48w	01-Dec-21	18-Nov-22
	Inpection of Materials during fabrication M-009.3.C.1.3.5	48w	01-Dec-21	18-Nov-22
	PST M-009.3.C.1.3.6	48w	01-Dec-21	18-Nov-22
	Contractor Construction M-009.3.C.1.4	88w	01-Oct-21	17-Jul-23
	Handling (pipe & bends, coat shop to stockpile) M-009.3.C.1.4.1	0w	18-Feb-22	18-Feb-22
	Clearing M-009.3.C.1.4.2	61w	18-Feb-22	10-May-23
	ROW Preparation M-009.3.C.1.4.3	61w	03-Mar-22	19-May-23
	Ditching & Trenching M-009.3.C.1.4.4	57w	21-Mar-22	10-May-23
	Stringing/Setup M-009.3.C.1.4.5	80w	01-Oct-21	18-May-23
	Bending M-009.3.C.1.4.6	54w	19-Apr-22	19-May-23
	Welding M-009.3.C.1.4.7	54w	20-Apr-22	20-May-23
	Joint Coating M-009.3.C.1.4.8	55w	12-Apr-22	23-May-23
	Lower-in M-009.3.C.1.4.9	55w	13-Apr-22	18-May-23
	Cathodic Protection M-009.3.C.1.4.10	33w	01-Nov-22	30-Jun-23
	AC Mitigation M-009.3.C.1.4.11	33w	01-Nov-22	30-Jun-23
	Backfill M-009.3.C.1.4.12	60w	05-Apr-22	13-Jun-23
	Pressure Test M-009.3.C.1.4.13	2w	17-Jun-23	03-Jul-23
	Test Support & Final Tie-ins M-009.3.C.1.4.14	4w	22-Jun-23	15-Jul-23
	Road Crossings M-009.3.C.1.4.16	6w	14-Oct-22	26-Nov-22
	Creek Crossings M-009.3.C.1.4.17	26w	13-Oct-22	26-Apr-23
	Other Crossings M-009.3.C.1.4.18	53w	08-Apr-22	29-Apr-23
	Clean up/ROW Restoration M-009.3.C.1.4.19	67w	15-Mar-22	17-Jul-23
	Steep Slope Construction M-009.3.C.1.4.20	17w	15-Feb-23	16-Jun-23
	Pipelne (~28km) - Indirect M-009.3.C.2	71w	24-Feb-22	25-Jul-23



Remaining Work
Critical Primary
Critical Secondary
Critical Tertiary
Milestone
Summary

Data Date: 31-Oct-20 **Print Date:** 04-Nov-20

Date	Revision	Checked	Approved
04-Nov-20	G	Lewi Sadik	Darren McElhinney

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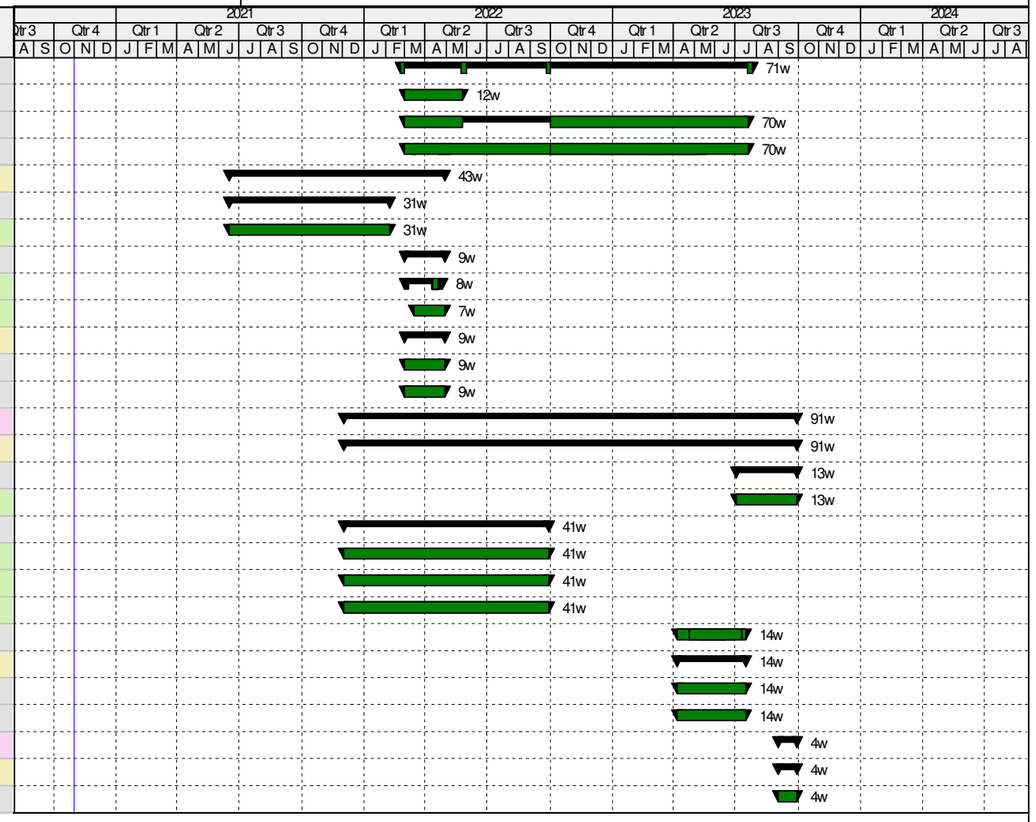
Okanagan Capacity Upgrade

FEI Level 6 Schedule

OLI PEN 406 Extension

SOLARIS MANAGEMENT CONSULTANTS INC.

Activity ID	Activity Name	Duration	Start Date	Finish Date
	Mobilization/Demobilization M-009.3.C.2.1	71w	24-Feb-22	25-Jul-23
	Site Office M-009.3.C.2.2	12w	01-Mar-22	24-May-22
	Temporary Facilities & Utilities M-009.3.C.2.3	70w	01-Mar-22	19-Jul-23
	Construction Support Services M-009.3.C.2.4	70w	01-Mar-22	19-Jul-23
	Penticton Creek HDD - M-009.3.C.3	43w	16-Jun-21	30-Apr-22
	FEI Materials M-009.3.C.3.3	31w	16-Jun-21	07-Feb-22
	Inpection of Materials during fabrication M-009.3.C.3.3.2	31w	16-Jun-21	07-Feb-22
	Construction M-009.3.C.3.4	9w	01-Mar-22	30-Apr-22
	Pipeline Contractor M-009.3.C.3.4.1	8w	01-Mar-22	26-Apr-22
	HDD Contractor M-009.3.C.3.4.2	7w	14-Mar-22	30-Apr-22
	Penticton Creek HDD- Indirect M-009.3.C.4	8w	02-Mar-22	29-Apr-22
	Temporary Facilties & Utilities M-009.3.C.4.3	8w	02-Mar-22	29-Apr-22
	Construction Support Services M-009.3.C.4.4	8w	02-Mar-22	29-Apr-22
	Facilities/Area M-009.3.D	91w	01-Dec-21	29-Sep-23
	(Chute Lake & OP5) M-009.3.D.1	91w	01-Dec-21	29-Sep-23
	FEI On-Site Construction Management M-009.3.D.1.1	13w	03-Jul-23	29-Sep-23
	Internal On-Site PM-FEI M-009.3.D.1.1.1	13w	03-Jul-23	29-Sep-23
	FEI Materials M-009.3.D.1.3	41w	01-Dec-21	29-Sep-22
	Mechanical M-009.3.D.1.3.1	41w	01-Dec-21	29-Sep-22
	Electrical & Instrumentation M-009.3.D.1.3.2	41w	01-Dec-21	29-Sep-22
	Inpection of Materials during fabrication M-009.3.D.1.3.3	41w	01-Dec-21	29-Sep-22
	Construction M-009.3.D.1.4	14w	05-Apr-23	15-Jul-23
	Indirect (Chute Lake & OP5) M-009.3.D.2	14w	05-Apr-23	15-Jul-23
	Temporary Facilities & Utilities M-009.3.D.2.3	14w	05-Apr-23	15-Jul-23
	Construction Support Services M-009.3.D.2.4	14w	05-Apr-23	15-Jul-23
	Deactivation M-009.3.E	4w	01-Sep-23	29-Sep-23
	Deactivation M-009.3.E.1	4w	01-Sep-23	29-Sep-23
	Internal Deactivation Pipe-FEI M-009.3.E.1.1	4w	01-Sep-23	29-Sep-23



Remaining Work
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Summary
Critical Secondary
Critical Tertiary

Data Date: 31-Oct-20 **Print Date:** 04-Nov-20

Date	Revision	Checked	Approved
04-Nov-20	G	Lewi Sadik	Darren McElhinney

Appendix E

FINANCIAL SCHEDULES

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Appendix E-1

FINANCIAL SCHEDULES FOR 3 FEASIBLE ALTERNATIVES

FILED CONFIDENTIALLY

Appendix E-2

FINANCIAL SCHEDULES FOR PREFERRED ALTERNATIVES

FILED CONFIDENTIALLY

Appendix F
ENVIRONMENTAL OVERVIEW ASSESSMENT REPORTS

Okanagan Capacity Upgrade Project
Environmental Overview Assessment

P-00760-ENV-EOA-0001

Prepared for:

FortisBC Energy Inc.
16705 Fraser Highway,
Surrey, BC V4N 0E8

Project No. 104279-01

Prepared by:

Hemmera Envirochem Inc.
18th Floor, 4730 Kingsway
Burnaby, BC V5H 0C6
T: 604.669.0424
F: 604.669.0430
hemmera.com

October 14, 2020

EXECUTIVE SUMMARY

Solaris Management Consultant Inc. (Solaris) retained Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), on behalf of Solaris's client FortisBC Energy Inc. (FortisBC), to provide environmental support services for the Okanagan Capacity Upgrade (OCU) project (the Project). FortisBC is planning capacity upgrades on the Interior Transmission System to meet load growth forecasts at the Kelowna Gate Station. Project construction will commence with horizontal directional drilling (HDD) under Penticton Creek beginning in Spring 2022. The construction completion target is for Summer 2023 with pipeline commissioning scheduled for Winter 2023. This Environmental Overview Assessment report presents environmental risks associated with the selected alignment.

The general study area for this Environmental Overview Assessment includes the length of the alignment with a 100 m width on either side. A 500 m width on either side of the alignment was used for the wildlife study area to assess potential wildlife and species at risk presence during desktop review. Hemmera completed a desktop assessment for the selected alignment and used the resulting information to (1) identify environmental receptors of concern and (2) focus and refine the scope of field reconnaissance activities undertaken to ground-truth the desktop information. Information included in the desktop assessment was gathered from queries of government databases, available in-house data, and open-source spatial data. Data collection and field reconnaissance methods specific to each environmental receptor category are described within this report.

A Hemmera biologist and a representative from the Penticton Indian Band's Natural Resources Department undertook a Preliminary Field Reconnaissance (PFR) to ground-truth the desktop assessment results in November 2019; winter conditions were present in portions of the assessed route during this reconnaissance. A follow-up field reconnaissance was undertaken August 2020 by a team of two biologists and a representative from the Penticton Indian Band's Natural Resources Department; conditions during the follow-up field reconnaissance allowed for a more comprehensive assessment of the general study area. During the PFR and follow-up field reconnaissance, Hemmera gathered biophysical information for the general study area of the selected alignment. Greenfield areas (i.e., generally undisturbed, natural, vegetated areas) were assessed to confirm desktop data and to capture environmental risks (e.g., unmapped waterbodies, species at risk presence, or evidence of potential soil contamination) that were not apparent during the desktop assessment. The assessments covered a broad area of the construction alignment to provide comprehensive risk assessment should minor adjustment to alignment be required (e.g., additional footprint requirements for access road(s) or expanded or new workspaces). Brownfield sites (in this case, disturbed sites that are already paved or developed or are active agricultural areas) were not visited during the PFR or follow-up field reconnaissance, unless a reason to visit the site was identified during the desktop assessment (e.g., if the site contained an identified construction zone or an area of potential environmental concern).

This report provides a high-level overview of the potential adverse effects to environmental receptors that may result from Project construction along the selected alignment. Environmental sensitivities were identified where sensitive features associated with an environmental receptor are anticipated to be directly impacted by construction activities (i.e., where the anticipated construction footprint overlaps with identified features) and where environmental factors present a risk to the Project. Environmental receptors are grouped into two categories: (1) Biophysical (i.e., land use, surface water, fish and fish habitat, vegetation, wildlife and wildlife habitat) and (2) Contaminated soils/groundwater. For the purposes of this report, risks to the Project include additional costs (e.g., activities requiring further follow-up work or mitigation), timing constraints (e.g., species-specific timing windows), or both (e.g., permits or approvals). **Table ES.1** presents a summary of the potential effects and Project risks identified for the selected alignment.

Table ES.1 Overview of Potential Effects and Risks to Biophysical Receptors Associated with the Selected Alignment

Environmental Receptor	Selected Alignment			
	Environmental Sensitivities	Potential Effects	Project Risks	Follow-up Activities and Mitigation
Land Use	• Construction zones that overlap with ALR • Construction zones that overlap with wineries • Construction zones that cross or are in the immediate vicinity of public roadways • Construction zones that overlap with City of Penticton Natural Environmental Development Permit Area • Recreational areas affected: study area passes near Okanagan Mountain Provincial Park, and pipeline crosses Kettle Valley Rail Trail • Municipal park areas affected: study area and pipeline encroaches upon Three Blind Mice Disc Golf Courses • Construction zones that overlap with the Campbell Mountain Landfill	• Temporary or permanent impact on soils and agricultural capacity of properties within construction footprint • Potential disruption to recreational activities during construction • Potential challenges to construction access and timing related to roadway use	Medium	• Public engagement • Development and implementation of a soil management plan for work within the ALR • Engagement with Agricultural Land Commission • Site restoration • Engagement with City of Penticton (Natural Area Development Permit) • Engagement with the City of Penticton, RDOS, and MFLNRORD's Department of Recreational Sites and Trails BC on the Kettle Valley Rail Trail • Engagement with Ministry of Transportation and Infrastructure • Coordinate planning and construction with the Campbell Mountain Landfill to comply with conditions of their landfill operating permit
Surface Water Quality and Quantity	• 20 stream or non-classified drainages (NCD) that are crossed by, or have SPEAs crossed by, the selected alignment study area • Four unclassified wetlands are crossed by the selected alignment study area.	• Temporary diversion of surface water • Introduction of deleterious substances into surface water (e.g., sediment, construction debris) • Temporary or permanent modification to watercourse morphology	Moderate to High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct water quality baseline assessment, if required • Water quality monitoring during construction • Construction timing (i.e., avoid periods of heavy precipitation) • Instream work area isolation
Fish and Fish Habitat	• 8 known or potentially fish-bearing waterbodies cross the selected alignment study area, or their SPEAs interact with the selected alignment	• Temporary modification or permanent destruction of fish habitat • Temporary disturbance to, or displacement of, fish • Direct injury or mortality to fish	High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct instream works within reduced risk work window • Where practical, design and plan Project activities to avoid fish and fish habitat • To the extent practicable, undertake construction within the least-risk timing windows for applicable species • Implement work zone isolation and aquatic life-form salvage • Conduct fish habitat restoration
Vegetation	• Construction areas within mature vegetation and riparian corridors • Construction areas in the vicinity of invasive vegetation • Selected alignment has the potential to support at-risk plants and ecological communities	• Temporary modification or permanent loss of mature native vegetation where selected alignment is through forested areas (i.e., north of Naramata) • Spread of invasive vegetation due to increased areas of exposed soil during construction and movement of soil and seeds by equipment • Potential damage to or destruction of plant species of concern or at-risk ecological communities if present	Moderate	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct surveys for plant species of concern and at-risk ecological communities with a high or medium potential to be present in areas to be affected by Project activities • Develop an invasive vegetation management plan to be implemented during construction • Site restoration activities

Environmental Receptor	Selected Alignment			
	Environmental Sensitivities	Potential Effects	Project Risks	Follow-up Activities and Mitigation
Wildlife	• Wildlife habitat features, including those not identified during the PFR or follow-up field reconnaissance. • Wildlife habitat features and habitat use confirmed during the follow-up field assessment for amphibians, western rattlesnake, Great Basin gopher snake, and Lewis's woodpecker • Areas where known occurrences of wildlife of concern are in the vicinity of the selected alignment (e.g., seven at- risk species CDC occurrences include American badger, white-head woodpecker, Great Basin spadefoot, flammulated owl, Nuttall's cottontail, and two masked occurrences). • Area where construction footprint overlaps with a core critical habitat polygon (e.g., WHA 8-369, sensitive data wildlife habitat core area; WHA 8-014, white-head woodpecker) • Areas where the selected alignment overlaps with federally posted critical habitat areas for Lewis's woodpecker, Great Basin spadefoot, desert nightsnake, western rattlesnake, Great Basin gopher snake. Within these polygons, areas defined as critical habitat may be present as described below. ▫ Lewis's woodpecker: breeding habitat (dry open Ponderosa pine or Douglas-fir and open grasslands with low stem densities, veteran trees, and rich herb/shrub layer, mature to old riparian cottonwood stands adjacent to grassland, shrub-steppe or open woodland habitat; relatively recently burned (<30 years) Ponderosa pine and Douglas-fir dominated forest with standing snags (Environment Canada 2011). ▫ Great Basin spadefoot: vernal ponds (seasonal and temporary wetlands); lakes, ponds, marshes, springs, sluggish streams, and seasonally wetted margins around permanent waterbodies; grassland, shrub-steppe, and open forest (Environment Canada 2017). ▫ Desert nightsnake: denning habitat (i.e., cliff, talus, or rock outcrop with cracks or fissures that provide access below the frost line) and foraging habitat (talus, rock outcrops, and to a lesser degree grassland, shrub-steppe, open ponderosa pine and Douglas-fir forest) (SIRAWG 2016). ▫ Western rattlesnake: rock outcrops and talus slopes, shrub-steppe/ grassland, riparian, and ponderosa pine habitat (SIRAWG 2008) ▫ Great Basin gopher snake: open and semi-open habitats with highest quality habitat along valley bottoms and lower slopes; hibernation (underground near cliff, rock outcrops, talus slopes, road or railroad fill and rodent burrows); foraging (grasslands, shrub-steppe, meadows, riparian areas, open ponderosa pine); egg-laying (rodent burrows, talus slopes, rock fissures, under decaying wood or other sheltered sites) (SIRAWG 2008). • UWR for mule deer and moose where construction footprint overlaps suitable habitat areas.	• Destruction of wildlife habitat features (including nests and dens) and disturbance of wildlife using these features during construction • Temporary disturbance and displacement of wildlife as a result of construction activities • Direct injury or mortality resulting from equipment operation • Alteration of critical habitat (Lewis's woodpecker, Great Basin spadefoot, desert nightsnake, western rattlesnake, Great Basin gopher snake) within the construction footprint	High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • To the extent practicable, undertake construction within the least-risk timing windows for applicable species • Conduct inventories and surveys (following appropriate Resources Information Standards Committee standards where applicable) for wildlife species of concern with a high or medium potential to be present and that may be adversely affected by Project activities. Inventories and surveys should determine whether nests or residences are present in areas that could be adversely affected by construction activities, to inform construction planning activities and determine if salvage will be required • Where practical, design and plan Project activities to avoid sensitive habitats and identified wildlife habitat features • Develop and implement a Snake Management Plan for construction • Conduct amphibian salvages during construction • Follow best management practices to minimize impacts to Lewis's woodpecker as outlined in the federal recovery strategy (ECCC 2017) • Conduct detailed follow-up assessments to determine if critical habitat features or attributes for the following species are present, disturbed or destroyed: ▫ Lewis's woodpecker ▫ Great Basin spadefoot ▫ Desert nightsnake ▫ Western rattlesnake ▫ Great Basin gopher snake

This work was performed in accordance with a service contract between Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), and Solaris Management Consultants Inc. (the Prime) for FortisBC Energy Inc. (Client), dated September 9, 2019 (Contract). This report has been prepared by Hemmera, based on fieldwork conducted by Hemmera, for sole benefit and use by FortisBC Energy Inc. In performing this work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

This Executive Summary is not intended to be a stand-alone document, but a summary of findings as described in the following Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

TABLE OF CONTENTS

LIST OF TABLES (WITHIN TEXT)

FIGURES (APPENDED)

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
ALR	Agricultural Land Reserve
APEC	Area of Potential Environmental Concern
Ausenco	Ausenco Engineering Canada Inc.
BC	British Columbia
BC ENV	BC Ministry of Environment and Climate Change Strategy
BEC	Biogeoclimatic Ecosystem Classification
BMP	Best Management Practices
CDC	Conservation Data Centre
COSEWIC	Committee of the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EPMR	Environmental Protection and Management Regulation
EOA	Environmental Overview Assessment
FortisBC	FortisBC Energy Inc.
FRPA	*Forest and Range Practices Act*
HCA	*Heritage Conservation Act*
Hemmera	Hemmera Envirochem Inc.
MBCA	*Migratory Birds Convention Act*
MFLNRO	Ministry of Forests, Lands and Natural Resource Operations (now Ministry of Forests, Lands, Natural Resource Operations and Rural Development)
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development
MOE	Ministry of Environment (now Ministry of Environment and Climate Change Strategy (ENV))
MWLAP	Ministry of Water, Land and Air Protection (now Ministry of Environment and Climate Change Strategy
NCD	Non-classified Drainage
NPS	nominal pipe size
OCU	Okanagan Capacity Upgrade
OCP	Official Community Plan
OGAA	*Oil and Gas Activities Act*
OGC	Oil and Gas Commission
OGMA	Old Growth Management Area
PFR	Preliminary Field Reconnaissance
PIBNR	Penticton Indian Band Department of Natural Resources
Project	Okanagan Capacity Upgrade (OCU) project
QEP	Qualified Environmental Professional
RAPR	Riparian Areas Protection Regulation
RDOS	Regional District of Okanagan Similkameen

Acronym / Abbreviation	Definition
RMA	Riparian Management Area
ROW	Right of Way
SARA	*Species at Risk Act*
Solaris	Solaris Management Consultants Inc.
SPEA	Streamside Protection and Enhancement Area
UWR	Ungulate Winter Range
WHA	Wildlife Habitat Area
WSA	*Water Sustainability Act*

LIST OF SYMBOLS AND UNITS OF MEASURE

Symbol / Unit of Measure	Definition
<	less than
>	greater than
≤	less than or equal to
≥	greater than or equal to
~	approximately
cm	centimetres
m	metres
masl	metres above mean sea level
km	kilometres

GLOSSARY

Term	Definition
contaminated sites study area	400 m wide; applies to contaminated sites
general study area	200 m wide; applies to land use, fish and fish habitat, and vegetation
selected alignment	alignment finalized as of January 2020
wildlife study area	1,000 m wide; applies to wildlife

1.0 INTRODUCTION

Solaris Management Consultants Inc. (Solaris) retained Hemmera Envirochem Inc., (Hemmera), a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), on behalf of Solaris's client FortisBC Energy Inc. (FortisBC), to provide environmental support services for the Okanagan Capacity Upgrade (OCU) project (Project) in the Okanagan region of British Columbia (BC). FortisBC is planning capacity upgrades on the Interior Transmission System to meet load growth forecasts at the Kelowna Gate Station. Project construction will kick off with horizontal directional drilling (HDD) under Penticton Creek beginning in Spring 2022. Construction completion is targeted for Summer 2023 and Project commissioning is scheduled for October 2023.

In this Environmental Overview Assessment (EOA) report, Hemmera reviews the environmental risks within the *general study area, the contaminated sites study area,* and *wildlife study area* for the selected alignment. The objective of this EOA report is to provide a high-level overview of the potential adverse effects on environmental receptors that may result from Project construction. The EOA was developed using secondary information such as queries of government databases, available in-house data, open source spatial data, and Golder Associates' preliminary geotechnical assessment of the Project area (Golder 2019) and primary data collected by Hemmera during a Preliminary Field Reconnaissance (PFR) in November 2019, and a follow-up field reconnaissance in August 2020. Environmental sensitivities were identified where sensitive features associated with an environmental receptor are anticipated to be directly impacted by construction activities (i.e., where the anticipated construction footprint overlaps with identified features) and where environmental factors present a risk to the Project. Environmental receptors are grouped into three categories: (1) Land use and ownership, (2) Contaminated sites (i.e., soils and groundwater) and (3) Biophysical (i.e., surface water, fish and fish habitat, vegetation, wildlife and wildlife habitat). For the purposes of this report, risks to the Project include additional costs (e.g., activities requiring further follow-up work or mitigation), timing constraints (e.g., species-specific timing windows), or both (e.g., permits or approvals).

To proceed with the Project, FortisBC requires a Certificate of Public Convenience and Necessity (CPCN) from the BC Utilities Commission as per Sections 45(1) and 46(1) of the *Utilities Commission Act*, RSBC 1996, c. 473, to recoup the cost of the Project from ratepayers. FortisBC will use this EOA in support of their CPCN application; accordingly, this report is intended to meet the CPCN application guidelines (BCUC 2015).

To meet the BC Utilities Commission guidelines, this report identifies environmental receptors in or adjacent to the expected footprint of the Project, potential impacts to those receptors, and environmental factors to be addressed or mitigated prior to or during construction (and in some cases post-construction). Most of these risks carry Project cost and schedule implications. The report provides an overview of five main environmental receptor categories:

1. Land use
2. Contaminated sites (water and soil)
3. Fish and fish habitat
4. Vegetation (including invasive plants)
5. Wildlife.

Species at risk are addressed within the fish, vegetation, and wildlife assessments.

2.0 PROJECT SCOPE AND AREA

The Project alignment is located around the eastern edge of Penticton city limits and extends in a north-south direction, paralleling Naramata Road and the Kettle Valley Rail Trail on the uphill rise to the east between Campbell Mountain and Chute Lake (**Figure 1**). The selected alignment is approximately 30 kilometers (km) long. Three Project study areas are defined for this EOA:

- The *general study area* includes the length of the selected alignment (**Figure 1**) with a 100 m width on either side of the centreline of the selected alignment. This 200 m wide study area applies to land use, fish and fish habitat, and vegetation and facilitates gathering sufficient information to meet Oil and Gas Commission requirements, which will support Project permitting.
- The *wildlife study area* includes the length of the selected alignment (**Figure 1**) with a 500 m width on either side of the centreline of the selected alignment to determine use by known wildlife and species at risk, and to assess the species' potential presence during desktop review.
- The *contaminated sites study area* includes the length of the selected alignment (**Figure 1**) with a 200 m width on either side of the centreline of the selected alignment to determine areas of potential environmental concern (APECs).

The general study area has a minimum elevation of 486 metres above sea level (masl), average elevation of 813 masl, and maximum elevation of 1,337 masl. The minimum elevation for the selected alignment is located south of Strutt Creek, and the maximum elevation is 1.6 km from the northern terminus of the selected alignment, immediately west of Chute Lake.

The alignment will be installed primarily via open cut construction, where practical. Horizontal directional drilling has been chosen as the preferred method for the Penticton Creek crossing as conditions are not favourable for open cut construction. FortisBC expects to construct the Project in two phases:

- Phase 1 of the Project consists of HDD to facilitate the pipeline crossing at Penticton Creek. Vegetation clearing and access will be established prior to the 2022 bird nesting window, and HDD construction will be completed prior to the start of heightened fire risk window as outlined by FortisBC (approximately July to the end of September, annually).
- Phase 2 of construction will encompass the remainder of the pipeline, beginning in Fall 2022 after the heightened fire risk window set out by FortisBC and has a target completion of Summer 2023 to facilitate commissioning in October 2023.

Anticipated activities associated with the Project construction phase are as follows:

- Site preparation
  - Mobilization and demobilization of construction equipment and materials
  - Storage of construction equipment and materials
  - Development of temporary and permanent workspaces
  - Clearing and widening of Right of Way (ROW) (vegetation clearing and grubbing)

- Trench, pit, or site excavation
  - Removal of existing asphalt from crossings
  - Controlled blasting activity
  - Stripping of topsoil
  - Site grading
  - Trench excavation
  - Construction of stream crossings using open cut crossing methods
- Horizontal Directional Drilling
  - Pipe installation where open cut crossing methods are not feasible
- Material stockpiling and disposal
  - Stockpiling and potential disposal of excavated materials
- Water quality and quantity management
  - Pumping and discharge of groundwater encountered during excavation (or from surface water sources)
  - Treatment of contaminated or sediment-laden water prior to discharge to aquatic habitat.
- Landscape restoration
  - Grading and smoothing of ground surface
  - Placement of topsoil
  - Hydroseeding or replanting of ground cover
  - Potential instream and riparian habitat restoration
  - Maintenance and operations
    - Invasive vegetation management.

3.0 METHODS

Hemmera completed a desktop review for the selected alignment. Information gathered in the desktop assessment was from queries of government databases, available in-house data, and open source spatial data. Information sources used in the desktop assessment are listed in **Table 3.1**. The information gathered in the desktop assessment was used to identify potential Project risks associated with each of the environmental receptors and to focus and refine the scope of the PFR and the subsequent follow-up field reconnaissance. The PFR and follow-up field reconnaissance was undertaken to ground-truth the information gathered during the desktop assessment. Data collection and field reconnaissance methods specific to each environmental receptor category are described in **Subsections 3.1** through **3.5**. Data sources listed in **Table 3.1** were queried in December 2019 and August 2020.

Table 3.1 Sources of Desktop Information

Data Source	Information Reviewed
Federal	
Species at Risk Public Registry (Government of Canada 2019b)	Review of federally-listed species at risk with identified critical habitat not included in the critical habitat spatial data available from DataBC (Province of British Columbia 2019c) (i.e., species with recovery strategies posted after August 2017)
Committee of the Status of Endangered Wildlife in Canada assessment reports (Government of Canada 2019b))	COSEWIC wildlife species assessment reports (range and habitat requirements) of species of concern identified with potential to occur within wildlife study area
Federal Contaminated Sites Inventory (Government of Canada n.d.)	All known federal contaminated sites under the custodianship of departments, agencies, and consolidated Crown corporations as well as those that are being, or have been, investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment
Provincial	
BC Conservation Data Centre (CDC 2019)	Data provided for species at risk occurrences within the study areas, including masked (i.e., confidential) occurrences
BC Data Catalogue (Province of British Columbia 2019a)	Agricultural capability mapping Agricultural Land Reserve boundary Biogeoclimatic (BEC) Ecosystem Classification map Community watersheds – current Critical habitat for federally listed species at risk (posted) Freshwater Atlas (human-made waterbodies, rivers, stream network and lines, wetlands) Invasive Alien Plant Site (i.e., known locations of noxious weeds) Known BC fish observations Municipal boundaries Old Growth Management Areas Integrated Cadastral Fabric Parcel Map BC Parcel Fabric (to determine lot boundaries and land ownership) Parks and Protected Areas Roads Ungulate Winter Range (approved) Wildlife Habitat Areas (approved) Wildlife Management Areas (approved)

Data Source	Information Reviewed
BC Weed Control Regulation, BC Reg. 66/85 under the *Weed Control Act*	Review of provincially and regionally designated noxious weeds
BC Site Registry (ECCCS n.d.)	The BC Ministry of Environment and Climate Change Strategy online Site Registry is a database of sites that have submitted information to the ministry with respect to BC's *Environmental Management Act*
Regional/Municipal	
Regional District of Okanagan-Similkameen (RDOS)	Regional District of Okanagan-Similkameen Parcel Viewer (legal land parcels) Regional government bylaws (Naramata Official Community Plan Bylaw No. 2458, 2008)
City of Penticton	GIS mapping Review of municipal Development Permit Area Review of municipal bylaws
Other	
Hemmera's technical experts	Personal knowledge based on education and project experience
FortisBC	Selected alignment
Environmental Systems Research Institute, Google	Ortho-imagery
BirdLife International (Birdlife et al. 2019)	Important Bird Area maps
Ecolog Environmental Risk Information System Report (ERIS 2019)	Federal contaminated sites inventory and BC registry database
University of British Columbia Geographic Information Centre	Historical aerial photographs

Notes: COSEWIC – Committee on the Status of Endangered Wildlife in Canada

The PFR work was undertaken by a Hemmera biologist and a representative from the Penticton Indian Band Department of Natural Resources (PIBNR) on November 19 to 20, 2019; winter conditions were observed during the PFR. The alignment considered and assessed during the PFR was replaced by the selected alignment received in August 2020; therefore, the follow-up field reconnaissance was undertaken between August 11 to 16, 2020 and provided a more comprehensive understanding of the general study area and wildlife study area. Both the PFR and follow-up field reconnaissance supported the desktop assessments and allowed Hemmera and PIBNR (the field crew) to gather additional biophysical information for the general study area and wildlife study area along the selected alignment. The field crew prioritized assessment of greenfield areas (i.e., generally undisturbed, natural vegetated areas) to confirm desktop data and to capture environmental risks (e.g., unmapped waterbodies, presence of species at risk) that had been identified during the desktop assessment as having the potential to support environmental receptors and have increased environmental sensitivities. Both the PFR and follow-up field reconnaissance covered the general study area to provide comprehensive risk assessment should adjustments to the alignment be required (e.g., additional footprint requirements for access road(s) or expanded or new workspaces).

The PFR and the follow-up field reconnaissance field crews took representative photos at environmental points of interest (e.g., watercourses, wildlife features, vegetation features) and at regular reference points (i.e., approximately every 200 m within contiguous sites where access permitted). Selected photos of key features are provided in a photo log (**Appendix A**). Additional photos are available upon request.

3.1 Land Use

Land use data sources from **Table 3.1** were reviewed within the general study area. Desktop studies identified the following features within the general study area for the selected alignment:

- General ownership of land (e.g., federal, provincial Crown, municipal, private, unknown)
- Regional districts and municipalities encompassed by the general study area
- Parks and protected areas within the general study area
- Agricultural Land Reserve (ALR) areas overlapped by the general study area and the number of properties within the ALR intersected by selected alignment.

3.2 Contaminated Sites (Water and Soil)

Hemmera completed a desktop assessment for the selected alignment to identify APECs where contaminated soil and groundwater may be encountered during the proposed construction activities. To identify APECs, Hemmera searched the BC Ministry of Environment and Climate Change Strategy (ENV n.d.) online Site Registry and the Federal Contaminated Sites Inventory (FCSI 2019) databases within 200 m of the alignment (completed through Ecolog ERIS (2019)) and reviewed current and historical aerial photographs to identify operations of potential concern.

The ENV Online Site Registry is a database of sites for which information has been submitted to ENV with respect to BC's *Environmental Management Act*, SBC 2003, c. 53. Where Site Registry results were identified within 50 m of the selected alignment, detailed Site Registry reports for the sites were also reviewed. The Federal Contaminated Sites Inventory includes information on all known federal contaminated sites under the custodianship of departments, agencies, and consolidated Crown corporations, as well as those that are being, or have been, investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment (FCSI 2019). The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility.

Hemmera requested historical aerial photographs through the University of BC Geographic Information Centre and reviewed them to identify APECs. The selected alignment was also reviewed using current and historical aerial and street view photography available in Google Earth.

The contaminated sites study area (i.e., the selected alignment and adjacent properties to a distance of 200 m on either side of the alignment's centreline) was assessed for potentially contaminating operations (e.g., auto repair, manufacturing, gas stations, industrial operations, etc.), evidence of underground or above ground storage tanks, waste dumping or landfilling, previous environmental investigations (e.g., as evidenced by the presence of groundwater monitoring wells), and storage of hazardous materials. Each of the identified APECs was then assigned a risk ranking of low, medium, or high, based on the likelihood of the operation having caused contamination in soil or groundwater within or near, the existing lateral alignment. The factors considered when determining the likelihood included:

- Type (e.g., metals vs. hydrocarbons) and mobility of potential contaminants
- Topographic location of the site or operation (downgradient vs. upgradient of the selected alignment)
- Age of potentially contaminating operations (older operations increase likelihood)
- Sophistication of operation (likelihood to have environmental policies).

The risk rankings can be further described as follows:

- **Low-risk** – Potentially contaminating operations were identified but are unlikely to have resulted in contamination within the Project's selected alignment. Additional assessment work is not recommended to characterize the risk associated with the low-risk sites, and there is not expected to be a cost for site management during Project construction. Should unexpected impacts be identified during the Project related to low-risk areas, appropriate investigation and management activities would be assessed and completed at that time.
- **Medium-risk –** Potentially contaminating operations were identified that are likely to have resulted in some level of contamination within a portion of the Project's selected alignment; however, the nature of the concern and distance of the site from the selected alignment may limit the overall liability during the construction phase. Further assessment is recommended to characterize the risk within each of the medium-risk APECs, and there is expected to be a cost for site management during Project construction.
- **High-risk** – Operations with significant potential for contamination, or confirmed contaminated sites, were identified that are likely to have resulted in contamination within much of the Project's selected alignment, and further work would be required to determine the extent of the potential liability. Further assessment is recommended to define the risk associated with each of the high-risk sites, and there is expected to be a cost for site management during Project construction.

A summary of the findings of the desktop assessment for the selected alignment is provided in **Section 4.0** Environmental Overview, and the APECs and affected segments of the selected alignment are presented on **Figures 1** to **4** appended to this report.

3.3 Fish and Fish Habitat

For the purposes of this report, fish habitat assessment includes all permanent and intermittent waterbodies and associated riparian vegetation within the general study area (100 m on either side of the selected alignment). To obtain existing data on fish and fish habitat, Hemmera conducted a desktop review that consisted of compiling data from the following sources:

- Fisheries Information Summary System (ECCS 2019a)
- BC Species and Ecosystem Explorer (CDC 2019)
- COSEWIC (Government of Canada 2019a)
- Aquatic Species at Risk online database (DFO 2019)
- iMapBC (Province of British Columbia 2019c)
- Freshwater Atlas online mapping databases (Province of British Columbia 2019b)
- Municipal and regional district online map data, where available.

Table 3.1 provides a list of information sources that Hemmera queried during this process. A search for known occurrences of fish species of concern, and species with federally-designated critical habitat within an expanded study area (i.e., the wildlife study area, comprising the selected alignment plus 500 m on either side of its centreline) was conducted. For the purposes of this report, fish species of concern were defined as species that are listed under the federal *Species at Risk Act*, SC 2002, c. 29 (SARA); species afforded protection by the BC *Wildlife Act,* RSBC 1996, c. 488; and species that fall under the BC Oil and Gas Commission (OGC) High Priority Wildlife species list (as outlined in the OGC Environmental Protection and Management Guideline Ver 2.7 (OGC 2018)). The list of at-risk species was further refined based on the species' current known range, the habitat suitability for each species assessed during the desktop

studies, and information gathered during PFR. Each at-risk species was then ranked according to its potential to occur within the wildlife study area (i.e., nil, low, medium, or high[1]). Fish species of concern that were determined to have a medium or high potential for occurrence within the wildlife study area for the selected alignment are presented in **Table 4.4** in this report.

Hemmera calculated riparian setbacks for watercourses based on the applicable legislation within each municipality and regional district (e.g., Riparian Areas Protection Regulation, BC Reg. 178/2019 (RAPR) as enacted under the *Riparian Areas Protection Act*, SBC 1997, c. 21). Outside municipal and regional district boundaries, the Environmental Protection and Management Regulation (EMPR) is enacted under the *Oil and Gas Activities Act*, SBC 2008, c. 36 (OGAA) to determine Riparian Management Areas (RMAs). All watercourses that overlap and cross the selected alignment are located within municipal and regional district boundaries that implement RAPR and local government- specific watercourse protection bylaws, respectively. Streamside Protection and Enhancement Areas (SPEAs) were calculated for all watercourses along the selected alignment based on **Table 3.2** (see **Section 5.3** Regional Bylaws and **Section 5.4** Municipal Bylaws). Hemmera determined the RMA for each watercourse along the selected alignment based on **Table 3.3**.

During the PFR and follow-up field reconnaissance, streams intersecting the general study area were accessed by foot or vehicle on existing road infrastructure, existing FortisBC ROW. Biophysical measurements (e.g., stream width, depth, gradient, and substrate type) were collected for each watercourse where it crossed the selected alignment, or at the nearest accessible location of select watercourses where lateral crossings were not accessible to the field crew. Obstructions to fish passage, unique channel characteristics (e.g., flood channels, braids, secondary channels, wetlands, bogs, depressions), and any other notable habitat features were also identified and recorded. Active fish sampling within the watercourses was not conducted during the PFR or follow-up field reconnaissance. Where fish presence was unknown, the stream was conservatively classified as fish bearing.

[1] **Nil**: Hemmera's current understanding of the species' range and known species habitat associations suggests the species is not expected to occur within the study area and its presence would be considered accidental. **Low**: Hemmera's current understanding of the species' range and known species habitat associations suggests the species is unlikely to occur within the study area with regularity or in adequate density to facilitate a functional population. Several ecological life-requisite stages would be challenged based on existing habitat conditions in the study area or connectivity with larger, more contiguous occurrence of the species. **Medium:** Hemmera's current understanding of the species range and known species habitat associations suggests that the species is expected to occur in the study area on a temporary or regular (i.e., predictable) seasonal basis and in densities that facilitate persistence of a functional population within the study area. **High:** Hemmera's current understanding of the species' range and known species habitat associations suggests that the species is expected to occur in the study area regularly, and in densities that would be expected to occur in provincial benchmark habitats.

Table 3.2 Streamside Protection and Enhancement Area Widths for Simple Assessment under the Riparian Areas Protection Regulation

Vegetation Category	Existing or Potential Streamside Vegetation Conditions	Streamside Protection and Enhancement Area Width*		
		Fish Bearing	Non-fish Bearing	
			Permanent	Non-permanent
1 (> 15 m)	Continuous areas ≥ 30 m or discontinuous but occasionally > 30 m to 50 m	30 m	30 m	15–30 m
2 (10–15 m)	Narrow but continuous area = 15 m or discontinuous but occasionally > 15 m to 30 m	15–30 m	15 m	15 m
3 (< 10 m)	Very narrow but continuous areas up to 5 m or discontinuous but occasionally > 5 m to 15 m	15 m	5–15 m	5–15 m

Notes:
Adapted from Riparian Areas Protection Regulation Assessment Methods (MFLNRORD 2019).
> indicates greater than; < indicates less than; ≥ indicates greater than or equal to.
*SPEA width under the Simple Assessment is measured from the watercourse top of bank.

Table 3.3 Riparian Management Area Widths under the Environmental Protection and Management Regulation

Stream Riparian Classification Table		
Average Channel Width	Riparian Class	Riparian Management Area (m)*
Fish-bearing		
≥ 100 m (stream or active flood plain width)	S1A	100
> 20 m	S1B	70
5 – 20 m	S2	50
1.5 – < 5 m	S3	40
< 1.5 m	S4	30
Non-fish-bearing		
> 3 m	S5	30
≤3 m	S6	20

Notes:
Adapted from EMPR (BC Reg. 200/2010 (amended 2016) under the OGAA).
> indicates greater than; < indicates less than; ≥ indicates greater than or equal to; ≤indicates less than or equal to.
*RMA is measured from the outer edge of the riparian reserve zone or the edge of the stream channel bank (if no riparian reserve zone exists).

3.4 Vegetation

Hemmera reviewed vegetation data resources from **Table 3.1** within the general study area for the selected alignment. Desktop studies identified the following features within the general study area:

- Biogeoclimatic (BEC) zones and subzones
- Areas of old growth forest stands, specifically legal vs. non-legal old growth management areas (OGMAs)
- Federally identified critical habitat for plant species at risk
- Known locations of invasive plants.

Plant species and ecological communities of concern with the potential to occur in the general study area for the selected alignment were also identified. For the purposes of this report, species and ecological communities of concern were defined as species that are listed under SARA and species that are included in the OGC High Priority Wildlife species list as outlined in the OGC Environmental Protection and Management Guideline Ver. 2.7 (OGC 2018).

To determine the potential presence of species and ecological communities of concern, a query of Government of BC Conservation Data Centre (CDC) Species and Ecosystem Explorer (CDC 2019) was conducted to identify plant species and ecological communities that are known to occur in the BC ENV Region and BEC zones (species) and subzones (communities) that overlap with the general study area. The list of species was further refined based on the range and habitat suitability of each species and on information collected during PFR and follow-up field reconnaissance. Species were ranked according to their potential to occur in the general study area (i.e., nil, low, medium, or high).

A list of species assessed with potential to occur in the general study area is provided in **Appendix B**. Species that were determined to have a medium or high potential for occurrence within the general study area are presented in the body of this report. Information regarding ecological communities is generally less available than for individual species; therefore, ecological communities were not ranked by potential for occurrence. All ecological communities identified within a BEC subzone that overlaps with the general study area were included within this report.

During the PFR, the field crew collected data on vegetation community assemblage along the general study area. Areas of invasive or noxious weeds within or immediately adjacent to the selected alignment were recorded and geographically referenced. Because the PFR was conducted in late November (November 19 to 20, 2019), visibility and identification of species were limited. Areas of unique habitats encountered along the ROW that were considered to have potential to support at-risk plant species (e.g., areas of old growth forest, rocky outcrops, and seeps) were recorded and geographically referenced. Additional data on vegetation conditions along the selected alignment was collected during the follow-up field assessment in August 2020.

3.5 Wildlife

Wildlife values from **Table 3.1** were reviewed within the wildlife study area for the selected alignment to provide a conservative (i.e., sufficiently large) zone in which to identify recorded occurrences of species at risk, especially mobile species (such as birds). During the desktop studies, Hemmera identified the following designations and features when they occurred within the wildlife study area:

- Important Bird Areas
- Approved Wildlife Habitat Areas (WHAs)[2]
- Wildlife Management Areas
- Approved UWRs
- Federally identified critical habitat for species at risk.

[2] Proposed WHAs were not included as a consideration because the management afforded to proposed WHAs is restricted to conservation of the wildlife habitat feature within each WHA. Where interim measures are required to ensure protection of a wildlife habitat feature within a proposed WHA, the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development is responsible for providing written notification to all affected parties of the location and protection allotted to the wildlife habitat feature during the consultation phase of WHA designation. The request will solicit voluntary protection consistent with the candidate general wildlife measures. If no such request has been advanced there is no requirement for interim protection (MWLAP 2004).

A query of BC CDC Species and Ecosystem Explorer (CDC 2019) was conducted to identify wildlife species known to occur in the BC ENV Region and BEC zones that overlap with the wildlife study area applied to the selected alignment. The list of species was further refined based on the current known range and habitat suitability for each species assessed during the desktop studies (see **Table 3.1** for a list of information sources that were queried during this process), and based on information gathered during the PFR and follow-up field reconnaissance, to rank each species according to its potential to occur within the wildlife study area for the selected alignment (i.e., nil, low, medium, or high) (**Appendix B**).

Hemmera also identified wildlife species of concern with the potential to occur in the wildlife study area. For the purposes of this report, wildlife species of concern were defined as species that are listed under SARA, species whose nests are afforded protection by Section 34b of the BC *Wildlife Act*, and species that fall under the OGC High Priority Wildlife species list (as outlined in the OGC Environmental Protection and Management Guideline (OGC 2018)). Species identified as wildlife of concern that were determined to have a medium or high potential for occurrence within the wildlife study area for the selected alignment are presented in the body of this report (**Table 4.8**).

During the PFR and the follow-up field reconnaissance, the field crew recorded, described, and geographically-referenced incidental observations of wildlife of concern and wildlife habitat features (e.g., raptor or heron nests, bird colonies, mineral licks, wallows, dens, burrows, and wildlife trees). Activity, behaviour, and species abundance, where evident and relevant, were also noted. Due to the timing of the PFR (late November) and weather conditions, wildlife observations at that time were limited. The follow-up field reconnaissance took place in August 2020 and provided more robust wildlife observations.

4.0 ENVIRONMENTAL OVERVIEW

A high-level description of the existing conditions related to each of the five environmental receptor categories is provided in the following subsections for the selected alignment. Information collected during the desktop assessment and the PFR surveys is summarized below. Pertinent spatial environmental data (e.g., waterbodies, land use zoning, APECs) is presented on a set of Environmental Worksheets prepared for the selected alignment in the attached **Figures 2** through **5**. The existing conditions of the five environmental receptor categories were used to develop a high-level summary of environmental constraints of the selected alignment (**Table 4.1**).

Table 4.1 Summary of Environmental Conditions

Environmental Constraints	Environmental Constraints Summary
Land Use	The selected alignment is located in the City of Penticton along its eastern extent of city limits, and the whole alignment is located entirely within the Regional District of Okanagan-Similkameen. Land ownership through the southern half of the selected alignment is primarily private, with intermittent sections of overlapping unknown, Crown, and municipal lands. The majority of alignment sections north of Naramata are Crown land with some areas of private and municipal lands. The general study area encroaches into 0.17 ha of ALR (soil capability class of 7) located south of Strutt Creek on the west side of the selected alignment. Several Development Permit Areas and planning areas are located over the portion of the selected alignment and general study area within the City of Penticton.
Contaminated Sites	One high-risk APEC and one low-risk APEC were identified in the contaminated sites study area for the selected alignment.
Fish and Fish Habitat	The general study area for the selected alignment overlaps 20 mapped watercourses, all of the watercourses were assessed during the follow-up field reconnaissance visit. Eight of the 10 named watercourses have documented fish presence. Ten watercourses are unnamed; 10 were determined to be NCD or NSCI during the follow-up field reconnaissance, and the final unnamed watercourse (OCU03-03) was judged to be a S2 watercourse. There is only one watercourse, Penticton Creek with a stream magnitude equal to or greater than 4 in the study area; it is a notable watercourse as it provides a source of drinking water for the City of Penticton. The PFR and follow-up field reconnaissance confirmed that six of the nine streams with documented fish presence are permanent streams and two of the streams with documented fish presence are ephemeral watercourses; one stream was not field-assessed.
Vegetation	The general study area contains 436 identified invasive plant occurrences, 17 invasive plant site polygons, and 23 at-risk ecological communities. One at-risk plant occurrence is documented near the general study area. The general study area crosses 7 non-legally designated (i.e., Listed) OGMAs.
Wildlife	There are 19 posted critical habitat polygons for at-risk wildlife species and 7 recorded occurrences of at-risk wildlife in the wildlife study area. The majority of the wildlife study area is overlapped by UWRs for mule deer and moose, and is near a UWR for mountain goat. The wildlife study area overlaps two WHAs (sensitive data wildlife and white-head woodpecker). The follow-up field assessment confirmed the presence of at-risk wildlife and relevant habitat features.

4.1 Land Use

The selected alignment extends northward around the eastern edge of the City of Penticton municipal boundary (**Figure 2**), crossing Penticton Creek then extending northward over Campbell Mountain toward Randolph Road, along the southwest side of the Campbell Mountain Landfill (**Figure 3**). Campbell Mountain has multiple recreational trails. The selected alignment continues to extend north roughly parallel to and along the east side of Naramata Road and the Kettle Valley Rail Trail. The selected alignment then crosses Chute Creek and Chute Lake Road and terminates north of Chute Lake. The general study area is located within the City of Penticton along the southern portion of the selected alignment and is located entirely within the Regional District of Okanagan-Similkameen (RDOS). The general study area is located over private, unknown, municipal and Crown land.

The southern half of the selected alignment consists predominantly of privately owned land which has been or is being developed. As the selected alignment extends northward, it passes over Penticton Creek and Campbell Mountain, and then passes along the western boundary of the Campbell Mountain Landfill. The majority of this land is under municipal ownership. It is recommended that planning and construction be coordinated with the Campbell Mountain Landfill to comply with conditions of their landfill operating permit.

The selected alignment continues to pass northward through privately owned land. At the northern city limit of Penticton, north of Riddle Road, the selected alignment and its associated study areas pass through the southwestern corner of a municipal parcel which has been rezoned and is now the Three Blind Mice disc golf course.

Beyond the north end of the City of Penticton municipal limits, south of Naramata, the selected alignment traverses provincial Crown land. Where the selected alignment passes near Naramata, the land is privately owned. North of Naramata, land ownership is classified as None based on iMapBC data (Province of British Columbia 2019c) with the exception of the electrical ROW which is provincial Crown land and where the alignment is adjacent to Rock Oven Park; land use observed during the PFR aligned with results of the desktop assessment. The north terminus of the selected alignment, near Chute Lake, crosses provincial Crown land.

A small section of the general study area south of Strutt Creek encroaches into the ALR; the ALR parcel has an unimproved Soil Capability Class of 7:6T-3:5T, indicating that 70% of the parcel has slopes, either simple or complex, which vary from 31 to 60% and can sustain natural grazing for domestic livestock. The remaining 30% of the ALR parcel has simple slopes varying from 21 to 30%, or complex slopes varying from 16 to 30% and is suitable for growing tree fruit and grapes (MOE and MOAF, 1983). Following construction, the portion of the Project workspace crossing the ALR should be reclaimed to the same or improved soil capability. A summary of the land use within the general study area is provided in **Table 4.2**.

Table 4.2 Overview of Land Use within the General Study Area for the Selected Alignment

Land Ownership (ha)	Regional District	Municipality	Parks and Protected Areas	ALR		
				Area within General Study Area (ha)	Number of Parcels Intersected by Selected Alignment	Agricultural Soil Capability Class (ha)
Crown Agency: 90.40 **Municipal**: 38.57 **Private**: 224.45 **None**: 306.00 **Unknown**: 0.57	Regional District of Okanagan-Similkameen	Penticton	The alignment crosses or is proximate to several parks, protected areas, and areas of recreational value, namely: • Campbell Mountain, which has hiking and mountain biking significance • Three Blind Mice disc golf course • Okanagan Mountain Provincial Park • Kettle Valley Rail Trail • Rock Oven Park	0.17	1	7:6T-3:5T

4.2 Contaminated Site Considerations

Hemmera identified areas of potential concern for the study through the review of the BC ENV Site Registry and Federal Contaminated Sites Inventory (FCSI 2019) databases (searched through Ecolog ERIS), and through a review of aerial photographs and Google Street View imagery. Two APECs were identified; these are listed in **Table 4.3** and shown on **Figure 3**. A review of current and historical aerial photographs determined that the area around the alignment was primarily undeveloped or agricultural land until the 1960s, at which time the southern end of the selected alignment began to be developed for commercial and industrial use, which has intensified to the present resulting in an increased risk of contamination. To the north of Penticton is the Campbell Mountain Landfill, which is located to the east of the selected alignment. The landfill is currently in operation, having opened in 1972.

Table 4.3 Summary of Areas of Potential Environmental Concern

APEC ID	Description and Location	PCOCs	Information Source	Location and Distance to Selected Alignment	Risk Classification	Length (m)
VP1	Campbell Mountain Landfill (901 Spiller Road) and associated sites which received Notices of Off-site Migration (750 Naramata Road, 730 Naramata Road, 1555 Randolph Road, 1655 Reservoir Road)	BTEX/VPH, LEPH/HEPH, PAHs, VOCs, PCBs, metals, phenols	Site Registry (ID 4712, ID 18615, ID 18616, ID 18613, and ID 18617)	On-site	High **(Figure 3-B)**	564.18
VP2	Potential Fill, Currently Residential Development (1945 Carmi Avenue, Penticton) – Notice of Independent Remediation Initiation Submitted in 2010	BTEX/VPH, LEPH/HEPH, PAHs, metals	Aerial Imagery, Site Registry (ID 12345)	50 m west	Low **(Figure 3-A)**	643.73

Notes: APEC – Area of Potential Environmental Concern
BTEX – Benzene, Toluene, Ethylbenzene, Xylenes
PAHs – Polycyclic Aromatic Hydrocarbons
HEPH – Heavy Extractable Petroleum Hydrocarbons
PCBs – Polychlorinated Biphenyls
PCOCs – Potential Contaminants of Concern
LEPH – Light Extractable Petroleum Hydrocarbons
VPH – Volatile Petroleum Hydrocarbons
VOCs – Volatile Organic Compounds

Risk classifications are defined in **Section 3.2**.

4.3 Ecological Considerations

4.3.1 Fish and Fish Habitat

Based on a review of Freshwater Atlas data on iMapBC (Province of British Columbia 2019c), the general study area overlaps 20 watercourses (**Figure 4**) and does not cross any wetlands. Ten of these watercourses are unnamed, and it is not known whether they contain fish. Of the 10 named watercourses based on desktop review, 8 have documented fish presence. Fish species that were determined to have a medium or high potential for occurrence within fish-bearing stream in the general study area for the selected alignment are presented in **Table 4.5**.There is one watercourse with a stream magnitude of 4 or greater in the general study area, Penticton Creek. Penticton Creek is also a source of drinking water for the City of Penticton and is a multi-use community watershed. **Table 4.4** provides a summary of the watercourses that the general study area for the selected alignment crosses. The general study area overlaps with three

designated community watershed polygons, from south to north: Penticton Creek, Naramata, and Robinson. The selected alignment crosses Penticton Creek approximately 750 m upstream of the reservoir located at Penticton Dam. Penticton Creek Watershed is a primary watershed for the City of Penticton, while Naramata and Robinson Community Watersheds are used as Emergency Back-Up for the Regional District of Okanagan-Similkameen.

During the PFR, Hemmera and PIBNR assessed all mapped watercourses that crossed the selected alignment. The Penticton Tributary (OCU03-03) was not accessible due to steep slope conditions and does not cross the selected alignment but overlaps the general study area. The Robinson Creek Tributary (OCU03-17) was not assessed in the field and is not crossed by the selected alignment.

From the PFR and follow-up field reconnaissance, eight mapped watercourses from the original alignment were confirmed as permanent streams, two watercourses (that do not cross the selected alignment) were not field assessed and were assigned conservative watercourse classifications, four watercourses were dry at the time of assessment and classified as Non-classified Drainage (NCD), and six watercourses had no stream channel present (No Stream Channel Identified; NSCI)).

During the follow-up field reconnaissance Hemmera observed seven additional NCD, four unclassified wetlands, one S6 and one S4 watercourse (WC-01, and WC-02, respectively) in the general study area. The 7 new NCDs identified during the follow-up field reconnaissance are labelled NCD-01 through -07 and shown on Figure 4. WC-01 and WC-02 parallel the selected alignment.

RAPR Section 2.1(b) identifies the RDOS as subject to RAPR watercourse setback requirements (i.e., SPEA). The City of Penticton has enacted their own riparian development bylaws, and their watercourse setback requirements are in accordance with RAPR (see **Section 5.4.1.1 Riparian Development Permit Area**). The City of Penticton requires a development permit for all development activities proposed to occur within 30 m of a stream. Riparian setbacks determined by the EMPR and RAPR are provided in **Table 4.4** for each watercourse. The S4 and S6 watercourses observed during the follow-up field reconnaissance have a 15-30 m SPEA.

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Table 4.4 Mapped Watercourses Overlapping the General Study Area, Classifications, and Riparian Setbacks

Watercourse	Environmental Protection and Management Regulation Classification	Riparian Management Area (m)	Local Watershed Code[1]	Stream Order	Fish Bearing	Location or Crossing Description	Streamside Protection and Enhancement Area[2] (m)	Figure Reference	Stream Permanence
OCU03-01	S6***	n/a	300-432687-623544-1139914 (Tributary to Ellis Creek)	1	No	An unnamed watercourse overlaps the study area and runs parallel to before crossing the pipeline under Saliken Drive.	15-30	Figure 4A	Ephemeral
OCU03-02	S6***	n/a	300-432687-623544-102657-539790	1	No	An unnamed watercourse overlaps with the study area and the pipeline.	15-30	Figure 4A	Ephemeral
OCU03-03	S2	50	300-432687-637835-192693 (Penticton Creek tributary)	1	UKN	An unnamed watercourse overlaps with the study area and ~25 m away from pipeline	30	Figure 4A	UKN
OCU03-04	S2	50	300-432687-637835-179687 (**Penticton Creek**)	3	Yes	Penticton Creek overlaps with the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4A	Permanent
OCU03-05	S4***	-	300-432687-637835-211241 (Penticton Creek tributary)	1	No	An unnamed watercourse crosses with the study area and pipeline and joins Penticton Creek to the east of the study area before Penticton Creek crosses the alignment.	15-30	Figure 4A	Ephemeral

Watercourse	Environmental Protection and Management Regulation Classification	Riparian Management Area (m)	Local Watershed Code[1]	Stream Order	Fish Bearing	Location or Crossing Description	Streamside Protection and Enhancement Area[2] (m)	Figure Reference	Stream Permanence
OCU03-06	NSCI	n/a	300-432687-644621-853582 (Randolph Creek tributary)	1	No	An unnamed watercourse crosses with the study area and pipeline northwest of Reservoir Road and joins Randolph Creek within the study area	**	Figure 4B	--
OCU03-07	NSCI	n/a	300-432687-644621-853582 (**Randolph Creek**)	1	**Yes (downstream of study area)	Randolph Creek crosses with the study area and pipeline and flows into Okanagan Lake.	**	Figure 4B	--
OCU03-08	NSCI	-	300-432687-644621-764561 (Randolph Creek tributary)	1	No	An unnamed watercourse crosses with the study area and pipeline and joins with Randolph Creek to the west of the study area.	**	Figure 4B	--
OCU03-09	S6	30	300-432687-646321 (**Strutt Creek**)	3	No	Strutt Creek crosses the study area and the pipeline and flows into Okanagan Lake.	15-30	Figure 4B	Permanent
OCU03-10	NSCI	n/a	300-432687-647543 (**Johnson Spring Creek**)	1	Yes (downstream of study area)	Johnson Spring Creek crosses the study area and the pipeline and flows into Okanagan Lake.	**	Figure 4C	--
OCU03-11	NSCI	n/a	300-432687-647543-552056 (Johnson Spring Creek tributary)	1	No	An unnamed watercourse crosses the study area approximately 10 m away from pipeline; joins Johnson Spring Creek outside of the study area.	**	Figure 4C	--

Watercourse	Environmental Protection and Management Regulation Classification	Riparian Management Area (m)	Local Watershed Code[1]	Stream Order	Fish Bearing	Location or Crossing Description	Streamside Protection and Enhancement Area[2] (m)	Figure Reference	Stream Permanence
OCU03-12	S3	30	300-432687-655718-140892 (**Turnbull Creek**)	1	Yes	Turnbull Creek crosses the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4C	Permanent
OCU03-13	NSCI	n/a	300-432687-664623-601339 (Tributary to Arawana Creek)	1	No	An unnamed watercourse crosses the study area and the pipeline, and joins Arawana Creek outside the study area	**	Figure 4D	--
OCU03-14	S3	40	300-432687-664623-262113 (**Arawana Creek**)	2	UKN	Arawana Creek crosses the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4D	Permanent
OCU03-15	S2	40	300-432687-668498-081260 (**Naramata Creek**)	3	Yes	Naramata Creek overlaps with the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4D	Permanent
OCU03-16	S3	40	300-432687-674998 (**Robinson Creek**)	2	Yes	Robinson Creek crosses the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4D	Permanent
OCU03-17	Unable to field-assess, conservatively assumed as S3 similar to Robinson Creek	40	300-432687-674998-360660 (Robinson Creek tributary)	1	UKN	An unnamed watercourse crosses the study area approximately 49 m northeast of the pipeline and joins with Robinson Creek within the study area.	30	Figure 4D	UKN

Watercourse	Environmental Protection and Management Regulation Classification	Riparian Management Area (m)	Local Watershed Code[1]	Stream Order	Fish Bearing	Location or Crossing Description	Streamside Protection and Enhancement Area[2] (m)	Figure Reference	Stream Permanence
OCU03-18	S3	40	300-432687-675833-666895 (**Trust Creek**)	1	Yes	Trust Creek crosses the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4E	Permanent
OCU03-19	S2	50	300-432687-688607-416446 (**Chute Creek**)	3	Yes	Chute Creek overlaps with the study area and the pipeline and flows into Okanagan Lake.	30	Figure 4G	Permanent
OCU03-20	S6***	n/a	300-432687-688607-484441 (Chute Creek tributary)	1	No	An unnamed watercourse overlaps the study area and the pipeline and joins Chute Creek south of the study area before Chute Creek crosses the study area.	15-30	Figure 4H	Ephemeral

Notes:

NSCI = no stream channel identified; NCD= Non-classified Drainage; N/A = not applicable; FWA = Freshwater Atlas; UKN = unknown
= not assessed during PFR
[1] 1:20,000 FWA watershed codes have a 300 prefix.
[2] Calculated from a Simple Assessment at the crossing location.
"No Stream Channel Identified (NSCI). These features should not be listed as NCDs in the AMS.
**If there is no watercourse present, then SPEA setbacks do not apply.
***Under the BC OGC Environmental Protection and Management Guideline (BC OGC 2018), if a feature is depicted as a stream on the Freshwater Atlas coverage is not identified during field survey, the construction plan submitted in conjunction with an application for oil and gas activity will note

Table 4.5 Summary of Documented Fish Species with Potential to Occur within the General Study Area

Fish Species	Watercourse with Documented Presence	Range in BC (McPhail 2007)	Habitat Description (McPhail 2007)
brook trout *Salvelinus fontinalis*	Penticton Creek (OCU03-04) Chute Creek (OCU03-19)	Introduced to BC in the 1920s. Established in all parts of province except Haida Gwaii, most short coastal rivers, and most of BC portions of upper Yukon and Mackenzie drainage systems.	Cool water in small streams, large rivers, beaver ponds, and lakes with preference for low-velocity habitats. Available cover and depth habitat important for juveniles. Young-of-year move into shallow edge habitats and establish territories over coarse gravel and cobble substrates.
kokanee *Oncorhynchus nerka*	Penticton Creek (OCU03-04) Randolph Creek (OCU3-07) Johnson Spring Creek (OCU03-10) Naramata Creek (OCU03-15) Robinson Creek (OCU03-16) Trust Creek (OCU03-18) Chute Creek (OCU03-19)	Widely distributed through BC including many lake systems.	Adult and juvenile kokanee live in the offshore habitat of lakes. During spawning they move into tributary streams or along the lakeshore.
longnose dace *Rhinichthys cataractae*	Penticton Creek (OCU03-04)	Occur from Columbia and Fraser River systems in the south to the lower Liard River in the north and are present in one of the coastal drainages that arise on the Interior Plateau, and flow east through the Coast Mountains – Klinaklini River.	Adapted to fast-flowing water and in the BC Interior shift from riffles to slower, deeper water in the winter. Juveniles become bottom dwellers and move into riffles with less overhead turbulence. Young-of-year show preference for shallow pool and low-velocity habitat with silt or sand substrates with cover.
peamouth chub *Mylocheilus caurinus*	Turnbull Creek (OCU03-012)	In the BC Interior, peamouth chub reach the headwaters of both the Columbia and Fraser drainage systems.	Adults occur in lakes, large rivers, and small streams in the spring. Juveniles show preference for slow, shallow water over fine substrates.
prickly sculpin *Cottus asper*	Penticton Creek (OCU03-04)	Common in lakes and streams throughout the interior portions of the Columbia, Skeena, and Nass drainage systems.	Adults occur in both flowing water and lakes, often associated with boulder substrates and average water velocities; in lakes associated with cover, especially cobbles, boulders, or woody debris interspersed among sandy patches. Juveniles occupy similar habitat as adults but in shallower areas. Young-of-year associated with flooded vegetation and weedy areas.

Fish Species	Watercourse with Documented Presence	Range in BC (McPhail 2007)	Habitat Description (McPhail 2007)
rainbow trout *Oncorhynchus mykiss*	Penticton Creek (OCU03-04) Randolph Creek (OCU3-07) Johnson Spring Creek (OCU03-10) Naramata Creek (OCU03-15) Robinson Creek (OCU3-16) Trust Creek (OCU3-18) Chute Creek (OCU3-19)	Most of the BC native range occurs in west flowing rivers.	Cool-water species with five broad habitat types: anadromous, lacustrine, large river, stream, and headwater habitats. Adults typically occupy riffles, runs, glides, and pools and prefer deeper and faster water than juveniles in stream habitat. In small streams primary pools (pools that span entire channel width) are used to overwinter. Cover habitat is important, including cobble and boulder substrates and large woody debris.
sculpin (General) (*Cottus* spp.)	Turnbull Creek (OCU3-012)	n/a – specific species not documented	n/a – specific species not documented
slimy sculpin *Cottus cognatus*	Penticton Creek (OCU3-04)	Widely distributed in inland waters of the province from Columbia system in the south to the Yukon system in the north.	Cool-water species; most populations found in cold, headwater streams or in glacier-fed rivers. Adults associated with riffle habitat and shelter among coarse gravel or cobbles; forage at night away from cover. Juveniles found in shallower and slower water than adults. During freshet in rivers and stream, transformed young-of-year found along stream edges in quiet water typically with flooded vegetation.

4.3.2 Vegetation

The southern half of the selected alignment, approximately 16.5 km, is within the Ponderosa Pine Very Dry Hot Okanagan (PPxh1) subzone, which occurs at low elevations along very dry valleys of the Southern Interior Plateau of BC, and is typically dominated by ponderosa pine (*Pinus ponderosa*) canopy and an understory of bluebunch wheatgrass (*Agropyron spicatum*) (Hope, Lloyd, et al. 1991a). Approximately 6 km of the central section of the selected alignment is located within the Interior Douglas-fir Very Dry Hot Okanagan (IDFxh1) subzone, which occurs in the lower elevations of the Okanagan valley south of Enderby and is characterized by the presence of Douglas-fir (*Pseudotsuga menziesii*) canopy cover, ponderosa pine, and grassland communities comprised of bluebunch wheatgrass together with Idaho fescue (*Festuca idahoensis*) (Hope et al. 1991b).

Approximately 4.2 km of the northern half of the selected alignment is within the Interior Douglas-fir Dry Mild Kettle (IDFdm1) subzone, which occurs in the Okanagan Highlands and along the Kettle River drainage and is distinguished by the presence of western larch (*Larix occidentalis*) (Hope et al. 1991b). The northern 3.2 km extent of the selected alignment is within the Montane Spruce Dry Mild Okanagan (MSdm1) subzone, which occurs at middle elevations on the Southern Interior Plateau (i.e., 1,100 to 1,700 masl) and is characterized by canopy species of lodgepole pine (*Pinus contorta*), hybrid white spruce (*Picea glauca x engelmannii*), and understory species of black huckleberry (*Vaccinium scoparium*), twinflower (*Linnaea borealis*), and red-stemmed feathermoss (*Pleurozium schreberi*) (Hope et al., 1991c).The study area crosses through 7 non-legally-designated OGMAs.

During the PFR, the field crew confirmed that vegetation along the southern extent of the general study area was predominantly characterized by grass communities with shrubs and low densities of the dominant tree species, ponderosa pine. Northward along the selected alignment, tree density increased to low to moderate; ponderosa pine remained the dominant tree species, with Douglas-fir also present. Along the northern extent of the selected alignment, the field crew observed high-density conifer forest dominated by lodgepole pine with Douglas-fir and hybrid white spruce subdominant. Vegetation densities and species composition along the PFR study area was consistent with BEC zone characterization. The PFR timing (late November) and an accumulation of snow limited understory vegetation observations.

Data from the follow-up field reconnaissance confirmed that vegetation was consistent with the BEC zone characterization. The existing FortisBC ROW had encroachment of non-native and invasive plant species periodically throughout.

A summary of documented invasive plant species recorded in the general study area is provided in **Table 4.6** and show on **Figure 4**. There are 23 invasive plant site polygons, all of which except one are in the north portion of the general study area. There are 436 recorded invasive plant occurrences altogether in the selected alignment.

Table 4.6 Invasive Plant Species Recorded in the General Study Area

Common Name	Scientific Name	2-Letter Identifier	Regulated Plant Status
bull thistle	*Cirsium vulgare*	BT	Unregulated invasive
burdock species	*Arctium spp*	BU	Regionally Noxious
baby's breath	*Gypsophila paniculata*	BY	Unregulated invasive
Canada thistle	*Cirsium arvense*	CT	Provincially Noxious
diffuse knapweed	*Centaurea diffuse*	DK	Provincially Noxious
dalmatian toadflax	*Linaria dalmatica*	DT	Provincially Noxious
hoary alyssum	*Berteroa incana*	HA	Regionally Noxious
hoary cress	*Cardaria draba*	HC	Regionally Noxious
hawkweed species	*Hieracium spp*	HS	Regionally Noxious (Hawkweed, Orange *(Hieracium aurantiacum)*
hound's tongue	*Cynoglossum officinale*	HT	Provincially Noxious
knapweed species	*Centaurea spp*	KS	Provincially Noxious
longspine sandbur	*Cenchrus longispinus*	LO	
oxeye daisy	*Leucanthemum vulgare*	OD	Regionally Noxious
orange hawkweed	*Hieracium aurantiacum*	OH	Regionally Noxious
perennial sow thistle	*Sonchus arvensis*	PS	Provincially Noxious
Russian knapweed	*Acroptilon repens*	RK	Regionally Noxious
sulphur cinquefoil	*Potentilla recta*	SC	Regionally Noxious
St. John's wort/Saint John's wort/goatweed	*Hypericum perforatum*	SJ	Unregulated invasive
spotted knapweed	*Centaurea biebersteinii*	SK	Provincially Noxious
common tansy	*Tanacetum vulgare*	TC	Regionally Noxious
tansy ragwort	*Senecio jacobaea*	TR	Provincially Noxious
western's goat beard	*Tragopogon dubius*	WG	Unregulated invasive
yellow/common toadflax	*Linaria vulgaris*	YT	Provincially Noxious

There are no CDC occurrences for at-risk plants located in or adjacent to the general study area. Three CDC occurrences for Black Cottonwood – Douglas fir / Douglas Maple – Common Snowberry at-risk ecological communities overlap the general or wildlife study area; black cottonwood ecological communities are provincially red-listed and are primarily found on moist floodplains, small rivers, adjacent to streams, at riparian edges of ponds and lakes, and occasionally in gullies. Desktop studies identified one plant species of concern (Thurber's needlegrass) with medium potential to occur within the general study area (**Table 4.7**) and 14 at-risk ecological communities that occur within the BEC subzones overlapped by the general study area. None of these plant species or ecological communities have federally designated critical habitat polygons within the general study area (Province of British Columbia 2019c).

Table 4.7 Plant Species of Concern and At-risk Ecological Communities with Potential to Occur in the General Study Area

Common Name	Scientific Name	Species at Risk Act	COSEWIC[1]	BC List[2]	OGC[3] High Priority Wildlife List3	Wildlife Act Section 34b	Potential to Occur[4]
Vascular Plants							
Thurber's needlegrass	*Achnatherum thurberianum*	-	-	Blue	Y	-	M

Notes:

1 COSEWIC – Committee on the Status of Endangered Wildlife in Canada
2 Red = Endangered or Threatened, Blue = Special Concern
3 OGC – BC Oil and Gas Commission
4 **Medium:** Hemmera's current understanding of the species range and known species habitat associations suggests that the species is expected to occur in the study area on a temporary or regular (i.e., predictable) seasonal basis and in densities that facilitate persistence of a functional population within the study area. **High:** Hemmera's current understanding of the species' range and known species habitat associations suggests that the species is expected to occur in the study area regularly, and in densities that would be expected to occur in provincial benchmark habitats.

4.3.3 Wildlife

The wildlife study area is predominantly overlapped by multiple ungulate winter ranges (UWRs) including multiple polygons for U-8-001 (mule deer; M-ODHE), the northernmost section overlaps U-8-006 (moose; M-ALAL), and the southern terminus of the selected alignment overlaps a polygon for U-8-005 (Mountain Goat; M-ORAM) along Ellis Creek.

The wildlife study area is located through two WHAs north of the City of Penticton city limits (WHA 8-369, sensitive data wildlife habitat core area; WHA 8-014, white-head woodpecker wildlife habitat core) between Turnbull Creek in the south and Arawana Creek in the north. The wildlife study area's south terminus along the eastern edge of the City of Penticton is located approximately 100 m north of the McTaggart-Cowan Wildlife Management area. The wildlife study area does not overlap any Important Bird Areas (Birdlife et al. 2019). There are multiple snake dens along the Kettle Valley Railway as well as downslope and parallel to the selected alignment (Sarell, M., pers. Comm, April 2020).

Desktop studies identified 25 wildlife species of concern with medium or high potential to occur within the wildlife study area (**Table 4.8**).

There are 19 posted critical habitat areas for five at-risk wildlife species located over the wildlife study area (**Table 4.9**)(**Figure 5**).

Table 4.10 summarizes the at-risk wildlife species occurrences documented within the wildlife study area. This study area overlaps seven recorded occurrences of at-risk wildlife for American badger, flammulated owl, Great Basin spadefoot, Nuttall's cottontail, white-headed woodpecker, and two mapped masked (i.e., confidential) CDC occurrences. The masked occurrences overlap only the outer edge of the wildlife study area for the selected alignment and are not expected to be impacted by the Project.

Due to winter conditions, no notable observations of wildlife or wildlife habitat features were recorded during the PFR.

The follow-up field reconnaissance in August 2020 provided more robust wildlife observations and many at-risk wildlife species were observed: bighorn sheep; gopher snake, *deserticola* subspecies (i.e., Great Basin gopher snake); western rattlesnake; western toad; Lewis's woodpecker; and common nighthawk.

A group of three bighorn sheep was observed between Campbell Mountain and Penticton Creek and a single bighorn sheep was observed right along the north side of Penticton Creek.

The Great Basin gopher snake was observed in the dry watercourse channel of OCU03-03 (tributary to Penticton Creek). A western rattlesnake was observed on rocks along the existing FortisBC ROW between Chute Lake Road and the Kettle Valley Rail Trail. The presence of similar habitat features was also noted close to other sections of the selected alignment.

Amphibians were observed at multiple watercourses. A western toad adult and juveniles were observed at OCU03-19 (Chute Creek) and Pacific tree frogs were observed at NCD-07, NCD-05, and OCU02-12 (Turnbull Creek)(**Figure 4**). Numerous tadpoles (species unknown) were observed at the crossing of OCU03-18 (Trust Creek).

Lewis's woodpeckers were observed at the south end of the selected alignment on Campbell Mountain down to Penticton Creek. Possible nesting habitat (large snags with cavities) was also observed in this area.

Common nighthawks were observed foraging overhead at the north end of the alignment near Chute Lake.

There was substantial sign of ungulate use of the alignment including tracks and scat. Mule deer and white-tailed deer were observed near the alignment.

Table 4.8 Wildlife of Concern with Medium or High Potential to Occur in Wildlife Study Area

Common Name	Scientific Name	Species at Risk Act	COSEWIC[1]	BC List[2]	OGC[3] High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[4]
Mammals							
bighorn sheep	*Ovis canadensis*	-	-	Blue	Y	-	H
Birds							
bald eagle	*Haliaeetus leucocephalus*	-	NAR (May 1984)	Yellow	-	Y	H
barn swallow	*Hirundo rustica*	1-T (Nov 2017)	T (May 2011)	Blue	-	-	H
common nighthawk	*Chordeiles minor*	1-T (Feb 2010)	SC (May 2018)	Yellow	-	-	M
evening grosbeak	*Coccothraustes vespertinus*	1-SC (May 2019)	SC (Nov 2016)	Yellow	-	-	M
golden eagle	*Aquila chrysaetos*	-	NAR (May 1996)	Yellow	-	Y	M
Lewis's woodpecker	*Melanerpes lewis*	1-T (Jul 2012)	T (Apr 2010)	Blue	Y		H
olive-sided flycatcher	*Contopus cooperi*	1-T (Feb 2010)	SC (May 2018)	Blue	-	-	M
osprey	*Pandion haliaetus*	-	-	Yellow	-	Y	M
Amphibians							
Great Basin spadefoot	*Spea intermontana*	1-T (Aug 2016)	T (Nov 2019)	Blue	Y	-	M
western toad	*Anaxyrus boreas*	1-SC (Jun 2008)	SC (Nov 2012)	Yellow	-	-	H
Reptiles							
Gopher Snake, deserticola subspecies	*Pituophis catenifer deserticola*	1-T (Jul 2005)	T (Apr 2013)	Blue	Y	-	H
North American racer	*Coluber constrictor*	1-SC (Jun 2003)	T (Nov 2015)	Blue	Y	-	M
northern rubber boa	*Charina bottae*	1-SC (Jan 2005)	SC (Apr 2016)	Yellow	-	-	M
western rattlesnake	*Crotalus oreganus*	1-T (Jul 2005)	T (May 2015)	Blue	Y	-	H

Common Name	Scientific Name	Species at Risk Act	COSEWIC[1]	BC List[2]	OGC[3] High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[4]
Insects							
lance-tipped darner	*Aeshna constricta*	-	-	Blue	Y	-	M
olive clubtail	*Stylurus olivaceus*	1-E (Feb 2017)	E (May 2011)	Red	Y	-	M
pronghorn clubtail	*Phanogomphus graslinellus*	-	-	Blue	Y	-	M
vivid dancer	*Argia vivida*	1-SC (Feb 2019))	SC (May 2015)	Blue	Y	-	M

Notes:
1 COSEWIC – Committee on the Status of Endangered Wildlife in Canada
2 Red = Endangered or Threatened, Blue = Special Concern
3 OGC – BC Oil and Gas Commission
4 **Medium:** Hemmera's current understanding of the species range and known species habitat associations suggests that the species is expected to occur in the study area on a temporary or regular (i.e., predictable) seasonal basis and in densities that facilitate persistence of a functional population within the study area. **High:** Hemmera's current understanding of the species' range and known species habitat associations suggests that the species is expected to occur in the study area regularly, and in densities that would be expected to occur in provincial benchmark habitats.

Table 4.9 Wildlife Posted Critical Habitat Located within the Wildlife Study Area

Common Name	Scientific Name	Critical Habitat ID	Shape ID	BC List	Proximity to Wildlife Study Area
desert nightsnake	*Hypsiglena chlorophaea*	110314	245335	Red	Overlaps
		110316	245337		Overlaps
		110318	245339		Overlaps
Great Basin gopher snake	*Pituophis catenifer deserticola*	110429	245450	Blue	Overlaps
		110431	245452		Overlaps
		110433	245454		Overlaps
Great Basin spadefoot	*Spea intermontana*	6314	142442	Blue	Overlaps
		6318	142446		Overlaps
		6515	142643		Overlaps
Lewis's woodpecker	*Melanerpes lewis*	5777	141931	Blue	Overlaps
		5780	141934		Overlaps
		5801	141954		Overlaps
		5802	141955		Overlaps
		5803	141956		Overlaps
		5809	141962		Overlaps
		5766	10000226		Overlaps
western rattlesnake	*Crotalus oreganus*	110199	245220	Blue	Overlaps
		110201	245222		Overlaps
		110203	245224		Overlaps

Table 4.10 Recorded Occurrences of At-risk Wildlife Near the Wildlife Study Area

Common Name	Scientific Name	Shape ID	BC List	Proximity to Study Area	Comments
American badger	*Taxidea taxus*	74373	Red	Partially overlaps	There are 498 sightings of badgers (mostly collected between 1995 and 2012) represented by the polygon, including 51 observations of family groups. Badgers consistently occur throughout the EO with concentrations in grassland/agricultural interface zones in the Vernon, Lumby, Mission Creek, Osoyoos, Anarchist Mountain/Rock Creek, and Grand Forks areas. Badgers also consistently occur in disturbed mid-elevation forests with suitable soils in the Aberdeen Plateau, Upper Kettle River, Beaverdell, and Venner Meadows areas. Badgers in the area have large home ranges (15-50 km²).
flammulated owl	*Psiloscops flammeolus*	10767	Blue	Overlaps	Males calling at 2 sites in ponderosa pine/Douglas-fir forest, on W-facing slope. Habitat Details: Age class 141 to 250 years; height class 19.5-28.4 m; crown closure 26-35%. Low to moderate budworm infestation.
Great Basin spadefoot	*Spea intermontana*	113170	Blue	Overlaps	Great Basin spadefoots have been recorded in Penticton in 1913, 1951, and 2013.
masked occurrence 1	-	-	-	Partially overlaps	Details of this occurrence are confidential.
masked occurrence 2	-	-	-	Partially overlaps	Details of this occurrence are confidential.
Nuttall's cottontail	*Sylvilagus nuttallii*	48259	Blue	Partially overlaps	2003: 1 Nuttall's cottontail seen on April 14th and 1 on June 4th; observations were 3 km apart. 2006-06-15: visual confirmation of 1 adult Nuttall's cottontail.
white-headed woodpecker	*Dryobates albolarvatus*	5840	Red	Partially overlaps	1961, 1962, 1966, 1967 and 1969: winter records of 1 to 3 birds. 1975-07-12: 3 immatures and 2 adults. 1976-07-01: 1.

Note: Comments are from BC CDC 2019 unless specified otherwise.

5.0 REGULATORY OVERVIEW

This section provides an overview of the environmental legislation, regulations and bylaws that apply to the Project. A list of environmental permits and approvals that are expected to be required for the Project is provided in **Section 6.1.2**.

5.1 Federal Legislation

5.1.1 *Fisheries Act*

Section 35(1) of the federal *Fisheries Act*, RSC 1985, c. F-14 (2019) requires that *"*no person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat."

Exceptions to the above that are stated in the *Fisheries Act* include the following:

> *"A person may carry on a work, undertaking or activity without contravening subsection (1) if (a) the work, undertaking or activity is prescribed work, undertaking or activity or belongs to a prescribed class of works, undertakings or activities, as the case may be, or is carried on in or around prescribed Canadian fisheries water, and the work, undertaking or activity is carried on in accordance with the prescribed conditions; (b) the carrying on of the work, undertaking or activity is authorized by the Minister and the work, undertaking or activity is carried on in accordance with conditions established by the Minister; (c) the carrying on of the work, undertaking or activity is authorized by a prescribed person or prescribed entity and the work is carried on in accordance with the conditions set out in the authorization"*

Under the *Fisheries Act*, a designated project is defined as follows:

> *"A project that is designated by regulations made under paragraph 43(1)(i.5) or that belongs to a class of projects that is designated by those regulations and that consists of works, undertakings or activities, including any works, undertakings or activities that the Minister designates to be associated with the project"*

Proponents must avoid or mitigate harm to fish; if harm cannot be avoided or mitigated, the Project requires an authorization under subsection 35(2) of the *Fisheries Act*. Other sections of the *Fisheries Act* that are applicable to the Project include Section 36(3) that prohibits the deposition of deleterious substances to waters frequented by fish and Sections 38(4) and 28(5) that require a contravention of either Sections 35 or 36(3) be reported without delay.

5.1.2 *Migratory Birds Convention Act*

The *Migratory Birds Convention Act, 1994*, SC 1994, c. 22) (MBCA) protects various species of migratory birds including gamebirds, insectivorous birds, and non-gamebirds. The MBCA prohibits the taking of migratory bird nests and the deposit of deleterious substances in waters or areas frequented by migratory birds. The provincial *Wildlife Act* described in **Section 5.2.7** encompasses most bird species not covered under the MBCA.

5.1.3 *Species at Risk Act*

The primary objective of SARA is to prevent species at risk from becoming extirpated or extinct, and to ensure appropriate management of species of special concern to prevent them from becoming threated or endangered. Under SARA, protection is afforded to individuals, residences, and in some cases federally designated critical habitat of species listed in Schedule 1 as “endangered,” “threatened,” or “extirpated.” The wildlife study area for the Project has federally designated critical habitat identified within it; further details are provided in **Section 4.0** Environmental Overview.

Permits under Section 73 of SARA are required by anyone conducting activities that may violate SARA prohibitions by intentionally or inadvertently killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, or trading of individuals of endangered, threatened, and extirpated species listed in Schedule 1 of the SARA. SARA also contains a prohibition against the damage or destruction of residences (e.g., nest or den) of species listed in its Schedule 1. The Species at Risk Public Registry (Government of Canada 2019b) states that Section 73 permits are required where a violation to the prohibitions of SARA is anticipated for listed species that are:

- Found on federal lands in a province, or on lands in a territory under the authority of the Minister of the Environment and Climate Change Strategy or of the Parks Canada Agency
- Migratory birds protected by the MBCA, anywhere they occur, including private lands or lands in a province or territory
- Aquatic species anywhere they occur, including private lands or lands in a province or territory.

SARA (Section 58) also contains a prohibition against destroying any part of the critical habitat of any listed endangered or threatened species, or of any listed extirpated species if a recovery strategy has recommended its reintroduction, if the:

- Critical habitat is on federal lands, in the exclusive economic zone of Canada or on the continental shelf of Canada
- Listed species is an aquatic species
- Listed species is a species of migratory bird protected by the MBCA.

5.2 Provincial Legislation

5.2.1 *Oil and Gas Activities Act*

The BC OGAA sets out a regulatory framework under which the OGC governs all oil and gas activities with the province. The OGAA was brought into effect in 2014 to consolidate and modernize the requirements that had previously existed under several acts and regulations. Section 8 of the OGAA gives the OGC the power to make decisions under several pieces of other provincial legislation in place of the statutory decision maker with the mandate to implement that legislation. Under existing legislation, which consists of the OGAA and several regulations passed under the Act, the OGC has established structure for the protection of environmental resources and a range of compliance and enforcement abilities.

The Environmental Protection and Management Regulations (Part 9 of the OGAA), which applies to Surface Crown land, provides the OGC with the authority to manage and protect environmental values on provincial Crown land. Key environmental values that require management and protections are identified as Government's Environmental Objectives under Part 2 of the EMPR, and are composed of:

- Water
- Riparian values
- Wildlife and wildlife habitat (such as UWRs and WHAs)
- Old growth management areas, resource features, and cultural heritage resources.

The BC OGC EMPR and associated Environmental Protection and Management Guideline (OGC 2018) contain RMA classification provisions that are consistent with the *Forests and Range Practices Act*, SBC 2002, c. 69(FRPA); see **Section 5.2.6**).

Because Project activities will include the installation of new gas main infrastructure within a new ROW, Fortis will require a New Pipeline Permit under the OGAA. This permit will include authorization for works in and about a stream, road use (as applicable), and clearing of trees.

5.2.2 *BC Environmental Management Act*

The BC *Environmental Management Act* provides requirements for the regulation of activities that introduce waste into the environment, store special waste, and treat or recycle special waste. This act establishes the Contaminated Sites Regulation, BC Reg 375/96; Hazardous Waste Regulation, BC Reg. 63/88; Spill Reporting Regulation, BC Reg. 187/2017; and Oil and Gas Waste Regulation, BC Reg. 254/2005; and provides a permitting system to enable the authorized disposal of solid waste (including soil), discharge of emissions, and discharge of waste water (including hydrostatic test water) and surface run-off.

Part 8 of the Contaminated Sites Regulation (including the most recent amendments to the *Environmental Management Act* under BC Reg. 196/2017, s.3,) identifies the requirements for contaminated soil relocation when considering the receiving site. If the industrial use standards or applicable standards of the receiving site are exceeded, the soil is considered contaminated and a Contaminated Soil Relocation Agreement or disposal at a permitted facility will be required. Thus, if suspect contaminated soil is encountered during trenching or construction and needs to be removed from site (e.g., for geotechnical or site remediation reasons), characterization will be required to ensure that relocation is completed appropriately.

Section 8 of the OGAA allows the OGC to administer the following sections of the *Environmental Management Act*: Section 9 (hazardous waste storage and disposal), Section 14 (permits), and Section 15 (approvals).

5.2.3 *Land Act*

The *Land Act*, RSBC 1996, c. 245, is the primary legislation used by government to permit the use of Crown land by communities, industry, and businesses. The *Land* Act allows the granting of land and the issuance of Crown land tenure in the form of leases, licences, permits, and rights-of-way.

Section 8 of the OGAA allows the OGC to administer the following sections of the *Land Act*: Section 11 (disposing of Crown land), Section 14 (temporary occupation of Crown land), Section 38 (lease of Crown land), Section 39 (licence of occupation), Section 40 (ROW and easement), and Section 96 (occupational rental).

5.2.4 *Agricultural Land Commission Act*

The BC *Agricultural Land Commission Act*, SBC 2002, c. 36, sets the legislative framework for the establishment and administration of the agricultural land preservation program. This act and enabling regulations are meant to protect agricultural land within the province. Under the act, this land is designated as ALR.

The Agricultural Land Commission is the agency responsible for the administration of the ALR. The OGC has a delegation agreement with the Agricultural Land Commission that gives the OGC authority to permit oil and gas activities in the ALR. Land must be reclaimed to its pre-development agricultural condition when no longer required for an oil or gas activity.

5.2.5 *Water Sustainability Act*

The BC *Water Sustainability Act*, SBC 2014, c. 15 (WSA) is the principal legislation for managing the diversion and use of water resources. Section 8 of the OGAA allows the OGC to administer Sections 10, 11, and 24 of the WSA, including issuing use approvals, change approvals, and permits over Crown land.

For changes in and about a stream, an application for a Change Approval or submission of a Notification is required under Section 11 of the *WSA*. Under the WSA, a stream is defined as "(*a) a natural watercourse, including a natural glacier course, or a natural body of water, whether or not the channel of the stream has been modified, or (b) a natural source of water supply, including, without limitation, a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier, whether or not usually containing water, including ice,* but does not include an aquifer."

Changes in and about a stream are defined in the WSA as:

- Any modification to the nature of a stream, including any modification to the land, vegetation and natural environment of a stream or the flow of water in a stream
- Any activity or construction within a stream channel that has or may have an impact on a stream or a stream channel.

5.2.6 *Forest and Range Practices Act*

The *Forest and Range Practices Act*, SBC 2002, c. 69, outlines how forest and range practices and resource-based activities are to be conducted on Crown land. It also addresses the protection of plants, animals, and ecosystems while undertaking these resource-based activities.

Forestry and range land use management guidelines for wildlife are established by the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) under FRPA. Under FRPA and the Government Actions Regulation, BC Reg. 582/2004, UWRs, general wildlife measures, and WHAs can be established for specified areas and for specified species to set objectives with respect to acceptable forest and range practices in these areas.

Under the FRPA Operational Planning Regulation Division 3 – Riparian Areas, there are seven stream riparian classes designated S1 to S6, five wetland riparian classes designated as W1 to W5, and five lake riparian classes designated as L1-A to L4. Each stream reach receives a stream riparian classification based on presence of fish, occurrence in a community watershed, and average channel width. Each wetland and lake receives a riparian classification based on size, biogeoclimatic zone, and subzone. The minimum RMA width, riparian reserve zone, and riparian management zone width on each side of the waterbody is determined based on the riparian class of the stream. The BC OGC EMPR and Environmental Protection and Management Guideline (OGC 2018) contain these same RMA classification provisions.

5.2.7 *Wildlife Act*

In general, the BC *Wildlife Act* provides a regulatory framework for the management of wildlife and, in very limited circumstance and limited to a few specifically designated species, wildlife habitat (i.e., bird nests) in the province. The *Wildlife Act* protects most native vertebrates from direct harm or harassment, regulates hunting, trapping and sport fishing, protects nesting birds and active nests that are occupied by a bird or its egg(s). The nests of some bird species are afforded specific consideration under Section 34b of the *Wildlife Act* regardless of whether they are occupied. These protected nests, as relevant to this Project, include those used seasonally by peregrine falcon, burrowing owl, bald eagle, osprey, and great blue heron.

A general *Wildlife Act* permit is required for any trapping or handling of live wildlife (i.e., salvages), including species at risk.

5.2.8 *Heritage Conservation Act*

Archaeological sites in BC are legally protected from alterations of any kind by the *Heritage Conservation Act*, RSBC 1996, c. 187 (HCA). The provisions of the HCA apply to archaeological sites located on both public and private land. The HCA is binding on government and prevails when in conflict with other legislation. The HCA is administered by the Archaeology Branch of the BC Ministry of Forests, Lands, Natural Resource Operations and Rural and is responsible for making final decisions concerning the management of archaeological resources in BC.

Section 12.1 of the HCA specifies that an individual (or corporation) must not damage, excavate, dig in or alter, or remove any heritage object from a heritage site except in accordance with a permit issued by the Minister pursuant to Sections 12.2 and 12.4 of the HCA. Section 12.4 permits are administered by the OGC for oil and gas projects. Section 12.4 permits are required if project impacts to recorded archaeological sites are anticipated. Section 12.2 Heritage Inspection and heritage investigation permits are administered by the Archaeology Branch for field-based assessments of archaeological and heritage resources in the Project area.

5.2.9 *Weed Control Act*

The BC *Weed Control Act*, RSBC 1996, c. 487, aims to control the spread of designated noxious plants on all provincial Crown and private land. There is an obligation under the Act for the land occupier to control these designated noxious plants. The Act requires all land occupiers to avoid establishment and dispersal of noxious weeds as defined by the Act.

5.2.10 *Riparian Areas Protection Act*

The *Riparian Areas Protection Act* and associated RAPR direct local governments to protect riparian areas during new residential, commercial, and industrial development. Local governments must either include riparian area protection provisions in its zoning bylaws and permits in accordance with the RAPR or ensure that its bylaws and permits meet or exceed the RAPR. The RAPR applies to the RDOS (Division 2 Section 2(1)(b)). The southern terminus of the study area partially overlaps the municipal jurisdiction of the City of Penticton, which has developed its own Riparian Development Permit Area Guidelines (**Section 5.4.1**).

5.3 Regional Bylaws

5.3.1 Regional District of Okanagan-Similkameen

The Project is located entirely within the RDOS, with approximately 8 km south of Turnbull Creek and northwest of Penticton Creek located within the municipality of Penticton. Both regional and municipal bylaws that will be pertinent to the Project have been noted in the following sections.

5.3.1.1 Naramata Official Community Plan

The Official Community Plan (OCP) for Naramata (RDOS 2020) outlines the vision, goals, and policies used to guide future land use decisions for Naramata and forms the regulatory land use bylaws, including those for:

- Agricultural land
- Parks, recreation, and trails
- Natural environment and conservation
- Riparian and foreshore area.

Under the Naramata OCP, the policies concerning works on land designated ALR supports the planning of new and modified roads and utility and communication corridors in the plan area, as long as they avoid the disruption and fragmentation of existing and potential agricultural land. For works on designated ALR, the Naramata OCP refers to the Province.

The Naramata OCP oversees regional parks, the Kettle Valley Railway Trail, and provincial recreation areas; policies under the OCP prioritize the maintenance of access to park and recreation resources. The Project will cross uphill of Naramata Creek Park, and the Kettle Valley Railway Trail along the northern portion of the alignment. Consultation and coordination with the RDOS would be required to minimize interruption to access of parks and recreational features.

Naramata OCP policies pertaining to Natural Environment & Conservation establish Environmentally Sensitive Development Permit Areas to protect privately held lands that possess High and Very High ecologically sensitive classifications. Development within Environmentally Sensitive Development Permit Areas require retention of a Qualified Environmental Professional (QEP) to prepare an environmental assessment in accordance with Section 23.2 of the Naramata OCP, the Regional District's approved Development Procedures Bylaw, and federal and provincial best management guidelines. The environmental assessment needs to incorporate Traditional Ecological Knowledge and needs to include provisions for working with the Penticton Indian Band, Osoyoos Indian Band, Upper Similkameen Indian Band, and Lower Similkameen Indian Band, where feasible, practical, and appropriate (RDOS 2020).

The RDOS is listed under Section 2 of the *Riparian Areas Protection Act* and has implemented a Watercourse Development Permit Area designation to protect riparian habitat, aquatic habitat, and associated environmentally sensitive areas from negative impacts.

5.4 Municipal Bylaws

5.4.1 City of Penticton

5.4.1.1 Riparian Development Permit Area

As mentioned in **Section 5.2.10**, the City of Penticton has their own Riparian Development Permit Area Guidelines which establish the objectives for the protection, enhancement, and restoration of riparian habitat (City of Penticton 2019b). The Project's southern terminus skirts the Riparian Development Permit Area (i.e., associated with Ellis Creek) and crosses several additional Riparian Development Permit Areas, in particular, Penticton Creek. The guidelines stipulate that a Riparian Assessment Report and Cost Estimate by a QEP shall be submitted to the City of Penticton and the Province for review and approval. If approved, a QEP is required to provide ongoing monitoring and a post-development report shall be submitted to the City of Penticton confirming conditions have been met.

5.4.1.2 Environmental Development Permit Area

The general study area and alignment skirts the eastern border of the Environmental Development Permit Area under the OCP (City of Penticton 2019a), which establishes the protection of ecosystem services, biological diversity, wildlife and important wildlife habitats, features and functions through the Environmental Development Permit Area. The southern terminus of the Project crosses an Environmental Protection Area established by the City.

The Environmental Development Permit Guidelines specify that a QEP who is a Registered Biologist be retained to prepare an environmental assessment report and cost estimate in accordance with the City's Terms of Reference for Environmental Reports. The issued Environmental Development Permit typically includes requirements for restoration and enhancement, environmental monitoring, and post-development reporting. Guidelines for construction in Environmental Assessment Areas stipulate that harm to the following be avoided:

- Native trees and tree containing active nest sites or cavities
- Critical habitat for Endangered or Threatened Species under the federal *Species at Risk Act* unless allowed under federal permits
- Provincially Red-listed ecosystems and species.

Guidelines also require that impacts on provincially Blue-listed ecosystems and species be minimized.

5.4.1.3 Development Procedures and Delegation Bylaw No. 2010-92

In accordance with Section 154 of the Community Charter, the Development Procedures and Delegation Bylaw delegates its powers under the *Local Government Act,* RSBC 2015, c. 1, to the Development Officer for the implementation of Environmental Protection Area Development Permits and Riparian Assessment Area Development Permits.

5.4.1.4 Earthworks Control Bylaw No. 2006-65

The Earthworks Control Bylaw regulates or prohibits the removal, movement, and deposit of soil, sand, gravel, rock, or other substance of which land is composed of within the City of Penticton. As such, any earthworks activity shall not occur without obtaining an Earthworks Permit granted by the Director for the Removal of Soils for the City of Penticton, unless work is excluded per Section 5 of the bylaw. The City of Penticton should be consulted to determine if an Earthworks Permit is required prior to construction.

5.4.1.5 Blasting Control Bylaw No. 2016-16

The City of Penticton Blasting Control Bylaw states that any blasting activity may only occur once a blasting permit has been issued by the City of Penticton, all neighbouring owners have been notified, and a pre-blast inspection report has been completed and submitted to the City. Blasting must occur under the supervision of a Security Person. Under the bylaw, a Security Person is defined as a trained and certified Security Person holding a valid security workers licence or a blaster having a valid blasting certificate issued by WorkSafeBC. The Security Person is responsible for ensuring that no material leaves the site during blasting or enters the property of any of the neighbouring owners; blasting mats are to be used at all times unless otherwise approved by the blasting engineer.

If the Project requires a blasting permit, it should be noted that the bylaw requires neighbouring owners are notified after the blasting permit has been issued and at least 15 days before blasting is to commence. The bylaw also requires that a pre-blast inspection take place three days after written notice to all neighbouring owners has been given. The pre-blast inspection must be conducted by a building engineer and the results of the inspection documented in a written report.

5.4.1.6 Irrigation, Sewer, and Water Bylaw No. 2005-02

The irrigation, sewer, and water bylaw oversees the supply, distribution, and use of treated and irrigated water, and the collection, conveyance, and discharge of sanitary sewage and storm drainage into or from the irrigation water, treated water, sanitary sewer and storm sewer systems of the City of Penticton. Under the bylaw, any discharge or cause to be discharge into the City's sanitary system will require a Permit to Discharge; Schedule A, C, and D of the bylaw stipulate the conditions of Permits to Discharge.

6.0 POTENTIAL ENVIRONMENTAL EFFECTS AND RISKS

This section provides a high-level overview of the potential adverse effects to environmental receptors that may result from Project construction. Hemmera has identified environmental sensitivities where sensitive features associated with an environmental receptor are anticipated to be directly impacted by construction activities (i.e., where the anticipated construction footprint overlaps with identified features) and where factors present a risk to the Project. For the purposes of this report, risks to the Project include additional costs (e.g., activities requiring further follow-up work or mitigation), timing constraints (e.g., species-specific timing windows), or both (e.g., permits or approvals).

Potential Project risks are identified and ranked for land use, surface water quantity and quality, fish and fish habitat, vegetation (including species at risk), wildlife (including species at risk), and contaminated soils and/or groundwater. The resulting list has been expanded compared to the environmental receptors considered in **Section 4.0**, as surface water quantity and quality are also included here. These environmental receptors were grouped into three categories as follows:

1. Land Use
    - Land use
    - Presence and potential disturbance to parks and protected areas
    - Presence and potential disturbance of ALR, with consideration to agricultural capability of soils
2. Biophysical Receptors
    - Surface water quantity and quality
        - Presence of surface water, and potential for contamination or modification to surface water flow
    - Fish and fish habitat
        - Presence of and potential disturbance and modification of fish and fish habitat
    - Vegetation
        - Presence and potential for spread of invasive vegetation
        - Presence and potential disturbance to areas of natural vegetation
        - Presence and potential for disturbance to plant species and communities of concern
    - Wildlife and wildlife habitat
        - Presence of and potential disturbance to wildlife species noted to be of concern and to associated wildlife habitat features
        - Presence of posted critical habitat
        - Presence of core WHA, UWR, and Wildlife Management Areas
3. Contaminated soils/groundwater:
    - Risk Areas along the selected alignment where there is a medium or high risk of soil or groundwater contamination present and intrusive work (i.e., ground disturbance) is recommended to confirm the presence and extent of the contamination. These areas are considered to pose a risk to the Project during construction activities related to soil and groundwater management. The list of Risk Areas for each lateral was further refined by removing identified APECs where contaminated soil, if encountered, will likely be reused as fill or spread within the ROW, resulting in a reduced risk to the Project.

Follow-up activities are recommended to address or mitigate risks associated with each receptor. Additionally, a separate list of permits and approvals that are expected to be required, along with the estimated timeframe for issuance, is provided for the selected alignment.

6.1 Biophysical Receptors

A summary of the potential effects to biophysical receptors and associated risk to the Project is provided in **Table 6.1**.

Table 6.1 Overview of Potential Effects and Risks to Biophysical Receptors Associated with the Selected Alignment

Environmental Receptor	Selected Alignment			
	Environmental Sensitivities	Potential Effects	Project Risk	Follow-up Activities / Mitigation
Land Use	• Construction zones that overlap with ALR • Construction zones that overlap with wineries • Construction zones that cross or are in the immediate vicinity of public roadways • Construction zones that overlap with City of Penticton Natural Environmental Development Permit Area • Recreational areas affected: study area passes near Okanagan Mountain Provincial Park, and pipeline crosses Kettle Valley Rail Trail • Municipal park areas affected: study area and pipeline encroaches upon Three Blind Mice Disc Golf Courses • Construction zones that overlap with the Campbell Mountain Landfill	• Temporary or permanent impact on soils and agricultural capacity of properties within construction footprint • Potential disruption to recreational activities during construction • Potential challenges to construction access and timing related to roadway use	Medium	• Public engagement • Development and implementation of a soil management plan for work within the ALR • Engagement with Agricultural Land Commission • Site restoration • Engagement with City of Penticton (Natural Area Development Permit) • Engagement with the City of Penticton, RDOS, and MFLNRORD's Department of Recreational Sites and Trails BC on the Kettle Valley Rail Trail • Engagement with Ministry of Transportation and Infrastructure • Coordinate planning and construction with the Campbell Mountain Landfill to comply with conditions of their landfill operating permit
Surface Water Quality and Quantity	• 20 stream or non-classified drainages (NCD) that are crossed by, or have SPEAs crossed by, the selected alignment study area • Four unclassified wetlands are crossed by the selected alignment study area.	• Temporary diversion of surface water • Introduction of deleterious substances into surface water (e.g., sediment, construction debris) • Temporary or permanent modification to watercourse morphology	Moderate to High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct water quality baseline assessment, if required • Water quality monitoring during construction • Construction timing (i.e., avoid periods of heavy precipitation) • Instream work area isolation
Fish and Fish Habitat	• 8 known or potentially fish-bearing waterbodies cross the selected alignment study area or their SPEAs interact with the selected alignment	• Temporary modification or permanent destruction of fish habitat • Temporary disturbance to, or displacement of, fish • Direct injury or mortality to fish	High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct instream works within reduced risk work window • Where practical, design and plan Project activities to avoid fish and fish habitat • To the extent practicable, undertake construction within the least-risk timing windows for applicable species • Implement work zone isolation and aquatic life-form salvage • Conduct fish habitat restoration
Vegetation	• Construction areas within mature vegetation and riparian corridors • Construction areas in the vicinity of invasive vegetation • Selected alignment has the potential to support at-risk plants and ecological communities	• Temporary modification or permanent loss of mature native vegetation where selected alignment is through forested areas (i.e., north of Naramata) • Spread of invasive vegetation as a result of increased areas of exposed soil during construction and movement of soil and seeds by equipment • Potential damage to or destruction of plant species of concern or at-risk ecological communities if present	Moderate	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • Conduct surveys for plant species of concern and at-risk ecological communities with a high or medium potential to be present in areas to be affected by Project activities • Develop an invasive vegetation management plan to be implemented during construction • Site restoration activities

Environmental Receptor	Selected Alignment			
	Environmental Sensitivities	Potential Effects	Project Risk	Follow-up Activities / Mitigation
Wildlife	• Wildlife habitat features, including those not identified during the PFR or follow-up field reconnaissance. • Wildlife habitat features and habitat use confirmed during the follow-up field assessment for bighorn sheep, amphibians, western rattlesnake, Great Basin gopher snake, and Lewis's woodpecker. • Areas where known occurrence of wildlife of concern are in the vicinity of the selected alignment (e.g., seven at- risk species CDC occurrences include American badger, white-head woodpecker, Great Basin spadefoot, flammulated owl, Nuttall's cottontail, and two masked occurrences). • Area where construction footprint overlaps with a core critical habitat polygon (e.g., WHA 8-369, sensitive data wildlife habitat core area; WHA 8-014, white-head woodpecker) • Areas where the selected alignment overlaps with federally posted critical habitat areas for Lewis's woodpecker, Great Basin spadefoot, desert nightsnake, western rattlesnake, Great Basin gopher snake. Within these polygons, areas defined as critical habitat may be present as described below. ▫ Lewis's woodpecker: breeding habitat (dry open Ponderosa pine or Douglas-fir and open grasslands with low stem densities, veteran trees, and rich herb/shrub layer, mature to old riparian cottonwood stands adjacent to grassland, shrub-steppe or open woodland habitat; relatively recently burned (<30 years) Ponderosa pine and Douglas-fir dominated forest with standing snags (Environment Canada 2011). ▫ Great Basin spadefoot: vernal ponds (seasonal and temporary wetlands); lakes, ponds, marshes, springs, sluggish streams, and seasonally wetted margins around permanent waterbodies; grassland, shrub-steppe, and open forest (Environment Canada 2017). ▫ Desert nightsnake: denning habitat (i.e., cliff, talus, or rock outcrop with cracks or fissures that provide access below the frost line) and foraging habitat (talus, rock outcrops, and to a lesser degree grassland, shrub-steppe, open ponderosa pine and Douglas-fir forest) (SIRAWG 2016). ▫ Western rattlesnake: rock outcrops and talus slopes, shrub-steppe/ grassland, riparian, and ponderosa pine habitat (SIRAWG 2008) ▫ Great Basin gopher snake: open and semi-open habitats with highest quality habitat along valley bottoms and lower slopes; hibernation (underground near cliff, rock outcrops, talus slopes, road or railroad fill and rodent burrows); foraging (grasslands, shrub-steppe, meadows, riparian areas, open ponderosa pine); egg-laying (rodent burrows, talus slopes, rock fissures, under decaying wood or other sheltered sites) (SIRAWG 2008). • UWR for mule deer and moose where construction footprint overlaps suitable habitat areas.	• Destruction of wildlife habitat features (including nests and dens) and disturbance of wildlife using these features during construction • Temporary disturbance and displacement of wildlife as a result of construction activities • Direct injury or mortality resulting from equipment operation • Alteration of critical habitat (Lewis's woodpecker, Great Basin spadefoot, desert nightsnake, western rattlesnake, Great Basin gopher snake) within the construction footprint	High	• Develop and implement an Environmental Management Plan and conduct environmental monitoring • To the extent practicable, undertake construction within the least-risk timing windows for applicable species • Conduct inventories and surveys (following appropriate Resources Information Standards Committee standards where applicable) for wildlife species of concern with a high or medium potential to be present and that may be adversely affected by Project activities. Inventories and surveys should determine whether nests or residences are present in areas that could be adversely affected by construction activities, to inform construction planning activities and determine if salvage will be required • Where practical, design and plan Project activities to avoid sensitive habitats and identified wildlife habitat features • Develop and implement a Snake Management Plan for construction • Conduct amphibian salvages during construction • Follow best management practices to minimize impacts to Lewis's woodpecker as outlined in the federal recovery strategy (ECCC 2017) • Conduct detailed follow-up assessments to determine if critical habitat features or attributes for the following species are present, disturbed or destroyed: ▫ Lewis's woodpecker ▫ Great Basin spadefoot ▫ Desert nightsnake ▫ Western rattlesnake ▫ Great Basin gopher snake

6.1.1 Contaminated Sites and Groundwater

Risk areas where additional investigation is recommended to refine the potential liabilities are presented in **Table 6.2**.

Table 6.2 Summary of Project Risk Areas – Contaminated Soil and/or Groundwater Investigation Recommended for Selected Alignment

APEC ID	Description and Location	PCOCs	Location and Distance to Selected Alignment (m)	Risk Classification	Length of Risk Area (m)	Figure
VP1	Campbell Mountain Landfill (901 Spiller Road) and associated sites which received Notices of Off-site Migration (750 Naramata Road, 730 Naramata Road, 1555 Randolph Road, 1655 Reservoir Road)	BTEX/VPH, LEPH/HEPH, PAHs, VOCs, PCBs, metals, phenols	On-site	High	564.18	3-B

Notes: APEC – Area of Potential Environmental Concern
BTEX – Benzene, Toluene, Ethylbenzene, Xylenes
PAHs – Polycyclic Aromatic Hydrocarbons
HEPH – Heavy Extractable Petroleum Hydrocarbons
PCBs – Polychlorinated Biphenyls
PCOCs – Potential Contaminants of Concern
LEPH – Light Extractable Petroleum Hydrocarbons
VPH – Volatile Petroleum Hydrocarbons
VOCs – Volatile Organic Compounds

If additional intrusive work is completed outside the selected alignment, the location should be cross-referenced with the full list of APECs in **Section 4.0** to determine whether contaminated soil or groundwater is likely to be encountered.

6.1.2 Environmental Permitting and Approvals

Based on the results of this EOA, Hemmera anticipates that several environmental permits and approvals will be required prior to proceeding with Project construction. A list of anticipated permits and approvals along with the estimated timeframe for issuance is provided in **Table 6.3**.

It is recommended that planning and construction be coordinated with the Campbell Mountain Landfill to comply with conditions of their landfill operating permit.

Table 6.3 Regulatory Approvals and Timelines for the Selected Alignment

Permitting Agency	Name of Permit, Approval, or Notification	Estimated Time to Be Issued once Submitted	Required for Selected Alignment
Fisheries and Oceans Canada	Request for Project Review	2–3 months	Yes
	Authorization under Paragraph 35(2)(b) (Authorization for Serious Harm)	Up to 150 days for Authorization (60 days to determine if application is complete, 90 days to issue once complete)	To be determined based on DFO determination of the Request for Project Review
	Scientific Fish Collection Permit	2–4 weeks	No
Environment and Climate Change Canada	Section 73 Permit	3 months	Yes – if destruction of critical habitat for Lewis's woodpecker, Great Basin spadefoot, western rattlesnake, desert nightsnake, or Great Basin gopher snake
OGC	Waste Discharge Authorization	3–6 months	Yes
	Short-term Water Use Approvals / Changes in and about a Stream	Issued with OGAA permit	Yes
MFLNRORD	General Wildlife Salvage Permit	1 month	Yes
	Scientific Fish Collection Permit	1 month	Yes
Regional District of Okanagan-Similkameen	Development within ALR Permit	~ 2 months	Yes
	Environmentally Sensitive Area Development Permit	-	No, FortisBC has received exemption from RDOS[1]
	Watercourse Development Permit	-	No, FortisBC has received an exemption from RDOS[1]
City of Penticton	OCP Bylaw No. 2019-08 (Riparian Development Permit Area)	~ 2 months	Yes, possible qualifying exemption as utility improvement
	OCP Bylaw No. 2019-08 (Natural Development Permit Area)		Yes
	Earthworks Permit Bylaw No. 2006-65		Yes
	Blasting Permit Bylaw No. 2016-16		Yes
	Permit to Discharge Bylaw No. 2005-02		Yes
	Development within ALR permit		Yes

Note:

~ indicates “approximately”

[1] personal communications with FortisBC

7.0 GUIDING DOCUMENTS, BEST MANAGEMENT PRACTICES, AND MITIGATION MEASURES

Project activities have the potential to negatively impact environmental receptors discussed in **Section 4.0**. Many of these impacts can be avoided or minimized through the implementation of standard best practices and mitigation measures developed to minimize potential adverse effects. Adhering to best practices also supports compliance with applicable legislation.

7.1 Guiding Documents and Best Management Practices

Guiding documents and Best Management Practices (BMPs) ensure that a project is planned and carried out in compliance with industry-specific and proven methods or procedures. Guiding document and BMPs that should be followed during Project activities, where practical, include the following:

7.1.1 Guiding Documents

- A Field Guide to Fuel Handling, Transportation and Storage (MWLAP 2002)
- A User's Guide to Working in and Around Water (MOE 2009a)
- BC OGC Environmental Protection and Management Guideline, Version 2.6 (OGC 2018)
- BC Water Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (ECCS 2019c)
- BC Approved Source Drinking Water Quality Guidelines (ECCS 2017)
- Fisheries Protection Policy Statement (DFO 2013a)
- FortisBC Generic Environmental Management Plan Small to Medium Projects (Tera 2015)
- FortisBC Generic Environmental Management Plan for Work in and About Water (Westland 2012)
- Guidance on Contaminated Sites #1, Site Characterization and Confirmation Testing (MOE 2009c)
- Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2013b)
- Oil and Gas Waste Regulation – Users Guide (Draft) (MOE 2007)
- Standards and Best Practices for Instream Works: Pipeline Crossings (MOE and DFO 2015).

7.1.2 Best Management Practices

- Best Management Practices for Amphibians and Reptile Salvages in BC (MFLNRO 2016)
- Best Management Practices for Bats in British Columbia (MOE 2016)
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (MOE 2014)
- Guidelines for Amphibian and Reptile Conservation during Urban and Rural Development in British Columbia (MFLNRO 2014)
- Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (MOE 2013)
- Land Development Guidelines for the Protection of Aquatic Habitat (DFO 1993)
- Best Practices for Managing Invasive Plants for Oil and Gas Operations (PRRD and ISCBC 2013)
- Best Management Practices for Tree Topping, Limbing and Removal in Riparian Areas (MOE 2009b).

7.2 Mitigation Measures

Project-specific and site-specific mitigation measures are typically developed once the project design, timing, footprint, and construction method have been finalized. They are developed to minimize or reduce an anticipated adverse effect.

7.2.1 Design Considerations

To the extent practicable, Project design should avoid impacts to sensitive habitats and species. Activities with locational flexibility (e.g., equipment storage, temporary workspace) should be situated away from sensitive areas or configured to avoid interacting with the sensitive habitat or feature.

7.2.2 Project Timing

Project construction should be timed to avoid or minimize impacts to sensitive environmental receptors. There are least-risk timing windows established as guidelines to protect fish species, breeding birds, and sensitive periods for other wildlife species.

7.2.2.1 Breeding Bird and Bat Least-risk Windows

Where possible, vegetation clearing and removal should be conducted outside the breeding bird nesting period to avoid disturbance or destruction of active bird nests. The general nesting period for migratory birds may start as early as late March and extend until mid-August (ECCC 2018). The following resources provide applicable breeding bird windows; however, nesting periods for the selected alignment should be determined by a QEP ahead of construction:

- Government of Canada region-specific nesting period calendars (ECCC 2018)
- Okanagan Timing Windows for Nesting Birds (ECCS 2019b)
- Bird Studies Canada Nesting Calendar Query Tool (Bird Studies Canada n.d.)

If the breeding bird window cannot be avoided, pre-construction nest surveys should be undertaken by a QEP prior to any clearing of vegetation within suitable nesting habitat.

There are 17 species of bats reported to occur regularly in BC (Nagorsen et al. 2018). Eight species are provincially Red- or Blue-listed (CDC 2019). Two species are listed by SARA as endangered: little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*), and one species (spotted bat (*Euderma maculatum*), is listed as special concern. Additional guidance (forestry-specific BMPs for bats) is currently being developed by the ECCS as Chapter 7 in the provincial BMP series (MOE 2016). Specific considerations, including timing restrictions, are being afforded to tree-type nursery roosts. In accordance with the draft guidance, Hemmera recommends that a QEP be consulted if removal of trees is anticipated, as this activity may affect tree roosting habitat for bats, including little brown myotis. Site-specific scheduling may be required when non-volant bat pups may be present in tree roosts.

7.2.2.2 Fisheries Least-risk Timing Windows

Fisheries work windows have been developed to minimize impacts to fish within streams and waterbodies. Any construction within fish-bearing streams should take place during these windows. The general timing windows, based on known occurrences of fish species, may start in early June and extend until late October (ECCS 2019b). The following resources can be used to determine applicable fisheries timing windows:

- Okanagan, Similkameen and Upper Shuswap Fisheries Timing Windows (MFLNRORD 2018)
- Okanagan Fisheries Species and General Timing Window (ECCS 2019b)

7.2.2.3 Amphibians and Turtle General Least-risk Periods

Amphibians and turtles are sensitive to work in and around aquatic features, particularly around ponds and wetlands. The general least-risk period for these species varies according to species and geographic location. In areas where amphibians and turtles are expected, construction should be avoided during hibernation, breeding, and migration periods, as determined by a QEP.

7.2.3 Fish and Wildlife Salvage

Prior to any disturbance of aquatic habitats where fish or wildlife may be encountered, aquatic life-form (i.e., amphibians and fish) salvages are recommended. Any salvage will require necessary permits under the *Wildlife Act* (and potentially SARA) and the *Fisheries Act* if fish are expected.

7.2.4 Snake Management

Open trench construction can result in snakes getting stranded in the trench. Prior to construction, a thorough inventory for dens and suspected habitat should be conducted by a QEP; the ideal period for detection is spring. Based on the presence of high-quality habitat and/or dens or the likelihood for moderate to high mortality, mitigation strategies can include rerouting, skinny stretches, or fencing (Sarell, M., pers. Comm, April 2020).

During construction, best management practices include:

- Removing surface cover objects within workspace prior to construction
- Monitoring excavation and providing escape ramps for wildlife
- Promoting the laying of pipe and backfill as quickly as possible
- Monitoring trench for trapped snakes
- Preparing a relocation plan and permit, if required
- Including snake management practices in health and safety, and environmental orientation for all contractors.

7.2.5 Wetland Management

Wetlands provide important ecosystem functions and should be closely managed during construction. Best management practices for wetlands include (WSA 2009):

- To the extent practicable, maintain the natural flow of water in the wetland.
- Where present, carefully remove hydrophytic vegetation ensuring root systems are intact, maintain on site, and reinstall in the wetland footprint following construction.
- Carefully excavate wetland soils, maintaining their original stratification, and reinstall following construction.
- Use low ground impact and / or low impact road building techniques (e.g., wooden mats) where work in or near wetland soils is unavoidable to minimize compaction.
- Where possible, locate worksites for material and equipment storage and fabrication outside riparian areas and manage surface water flows to prevent sediment and contaminants form entering wetlands.
- Prevent establishment and spread of invasive species along right of way. Clean equipment before moving into new area where there is potential for transport of invasive species.
- Schedule activities to avoid critical breeding and rearing seasons and when activities will have the least impacts on wetland habitat (e.g., winter or dry periods). Follow the regional least risk windows for fish and wildlife.
- Suspend or limit operations when soils become saturated.
- Maintain the natural wetland hydrograph.
- Ensure drainage structures maintain an adequate flow of water into and out of the wetland to sustain water levels and drainage patterns.
- Use native grasses or other plant species to reseed bare, erodible riparian areas.
- Remove temporary fills and structures in wetlands to the extent practical when construction use is complete.

7.2.6 Site Restoration

Areas disturbed during construction should be restored to meet or improve upon pre-construction conditions, particularly for work within the ALR, in and around fish habitat, and near important wildlife habitat features. Project-specific restoration plans should be developed that outline how to stabilize any disturbed areas while maximizing the resultant conditions and habitat values for environmental receptors.

7.2.7 Contaminated Soil and Groundwater Management

Within the APECs identified along the proposed Project alignment, there is the potential for contaminated soil and groundwater to be encountered during construction. This poses a budget and schedule risk to the Project. Where construction work is planned within medium- and high-risk APECs, additional soil and groundwater investigation is recommended to determine if contamination is present, quantify expected volumes of soil and groundwater that will require management, and refine the estimated liability. The investigation will allow for the development of a soil and water management plan to be used during the Project planning (e.g., tendering) and will guide the management of these materials during construction. Within low-risk APECs, the potential for encountering contamination is low, and any contaminated soil or groundwater encountered during construction activities should be managed on a case by case basis.

7.2.8 Environmental Management Plan and Environmental Monitoring

All construction should be undertaken in accordance with FortisBC's Environmental Management Plans (Tera 2015, CH2MHill 2016). Additionally, a Project-specific Construction Environmental Management Plan should be developed by a QEP, where appropriate. The Construction Environmental Management Plan should address factors such as erosion and sediment control, and spill prevention and response, and should provide other applicable site-specific measures to avoid or mitigate potential negative impacts to environmental resources.

Environmental construction monitoring should also be utilized to ensure the proper implementation of these mitigation measures and to confirm that any potential negative effects to the environment are avoided or minimized.

8.0 CLOSURE

The content of this report is based on information obtained by Hemmera during desktop studies and by the field crews during the PFR and follow-up field reconnaissance. The findings presented herein should be considered within the context of the scope of work and Project terms of reference; further, the findings are time-sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

We sincerely appreciate the opportunity to have assisted you with this Project, and if there are any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

Report prepared by:
Hemmera Envirochem Inc.

ORIGINAL SIGNED BY

Sarah Wyness, M.Sc., R.P.Bio.
Biologist

Report prepared by:
Hemmera Envirochem Inc.

ORIGINAL SIGNED BY

Evelyn Playle, P.Eng
Environmental Engineer

Report reviewed by:
Hemmera Envirochem Inc.

ORIGINAL SIGNED BY

Trevor Welton
Vice-President, BC/YT

Report reviewed by:
Hemmera Envirochem Inc.

ORIGINAL SIGNED BY

Karey Dow, P.Ag., PMP
Business Leader, SAR

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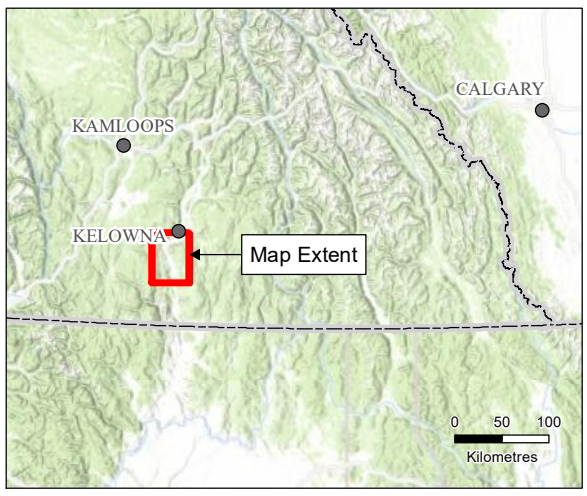
FIGURES



KELOWNA

33

97

Okanagan Lake

Chute Lake

PENTICTON

97

Skaha Lake

Legend

- Proposed OLI PEN 406
- Highway
- Road
- Municipal Boundary

Notes

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Sources

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- Basemap: ESRI World Topographic Base

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Kilometres

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Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Project Overview
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 1

Hemmera An Ausenco Company

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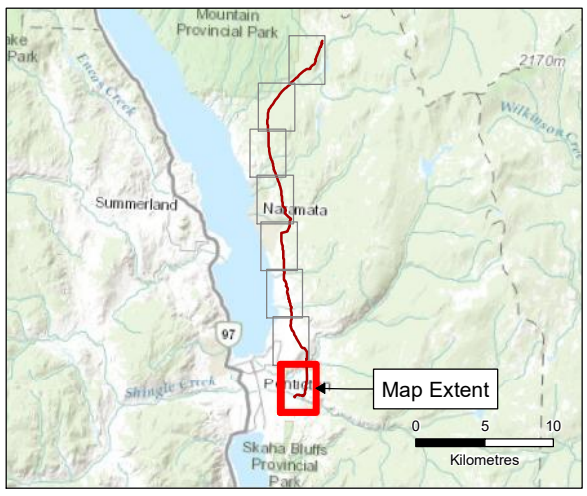

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Provincial
- Municipal
- Private
- Unknown

Notes

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Sources

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- Inset Basemap: ESRI World Topographic Map

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Metres

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-A

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Solaris Management Consultants Inc.

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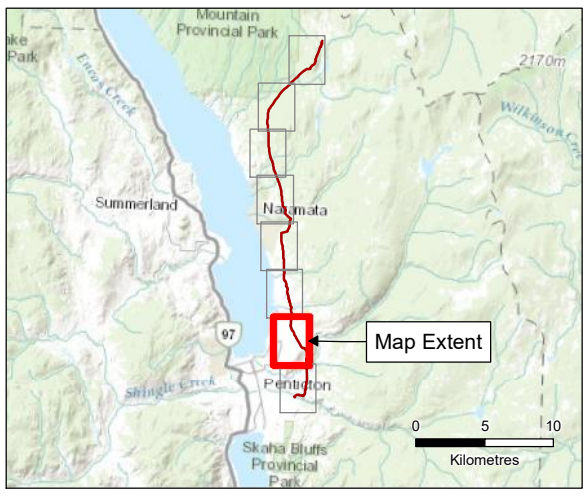

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Provincial
- Municipal
- Private
- Unknown

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-B

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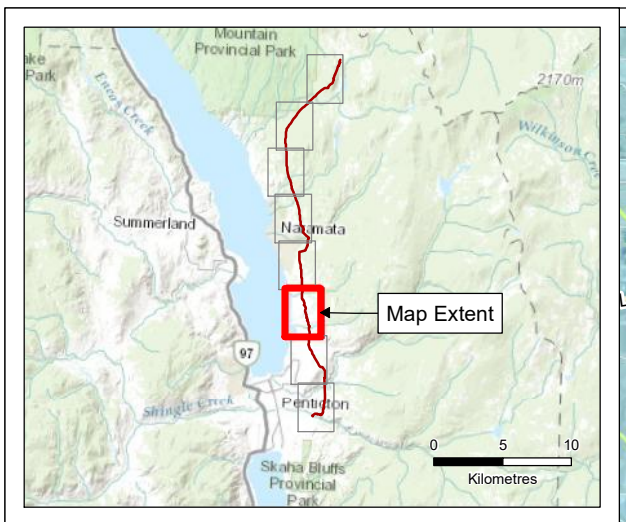

NARAMATA RD
MAYNARD RD
SUTHERLAND RD
FLEET RD
RIDDLE RD
THREE MILE RD
SPILLER RD
POPLAR GROVE RD
TODD RD
VISTA PL
DAVENPORT AVE
LOCHORE RD
EVANS AVE
CARDER RD
Okanagan Lake
ALR

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Provincial
- Municipal
- Private
- Unknown

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-C

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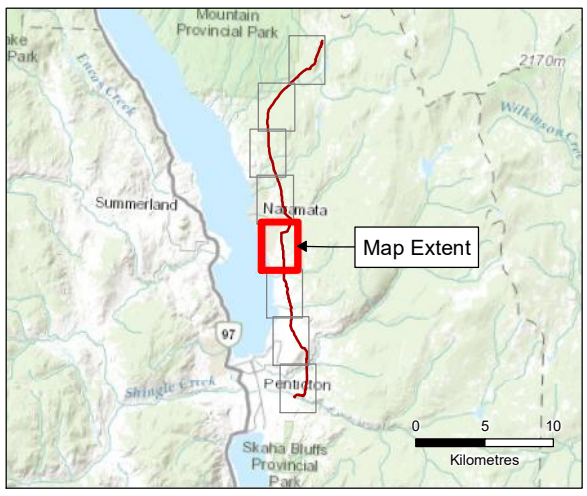

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Provincial
- Municipal
- Private
- Unknown

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-D

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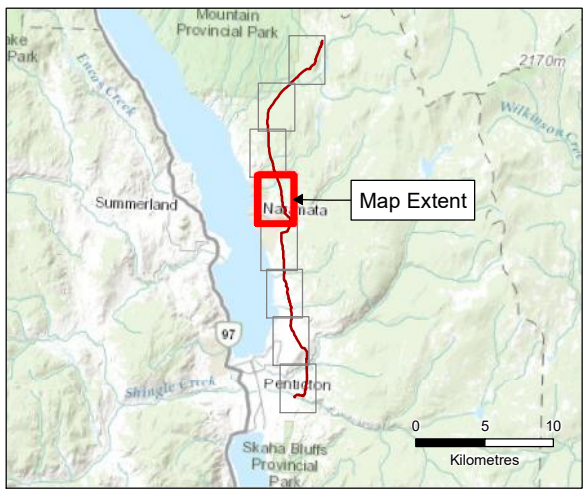

Okanagan Lake
N NARAMATA RD
LANGUEDOC RD
ALR
MILL RD
CLARKE RD
GULCH RD
HOOK PL
BOOTHE RD
KING DR
SALTING RD
WISEMAN PL
PARTRIDGE RD
RITCHIE AVE
3RD ST
4TH ST
ELLIS AVE
KATHLEEN RD
8TH ST
BARTLETT RD
MCKAY RD
ROBINSON AVE
LYONS RD
SMETHURST RD
ARAWANA FSR
LOWER DEBECK RD
HAYMAN RD
OLD MAIN RD
FLAGSTONE RISE
ARAWANA RD
AIKENS LOOP
NARAMATA RD
GAMMON RD
NOYES RD
WORKMAN PL

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Agency
- Crown Provincial
- Municipal
- Private
- Unknown

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-E

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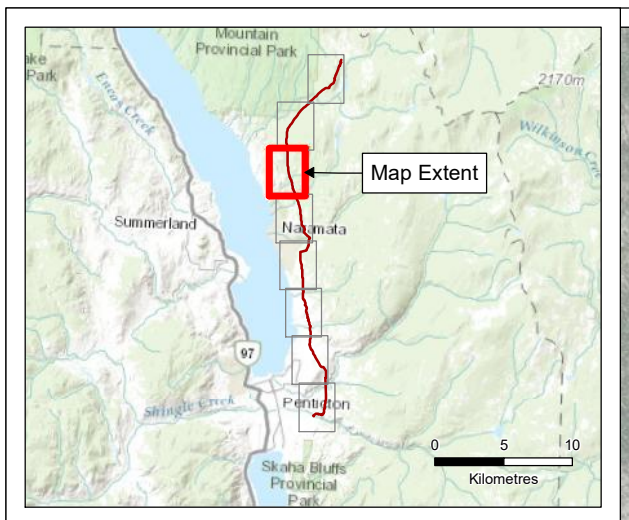

N NARAMATA RD

Okanagan Lake

LANGUEDOC RD

ALR

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Agricultural Land Reserve
- Property Line

Land Ownership

- Crown Provincial
- Municipal
- Private
- Unknown

Notes

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NAD 1983 UTM Zone 11N

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-F

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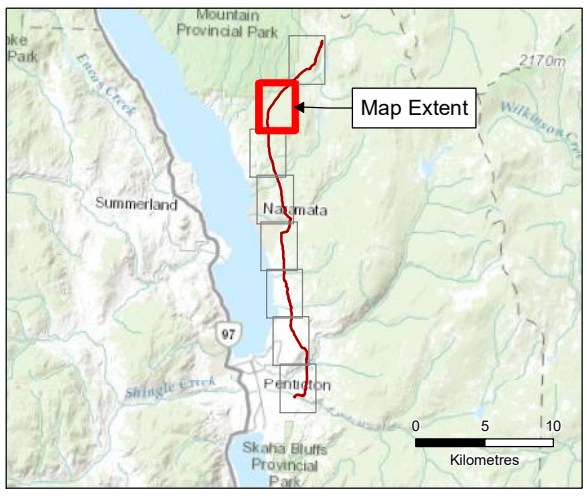

CHUTE LAKE RD

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Property Line

Land Ownership

- Crown Provincial
- Private

Sources

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Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-G

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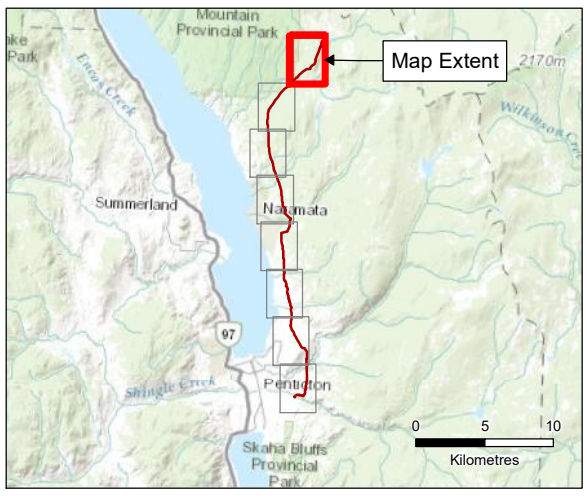

Gemmill Lake

Chute Lake

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Property Line

Land Ownership

- Crown Provincial
- Private

Sources

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- Inset Basemap: ESRI World Topographic Map

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Page Size: 11" x 17"

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Land Use Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 2-H

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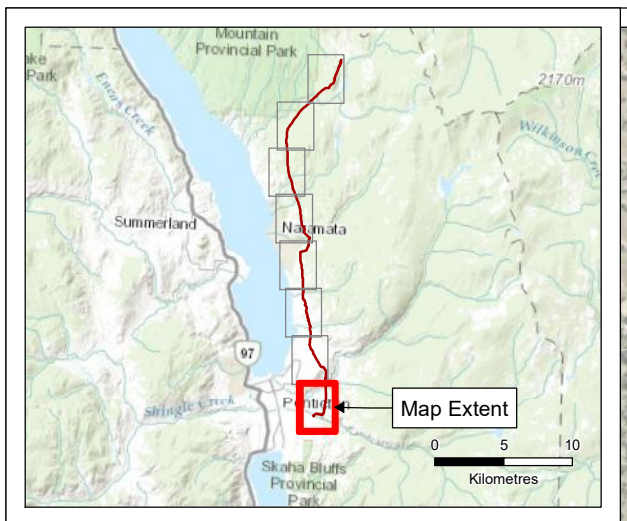

APEC VP2:
1945 CARMI AVENUE, PENTICTON

SITE ID: 12345

L

HUDSON ST
MCPHERSON CRES
UTILITY ACCESS RD
GLEN PL
PENTICTON AVE
EDGEWOOD DR
DEBECK RD
KENDALL CRES
RIDGEDALE AVE
E DUNCAN AVE
LAWRENCE AVE
SYER RD
JOY RD
CARMI RD
MONTREAL ST
PINE ST
NAISH DR
COLUMBIA ST
ALLISON ST
CLELAND DR
BRACEWELL DR
HATFIELD AVE
MACCLEAVE AVE
DUNANT CRES
CARMI AVE
DEWDNEY CRES
DARTMOUTH RD
COMMERCIAL WAY
PANORAMA RIDGE RD
E OKANAGAN AVE
SALIKEN DR
DALOC RD
BEAVERDELL RD
WESTVIEW DR
ROGERS CRES
DARTMOUTH DR
WILTSE DR
STEVENS CRES
WILTSE BLVD
STOCKS CRES
EVERGREEN DR
BALSAM AVE
CEDAR RD
PINEVIEW RD
AARON CRT
PARTRIDGE DR
JUNIPER DR

Legend

- BC ENV Site Registry Listing
- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- L — Low Risk of Contamination
- M — Medium Risk of Contamination
- H — High Risk of Contamination
- Area of Potential Environmental Concern (APEC)
- Property Line

Notes

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- Inset Basemap: ESRI World Topographic Map

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-A

Hemmera
An Ausenco Company

Solaris Management Consultants Inc.

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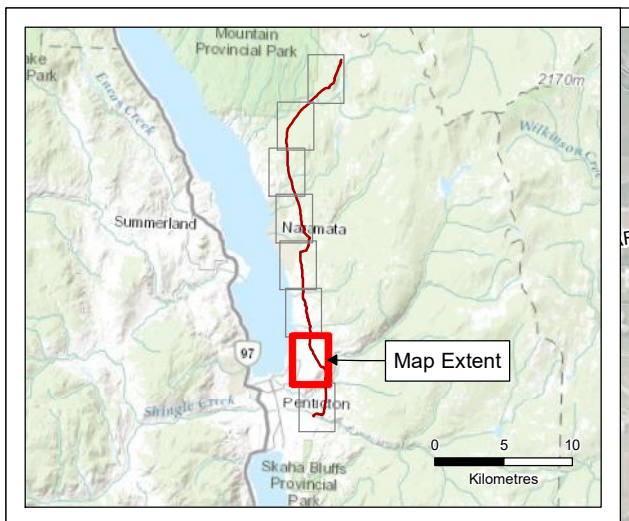

APEC VP1: CAMPBELL MOUNTAIN LANDFILL AND ASSOCIATED SITES

APEC VP2: 1945 CARMI AVENUE, PENTICTON

SITE ID: 4712
SITE ID: 18617
SITE ID: 18615
SITE ID: 18613
SITE ID: 18616
SITE ID: 12345

SPILLER RD
R GROVE RD
TODD RD
VISTA PL
PINETREE WAY
FALCONRIDGE DR
DAVENPORT AVE
LOCHORE RD
EVANS AVE
CARDER RD
NARAMATA RD
GREYBACK MOUNTAIN RD
LOWER BENCH RD
CORBISHLEY AVE
N UPPER BENCH RD
MUNSON AVE
MIDDLE BENCH RD N
MCMILLAN AVE
RESERVOIR RD
TUPPER AVE
MUTCH AVE
HILLSIDE RD
E WESTMINSTER AVE
MIDDLE BENCH RD S
S UPPER BENCH RD
JOHNSON RD
ACACIA CRES
TRURO ST
ALDER ST
HUDSON ST
HEATHER RD
CREEKSIDE RD
FORESTBROOK DR
KILWINNING ST
KING ST
NELSON AVE
MCPHERSON CRES
PENTICTON AVE
UTILITY ACCESS RD
GLEN PL
RIDGEDALE AVE
CARMI AVE
CARMI RD
JOY RD

Legend

- BC ENV Site Registry Listing
- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Low Risk of Contamination
- Medium Risk of Contamination
- High Risk of Contamination
- Area of Potential Environmental Concern (APEC)
- Property Line

Notes

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- Inset Basemap: ESRI World Topographic Map

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Metres

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-B

Hemmera An Ausenco Company

Solaris Management Consultants Inc.

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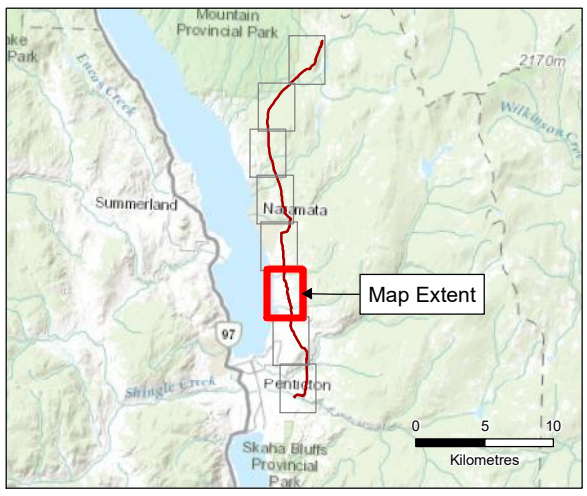

NARAMATA RD
MAYNARD RD
SUTHERLAND RD
FLEET RD
RIDDLE RD
THREE MILE RD
SPILLER RD
POPLAR GROVE RD
TODD RD
VISTA PL
DAVENPORT AVE
LOCHORE RD
EVANS AVE
CARDER RD
APEC VP1: CAMPBELL MOUNTAIN LANDFILL AND ASSOCIATED SITES
SITE ID: 4712

Legend

- BC ENV Site Registry Listing
- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Low Risk of Contamination
- Medium Risk of Contamination
- High Risk of Contamination
- Area of Potential Environmental Concern (APEC)
- Property Line

Notes

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-C

Hemmera
An Ausenco Company

Solaris Management Consultants Inc.

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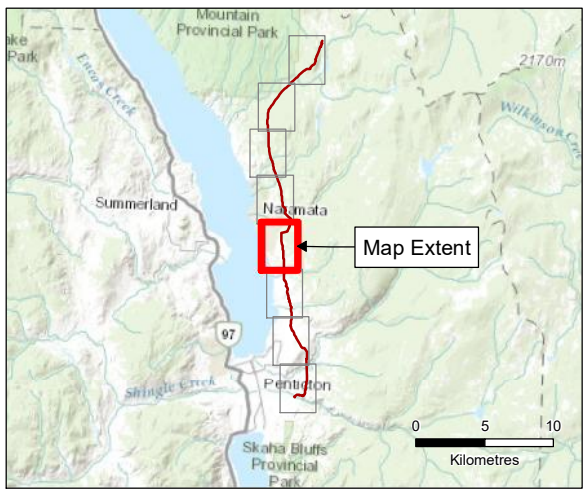

HAYMAN RD
OLD MAIN RD
AIKENS LOOP
TILLER RD
SAMMET RD
NOYES RD
WINIFRED RD
WORKMAN PL
GAMMON RD
GAWNE RD
NUTTALL RD
NARAMATA RD
N NARAMATA RD
DEBECK RD
LYONS RD
SMETHURST RD
JUNIPER RD
SLATE PL
FLAGSTONE RISE
ARAWANA RD
ARAWANA FSR

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Low Risk of Contamination
- Medium Risk of Contamination
- High Risk of Contamination
- Property Line

Notes

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NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-D

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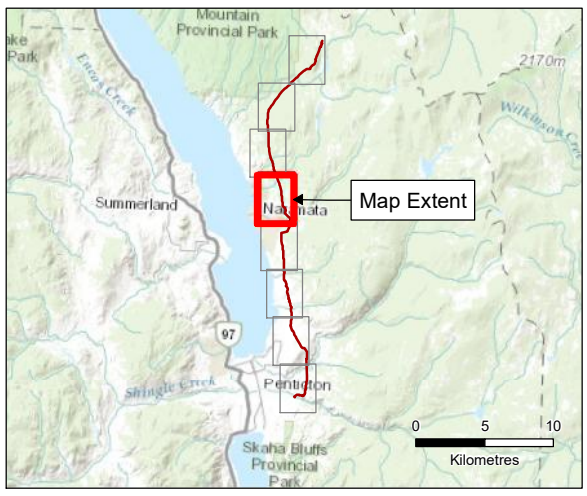

N NARAMATA RD
LANGUEDOC RD
MILL RD
CLARKE RD
GULCH RD
HOOK PL
BOOTHE RD
1ST ST
KING DR
SALTING RD
WISEMAN PL
PARTRIDGE RD
RITCHIE AVE
3RD ST
4TH ST
ELLIS AVE
KATHLEEN RD
8TH ST
BARTLETT RD
MCKAY RD
ROBINSON AVE
LYONS RD
SMETHURST RD
ARAWANA FSR
LOWER DEBECK RD
DEBECK RD
JUNIPER RD
SLATE PL
FLAGSTONE RISE
ARAWANA RD
HAYMAN RD
OLD MAIN RD
AIKENS LOOP
NARAMATA RD
GAMMON RD
NOYES RD
WORKMAN PL

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Low Risk of Contamination
- Medium Risk of Contamination
- High Risk of Contamination
- Property Line

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-E

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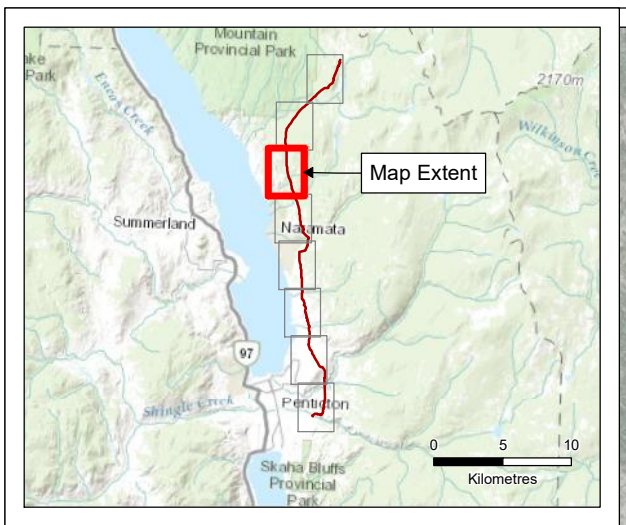

N NARAMATA RD

LANGUEDOC RD

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- L — Low Risk of Contamination
- M — Medium Risk of Contamination
- H — High Risk of Contamination
- Property Line

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-F

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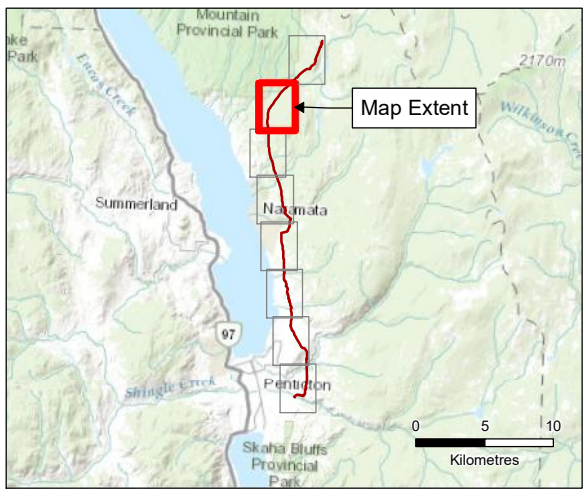

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- L — Low Risk of Contamination
- M — Medium Risk of Contamination
- H — High Risk of Contamination
- Property Line

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-G

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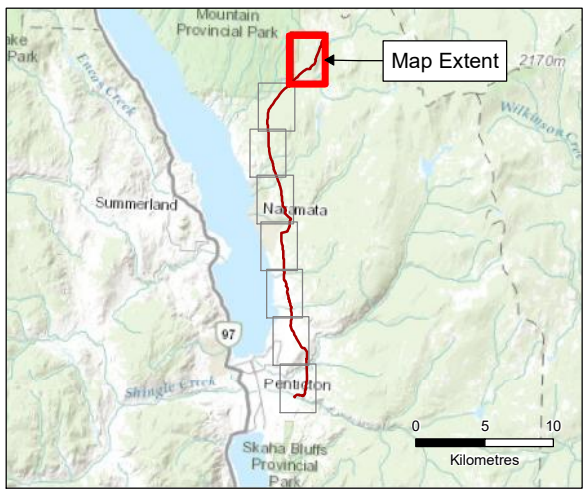

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- L — Low Risk of Contamination
- M — Medium Risk of Contamination
- H — High Risk of Contamination
- Property Line

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Contaminated Sites Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 3-H

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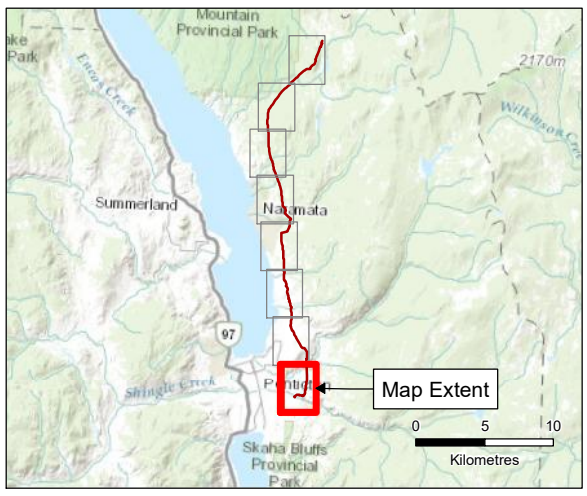

SC
DT
DK
OCU03-05
OCU03-04
OCU03-03
NCD-01
OCU03-02
OCU03-01
PALE EVENING-PRIMROSE
PALE EVENING-PRIMROSE
Penticton Creek
Steward Creek
Wetland-1
Saliken Drive Wetland
GREAT BASIN SPADEFOOT
AMERICAN BADGER *
BT BU DK HA HT LO
DK KS
BT DK DT HA HT SC
AA DK
DK KS
DK KS
DK KS
DK
HUDSON ST
PENTICTON AVE
UTILITY ACCESS RD
GLEN PL
SENDERO CRES
HOLDEN RD
JOY RD
CARMI RD
LAWRENCE AVE
SYER RD
PANORAMA RIDGE RD
DALOC RD
BEAVERDELL RD
SALIKEN DR
Ellis Creek
DEWDNEY CRES
CLELAND DR
BRACEWELL DR
HATFIELD AVE
COLUMBIA ST
MACCLEAVE AVE
DUNANT CRES
CARMI AVE
COMMERCIAL WAY
E OKANAGAN AVE
E DUNCAN AVE
RIDGEDALE AVE
NAISH DR
PINE ST
MONTREAL ST
EDGEWOOD DR
DEBECK RD
KENDALL CRES
DARTMOUTH RD
WESTVIEW DR
ROGERS CRES
DARTMOUTH DR
WILTSE DR
WILTSE BLVD
STEVENS CRES
STOCKS CRES
EVERGREEN DR
BALSAM AVE
CEDAR RD
PINEVIEW RD
PARTRIDGE DR
JUNIPER DR
MCPHERSON CRES

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- NCD (Non-Classified Drainage) Location
- Watercourse Crossing
- Watercourse
- Lake
- Wetland
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

- ESDP Area
- Important Ecosystem

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-A

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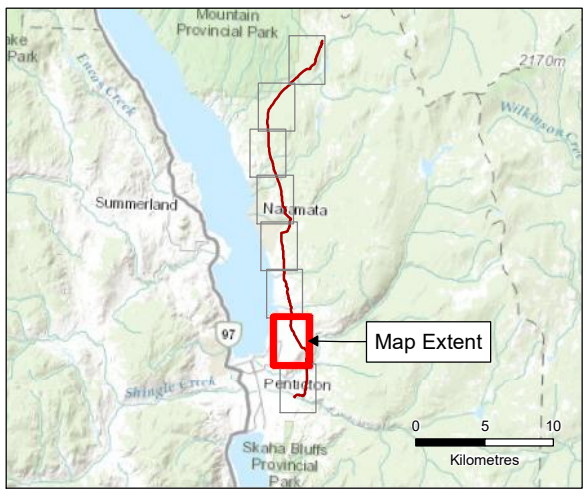

Strutt Creek
Randolph Creek
Penticton Creek
Steward Creek
SPILLER RD
VISTA PL
PINETREE WAY
FALCONRIDGE DR
TODD RD
DAVENPORT AVE
LOCHORE RD
EVANS AVE
CARDER RD
LOWER BENCH RD
CORBISHLEY AVE
N UPPER BENCH RD
NARAMATA RD
RANDOLPH RD
GREYBACK MOUNTAIN RD
MUNSON AVE
MIDDLE BENCH RD N
MCMILLAN AVE
RESERVOIR RD
TUPPER AVE
MUTCH AVE
HILLSIDE RD
MIDDLE BENCH RD S
S UPPER BENCH RD
E WESTMINSTER AVE
JOHNSON RD
ACACIA CRES
HEATHER RD
TRURO ST
ALDER ST
HUDSON ST
CREEKSIDE RD
FORESTBROOK DR
KILWINNING ST
KING ST
NELSON AVE
PENTICTON AVE
MCPHERSON CRES
UTILITY ACCESS RD
RIDGEDALE AVE
LAWRENCE AVE
SENDERO CRES
HOLDEN RD
CARMI AVE
CARMI RD
JOY RD
AMERICAN BADGER *
PALE EVENING-PRIMROSE
OCU03-09
OCU03-08
OCU03-07
OCU03-06
OCU03-05
OCU03-04
OCU03-03
NCD-01
BU
HA
HC
HT
DK KS
SC
SJ
BY
DT
AA BY
BU RO
PV
BT DK HA
DK HT LS SJ
DT HA HT KS RK SJ
RK
AA
DK
SC

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- NCD (Non-Classified Drainage) Location
- Watercourse Crossing
- Watercourse
- Lake
- Wetland
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

- ESDP Area
- Important Ecosystem

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-B

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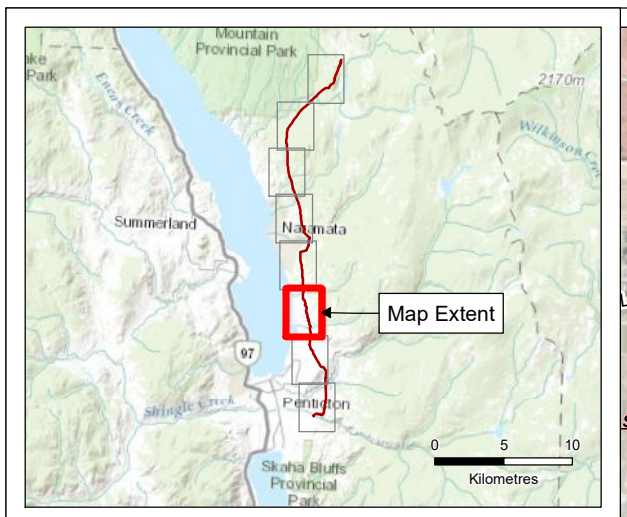

Okanagan Lake
Tumbull Creek
Johnson Spring Creek
Strutt Creek
Randolph Creek
SUTHERLAND RD
MAYNARD RD
FLEET RD
RIDDLE RD
THREE MILE RD
POPLAR GROVE RD
TODD RD
DAVENPORT AVE
EVANS AVE
LOCHORE RD
CARDER RD
SPILLER RD
VISTA PL
OCU03-12
OCU03-11
OCU03-10
OCU03-09
GREAT BASIN SPADEFOOT
WATER BIRCH / ROSES
NUTTALL'S COTTONTAIL
YELLOW-BREASTED CHAT
AMERICAN BADGER
TINY TASSEL

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse
- Lake
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

- ESDP Area
- Important Ecosystem

Notes

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-C

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Solaris Management Consultants Inc.

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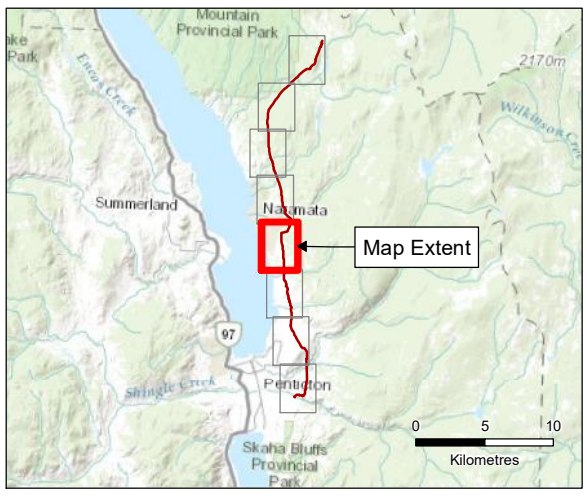

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01 | Production Date: Oct 20, 2020 | Figure 4-D

Hemmera An Ausenco Company

Solaris Management Consultants Inc.

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- NCD (Non-Classified Drainage) Location
- Watercourse Crossing
- Watercourse
- Lake
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

- ESDP Area
- Important Ecosystem

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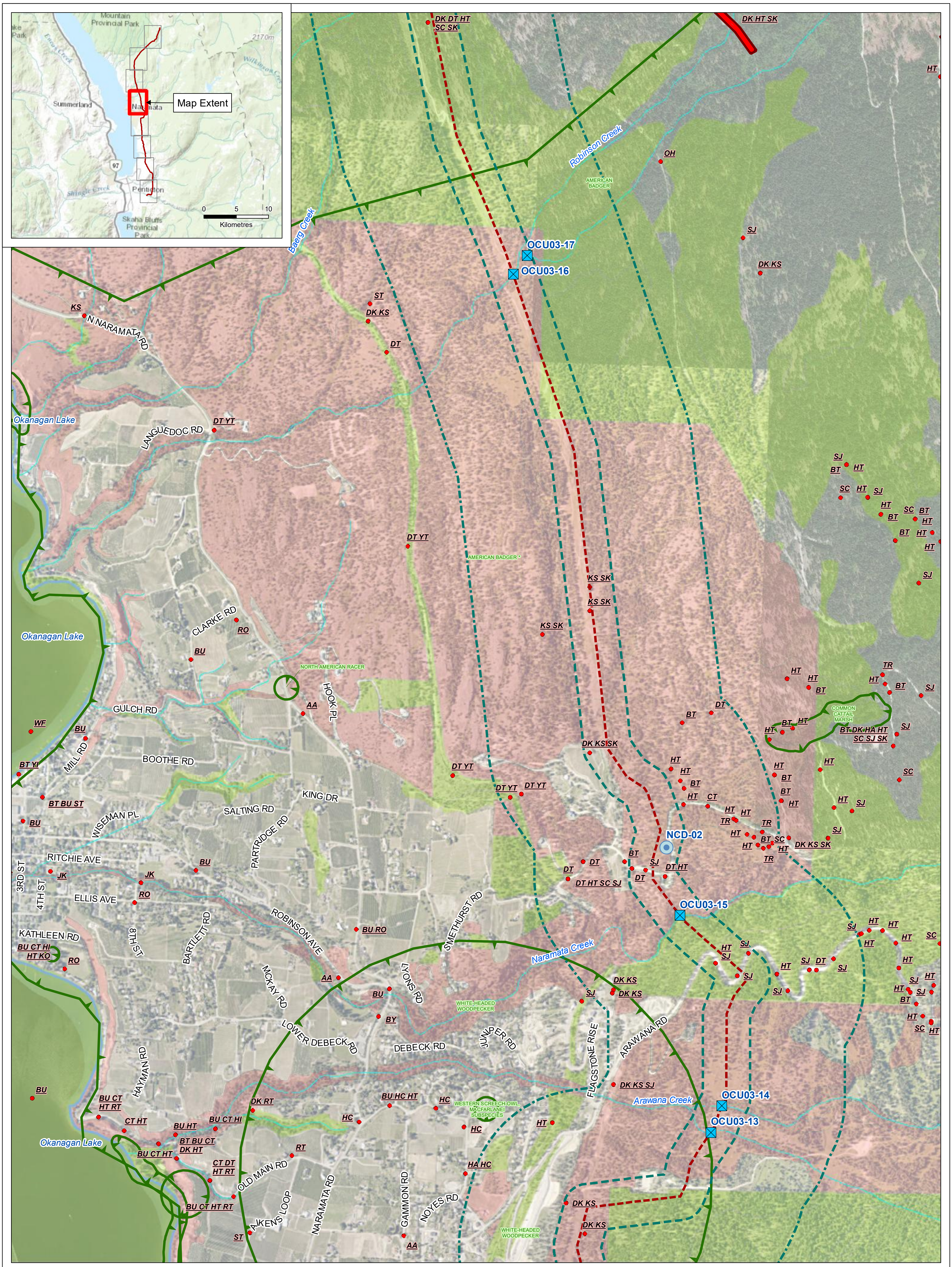

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- NCD (Non-Classified Drainage) Location
- Watercourse Crossing
- Watercourse
- Lake
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

- ESDP Area
- Important Ecosystem

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-E

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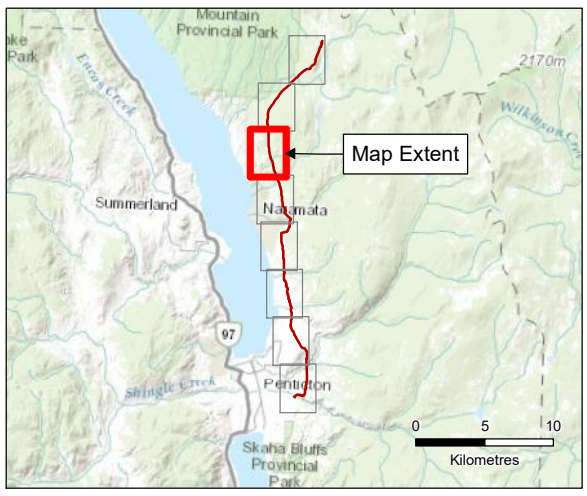

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SC TC
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TR
SC
SC
DK
HS TR
SC
DK KS
DK SK
OD TR
TR
BU SC SK
FLAMMULATED OWL
OD TR
TR
TR
DK DT SC SK
HT SC
SJ
WC_02
WC_01
DK HT SC SK TR
OCU03-18
DT YT
BU
DK DT RK
CANYON WREN
Trust Creek
Gliser Brook
FLAMMULATED OWL
AMERICAN BADGER
TR
BT
HT
HT
DK HT SK
TR
DK DT HT SC SK
Robinson Creek
OH
AMERICAN BADGER
SJ
DK KS
OCU03-17
OCU03-16
ST
DK KS
DT
N NARAMATA RD
KS
Okanagan Lake
Baerg Creek
DT YT
LANGUEDOC RD

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse
- New Watercourse
- Lake
- Wetland
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-F

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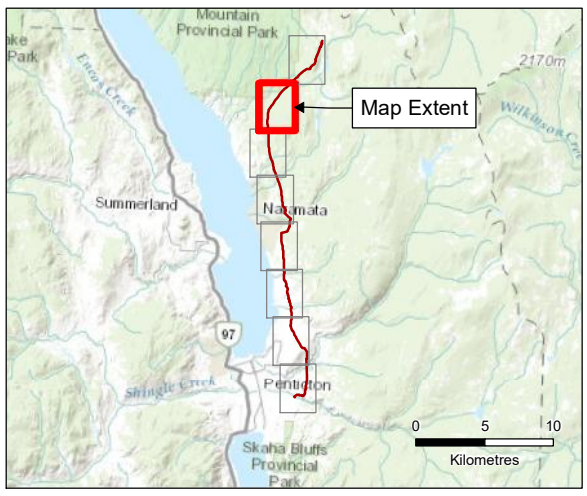

Wetland-2
NCD-07
NCD-06
NCD-05
NCD-04
NCD-03
OCU03-19
Chute Creek
CHUTE LAKE RD
AMERICAN BADGER
FLAMMULATED OWL
Gilser Brook

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- NCD (Non-Classified Drainage) Location
- Watercourse Crossing
- Watercourse
- Lake
- Wetland
- CDC Public Occurence
- Invasive Plant Site

Environmentally Sensitive Development Permit Areas

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-G

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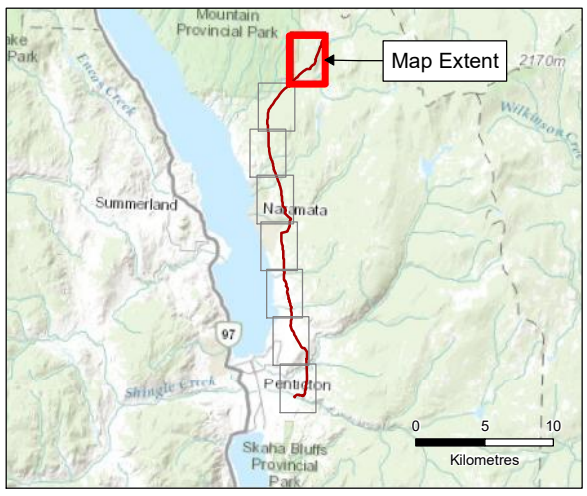

Wetland-4

Wetland-3

Wetland-2

OCU03-20

OCU03-19

NCD-07

Gemmill Creek

Gemmill Lake

Ratnip Creek

Chute Lake

Chute Creek

AMERICAN BADGER

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
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- Lake
- Wetland
- CDC Public Occurence
- Invasive Plant Site
- **Environmentally Sensitive Development Permit Areas**
- Important Ecosystem

Notes

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3. * = CDC public occurrence covers the entire map extent; therefore, no boundary is visible.

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 4-H

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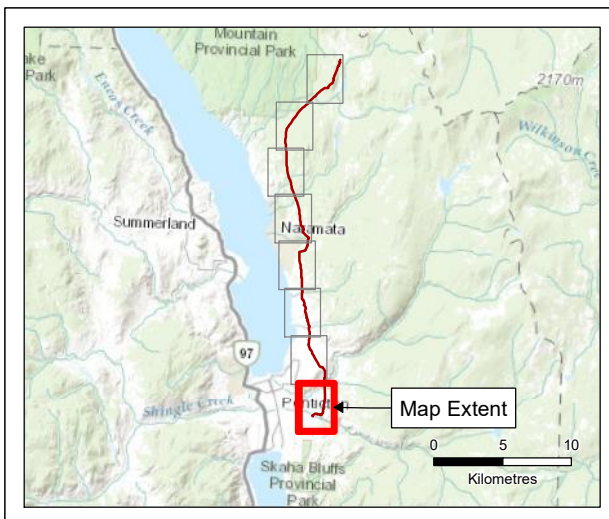

OCU03-05
OCU03-04
OCU03-03
OCU03-02
OCU03-01
Steward Creek
Penticton Creek
Ellis Creek
HUDSON ST
MCPHERSON CRES
UTILITY ACCESS RD
GLEN PL
SENDERO CRES
JOY RD
HOLDEN RD
CARMI RD
PENTICTON AVE
DEBECK RD
KENDALL CRES
EDGEWOOD DR
RIDGEDALE AVE
E DUNCAN AVE
LAWRENCE AVE
SYER RD
MONTREAL ST
PINE ST
NAISH DR
COLUMBIA ST
CLELAND DR
BRACEWELL DR
HATFIELD AVE
MACCLEAVE AVE
DUNANT CRES
CARMI AVE
DEWDNEY CRES
PANORAMA RIDGE RD
COMMERCIAL WAY
DARTMOUTH RD
E OKANAGAN AVE
SALIKEN DR
DALOC RD
BEAVERDELL RD
WESTVIEW DR
ROGERS CRES
DARTMOUTH DR
WILTSE DR
STEVENS CRES
WILTSE BLVD
STOCKS CRES
EVERGREEN DR
BALSAM AVE
CEDAR RD
PINEVIEW RD
PARTRIDGE DR
JUNIPER DR

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

- Lake
- Wetland

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-A

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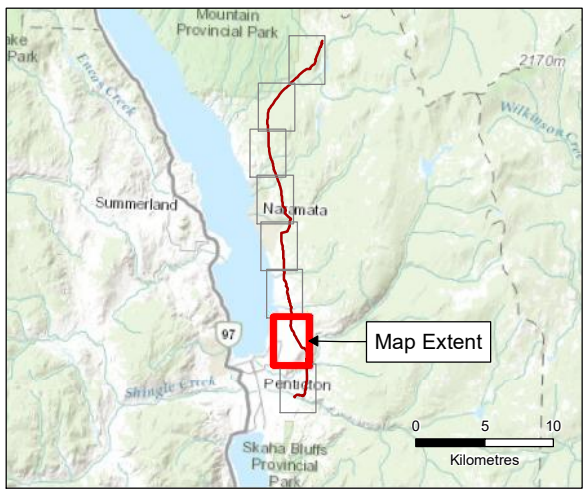

Strutt Creek
OCU03-09
SPILLER RD
R GROVE RD
TODD RD
VISTA PL
PINETREE WAY
FALCONRIDGE DR
DAVENPORT AVE
LOCHORE RD
Randolph Creek
EVANS AVE
CARDER RD
LOWER BENCH RD
CORBISHLEY AVE
NARAMATA RD
OCU03-08
GREYBACK MOUNTAIN RD
RANDOLPH RD
OCU03-07
OCU03-06
N UPPER BENCH RD
MUNSON AVE
MIDDLE BENCH RD N
MCMILLAN AVE
RESERVOIR RD
TUPPER AVE
MUTCH AVE
HILLSIDE RD
OCU03-05
E WESTMINSTER AVE
MIDDLE BENCH RD S
S UPPER BENCH RD
Steward Creek
JOHNSON RD
ACACIA CRES
HEATHER RD
TRURO ST
ALDER ST
HUDSON ST
OCU03-04
OCU03-03
JOY RD
CREEKSIDE RD
Penticton Creek
FORESTBROOK DR
LAWRENCE AVE
SENDERO CRES
KILWINNING ST
KING ST
MCPHERSON CRES
UTILITY ACCESS RD
RIDGEDALE AVE
HOLDEN RD
CARMI AVE
CARMI RD
NELSON AVE
PENTICTON AVE

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

- Lake
- Wetland

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-B

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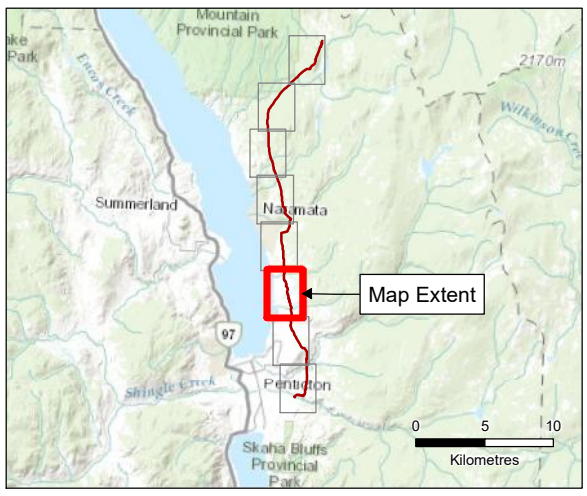

OCU03-12
OCU03-11
OCU03-10
OCU03-09
NARAMATA RD
MAYNARD RD
SUTHERLAND RD
FLEET RD
RIDDLE RD
THREE MILE RD
POPLAR GROVE RD
TODD RD
DAVENPORT AVE
LOCHORE RD
EVANS AVE
CARDER RD
SPILLER RD
VISTA PL
Okanagan Lake
Turnbull Creek
Johnson Spring Creek
Strutt Creek
Randolph Creek

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

- Lake

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-C

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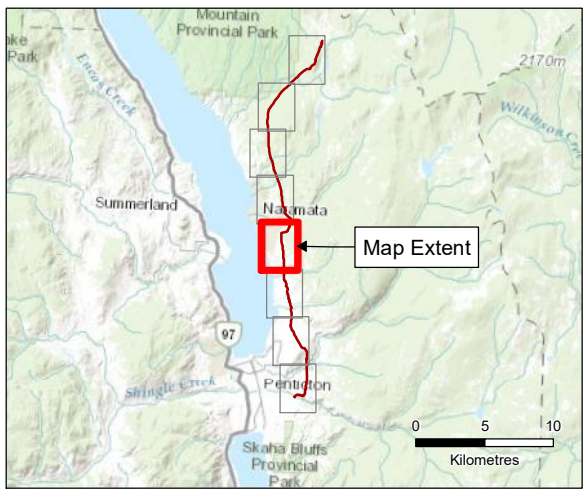

OCU03-15
OCU03-14
OCU03-13
OCU03-12
SMETHURST RD
LYONS RD
N NARAMATA RD
DEBECK RD
JUNIPER RD
FLAGSTONE RISE
ARAWANA RD
ARAWANA FSR
Naramata Creek
Arawana Creek
HAYMAN
OLD MAIN RD
AIKENS LOOP
NOYES RD
WINIFRED RD
WORKMAN PL
TILLER RD
SAMMET RD
GAMMON RD
GAWNE RD
NUTTALL RD
NARAMATA RD
Okanagan Lake
Turnbull Creek
Johnson Spring Creek

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

- Lake

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Metres

NAD 1983 UTM Zone 11N

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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-D

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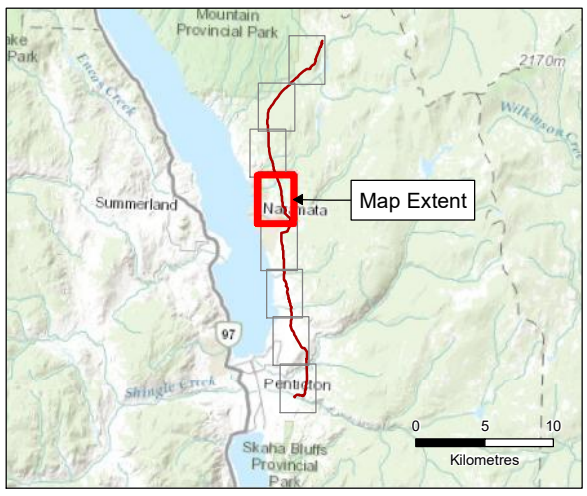

Robinson Creek
Baerg Creek
OCU03-17
OCU03-16
N NARAMATA RD
Okanagan Lake
LANGUEDOC RD
CLARKE RD
HOOK PL
GULCH RD
MILL RD
BOOTHE RD
KING DR
SALTING RD
WISEMAN PL
PARTRIDGE RD
RITCHIE AVE
3RD ST
4TH ST
ELLIS AVE
KATHLEEN RD
8TH ST
BARTLETT RD
MCKAY RD
ROBINSON AVE
LYONS RD
SMETHURST RD
OCU03-15
Naramata Creek
ARAWANA FSR
LOWER DEBECK RD
DEBECK RD
JUNIPER RD
FLAGSTONE RISE
ARAWANA RD
HAYMAN RD
Arawana Creek
OCU03-14
OCU03-13
OLD MAIN RD
AIKENS LOOP
NARAMATA RD
GAMMON RD
NOYES RD
WORKMAN PL

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse
- Lake

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-E

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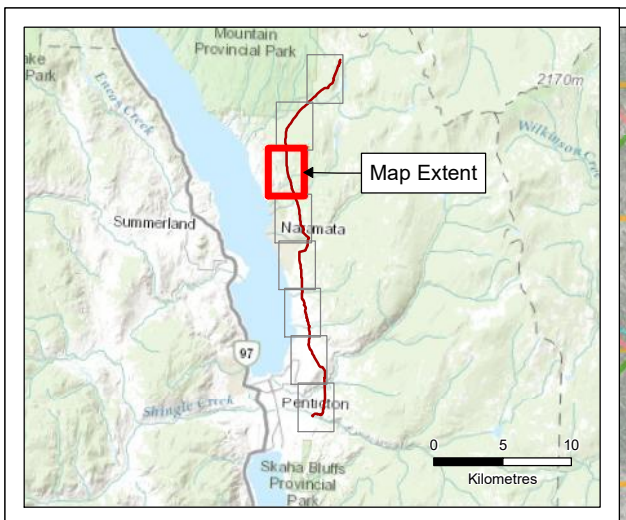

Gliser Brook
OCU03-18
Trust Creek
Robinson Creek
Baerg Creek
OCU03-17
OCU03-16
N NARAMATA RD
Okanagan Lake
LANGUEDOC RD

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-F

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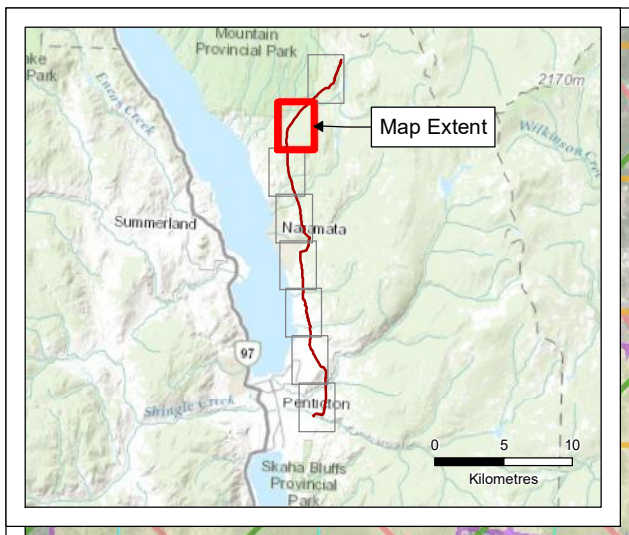

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
- Great Basin Spadefoot
- Lewis Woodpecker
- Western Rattlesnake

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- Wetland

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Metres

NAD 1983 UTM Zone 11N

Page Size: 11" x 17"

Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-G

Hemmera
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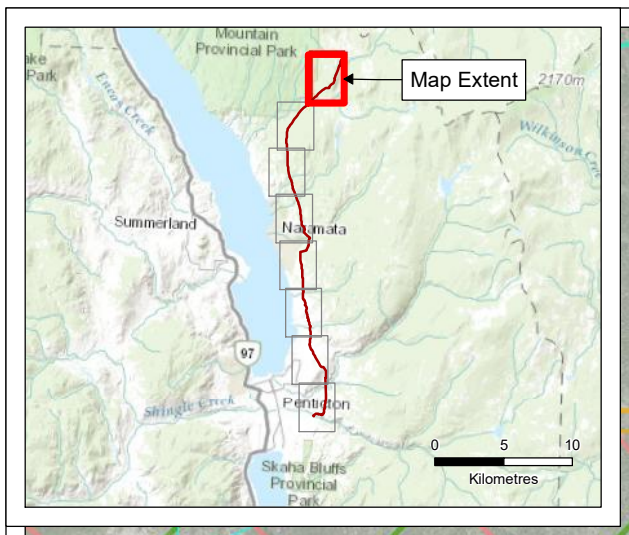

Legend

- Proposed OLI PEN 406
- 100 m Buffer
- 500 m Buffer
- Watercourse Crossing
- Watercourse

SARA Critical Habitat

- Desert Nightsnake
- Great Basin Gophersnake
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Okanagan Capacity Upgrade
Penticton to Chute Lake, BC

Ecological Considerations
SARA Critical Habitat
Proposed OLI PEN 406

104279-01	Production Date: Oct 20, 2020	Figure 5-H

Hemmera
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Solaris Management Consultants Inc.

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APPENDIX A
Photo Log

Photo 1 (Lat, Long: 49.47733, -119.552)
View of Ellis Creek, taken from north bank facing south toward gravel pit. November 19, 2019.

Photo 2 (Lat, Long: 49.47666, -119.548)
View of Ellis Creek at FortisBC alignment crossing. Photo taken from cliff above bank facing south. November 19, 2019.

Photo 3 (Lat, Long: 49.47666, -119.548)
View of representative vegetation at southern extent of study area. Photo facing east. November 19, 2019.

Photo 4 (Lat, Long: 49.48022, -119.546)
View of representative vegetation from Saliken Drive along the study area. Photo facing west. November 19, 2019.

Photo 5 (Lat, Long: 49.48510, -119.53)
No defined watercourse at mapped location. View of drainage swale perpendicular to power line access road; drainage culvert under access road. Photo facing east. November 19, 2019.

Photo 6 (Lat, Long: 49.49002, -119.536)
View of representative vegetation where the study area crosses Carmi Avenue. Photo facing north. November 19, 2019.

Photo 7 (Lat, Long: 49.49603, -119.536)
View of representative vegetation adjacent to Penticton Creek gully, which crosses the study area. Photo facing north. November 19, 2019.

Photo 8 (Lat, Long: 49.49603, -119.536)
View of Penticton Creek where it crosses the study area. Photo facing north (upstream). November 19, 2019.

Photo 9 (Lat, Long: 49.49425, -119.535)

View of potential drainage gully at mapped location of tributary to Penticton Creek. Photo facing east. November 19, 2019.

Photo 10 (Lat, Long: 49.51621, -119.549)

No defined watercourse at mapped location of southern tributary to Randolph Creek. View of potential drainage swale perpendicular to Reservoir Road. Photo facing west. November 19, 2019.

Photo 11 (Lat, Long: 49.51704, -119.548)

No defined watercourse at mapped location of Randolph Creek upper reach. Drainage culvert observed under Reservoir Road, but no evidence of scour. Photo facing east. November 19, 2019.

Photo 12 (Lat, Long: 49.51879, -119.551)

No defined watercourse at mapped location of northern tributary to Randolph Creek. Photo facing east. November 19, 2019.

Photo 13 (Lat, Long: 49.53750, -119.538)

View of Strutt Creek, taken upstream of study area due to access restrictions. Creek bed is 0.7 m wide and barely visible through vegetation. Photo taken off Spiller Road, facing north. November 19, 2019.

Photo 14 (Lat, Long: 49.53364, -119.562)

Strutt Creek not visible; view of storm drain downstream of study area. Photo taken from Naramata Road, facing east. November 19, 2019.

Photo 15 (Lat, Long: 49.54157, -119.561)
No defined watercourse at mapped location of Johnson Spring Creek at existing gas pipeline alignment. Photo from Riddler Road, facing north. November 19, 2019.

Photo 16 (Lat, Long: 49.54366, -119.558)
No defined watercourse at mapped location of Johnson Spring Creek within modified study area alignment. Photo from trail in 3 Blind Mice Disc Golf Course, facing east. November 19, 2019.

Photo 17 (Lat, Long: 49.55059, -119.563)
View of representative vegetation where Southerland Road parallels the study area. Photo facing north. November 19, 2019.

Photo 18 (Lat, Long: 49.55620, -119.570)
View of Turnbull Creek downstream of study area due to access restrictions. Photo taken from Naramata Road, facing east (upstream). November 19, 2019.

Photo 19 (Lat, Long: 49.58843, -119.566)
View of Arawana Creek culvert inlet under Flagstone Rise. Dry at the time of assessment, but evidence of scour observed. Photo from Flagstone Rise facing east (upstream). November 20, 2019.

Photo 20 (Lat, Long: 49.59386, -119.565)
View of representative vegetation adjacent to Naramata Creek where it crosses the study area. Photo from KVR Trail facing north. November 20, 2019.

Photo 21 (Lat, Long: 49.59386, -119.565)
View of Naramata Creek where it crosses the study area. Photo adjacent to KVR Trail facing south (upstream). November 20, 2019.

Photo 22 (Lat, Long: 49.59735, -119.564)
View of representative vegetation where Naramata Creek Forest Service Road. Photo facing north. November 20, 2019.

Photo 23 (Lat, Long: 49.60691, -119.568)
View of representative vegetation along power line access road parallel to the study area. Photo facing south. November 20, 2019.

Photo 24 (Lat, Long: 49.61922, -119.573)
View of Robinson Creek at power line access road culvert outlet. Photo facing west (downstream). November 20, 2019.

Photo 25 (Lat, Long: 49.61922, -119.573)
View of Robinson Creek at power line access road culvert inlet. Photo facing east (upstream). November 20, 2019.

Photo 26 (Lat, Long: 49.62619, -119.578)
View of representative vegetation along power line access road parallel to the study area. Photo facing south. November 20, 2019.

Photo 27 (Lat, Long: 49.47666, -119.548)

No defined watercourse at mapped location of Trust Creek. View of drainage swale perpendicular to power line access road; drainage culvert under access road. Photo facing east. November 20, 2019.

Photo 28 (Lat, Long: 49.47666, -119.548)

No defined watercourse at mapped location of Trust Creek. View of drainage swale perpendicular to power line access road; drainage culvert under access road. Photo facing west. November 20, 2019.

Photo 29 (Lat, Long: 49.65370, -119.584)
View of representative vegetation along study area. Photo taken along KVR Trail east of study area, facing west. November 20, 2019.

Photo 30 (Lat, Long: 49.67827, -119.570)
View of representative vegetation along study area. Photo facing northeast. November 20, 2019.

Photo 31 (Lat, Long: 49.68581, -119.557)
View of Chute Creek crossing study area. Photo taken along power line access road facing southwest. November 20, 2019.

Photo 32 (Lat, Long: 49. 68581, -119.557)
View of Chute Creek where it crosses the study area. Photo facing north (upstream). November 20, 2019.

Photo 33 (Lat, Long: 49.68458, -119.546)

No defined watercourse at mapped location; potential drainage swale. Photo taken from Chute Lake Road south of study area due to access restrictions. Photo facing north. November 20, 2019.

Photo 34 (Lat, Long: 49.70999, -119.532)

View of representative vegetation at northern extent of study area. Photo facing south. November 20, 2019.

APPENDIX B

Species of Concern Identified with Potential to Occur within Study Area

APPENDIX B

Table B.1 Wildlife Species of Concern Identified with the Potential to Occur Within Study Area

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
Mammals							
American badger	*Taxidea taxus*	1-E (Jun 2018)	E (Nov 2012)	Red			L
bighorn sheep	*Ovis canadensis*			Blue	Y		H
little brown myotis	*Myotis lucifugus*	1-E (Dec 2014)	E (Nov 2013)	Yellow			L
mountain goat	*Oreamnos americanus*			Blue	Y		L
Birds							
bald eagle	*Haliaeetus leucocephalus*		NAR (May 1984)	Yellow		Y	H
barn swallow	*Hirundo rustica*	1-T (Nov 2017)	T (May 2011)	Blue			M
common nighthawk	*Chordeiles minor*	1-T (Feb 2010)	SC (May 2018)	Yellow			M
evening grosbeak	*Coccothraustes vespertinus*	1-SC (May 2019)	SC (Nov 2016)	Yellow			M
flammulated owl	*Psiloscops flammeolus*	1-SC (Jun 2003)	SC (Apr 2010)	Blue	Y		L
golden eagle	*Aquila chrysaetos*		NAR (May 1996)	Yellow		Y	M
great blue heron, *herodias* subspecies	*Ardea herodias herodias*			Blue	Y	Y	L
lark sparrow	*Chondestes grammacus*			Blue	Y		L
Lewis's woodpecker	*Melanerpes lewis*	1-T (Jul 2012)	T (Apr 2010)	Blue	Y		H
olive-sided flycatcher	*Contopus cooperi*	1-T (FEB 2010)	SC (May 2018)	Blue			M

[1] **Nil**: Hemmera's current understanding of the species' range and known species habitat associations suggests the species is not expected to occur within the study area and its presence would be considered accidental. **Low**: Hemmera's current understanding of the species' range and known species habitat associations suggests the species is unlikely to occur within the study area with regularity or in adequate density to facilitate a functional population. Several ecological life-requisite stages would be challenged based on existing habitat conditions in the study area or connectivity with larger, more contiguous occurrence of the species. **Medium:** Hemmera's current understanding of the species range and known species habitat associations suggests that the species is expected to occur in the study area on a temporary or regular (i.e., predictable) seasonal basis and in densities that facilitate persistence of a functional population within the study area. **High:** Hemmera's current understanding of the species' range and known species habitat associations suggests that the species is expected to occur in the study area regularly, and in densities that would be expected to occur in provincial benchmark habitats.

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
osprey	*Pandion haliaetus*			Yellow		Y	M
peregrine falcon	*Falco peregrinus*	1-SC (N/A)	SC (Apr 2007)	No Status		Y	L
sandhill crane	*Antigone canadensis*		NAR (May 1979)	Yellow	Y		L
western screech-owl, *macfarlanei* subspecies	*Megascops kennicottii macfarlanei*	1-T (Jan 2005)	T (May 2012)	Blue	Y		L
Amphibians							
blotched tiger salamander	*Ambystoma mavortium*	1-E (Jun 2015)	E (Nov 2012)	Red	Y		L
Great Basin spadefoot	*Spea intermontana*	1-T (Aug 2016)	T (Nov 2019)	Blue	Y		M
western toad	*Anaxyrus boreas*	1-SC (Jan 2008)	SC (Nov 2012)	Yellow			H
Reptiles							
desert nightsnake	*Hypsiglena chlorophaea*	1-E (Jan 2005)	E (May 2011)	Red	Y		L
Gopher Snake, deserticola subspecies	*Pituophis catenifer deserticola*	1-T (Jul 2005)	T (Apr 2013)	Blue	Y		H
North American racer	*Coluber constrictor*	1-SC (Jun 2003)	T (Nov 2015)	Blue	Y		M
Northern Rubber boa	*Charina bottae*	1-SC (Jan 2005)	SC (Apr 2016)	Yellow			M
Painted turtle - intermountain - Rocky Mountain population	*Chrysemys picta pop. 2*	1-SC (Dec 2007)	SC (Nov 2016)	Blue	Y		L
western rattlesnake	*Crotalus oreganus*	1-T (Jan 2005)	T (May 2015)	Blue	Y		H
western skink	*Plestiodon skiltonianus*	1-SC (Jan 2005)	SC (Nov 2014)	Blue	Y		L
Insects							
Behr's hairstreak	*Satyrium behrii*	1-E (Jun 2003)	E (May 2012)	Red	Y		L
lance-tipped darner	*Aeshna constricta*			Blue	Y		M
monarch	*Danaus plexippus*	1-SC (Jun 2003)	E (Nov 2016)	Red	Y		L
Mormon fritillary, *erinna* subspecies	*Speyeria mormonia erinna*			Red	Y		L
Mormon metalmark	*Apodemia mormo*	1-E (Jan 2005)	E (May 2014)	Red	Y		L

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
olive clubtail	*Stylurus olivaceus*	1-E (Feb 2017)	E (May 2011)	Red	Y		M
pronghorn clubtail	*Phanogomphus graslinellus*			Blue	Y		M
sandhill skipper	*Polites sabuleti*			Red	Y		L
Sonora skipper	*Polites sonora*	1-SC (Dec 2007)	NAR (Nov 2016)	Blue	Y		L
viceroy	*Limenitis archippus*			Red	Y		L
vivid dancer	*Argia vivida*	1-SC (Feb 2019)	SC (May 2015)	Blue	Y		M
western river cruiser	*Macromia magnifica*			Blue	Y		L

Notes:
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
OGC – BC Oil and Gas Commission

Table B.2 Plant Species of Concern Identified with the Potential to Occur Within Study Area

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
Vascular plants							
Lyall's mariposa lily	*Calochortus lyallii*	1-SC	SC (May 2011)	Blue	Y		L
Rocky Mountain clubrush	*Schoenoplectiella saximontana*			Red	Y		L
Thurber's needlegrass	*Achnatherum thurberianum*			Blue	Y		M
intermediate candle snuffer moss	*Encalypta intermedia*			Blue	Y		L
Muhlenberg's cord-moss (Muhlenberg's funaria moss)	*Funaria muhlenbergii*			Blue	Y		N/L

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
Douglas-fir - ponderosa pine / bluebunch wheatgrass	*Pseudotsuga menziesii - Pinus ponderosa / Pseudoroegneria spicata*			Blue	Y		-
Douglas-fir - ponderosa pine / bluebunch wheatgrass - pinegrass	*Pseudotsuga menziesii - Pinus ponderosa / Pseudoroegneria spicata - Calamagrostis rubescens*			Blue	Y		-
Douglas-fir - ponderosa pine / snowbrush	*Pseudotsuga menziesii - Pinus ponderosa / Ceanothus velutinus*			Blue	Y		-
Douglas-fir - western larch / pinegrass	*Pseudotsuga menziesii - Larix occidentalis / Calamagrostis rubescens*			Red	Y		-
Douglas-fir / common snowberry - birch-leaved spirea	*Pseudotsuga menziesii / Symphoricarpos albus - Spiraea betulifolia*			Blue	Y		-
Douglas-fir / common snowberry / pinegrass	*Pseudotsuga menziesii / Symphoricarpos albus / Calamagrostis rubescens*			Red	Y		-
Douglas-fir / Douglas maple - red-osier dogwood	*Pseudotsuga menziesii / Acer glabrum - Cornus sericea*			Red	Y		-
Douglas-fir / pinegrass - kinnikinnick	*Pseudotsuga menziesii / Calamagrostis rubescens - Arctostaphylos uva-ursi*			Blue	Y		-
Douglas-fir / pinegrass - twinflower	*Pseudotsuga menziesii / Calamagrostis rubescens - Linnaea borealis*			Blue	Y		-
ponderosa pine / bluebunch wheatgrass - Idaho fescue	*Pinus ponderosa / Pseudoroegneria spicata - Festuca idahoensis*			Blue	Y		-

English Name	Scientific Name	Species at Risk Act	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
ponderosa pine / red three-awn	*Pinus ponderosa / Aristida purpurea* var. *longiseta*			Blue	Y		-
trembling aspen / common snowberry / Kentucky bluegrass	*Populus tremuloides / Symphoricarpos albus / Poa pratensis*			Red	Y		-
western redcedar - Douglas-fir / false Solomon's seal	*Thuja plicata - Pseudotsuga menziesii / Maianthemum racemosum*			Red	Y		-

Notes:
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
OGC – BC Oil and Gas Commission
The potential for at-risk ecological communities to occur within the study area was not ranked.

Table B.3 Fish Species of Concern Identified with the Potential to Occur Within Study Area

English Name	Scientific Name	SARA	COSEWIC	BC List	OGC High Priority Wildlife List	Wildlife Act Section 34b	Potential to Occur[1]
bull trout	*Salvelinus confluentus*		SC (Nov 2012)	Blue	Y		L

Notes:
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
OGC – BC Oil and Gas Commission

Appendix G
ARCHAEOLOGICAL OVERVIEW ASSESSMENT REPORTS

REPORT

FortisBC Okanagan Capacity Upgrade Project

OLI PEN 406 Extension Archaeological Overview Analysis

Submitted to:

Solaris Management Consultants Inc.
Attention: William Tang

Submitted by:

Golder Associates Ltd.
Suite 200 - 2920 Virtual Way Vancouver, BC, V5M 0C4 Canada

+1 604 296 4200

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Distribution List

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e-copy: Golder Associates Ltd.

Executive Summary

Golder Associates Ltd. was retained by Solaris Management Consultants Inc. to complete an Archaeological Overview Assessment for FortisBC Energy Inc.'s Okanagan Capacity Upgrade Project. An Archaeological Overview Assessment was completed for the proposed OLI PEN 406 Extension NPS 16 pipeline, and is described herein.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Solaris Management Consultants Inc. (Solaris) to complete an archaeological overview assessment (AOA) for FortisBC Energy Inc.'s (FortisBC) Okanagan Capacity Upgrade (OCU) Project (the Project). The Project comprises a proposed extension to the existing OLI PEN 406 pipeline between Chute Lake and the City of Penticton (Figure 1). The Study Area extends 1 km from the proposed centreline along its entire length (Figures 2-1 to 2-4). The Project Area is confined to the proposed project footprint, which consists of a 20 m wide corridor (10 m on either side of the centreline).

The objectives of this AOA are as follows:

1) To identify recorded archaeological and historical sites in the vicinity of the Study Area and Project Area.

2) Identify and evaluate archaeological potential within the Study Area and Project Area.

3) Identify areas of archaeological or cultural interest to local Indigenous communities that could influence the assessment of archaeological potential.

4) Assess the need for more detailed archaeological investigations, such as an archaeological impact assessment (AIA).

For the purposes of this report, archaeological sites are defined as locations which contain physical remains of past human activity and are associated with pre-contact and/or post-contact periods. Historical sites are defined as any structure, site or thing that is of historical or architectural significance. Historical sites and locations in British Columbia are primarily attributable to post-contact Euro Canadian settlement and land use but can also include habitations and other evidence left by Indigenous peoples. These heritage resources may include structures, engineering works, architectural features and artifacts.

2.0 PROPOSED PROJECT

2.1 Project Description and Location

FortisBC is proposing to upgrade the capacity of existing infrastructure associated with the southern portion of the Vernon to Penticton segment (VER PEN 323) of the Savona Nelson Main Line. The proposed Project includes new pipeline installation running from Chute Lake and extending south to the City of Penticton. The Study Area extends 1 km from the centreline of the proposed pipeline. The Project Area is confined to the proposed project footprint, which consists of a 20 m wide corridor (10 m on either side of the centreline).

The Study Area measures 29.2 km (north-south) by 2 km (east-west), constituting approximately 6,181 hectares (ha). The Project Area measures 30.1 km (north south) by 20 m (east-west), constituting approximately 53 ha.

3.0 HERITAGE LEGISLATION, POLICIES, AND PERMITTING

3.1 Heritage Conservation Act

All archaeological sites on provincial Crown or private land that predate AD 1846 are automatically protected under the 2019 amendments to the *Heritage Conservation Act* (HCA). Certain sites, including burials and rock art sites, that have historical or archaeological value, are also protected regardless of age. Heritage wrecks, consisting of the remains of vessels (and aircraft) after two or more years have passed since they sank, crashed or were abandoned (including being placed in terrestrial environment as part of land fill), are also protected.

Sub-surface investigation of an archaeological site or investigation with the intent to locate a site requires a permit under Section 12.2 of the HCA. The Archaeology Branch, Ministry of Forests, Lands, Natural Resource Operations and Rural Development is the provincial government agency responsible for administering the HCA, issuing permits, maintaining a database of recorded archaeological sites, and handling referrals from various development agencies. The BC Oil and Gas Commission (OGC) issues HCA permits for projects under its mandate.

Site protection under the HCA does not necessarily negate impact; in some cases, development proceeds after an impact assessment or other mitigation actions. With the exception of impacts occurring under a Section 12.2 permit, any alteration to a known archaeological site must be permitted under Section 12.4 of the HCA. A Section 12.4 permit is held by the individual responsible for the site alteration and normally includes data recovery or mitigation requirements such as archaeological construction monitoring or systematic data recovery (i.e., an archaeological excavation).

All applications for Section 12 HCA permits are forwarded by the Archaeology Branch or OGC to appropriate First Nations for a 30-day review. The Archaeology Branch or OGC determines which groups and organizations receive the application based on provincial records.

3.2 Oil and Gas Activities Act

The *Oil and Gas Activities Act* (OGAA) governs oil and gas related activities in British Columbia, including pipelines, and is regulated by the OGC. Permits and authorizations from the OGC are required for a proponent to undertake any oil and gas related activities within the province, and archaeological review by way of an Archaeological Information Form (AIF) is a required part of the OGC application system. An AIF outlines the results of an archaeological review and potential assessment for the Project area and identifies any requirements for further archaeological work, and must be completed by a professional archaeologist on behalf of the proponent. Completion of any required archaeological work identified by the AIF becomes a condition of OGC permit issuance for the Project.

The OGC is responsible for issuing both Inspection and Alteration permits for work related to oil and gas developments, pursuant to Section 12 of the HCA. All HCA permit applications submitted to the OGC are also referred to appropriate First Nations for a 30-day review.

3.3 Local Government By-laws

Historical sites that are not protected by the HCA may be protected by by-law, under the authority of the *Local Government Act*. These sites are usually documented on Municipally administered Community Heritage Registers (CHRs), the Provincial Heritage Register (PHR), and the Canadian Register of Historic Places (CRHP). A CHR entry generates a degree of recognition for these sites; however, without a site-specific protection mechanism such as a heritage designation by-law, heritage revitalization agreement by-law, or heritage restrictive covenant, inclusion on a CHR, the PHR, and/or the CRHP does not provide automatic protection for these sites.

The CRHP is Canada's definitive source of information on historic places. Federal, provincial, and territorial governments have worked together since 2001 to produce the register. The register is a work in progress and new listings are added continuously.

3.4 First Nations Heritage Policy and Permitting Systems

Many BC First Nations have developed their own heritage policies and permitting systems. Golder and the professional archaeological community largely respect these requirements, although they are not required by the Province to meet regulatory requirements. In general, the scope of these policies reflects a desire to have some measure of oversight with archaeological research in each respective First Nations' territory so that specific cultural protocols are observed, particularly as they relate to human remains and spiritual locations. While aspects of these policies parallel the HCA, many diverge when it comes to the definition of what constitutes a "heritage resource". Most First Nations heritage policies take a broader view of heritage resources that warrant management, compared to the HCA (Mason 2011).

4.0 METHODS

4.1 First Nation Communication and Permitting

Based on a review of the Consultative Areas Database – Public (CAD) maintained by the Ministry of Indigenous Relations and Reconciliation, First Nations groups or organizations with interests in the Study Area were identified, and heritage permits were requested from those First Nations groups and organizations that have a heritage permitting system in place. For those groups without a permitting process in place, a notification of the AOA was prepared and issued in advance of the assessment. Included in this notification was a request for information – whereby First Nations groups were provided an opportunity to share information that could inform the assessment (e.g., place names, undocumented archaeological sites).

Indigenous groups and organizations known to have heritage policies and permitting systems that are applicable to the Study Area include Okanagan Indian Band, Upper Nicola Indian Band, and Westbank First Nation.

4.2 Background Research and Potential Assessment

Golder assembled and reviewed readily available information for the Study Area pertaining to the local environmental setting, cultural background, historical land use, and previously recorded archaeological sites.

The sources of available information that were reviewed include:

- Provincial Heritage Register using the Remote Access to Archaeological Data (RAAD) application maintained by the Archaeology Branch (FLNRORD 2019)
- The Provincial Archaeological Report Library (PARL)
- GIS-based archaeological potential model (Arcas 1997)
- Readily available ethnographic and archaeological reports
- Surficial geology maps
- Archival photographs and maps
- Readily available historical land use records
- Canadian Register of Historic Places (Parks Canada 2016)
- Vegetation Resource Inventory (VRI) mapping (FLNRORD 2020)
- LiDAR[1] data

These sources of information were used to identify known archaeological and historical sites and to identify areas with archaeological site potential. The assessment of archaeological potential was based on an analysis of existing archaeological potential models, cultural variables (e.g., proximity to known archaeological site locations, proximity to locations associated with First Nations place names and/or traditional land uses) and environmental variables (e.g., forest coverage class, and proximity to environmental features that tend to correlate with archaeological site locations).

5.0 RESULTS

5.1 First Nations Communication and Permitting

Based on information identified through the CAD search (Ministry of Indigenous Relations and Reconciliation 2019), Golder understands that the Study Area falls within the area of interest of the following First Nation groups and organizations:

- Esh-kn-am Cultural Resources Management
- Lower Similkameen Indian Band
- Nooaitch Indian Band
- Okanagan Indian Band
- Okanagan Nation Alliance
- Penticton Indian Band
- Upper Nicola Indian Band
- Westbank First Nation

[1] LiDAR data provided by McElhanney

The First Nations groups listed above were contacted by telephone on 9 December 2019 and notified of the AOA by email on 16 December 2019. Okanagan Indian Band, Upper Nicola Indian Band, and Westbank First Nation heritage permit applications were submitted, but permits have not yet been received at the time of reporting.

5.2 Environmental Setting

The physical and biological environment influences many of the activities that contribute to the development of the regional archaeological record. These variables are interconnected and include physical aspects of the land (e.g., topography) and resource availability (e.g., flora and fauna). Linking both are the valuation of landscapes through the cultural activities of site selection, travel in the area, and resource utilization and optimization. The following sections provide summaries of the physical setting, palaeoenvironment and biogeoclimatic zones and how these variables contribute to the assessment of archaeological potential.

5.2.1 Physical Setting

The Project is located within the Okanagan Valley and extends from Chute Lake south along the eastern bank of Okanagan Lake to the City of Penticton. Okanagan Lake is at approximately 350 m above sea level (ASL) and elevations within the Project Area vary from approximately 530 m above ASL near Penticton to over 1,200 m ASL on the plateau near Chute Lake. The Study Area overlaps areas suitable for recent historical and pre-contact habitation that correspond with recorded heritage resources. Areas of interest include creek crossings, stands of old growth forest, and other locations favorable for resource extraction, travel, and/ or human habitation.

5.2.2 Palaeoenvironment

Most glacial ice in the Okanagan had melted by 12,000 BP and freshwater fish (e.g., chiselmouth, large scale sucker, leopard dace, redside shiners and squawfish) from the Columbia River drainage likely travelled north through Glacial Lake Penticton and into the Thompson and Fraser River systems. During this Late-Glacial Period (ca. 13,000 to 12,000 BP), tundra or cold-steppe species pioneered deglaciated areas and plant species such as sage, juniper and grasses were present (Walker 2004). The climate was typically cold and dry during this time, but habitable.

The onset of the Early Holocene (Xerothermic; ca. 12,000 to 8,000 BP) brought warmer temperatures and drier conditions compared to today and heralded the onset of deglaciation around approximately 11,000 BP (Walker 2004). This warming allowed for the introduction of open forests of lodgepole pine, Engelmann spruce, and subalpine fir in upper elevations, and extensive grasslands at mid- to lower elevations.

The beginning of the Middle Holocene (Mesothermic; ca. 8,000 to 4,000 BP) is marked by the eruption of Mount Mazama (now known as Crater Lake, Oregon) approximately 7,700 years BP (Bacon 1983; Walker 2004; Zdanowicz 1999). The ash deposit from this eruption has been identified in Okanagan lakes, and measures up to 80 cm in thickness. The Middle Holocene was initially characterized by grasslands along valley slopes, with forested highlands and cottonwood along streams. Later, forests began to expand down into the grasslands as a result of cooler summer temperatures and moister soils (Walker 2004). The Middle Holocene marks the transition between the warm, dry conditions of the Early Holocene to the modern climate. Human settlement patterns and resource collecting locations in the Middle Holocene may have varied from later times due to different environmental conditions.

The Late Holocene (Neoglacial; ca. 4,000 BP to present) is characterized by conditions similar to that of today, although slightly cooler and wetter in the early part of the Late Holocene (Hebda 2007; Walker 2004). This period also saw the expansion of forests and wetlands. Indigenous settlement patterns may have been similar to ethnographically documented patterns.

5.2.3 Modern Biogeoclimatic Zones

The north end of the Project Area is located in the Interior Douglas-fir biogeoclimatic zone, with the remainder in the Ponderosa Pine zone, and characterized by hot, dry summers and cool winters with minimal snow. Forests are dominated by open stands of Douglas-fir (*Pseudotsuga menziesii*) in the north, and Ponderosa pine (*Pinus ponderosa*) in the south and at lower elevations. Other tree species include, trembling aspen (*Populus tremuloides*), water birch (*Betula occidentalis*), and black cottonwood (*Populus balsamifera ssp. trichocarpa*). Lodgepole pine (*Pinus contorta*) is a common tree species at higher elevations (Meidinger and Pojar 1991). Trees and their wood were often used by Indigenous people for making tools, shelter, and other implements. Different elevations contain different tree species and were used at different times of the year as part of a seasonal round.

Other plant species in these zones that may have been used by Indigenous peoples include: silky lupine, orange arnica, rosy pussytoes, slender hawksbeard, timber milk-vetch, junegrass, big sagebrush, antelope brush, bluebunch wheatgrass, rough fescue, Sandberg's bluegrass, invasive species such as cheatgrass and knapweed, saskatoon, pasture sage, lemonweed, snowberry, roses, red-osier dogwood, Douglas maple, Oregon grape, and yarrow (Hope et al. 1991; MoF 1998).

This zone is also home to many wildlife species that may have been used a food resources or hides for clothing, shelter, or warmth. These species include badger, bats, beaver, bighorn sheep, black bear, cougar, coyote, elk, marmot, muskrat, mule deer, white-tailed deer, numerous bird species, and small rodents such as chipmunks, squirrels and voles (Hope et al. 1991; MoF 1998).

A review of the Interior Douglas-fir biogeoclimatic zone furthers understanding of pre-contact and historical use of the Study Area. First Nations peoples and early settlers were dependent upon the natural resources available to them, including select animals, fish, and plant species as described above. Many archaeological, traditional use, and historical sites are the result of activities associated with use of these natural resources or are situated in locations that would maximize access to particular resources. Fluctuations in climate through time influenced biogeoclimatic zone distribution, associated human behavior, and the archaeological remains of such behavior.

5.3 Cultural Setting

Ethnographic and ethnohistoric records associate the Okanagan (Syilx) and Nlaka'pamux peoples with the Study Area. Ethnographic accounts of the Syilx and Nlaka'pamux peoples are found in Boas (1891), Hill-Tout (1978), Kennedy and Bouchard (1998), Ray (1939), Teit (1900) and Wyatt (1998). These groups utilized a broad range of fish and game and plant species for food, medicines, raw materials and trade. Campsites were located at seasonally available resource locations, and main residential sites were generally situated in protected valleys.

Further information pertaining to Syilx peoples can be found at www.pib.ca (Penticton Indian Band), www.wfn.ca (Westbank First Nation 2012) and www.syilx.org (Okanagan Nation Alliance 2012). Further information on the Nlaka'pamux can be found at www.nicolatribal.com (Nicola Tribal Association 2012).

5.4 Archaeological Research

Information maintained by the Archaeology Branch was consulted and the following records and GIS data layers were obtained.

- Previous archaeological assessment location data (~2010 to present) (GIS data layer)
- Previously recorded archaeological sites (site inventory forms, mapping and associated reports)
- Archaeological potential model (GIS data layer)

This information is summarized in the sections that follow.

5.4.1 Previous Archaeological Assessments

An archaeological impact assessment was not conducted for the VER PEN 323 existing pipeline or laterals. The review of Archaeology Branch information indicates three archaeological impact assessments have been completed that overlap or are in close proximity to the Study Area.

HCA Permit 1975-0014

In 1975, Okanagan College (Kelowna) conducted an ethnographic study combined with field survey to create an inventory of archaeological sites in the Okanagan Valley (Baker 1975). The study attempted to reconcile the location of known, but undocumented archaeological sites through historical data and interviews. A total of 50 archaeological sites were recorded. A second component of this study used a random quadrat survey of lands adjacent to waterways flowing into Okanagan Lake that overlap portions of the Study Area (Lawhead 1975). An additional 26 archaeological sites were recorded in these areas. Two of the newly documented sites (DjQv-12 and DkQv-26) are within 500 metres of the Project Area (Figures 2-2 and 2-4).

HCA Permit 1996-0072

In 1996, the Penticton Forest District commissioned an AIA for planned cut blocks and roads as part of the Small Business Forest Enterprise Program. Points West Heritage Consulting Ltd. (Points West) conducted the AIA and identified one archaeological site (DiQv-69), located beyond the Study Area. A cut block located south of Chute Lake is the nearest assessed development component in relation to the Study Area. This is referred to as Operating Area #7: Naramata FSR – Naramata Creek within the Points West (1996) report. Operating Area #7 is located approximately 15 km northeast of Penticton on the east side of Okanagan Lake[2] The block is described as extending along the west side of the upper reaches of Naramata Creek, and includes one small unnamed lake and several tributary creeks. Points West (1996) determined this location has low archaeological potential due to sloping terrain. Assessment was conducted via vehicle and pedestrian survey.

[2] Points West Heritage Consulting Ltd. (1996) *Archaeological Investigations of Penticton Forest District Small Business Forest Enterprise Program Developments (Permit 1996-072) Part A.* Section 3.3, Page 15-16. On file at the BC Archaeology Branch.

HCA Permit 2001-0082

In 2001, Kutenai West Heritage Consulting Ltd. (2002) conducted an AIA for timber harvesting operations within the Penticton Forest District. The Study Area overlaps with cut block 198-3 which was subject to subsurface testing. A total of 27 shovel tests were conducted at four locations throughout cut block 198-3. These are described as: a level bench margin in the northeast corner of the cutblock (n=7), a level terrace margin in the northwest corner of the cutblock (n=7), a level ridge along the west-central cutblock boundary (n=6), and, a level ridge in the southwest corner of the cutblock (n=7). Shovel tests were terminated at 25 cm depth below surface (dbs). Stratigraphy is described as duff, underlain by a light brown sandy silt, terminating at a grey loam with rounded cobbles. No archaeological materials or features were observed during the AIA[3].

5.4.2 Archaeological Sites

A review of the PHR maintained by the Archaeology Branch indicates that the Study Area overlaps with two recorded archaeological sites (Table 1). The Project Area does not overlap with any known archaeological sites (Figures 2-1 to 2-4).

Table 1: Recorded Archaeological Sites

Borden Number	Site Type	Approximate Distance and Direction to Project Area
DjQv-12	Cultural depression (likely a house pit)	289 m west of the Project Area; within the Study Area; HCA Permit 1975-0014
DkQv-26	Habitation feature, rock shelter	388 m east of the Project Area; within the Study Area; HCA Permit 1975-0014

Expected archaeological site types within the Study Area and Project Area include ancestral remains (i.e., subsurface burials, rock cairn burials), rock art, cultural trails, culturally modified trees, house pits, cache pits, roasting pits, and surface and subsurface scatters of lithic artifacts, fauna, and shell. The scarcity of recorded archaeological sites in the Study Area likely represents a data gap (i.e., lack of archaeological survey) rather than indicating a lack of past use of the area by Indigenous peoples.

5.4.3 Archaeological Potential Modelling

The purpose of predictive modelling in archaeology is to identify areas that have higher potential to contain archaeological remains than areas selected randomly. Predictive models use environmental and cultural variables to make their predictions. Some models use a wide range of mapped environmental variables (e.g., slope, slope direction, vegetation classes, soil types, distance to various water bodies, trails) to determine archaeological site potential.

[3] Kutenai West Heritage Consulting Ltd. (2002) *Archaeological Impact Assessment Letter Report for Gorman Bros. Lumber Ltd., Penticton Forst District (Permit 2001-082).* On file at the BC Archaeology Branch.

An archaeological predictive model was prepared for the Okanagan Timber Supply Area in 1997 on behalf of the Ministry of Forests by Arcas Consulting Archeologists Ltd. (Arcas). This potential model covers the Study Area and Project Area and was developed using the following data sets: known archaeological sites, trails, environment, forest stand composition, landforms, slope, lakes and ponds, rivers and streams, ungulate winter range, mountain passes, and sections of rivers where fish traps might be present. Areas identified as having archaeological potential are rated as moderate or high (Arcas 1997).

The Arcas (1997) model was applied to the Study Area and Project Area (Figures 2-1 to 2-4) and the results are summarized in Table 2. Caution must be exercised in the application of this model as it was developed in 1997 and may not meet current provincial standards for efficiency or effectiveness set forth by the Archaeology Branch (2009). The Archaeology Branch has recently commissioned the preparation of a new predictive model for this area. Preliminary Field Reconnaissance (PFR) was conducted by Golder within portions of the Project area in summer of 2020[4] to ground-truth modelled archaeological potential within the study area and help inform the HCA permit application for the AIA phase.

Table 2: Summary of Modelled Archaeological Potential

OLI PEN 406	Total Size (ha)	CMT Potential (ha)	Moderate Potential (ha)	High Potential (ha)
Study Area	6,106.98	1474.70	1965.54	904.37
Project Area	52.59	12.38	20.77	1.36

Areas with potential for the present of HCA-protected culturally modified trees (CMTs) were identified using VRI data. These areas contain forest stands that range in age from 141 to 251+ years (Figures 3-1 to 3-4).

5.4.4 Historical Research

Historical sites have been documented in the Study Area through heritage assessments commissioned by local governments (e.g., Penticton 2009). These sites and their associated records are maintained by the Province and were obtained with the RAAD application. Other sources of information on historical sites include the Canadian Register of Historic Places. A review of available information indicates the Study Area overlaps with two historical sites (Table 3). The Project Area does not overlap with any historical sites (Figures 2-1 to 2-4).

Table 3: Recorded Historical Sites

Borden Number	Historical	Site Type	Approximate Distance and Direction to Project Area
DjQv-63	Historical	Kettle Valley Railway Right-of-Way	241 m west of the Project Area; within the Study Area
DjQv-62	Historical	Penticton Agricultural Water Flume	440 m west of the Project Area; within the Study Area

[4] PFR Summary Report pending.

5.4.5 Research Summary and Potential Assessment

As noted above, this assessment is based on a review of background information to evaluate and identify locations within the Study Area and Project Area that have potential to contain intact or disturbed archaeological deposits at any depth. Table 4 combines model output from Arcas (1997) with VRI data to provide an overall estimate of archaeological potential in the Study Area and Project Area.

Table 4: Summary of Archaeological Potential

OLI PEN 406	Area (ha)	CMT Potential (ha)	%	Moderate Potential (ha)	%	High Potential (ha)	%
Study Area	6,106.98	1474.70	24.14%	1965.54	32.19%	904.37	14.81%
Project Area	52.59	12.38	23.54%	20.77	39.49%	1.36	2.59%

Expected archaeological site types in these areas include, but are not limited to, habitation sites, resource procurement (e.g., harvesting, fishing, hunting) and processing sites (e.g., brief and long-term occupational camps, berry picking), artifact scatters, petroglyphs and petroforms, isolated finds, trails, and CMT sites.

All other areas are considered to have low archaeological potential due to the absence of variables that normally correlate with archaeological sites. The assessment of “low” potential does not mean “no” potential for the presence of heritage sites. Areas having low potential still retain archaeological potential as human behaviour can be variable and unpredictable, forming sites in unexpected locations. Archaeological site types in low potential areas can include brief occupational camps, isolated finds, expedient processing sites, and low-density artifact scatters.

6.0 RECOMMENDATIONS

It is recommended that additional PFR be completed of the entire Project Area (about 53 hectares) once snow-free conditions are available. The purpose of the additional PFR would be to meaningfully include Indigenous communities in the assessment of archaeological potential and to accurately define the boundaries of high potential areas that will require subsurface testing during the AIA phase. Should the archaeological potential model that is currently under development by the Archaeology Branch become available prior to the PFR, potential mapping for the Study Area and Project Area should be updated prior to undertaking field work.

Following the PFR, an AIA will be conducted under an HCA Section 12.2 permit. The objectives of the AIA will include the following: 1) identify, record, and assess archaeological sites located within the Project Area; 2) identify and evaluate possible impacts by the proposed development to these archaeological sites, if present; and 3) recommend appropriate impact management actions, including mitigation actions where significant archaeological deposits are encountered in unavoidable conflict with proposed developments. The AIA will consist of a visual inspection and subsurface testing program within areas identified as high archaeological potential by the qualified Field Director and field crew during the PFR.

7.0 LIMITATIONS

This report was prepared for the exclusive use of Solaris and FortisBC. Any use, reliance, or decisions made by third parties on the basis of this report are the responsibility of such third parties. The study was not specifically designed to address past, present, or anticipated First Nation use of the Study Area for traditional purposes and does not constitute a traditional use study. This report was written without prejudice to potential or established First Nation rights, including title, or treaty rights.

8.0 CLOSURE

We trust that this information is sufficient for your needs at this time. In the event that further information regarding the contents of this AOA is required, please contact the undersigned.

Golder Associates Ltd.

Ryan Sagarbarria, BA
Archaeologist

Andrew Mason, MA, RPCA
Principal, Cultural Heritage Specialist

RS/ARM/lih

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Okanagan Lake

KEY MAP

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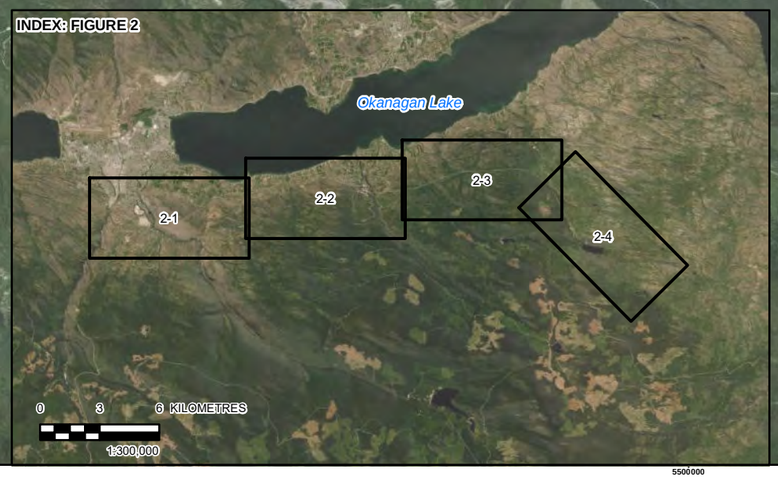

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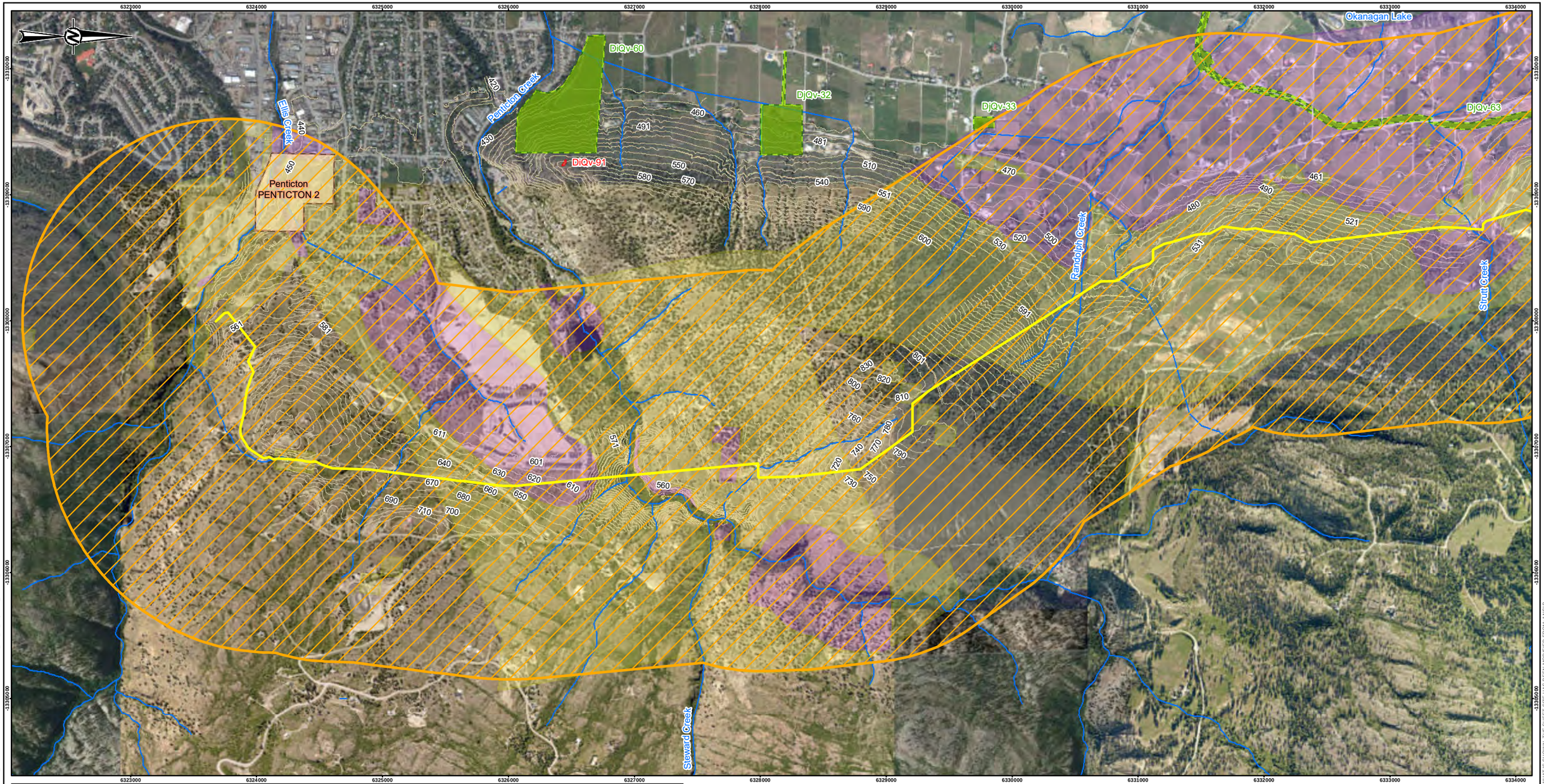

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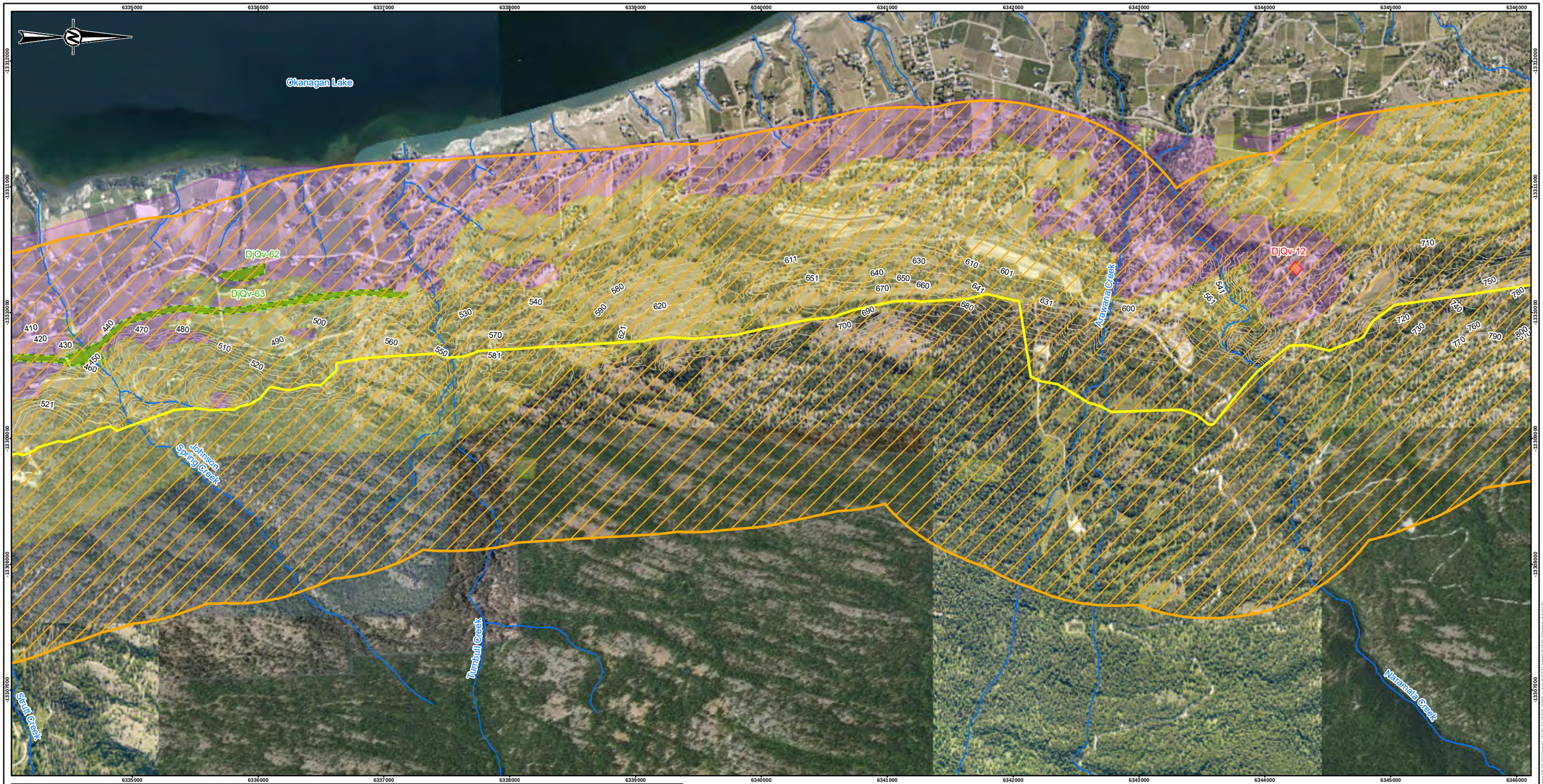

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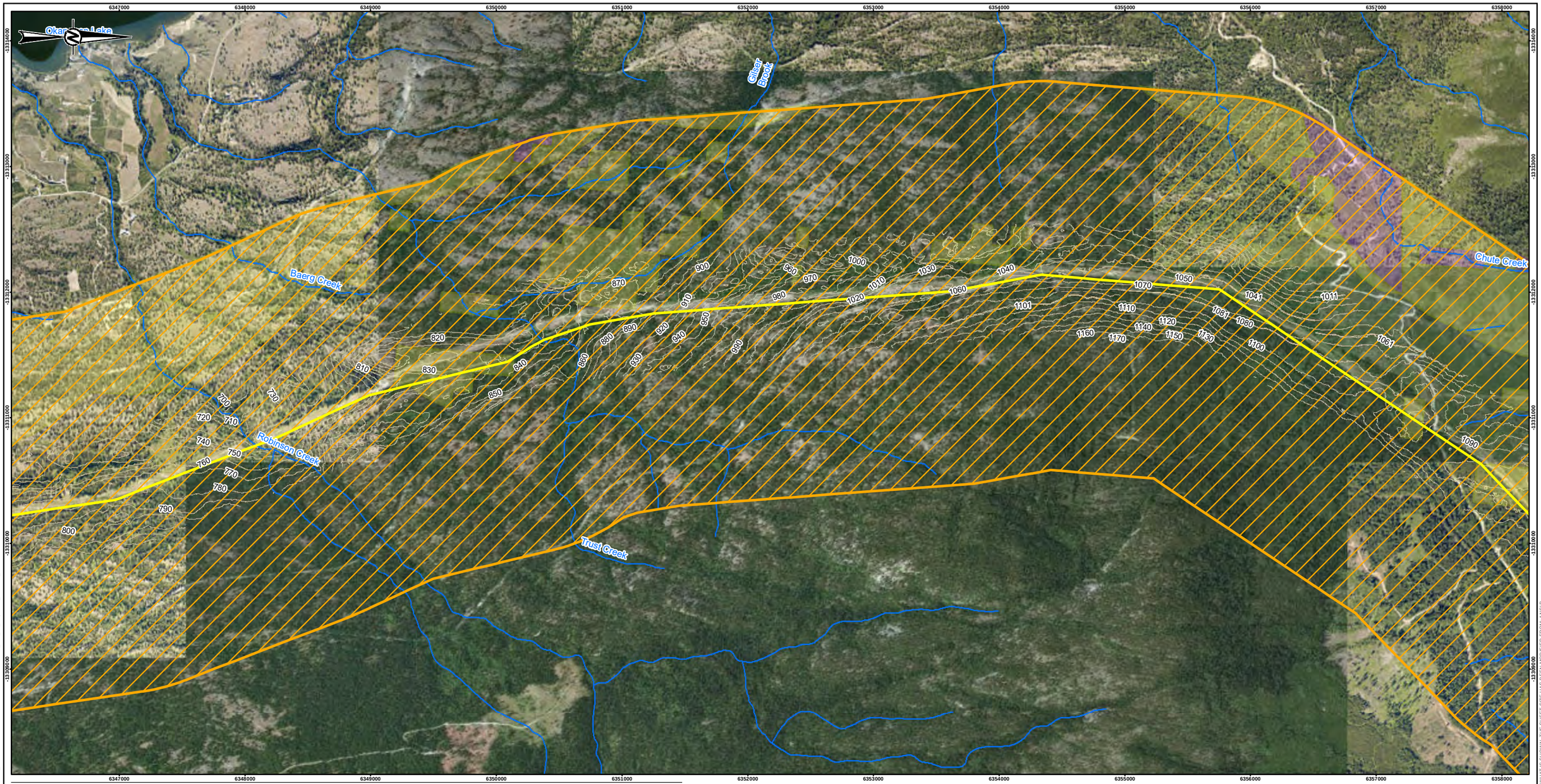

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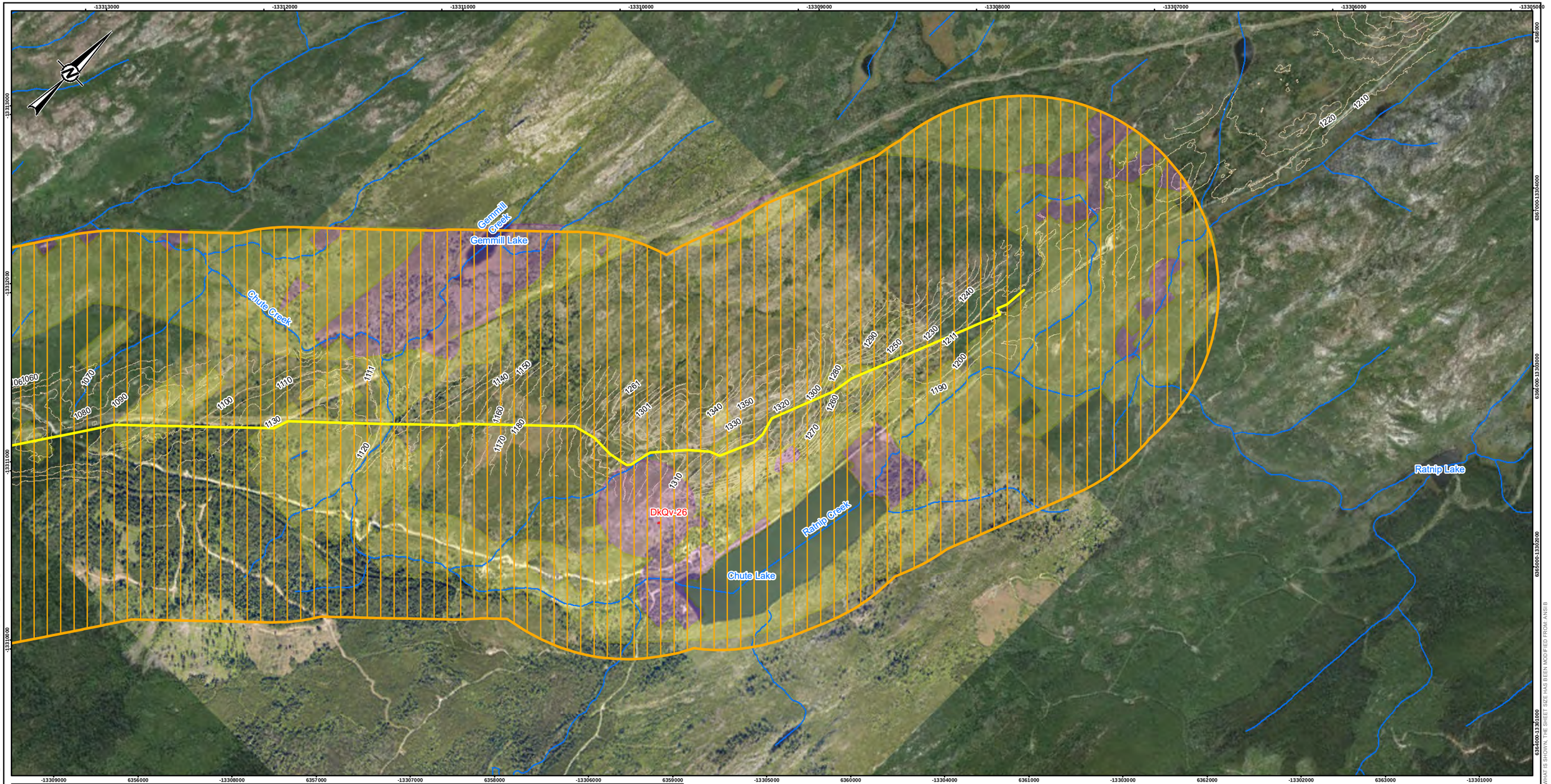

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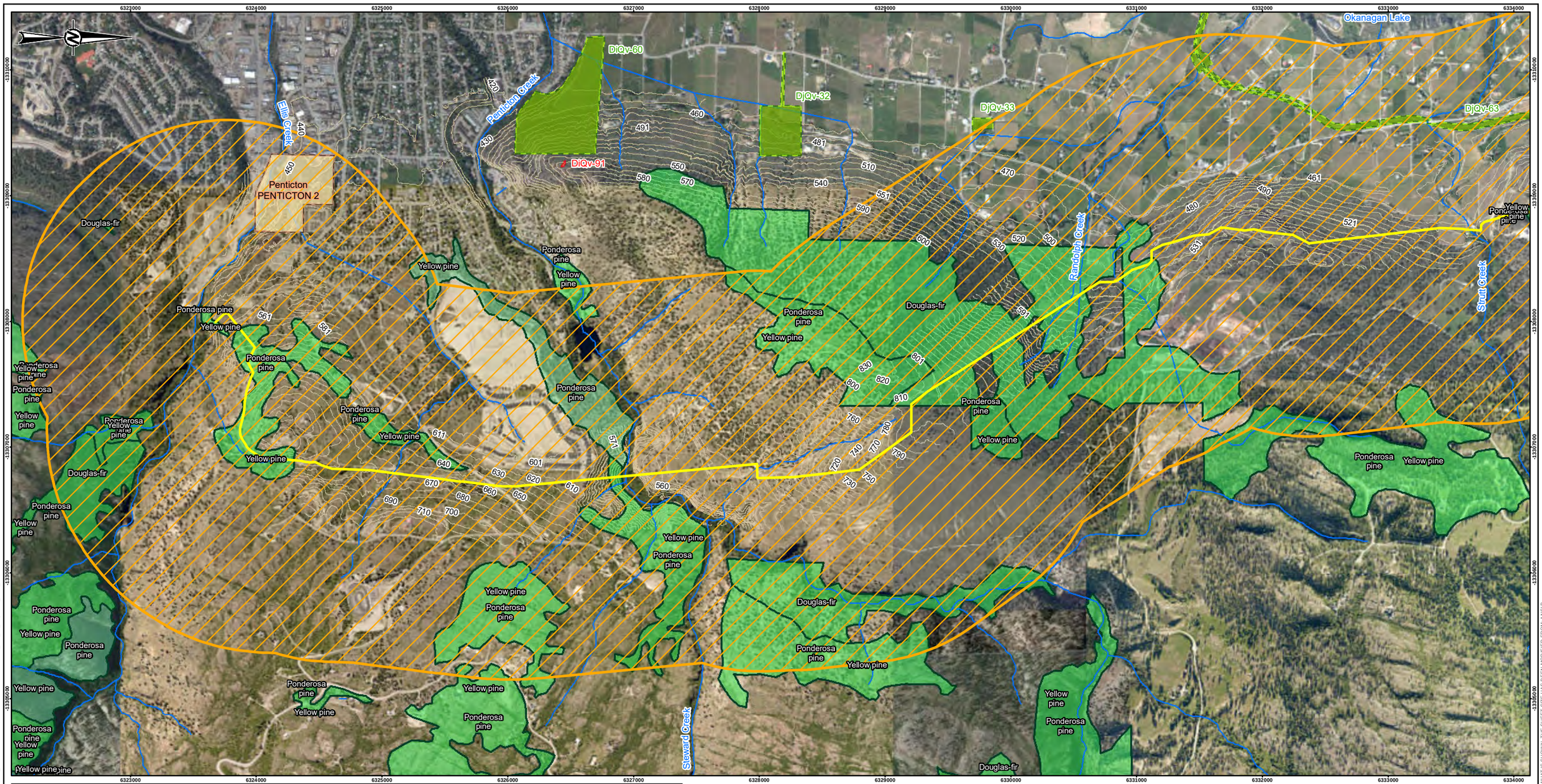

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- INDIAN RESERVE

TREE STAND AGE

- 141 TO 250 YEARS
- 251 AND OLDER

- WATERCOURSE
- CONTOUR (10 m)

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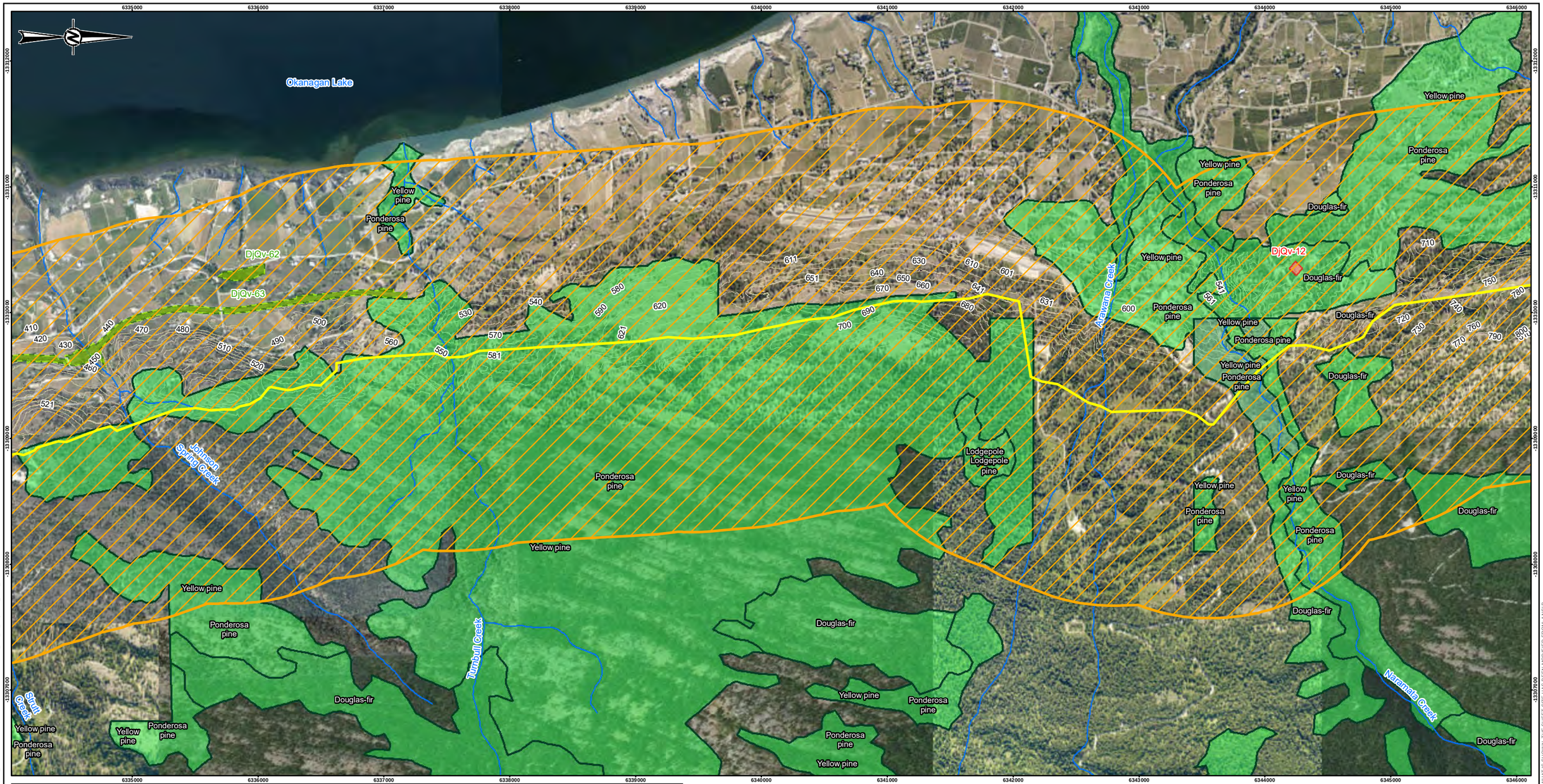

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- WATERCOURSE
- CONTOUR (10 m)

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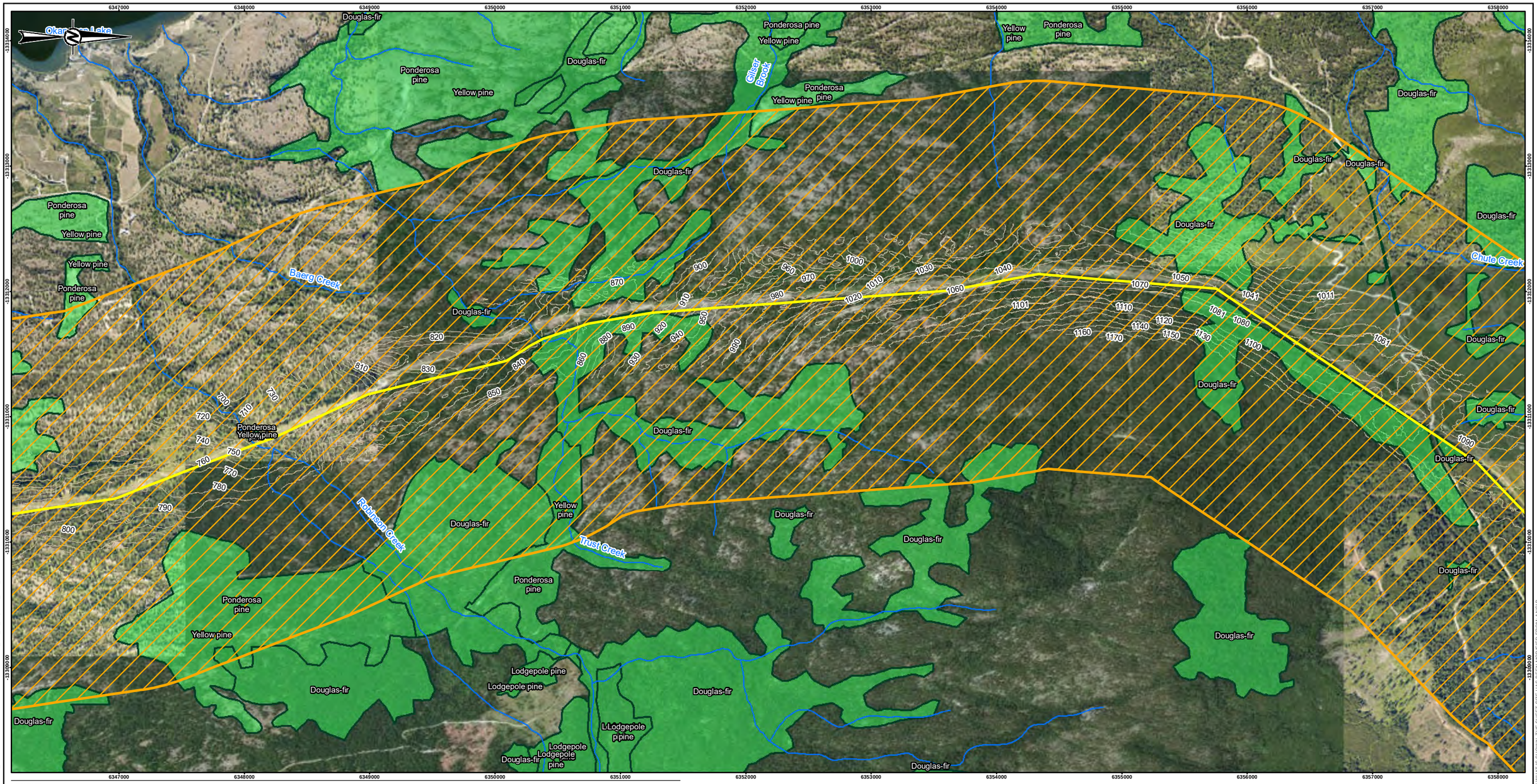

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TREE STAND AGE

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- CONTOUR (10 m)

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2. ARCHAEOLOGICAL SITES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT ON 20200414.
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4. BACKGROUND DATA CONTAIN INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
5. CONTOUR DATA OBTAINED FROM MCELHANNEY.

COORDINATE SYSTEM: WGS 1984 WORLD MERCATOR

0 600 1,200

1:30,000 METRES

CLIENT
SOLARIS MANAGEMENT CONSULTANTS INC.

CONSULTANT
GOLDER

YYYY-MM-DD	2020-08-17
DESIGNED	ARM
PREPARED	CC
REVIEWED	SD
APPROVED	ARM

PROJECT
FORTISBC OKANAGAN CAPACITY UPGRADE PROJECT

TITLE
OLI PEN 406
(CMT POTENTIAL)

PROJECT NO.	CONTROL	REV.	FIGURE
19125274		1	3-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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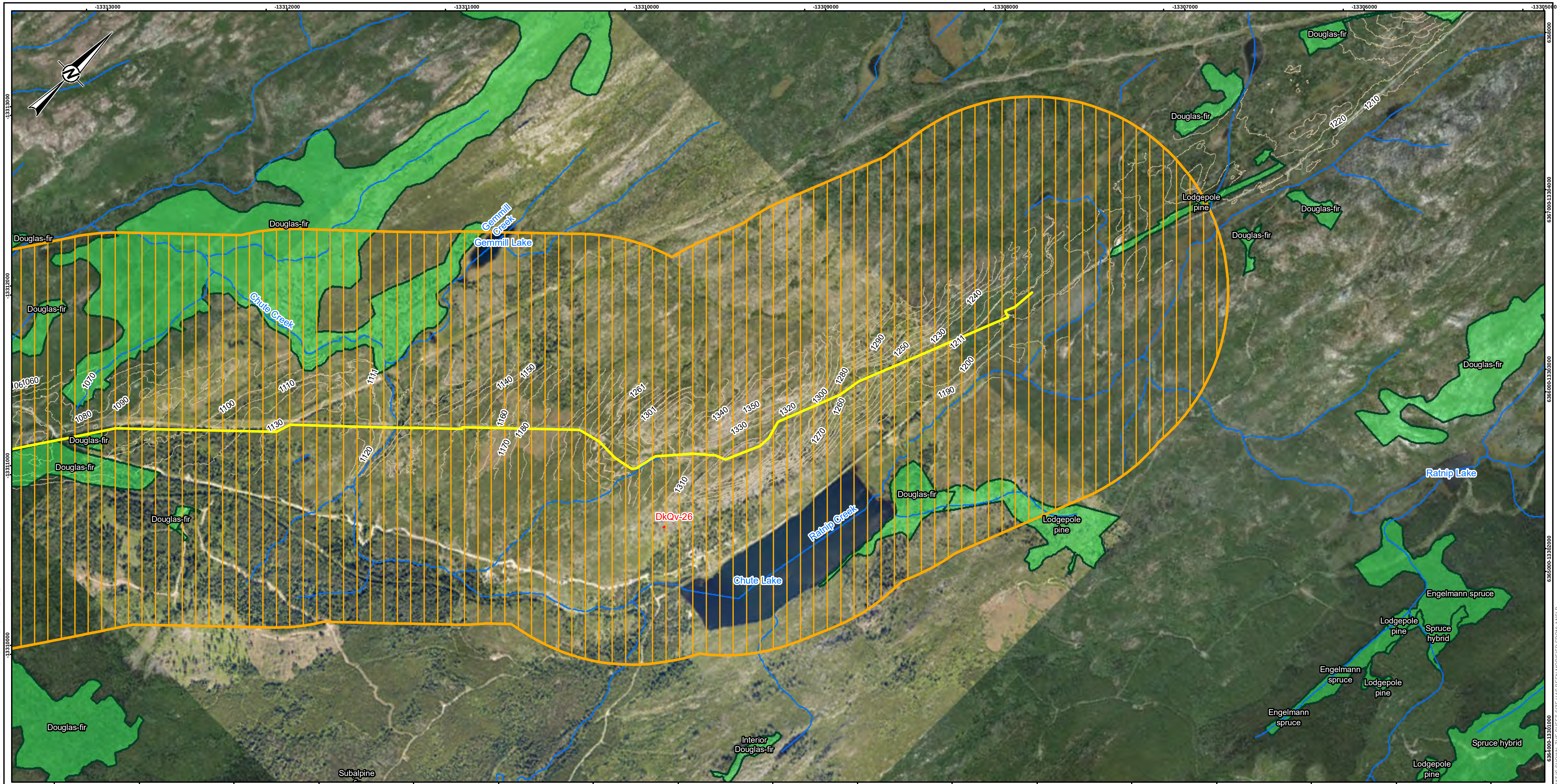

LEGEND

PROJECT DATA

- PROJECT AREA
- STUDY AREA

BACKGROUND DATA

- PREVIOUSLY RECORED ARCHAEOLOGICAL SITE

TREE STAND AGE

- 141 TO 250 YEARS
- 251 AND OLDER
- WATERCOURSE
- CONTOUR (10 m)

0 600 1,200

1:30,000 METRES

REFERENCES

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FORTISBC OKANAGAN CAPACITY UPGRADE PROJECT

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OLI PEN 406
(CMT POTENTIAL)

PROJECT NO.	CONTROL	REV.	FIGURE
19125274		1	3-4

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Appendix H
CONSULTATION AND ENGAGEMENT

Appendix H-1
OCU CONSULATION AND ENGAGEMENT PLAN

Okanagan Capacity Upgrade – Consultation and Engagement Plan

This document outlines FortisBC's (FEI) Community Engagement, Indigenous Relations, and Communications Plan (Consultation and Engagement Plan) for the Okanagan Capacity Upgrade (OCU) project.

Contents

Purpose

The focus of the Consultation and Engagement Plan is to ensure that local rights holders and stakeholders are informed about the Project, have access to information regarding the Project, and have opportunities to express questions and concerns. Feedback from local rights holders and stakeholders is valuable in order to not only understand, but also work to mitigate concerns. Additionally, FEI recognizes the importance of transparency and communication with all of our natural gas customers as it pertains to rates, and has taken steps to ensure this is the case.

Overview

The Okanagan Capacity Upgrade project is a planned extension of FEI's existing system to meet capacity requirements in the Okanagan in response to regional growth. This extension involves adding approximately 30 kilometers of new gas line that would connect to FEI's system along Penticton's eastern border and head north, tying back in at Chute Lake.

FEI recognizes the importance of community, social and environmental considerations. As part of building this plan, we have reviewed in detail the landscape in which this project is proposed. Compared to other areas in the Southern Okanagan, the project takes place in a largely rural landscape with a low population density. Penticton is the gateway to the Southern Okanagan region, and is a growing community of over 33,000. Naramata is primarily a wine agricultural community, as well as a biking and tourism hub within the Regional District of Okanagan–Similkameen. FEI has included these considerations in its route selection process, and as such, has proposed a route that runs alongside existing rights-of-ways. FEI is working with individual property owners, local government, and Indigenous communities to minimize impacts to private and traditional lands.

FEI's Consultation and Engagement Plan will guide our communication and engagement strategies. The plan is divided into two phases, reflecting the different strategies that will be required to support the OCU project from public announcement through to restoration. This plan outlines phase one activities in detail. Phase two activities are outlined at a high level in the table below, and will be developed in greater detail should the project receive BCUC approval.

Phase one engagement began in fall 2019, with outreach to local government and Indigenous communities. This began a series of ongoing touchpoints between FEI and the parties. In March 2020, FEI's Property Services division began outreach to directly affected landowners. On April 15, 2020, the project launched publicly with an information bulletin distributed to regional media, along with a dedicated project webpage, phone number and email address. In coordination with the broader public launch, FEI delivered notification letters to the Ministry of Energy, Mines, and Petroleum Resources, the local MLA and MP, and eight surrounding Indigenous communities. Following the project launch, FEI contacted a number of local associations and other interested stakeholders with offers to meet and share more about the project. On April 30 and May 6, FEI held telephone town hall information sessions, inviting the public to learn more about the OCU project. Thee town halls were promoted through locally targeted digital and print ads, along with media interviews referencing the session dates. Although originally venues were booked and information card handouts were developed in anticipation of in-person engagement, the approach was adapted to accommodate virtual gatherings in light of the COVID-19 public health emergency.

In addition to these activities, FEI understands the importance of communicating more broadly with its natural gas customers when it comes to major initiatives and projects with the potential to impact rates. To ensure transparent, broad scale communication with all natural gas customers, FEI included a bill insert on May bills to introduce the project, indicate a minimal expected rate impact, and invite feedback through our project webpage.

Communication and Engagement Objectives

- Create awareness of the OCU project with customers, stakeholders, Indigenous communities and the public to:
    - Ensure balanced and objective information is available, promoted and understood.
    - Provide opportunities for local stakeholders to give feedback and to understand their concerns in an attempt to mitigate impacts to the public;
    - Proactively provide information to local media outlets to help inform the broader public about the Project and early construction work in the community; and
    - Be a leader in the development of strong, mutually beneficial relationships with Indigenous communities. FEI's Statement of Indigenous Principles guides FEI's approach. FEI seeks to build and nurture effective relationships with Indigenous communities across the province, while ensuring that the Company has the structure, resources and skills necessary to maintain these relationships. These principles will continue to guide FEI throughout the lifecycle of this Project.

Rights holders and stakeholders

FEI identified the following rights holders, groups, and representatives as core to its consultation and engagement activities:

1. Indigenous communities with asserted interest in the project (as per BC provincial database). These include Penticton Indian Band, Westbank First Nation, Okanagan Indian Band, Upper Nicola Band, Esh-kn-am Cultural Resource Management, Okanagan Nation Alliance (ONA), Lower Similkameen Indian Band, and Nooaitch Indian Band;
2. Residents, landowners, businesses and customers who may be impacted by the Project;

3. Provincial government bodies, including: respective Members of the Legislative Assembly, Members of Parliament, and the Ministry of Energy and Mines;
4. Local governments including: Mayor, Council, Regional Board members, City Manager and/or staff within the following municipalities and regional districts: City of Penticton, Regional District of Okanagan Similkameen (RDOS), City of Kelowna, and City of West Kelowna

COVID-19

As with many other critical service providers, FEI has adapted to the challenges of COVID-19. This means continuing to advance critical projects, including the OCU, to meet the energy needs of customers and communities. This is particularly relevant in the Okanagan, in light of increasing demands.

As a result, FEI adapted our public engagement approach to uphold the guidance of public health authorities while continuing to effectively engage local communities and stakeholders. For example, rather than in-person meetings FEI engaged interested parties via telephone, including telephone town hall presentations (instead of in-person public information sessions). Various communications tactics were adopted to support these activities. This included proactively providing information about the telephone town halls to local media outlets at the time of our public launch; developing resources such as a project webpage, phone number, and email address; introducing the project to customers through a bill insert; producing information cards; and promoting the project through regionally targeted print and digital advertisements.

Table: Activities Sequence

The sequence of notifications and activities is as follows:

Phase	***Milestones***	***Communications and Engagement Activities***
Phase 1: BCUC Decision Summer 2020 to Fall 2021	**Public launch** Apr 2020 **Info sessions** Apr/May 2020 **BCUC Application filed** Nov 2020 • **BCUC decision** (*expected*) Nov 2021	• Public and customer engagement in support of BCUC application, including communicating updates, conducting early engagement, hosting public telephone town hall information sessions, and responding to inquiries. • Local and Provincial Government engagement in support of BCUC application. • Create and maintain Phase 1 communication materials, such as an information bulletin, bill insert, a webpage and information cards, to support BCUC application. • Indigenous engagement to support regulatory applications, including the BCUC, the BC Oil and Gas Commission and other relevant agencies • Develop capacity funding agreements to support the involvement of interested Indigenous communities; particularly, Penticton Indian Band and Westbank First Nation • Support FEI's Property Services branch in engagement with affected landowners and responding to concerns • Develop a plan to ensure Indigenous and other Local socio-economic benefits are being maximized, and risks mitigated; tracking and reporting means to be developed.

		• Support the inclusion, and to track Indigenous and other Local businesses and workers to work on the OCU project • Customer rate impact awareness as part of BCUC application (May bill insert)
Phase 2: Implementation Fall 2021 to late 2023 **to be expanded if Project approved.*	**Construction begins** 2022 **Anticipated completion** Late 2023 • **Project Closeout** Late 2023/early 2024	• Stakeholder and municipal notifications ahead of implementation. • Outreach to affected communities ahead of implementation to raise project awareness and respond to inquiries in advance of, and throughout, implementation. • Create and maintain Phase 1 communication materials, such as a bill insert, webpage and information cards, to support implementation. • Ongoing engagement with Indigenous communities from FortisBC to ensure that potential effects on their interests are mitigated, and collaborative, transparent dialogue continues. • Support from FEI for our contractors to ensure they are upholding FEI's standards of Indigenous Engagement • Implementation of measures to ensure Indigenous and other Local socio-economic benefits are being maximized, and risks mitigated; tracking and reporting ongoing. • Ongoing contractor/project team support to ensure positive customer and community interactions. • Look into general outreach to thank communities where work has been completed.

Appendix H-2
STAKEHOLDER CONSULTATION LOG

Stakeholder Consultation Log - Okanagan Capacity Upgrade					
Date	Consultation Type	External Representatives	FEI Representatives	Location	Summary/Follow-up
26-Nov-19	In Person Meeting	City of Penticton: Donny Van Dyk - City Manager, Michael Hodges - Development Infrastructure Manager, Ben Johnson - Manager, Special Projects.	Shelley Martens - Community & Indigenous Relations Manager, Courtney Hodson - Community Relations Manager, Mark Morrison - Senior Project Engineer, Darren McElhinney - Senior Project Manager.	Penticton City Hall	FEI provided a high-level overview of the project, sought feedback on the proposed route, and crossing options at Penticton Creek. City staff provided considerations on the route and FEI committed to keeping the City of Penticton informed about the project as it develops. At this time, a presentation to mayor/council was not required.
12-Dec-19	In Person Meeting	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director	Shelley Martens - Community & Indigenous Relations Manager, Courtney Hodson - Community Relations Manager Mark Morrison - Senior Project Engineer (by phone), Darren McElhinney - Senior Project Manager	FortisBC Office Kelowna	FEI provided a high-level overview of the project, sought feedback on the proposed route, and crossing options at Naramata Creek. Karla recommended that we include Director, Electoral Area D (OK Falls/ Skaha) in future discussions as Upper Carmi falls into this area. FEI received confirmation that the RDOS/ Naramata boundary also includes Okanagan Mountain Park and Chute Lake. Received feedback on neighbourhoods and residents it will be important to speak with, including Outlook/Kettle Ridge strata. Also advised of new conservation area that was donated to the RDOS by a local landowner, so they will share a map of the area. Suggested FEI speak with the owners of Chute Lake Lodge. Complete delegation request form to present to RDOS Board of Directors in February 2020. *Due to COVID-19 all in person presentations were cancelled. The RDOS Directors were updated with an electronic memo on April 6, 2020.
18-Dec-19	In Person Meeting	City of Kelowna: Mayor Colin Basran	Shelley Martens - Community & Indigenous Relations Manager	Kelowna BC	FEI provided a high-level overview of the Project and sought feedback on consultation requirements by the City. As the City will not be impacted by construction activities, but will benefit from the Project, they would like to be kept informed of the Project progress, but at this time do not feel a presentation to Council or staff will be required.
28-Feb-20	In Person Meeting	Michael Hodges - Development Infrastructure Manager, Tyler Figgitt - Design Supervisor	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager Mark Morrison - Senior Project Engineer, Darren McElhinney - Senior Project Manager, Paul Kropp - Operations Manager, Ly-Shu Ramos - Project Permit Manager, Kevin Kendal - Transmission Engineer FortisBC	Penticton City Hall	FEI provided an overview of the revised route, which had changed since the previous meeting in November. The City recommended the route to stick to the east of the landfill to avoid residential customers. FEI was notified that the RDOS owns the landfill and the City owns the lease. FEI was also notified of the PIB hunting hut (traditional area) west of the electrical line. PACA near Campbell Mountain, is a stakeholder to reach out to during the project. Reach out to Michael Hodges to book a council meeting. *Due to COVID 19 all in person presentations were cancelled. The Mayor and Council were updated with an electronic memo on April 6, 2020.
4-Mar-20	In Person Meeting	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen, Electoral Area D (Skaha East and OK Falls): Ron Obirek - RDOS Board Chair & Director	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Mark Morrison - Senior Project Engineer (by phone), Darren McElhinney - Senior Project Manager	RDOS Office	RDOS Office informed FEI that blasting is a concern in the Naramata area. Previous Developer caused issues when blasting and building the subdivision near Naramata Creek. The combination of blasting and tree removal has led to more water and flooding to the homes below the new subdivisions, near Arawana Road. FEI has an in-house specialist that reviews all blasting plans and will monitor all blasting for the Project. RDOS advised to try not to schedule the construction around their events such as May Days, Canada Day events, August long weekend events and WineFest.
6-Apr-20	Email	City of Penticton: Mayor and Council	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a memo update to the Mayor and Council via email, as the in person Council presentation was cancelled due to COVID-19.
6-Apr-20	Email	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen, Electoral Area D (Skaha East and OK Falls): Ron Obirek - RDOS Board Chair & Director	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a memo update to the RDOS Directors via email.
7-Apr-20	Email	City of Kelowna: City Manager	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a memo update to the City Manager via email.
8-Apr-20	Email	City of West Kelowna: CAO	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a memo update to the CAO via email.
17-Apr-20	Email	Upper Carmi Neighbourhood Association	Ron Obirek - RDOS Board Chair & Director on behalf of FEI	N/A	Director Ron Obirek from the RDOS contacted the Upper Carmi Association on FEI's behalf and sent them an email on the day of the project announcement. The Upper Carmi Neighbourhood Association is within his electoral "D" area.

Stakeholder Consultation Log - Okanagan Capacity Upgrade					
Date	Consultation Type	External Representatives	FEI Representatives	Location	Summary/Follow-up
21-Apr-20	Email	Naramata Bench Winery Association	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email introducing the project, along with the OCU project contact information.
21-Apr-20	Email	Naramata Citizens Association	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email introducing the project, along with the OCU project contact information..
21-Apr-20	Email	South Okanagan Trail Alliance	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email introducing the project, along with the OCU project contact information.
21-Apr-20	Email	Hoodoo Adventure Company Ltd.	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email introducing the project, along with the OCU project contact information.
28-Apr-20	Telephone	Chute Lake Lodge	Hayley Newmarch - Community Relations Manager	N/A	FEI spoke with the owner of Chute Lake Lodge about the potential impacts of the route to the lodge. The owner requested further information on the route, and in response, FEI emailed the owner a link to the Talking Energy webpage containing the fly over video of the route.
28-Apr-20	Email	Okanagan Similkameen Stewardship Society (OSS)	Hayley Newmarch - Community Relations Manager	N/A	FEI emailed the OSS, as a number of their Wildlife Habitat Steward partners have properties along the project line. FEI received a response via email on May 6, 2020 from the Executive Director of the OSS, explaining their role is to support the landowner partners with environmental stewardship of their properties. No objection to the project continuing was identified in the response from OSS.
30-Apr-20	Virtual Information Session	Public	Hayley Newmarch - Community Relations Manager	N/A	Session was hosted from 5:00 pm to 8:00 pm. A presentation was delivered at the top of every hour during each session. The remainder of the time was intended for questions and answers. FEI had project team members available and on the phone to answer questions during this time. This town hall structure provided multiple opportunities throughout the session for FEI to share the Project overview and to receive public feedback.
30-Apr-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	Email received in project inbox. Email inquired about project and if existing gasline that runs along the backyards of Columbia Avenue will be twinned or upgraded. FEI responded to email and informed them that the pipeline along Columbia Street will continue to be an active line and we would not twin in this area. No follow up required.
2-May-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	Email received in project inbox. Email inquired about if service would be provided north of Narmata. FEI responded to email and provided information on the project and further information on how to add natural gas to a home or business address. No follow up required.
5-May-20	In Person Meeting	Penticton and Area Cycling Association (PACA) – Three Blind Mice trails	Hayley Newmarch - Community Relations Manager	Three Blind Mice trails	FEI met with the President of PACA at the Three Blind Mice trails and walked the trails that would be impacted by the potential gas line route. FEI and PACA committed to communicating closer to construction, and to provide trail users with updates on the trail closures during construction.
6-May-20	Email	Penticton Cycling Association (PACA)	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email on May 6, 2020 after on site meeting with the PACA President. Discussed the route impacted to the biking trails, restoration efforts and sponsorship opportunities. FEI has agreed to sponsor PACA and the Three Blind Mice trails near the OCU project for three years, during the course of construction. In 2020, PACA has used some of the funds for trail upgrades and improvements, primarily on a trail named Bronco.
6-May-20	Virtual Information Session	Public	Hayley Newmarch - Community Relations Manager	N/A	Session was hosted from 3:00 pm to 6:00 pm. A presentation was delivered at the top of every hour during each session. The remainder of the time was intended for questions and answers. FEI had project team members available and on the phone to answer questions during this time. This town hall structure provided multiple opportunities throughout the session for FEI to share the Project overview and to receive public feedback.
21-May-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	Email received in project inbox. Email inquired if the new gas line will service homes in the area. FEI responded to email and informed them that the this project is a transmission gas line that will connect into our larger system and provided further information on how to add natural gas to a home or business address. No follow up required.
19-Jun-20	In Person Meeting	Penticton Disc Golf Club President	Hayley Newmarch - Community Relations Manager	Penticton Disc Golf Club	FEI met with the Penticton Disc Golf Club President and walked the course and discussed any potentially impacted holes by the project and sponsorship opportunities.

Stakeholder Consultation Log - Okanagan Capacity Upgrade					
Date	Consultation Type	External Representatives	FEI Representatives	Location	Summary/Follow-up
23-Jun-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	Email received in project inbox inquiring if there is currently a natural gas line from Kelowna to north of Chute Lake. FEI responded to email providing information about the new project and the details about the existing gasline which runs from Penticton through Chute Lake and north towards Vernon. No follow up required.
29-Jun-20	Email	Penticton Disc Golf Club President	Hayley Newmarch - Community Relations Manager	N/A	FEI sent on a follow up email agreeing to sponsor the Penticton Disc Golf Club during the course of construction. The sponsorship funding will be used to: purchase and install new disc golf basket targets; install FortisBC's logo on each basket; add FortisBC as the "Course Sponsor" on the main course information sign located at the beginning of the course.
29-Jul-20	Mailed Letter	Sendero Canyon and Upper Carmi	Hayley Newmarch - Community Relations Manager	N/A	FEI sent out notification letters to the residents near Sendero Canyon and Upper Carmi. A copy of each letter was also sent to the RDOS Board Chair & Directors in Electoral Area D and E, as well as the Development Engineer at the City of Penticton. These letters were to update the residents about the geotechnical work starting in September 2020 in Penticton Creek. The letters outlined the hours of work, the dates, the work site locations, as well as FEI contact information, if the residents had any questions.
29-Jul-20	Email	City of Penticton: Development Engineer	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a copy of the notification letters that were mailed to the residents in the Sendero Canyon area. This letter was to notify residents of the upcoming geotechnical work that will be taking place.
29-Jul-20	Email	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen, Electoral Area D (Skaha East and OK Falls): Ron Obirek - RDOS Board Chair & Director	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a copy of the notification letters that were mailed to the residents in the Sendero Canyon area. This letter was to notify residents of the upcoming geotechnical work that will be taking place.
18-Aug-20	Conference Call	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director	Shelley Martens -Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager	N/A	Discussed potential community investment opportunities for Naramata during the course of construction for the project. The Naramata Wharf Park upgrades was discussed, as well as joint community investment ventures with PIB. RDOS to send FEI more information about the Wharf Park Project and set up a follow up call.
28-Aug-20	Mailed Letter	Sendero Canyon and Upper Carmi	Hayley Newmarch - Community Relations Manager	N/A	FEI sent out notification letters to the residents near Sendero Canyon and Upper Carmi. A copy of each letter was also sent to the RDOS Board Chair & Directors in Electoral Area D and E, as well as the Development Engineer at the City of Penticton. These letters were to update the residents about the geotechnical work starting in September 2020 in Penticton Creek. This letter was a follow up to the letter sent in July informing residents about the work schedule change due to the Mt Christie fires in Penticton. The letters outlined the hours of work, the dates, the work site locations, as well as FEI contact information, if the residents had any questions.
28-Aug-20	Email	City of Penticton: Development Engineer	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a copy of the notification letters that were mailed to the residents in the Sendero Canyon area. This letter was to notify residents of the upcoming geotechnical work that will be taking place.
28-Aug-20	Email	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen, Electoral Area D (Skaha East and OK Falls): Ron Obirek - RDOS Board Chair & Director	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a copy of the notification letters that were mailed to the residents in the Sendero Canyon area. This letter was to notify residents of the upcoming geotechnical work that will be taking place.

Stakeholder Consultation Log - Okanagan Capacity Upgrade					
Date	Consultation Type	External Representatives	FEI Representatives	Location	Summary/Follow-up
7-Sep-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	FEI received an email from a landowner in the Sendero Canyon area. They are interested in the additional benefit that could be derived from the project for affected communities. A particular suggestion is the provision of pedestrian access in the vicinity of the gas line and particular across Penticton Creek from the Sendero/Upper Duncan area across to Campbell Mountain. FEI replied to their email and notified the landowner that we have received their email and would share their ideas with the project team.
12-Sep-20	Email	Public	Hayley Newmarch - Community Relations Manager	N/A	Email received in project inbox. Email inquired about how someone could get involved with project controls of the construction projects. FEI responded to email informing them that the project is in the early stages of planning and that we have not finalized our resourcing strategy at this time. Email was forwarded onto the Project Controls Manager for consideration. No follow up required.
2-Oct-20	Phone Call	Ron Obirek - RDOS Board Chair & Director	Hayley Newmarch - Community Relations Manager	N/A	Ron reached out via phone to ask about an update on the Saliken Drive re-route. FEI replied about the potential option and that he would be kept up to date on the outcome. FEI discussed the drilling work going on in Penticton Creek and the notification letters that were sent to the nearby landowners. FEI and Ron also discussed the upcoming CPCN filling. Follow up: FEI sent Ron and Karla a copy of the landowner notification letter for the drilling work.
5-Oct-20	Email	Regional District Okanagan Similkameen, Electoral Area E (Naramata): Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen, Electoral Area D (Skaha East and OK Falls): Ron Obirek - RDOS Board Chair & Director	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a follow up email to Ron and Karla with a copy of the early geotechnical work notification letter to the residents in Sendero Canyon. A copy of the letter was sent on August 28, 2020 but the RDOS email system was down for weeks due to the security issue at RDOS.
7-Oct-20	Email	Karla Kozakevich - RDOS Board Chair & Director & Regional District Okanagan Similkameen	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a follow up email to Karla in regards to the Wharf Park Project in Naramata and requesting more information about the proposed project.
7-Oct-20	Email	Shawn Black, President of the Penticton Disc Golf Course	Hayley Newmarch - Community Relations Manager	N/A	FEI sent a follow up email to Shawn Black at the Disc Golf Course in regards to a sponsorship agreement.
7-Oct-20	Phone call	Publc	Hayley Newmarch - Community Relations Manager	N/A	FEI received a phone call from a customer in regards to the location of the proposed natural gas line and if it would be located close to their property. FEI reviewed the route with the customer via the map on our webpage.
29-Oct-20	Email	Shawn Black, President of the Penticton Disc Golf Course	Hayley Newmarch - Community Relations Manager	N/A	FEI sent an email to follow up on the email sent on October 7.

Appendix H-3
PUBLIC PROJECT ANNOUNCEMENTS

http://www.pentictonherald.ca/news/article_e2a86b7a-7f73-11ea-9421-efd2f2d148b8.html

FEATURED

FortisBC pitches $200M gas pipeline east of Penticton

JOE FRIES
Apr 15, 2020

Workers install a new natural gas pipeline near Grand Forks in 2018. FortisBC is proposing to put in a smaller, but similar, line east of Penticton.

FortisBC/Special to The Herald

FortisBC has unveiled early-stage plans for a new natural gas pipeline that would run north along the east side of Penticton and Naramata to the Chute Lake area.

The 30-kilometre line isn't intended to service any specific new developments right now, according to company spokesman Grace Peach, but rather is meant to add capacity to accommodate future growth in the region and strengthen the system as a whole to better serve its 90,000 customers.

Peach said the majority of the steel, 40-centimetre-diameter pipe would be installed in or near existing right-of-ways, while FortisBC is also planning broad consultation with local governments, First Nations and private landowners.

She doesn't anticipate the same level of opposition seen in northwestern B.C. this past winter against the Coastal GasLink project, which will carry gas from northeastern B.C. to tidewater for export.

"I think it's important to remember this is a local utility expansion," said Peach of her project.

"This gas line is serving the homes and businesses that use gas on a day-to-day basis and serving the growth we're expecting to see in the Okanagan."

Peach estimates the project will cost upwards of $200 million, which will translate into an extra $6 per year for the average FortisBC gas customer.

"For projects like this," she added, "the cost of the expansion is borne across all of our customers so everyone can benefit by having a stronger system."

But it's far from a done deal yet. The company is hosting a pair of phone-in town hall meetings April 30 and May 6, plus accepting feedback online.

Peach said any changes to the proposed routing resulting from the consultations will be incorporated in the application package that goes to the B.C. Utilities Commission later this year. If the BCUC approves the pipeline, construction is expected to start in 2021 and take two years.

For more information, call 1-888-592-7704, email okanaganupgrade@fortisbc.com, or visit www.talkingenergy.ca/okanagan.

This article has been updated to correct the size of the pipe and clarify the majority of the line will be buried in or near existing right-of-ways.

FortisBC is planning to expand its natural gas system in the Okanagan Valley (Black Press file photo)

FortisBC plans for upgrade in Okanagan Valley

Upgrade near Penticton would enhance present supply and prepare for future needs

JOHN ARENDT / Apr. 15, 2020 11:28 a.m. / NEWS

FortisBC has announced an expansion of its natural gas system in the Okanagan Valley.

The Okanagan Capacity Upgrade project was announced on April 15 and expands the energy supplier's system in the region.

According to FortisBC, the project is driven by the increasing demand we will be facing in the region over the next five years.

The project is for 30 kilometres of new gas line that would connect the system along Penticton's eastern border and extend north towards Chute Lake.

READ ALSO: FortisBC offers 90-day bill deferrals to customers impacted by COVID-19

READ ALSO: FortisBC pausing power disconnections and late-fees amid COVID-19 crisis

This will add capacity to meet present and future demands.

FortisBC is now preparing an application for a Certificate of Public Convenience and Necessity to the British Columbia Utilities Commission.

The application will be filed this yer.

If approved, the upgrade would strengthen the system for roughly 90,000 homes and businesses in the Okanagan. It would also meet growth in regional demand.

Construction could begin as early as 2021, with the upgrade becoming operational by 2023.

“As we navigate the current public health emergency, FortisBC is committed to ongoing opportunities for meaningful engagement with local governments, Indigenous communities, and residents as we progress towards our CPCN application,” a statement from FortisBC reads. “Opportunities for upcoming engagement include two telephone town halls on April 30 and May 6.”

Details about the upcoming telephone town hall meetings are available online at talkingenergy.ca/okanagan, by telephone at 1-888-592-7704 or by email at okanaganupgrade@fortisbc.com.

To report a typo, email: news@summerlandreview.com.

---

news@summerlandreview.com

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NATURAL GAS

CANADA

FortisBC proposes new gas line project to meet Okanagan growth

By **Darrian Matassa-Fung** · **Global News**
Posted April 15, 2020 3:29 pm

FortisBC is planning a new expansion project to help meet the energy demands of the Okanagan. **Global News**

-A A+

FortisBC has announced that it is proposing an expansion to the natural gas system in the Okanagan.

The Okanagan Capacity Upgrade project is aimed at supporting the everyday energy needs of the Okanagan community.

READ MORE: Chaos ensues when distillery in Kelowna, B.C., gives away

READ MORE: [redacted] free sanitizer

FortisBC says the proposed project is driven by the growing demand for energy in the Okanagan region.

It adds that the upgrades would meet the needs of the community for the next five years.

READ MORE: Coronavirus — more infrastructure for B.C. commercial truck drivers

Around 30 kilometres of new gas lines would be built, connecting to Penticton's eastern system and extending north towards Chute Lake, according to FortisBC.

The energy company says the project is still in its infancy as FortisBC prepares its application for the project.

It says the application is expected to be submitted this year.

READ MORE: Indo-Canadian community in Kelowna shows appreciation for front-line health-care workers

If the Okanagan Capacity Upgrade project is approved, FortisBC says it will:

- Strengthen the system for approximately 90,000 homes and businesses in the Okanagan that rely on natural gas service.
- Meet growth in regional demand, with some communities expected to grow by up to 40 per cent in the next 20 years.

- Begin construction as early as 2021 and be operational by 2023.

Opportunities for public feedback include two telephone town halls on April 30 and May 6.

You can find more info on the new proposed project here.

2:40

Reality show goes ahead in West Kelowna amid pande...

Reality show goes ahead in West Kelowna amid pandemic

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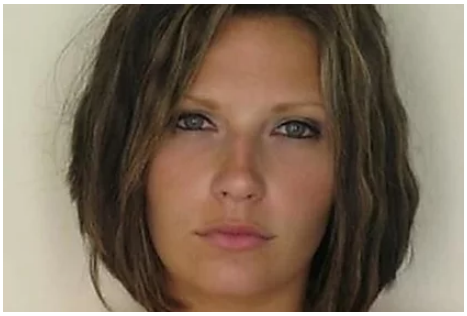

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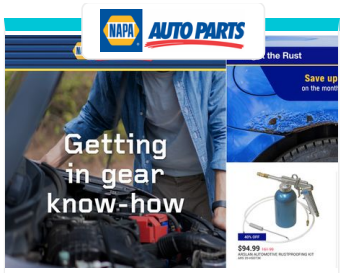

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Penticton

Gas line expansion planned

FortisBC natural gas line expansion planned in Penticton

Chelsea Powrie - Apr 15, 2020 / 12:50 pm | Story: 297305

Photo: Contributed
A planned FortisBC gas line expansion spans the east side of Penticton to Chute Lake.

FortisBC has announced plans for a 30-kilometre natural gas line expansion along the east border of Penticton and Okanagan Lake, aimed at expanding service for Okanagan customers.

The proposed line would connect to the existing Penticton system and extend north to Chute Lake, and while it is awaiting official approval from the BC Utilities Commission, FortisBC communications manager Grace Peach said she anticipates customers won't be adversely affected.

"Right now we anticipate the rate impacts would be minimal," Peach said. "Our projections are showing it would be around $6 per year for the average gas customer."

FortisBC says the project, if approved, would strengthen the system for 90,000 existing home and business customers in the Okanagan and prepare for an anticipated growth in regional demand.

"We are still in the very early planning stages so the projected costs and all of that could still continue to evolve as we engage with the community and go through the regulatory process," Peach said.

They have spoken to the City of Penticton, Regional District of Okanagan Similkameen and local indigenous communities to get early feedback, and are now launching more community outreach via two teleconference town hall meetings and mail-out information packets.

"We will take all of that information, put it into our application to the regulator and they will review it, and there are ongoing opportunities for people to engage throughout that process before the regulator makes a decision," Peach explained. "And after that we're able to move it to a construction phase."


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They hope to have construction underway as early as 2021 and be operational by 2023.

Information on teleconference town halls, scheduled for April 30 and May 6, can be found here, and anyone with questions or concerns can contact FortisBC at 1-888-592-7704 or okanaganupgrade@fortisbc.com.

3

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Janie

Penticton SPCA >

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South Okanagan Quick Links

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Penticton Tourism
Penticton Transit
Okanagan Falls
Town of Oliver
Town of Osoyoos
Town of Keremeos
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Okanagan College
Regional District Okanagan-Similkameen
Penticton & Wine Country Chamber
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District of Summerland
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Appendix H-4
OCU – CITY OF PENTICTON MEMO

Okanagan Capacity Upgrade Project Update

Prepared for the City of Penticton Mayor and Council
April 6, 2020

Background

The Okanagan is growing, and demand for natural gas is growing with it. Some communities in the Okanagan are expected to grow by up to 40% in the next two decades. Driven by increasing demand over the next five years, FortisBC is preparing an application to our regulator, the British Columbia Utilities Commission, to install approximately 30 kilometers of new gas line in the South Okanagan that would increase our gas capacity and keep pace with growth.

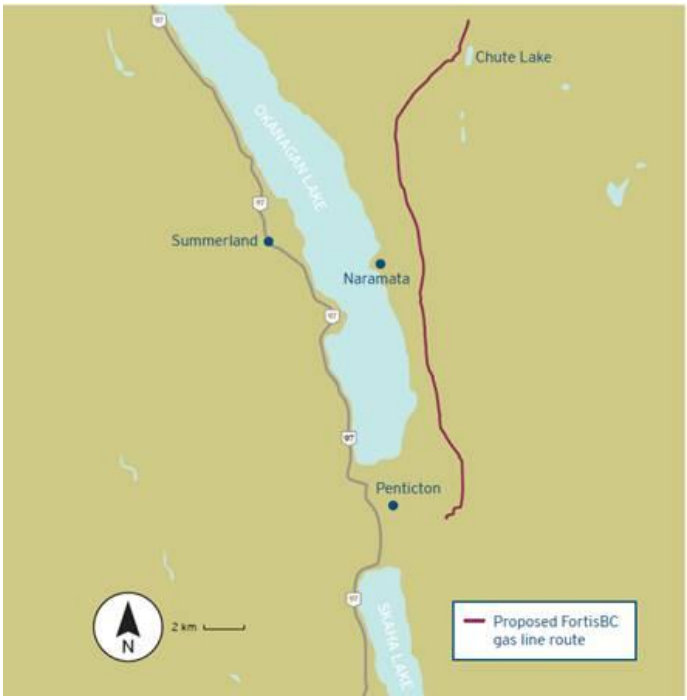
If approved, FortisBC will install the new 16-inch gas line in the South Okanagan, connecting to our system along Penticton's eastern border and extending north just beyond Chute Lake. The new gas line would be installed and commissioned by 2023.

Timeline

- Public engagement for feedback on the alignment of the route - ongoing
- File for Certificate of Public Convenience and Necessity (CPCN) - 2020
- Anticipated construction, if approved - 2021
- Anticipated completion - 2023

Proposed Route

The proposed alignment for the project parallels FortisBC's existing gas and electric right-of-ways, in an effort to minimize impacts and our environmental footprint. The proposed route can be viewed in the map below or in YouTube via a Google Earth video. Please click here to view the video.



Next Steps

As we adapt together during the unprecedented challenges of COVID-19, FortisBC is prioritizing critical energy projects, such as the Okanagan Capacity Upgrades, which support the everyday livelihood and well-being of customers and communities. As a result, FortisBC will continue engagement with the City of Penticton, local Indigenous communities, RDOS, landowners, and community stakeholders to seek feedback on the project. We are also planning broader public notifications this month, which will involve sharing information with local media outlets and launching the project webpage on our talkingenergy.ca website.

We will also be encouraging community stakeholders to engage with us through the following channels:

- Inviting the public to contact us via phone at 1-888-592-7704 or email at okanaganupgrade@fortisbc.com
- Inviting the community to participate in upcoming telephone town hall sessions, with both phone and internet-based options. These are scheduled for April 30 and May 6

FortisBC is committed to keeping the City of Penticton updated as the project progresses, and will continue to work closely with staff to provide relevant updates. We will continue to monitor the current public health emergency, and when appropriate, we would be pleased to provide an online Skype presentation to the Mayor and Council, as well as your staff.

If you have any questions, or would appreciate the details to participate in the upcoming telephone town hall sessions, please contact me directly by phone at 778-215-1435, or by email at Hayley.Newmarch@fortisbc.com.

Best regards,

HNewmarch

Hayley Newmarch
Community Relations Manager – Major Projects
FortisBC Energy Inc.

Appendix H-5
INFORMATION BULLETIN

Information bulletin

FortisBC proposes new gas line project to meet Okanagan growth

April 15, 2020

SURREY, B.C. – Today, FortisBC Energy Inc. ("FortisBC") is announcing the Okanagan Capacity Upgrade project, an expansion of our natural gas system in the Okanagan. As we adapt together to the unprecedented challenges of COVID-19, FortisBC is continuing to advance critical projects, such as this upgrade, to support the everyday energy needs of customers and communities.

The Okanagan Capacity Upgrade project is driven by the increasing demand we will be facing in the region over the next five years. It proposes 30 kilometres of new gas line that would connect to our system along Penticton's eastern border and extend north towards Chute Lake. This extension will add crucial capacity that will meet demand both now, and well into the future.

The project is still in the early planning stages, as FortisBC prepares an application for a Certificate of Public Convenience and Necessity (CPCN) to our regulator, the British Columbia Utilities Commission. The application is expected to be filed this year.

If approved, the Okanagan Capacity Upgrade project would:

- Strengthen our system for approximately 90,000 homes and businesses in the Okanagan that rely on our natural gas service every day
- Meet growth in regional demand, with some communities expected to grow by up to 40 per cent in the next 20 years
- Begin construction as early as 2021 and be operational by 2023

As we navigate the current public health emergency, FortisBC is committed to ongoing opportunities for meaningful engagement with local governments, Indigenous communities, and residents as we progress towards our CPCN application. Opportunities for upcoming engagement include two telephone town halls on April 30 and May 6, 2020.

To learn more about the Okanagan Capacity Upgrade project, including details on the upcoming telephone town halls, visit the project webpage at talkingenergy.ca/okanagan. Alternatively, interested parties can connect with us at 1-888-592-7704 or by email at okanaganupgrade@fortisbc.com.

MEDIA CONTACT:
Grace Peach
Manager, Communications
Communications and External Relations
FortisBC
Phone: 604-328-2544
Email: grace.peach@fortisbc.com
fortisbc.com
@fortisBC
24-hour media line: 1-855-322-639

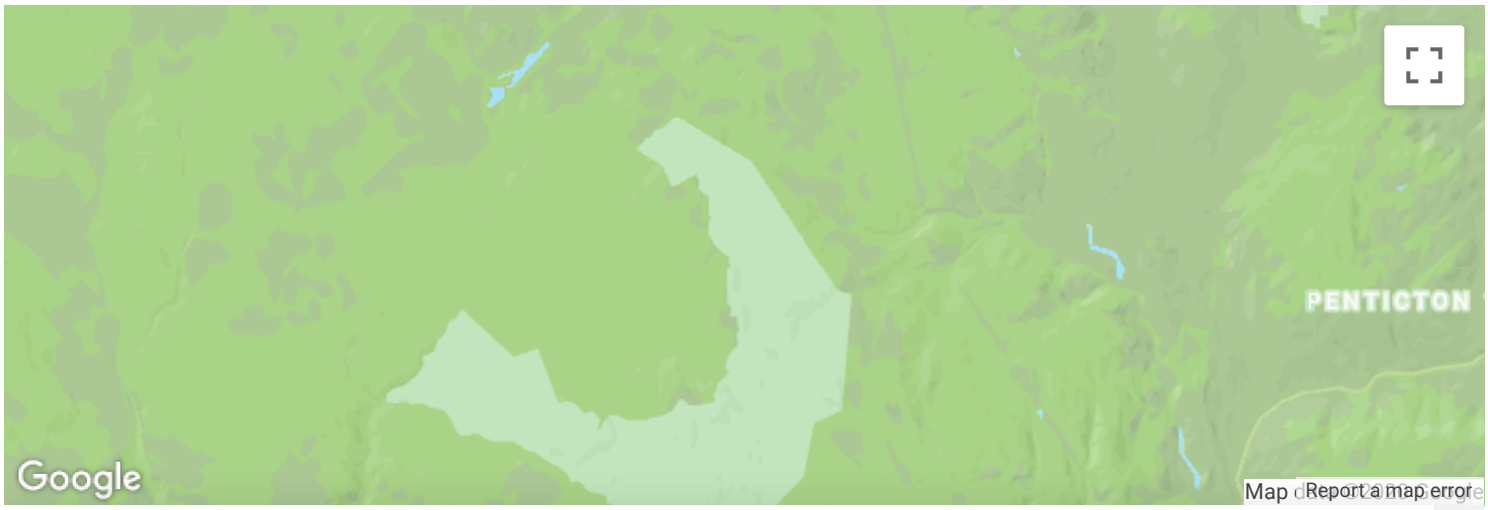
About FortisBC

FortisBC Energy Inc. is a regulated utility focused on providing safe and reliable energy, including natural gas, propane and thermal energy solutions. FortisBC Energy Inc. employs more than 1,800 British Columbians and serves approximately 1,029,000 customers in 135 B.C. communities. FortisBC Energy Inc. owns and operates approximately 49,000 kilometres of natural gas transmission and distribution pipelines. FortisBC Energy Inc. is an indirect, wholly owned subsidiary of Fortis Inc., a leader in the North American regulated electric and gas utility industry. For further information, visit www.fortisinc.com. FortisBC uses the FortisBC name and logo under license from Fortis Inc.

Appendix H-6
PROJECT WEBPAGE

FORTIS BC™ Energy at work

Okanagan Capacity Upgrade



Overview Updates Community FAQs Resources

About this project

We're planning to increase our capacity in the Okanagan by adding approximately 30 kilometres of new gas line. This project will be an extension of our existing natural gas system, connecting along Penticton's eastern border and extending north, just beyond Chute Lake.

As a critical energy infrastructure service we're continuing to advance projects, such as this upgrade, that support the energy needs of customers and communities while adapting to the challenges of COVID-19.

The Okanagan Capacity Upgrade project is driven by the increasing demand we will be facing in the region over the next five years, and also allows us to meet long-term needs as the region continues to grow.

This expansion would strengthen our system for approximately 90,000 homes and businesses in the Okanagan that rely on our natural gas service every day.

Flyover of proposed route

Okanagan Capacity Upgrade route flyover | FortisBC

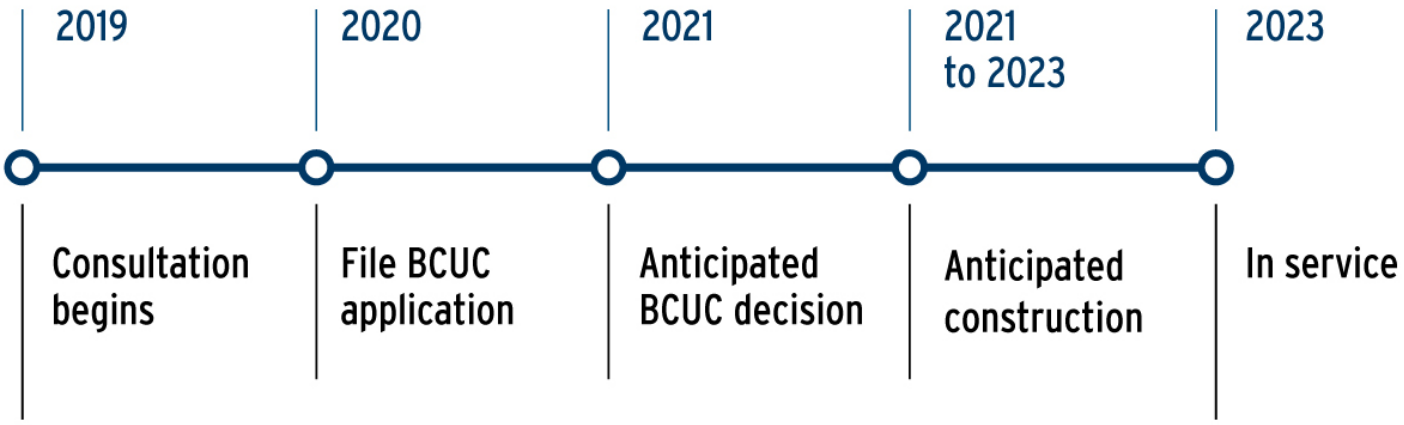
- Extension of existing system will keep pace with regional growth - now, and into the future
- Will also strengthen our system for approximately 90,000 current customers
- Connecting to our existing system at Ellis Creek (Penticton) and Chute Lake end points

Project timelines and next steps

We're in the early planning stages of this project and are engaging with Indigenous communities, local governments and area residents, as we work toward submitting an application to the British Columbia Utilities Commission (BCUC) this year.

As part of our ongoing engagement we'll be hosting two telephone town halls instead of in-person information sessions, to ensure physical distancing, on April 30 and May 6, 2020 for the community to learn more, ask questions and provide feedback.

If approved, we expect project construction will take place between 2021 and 2023.



FORTIS BC™ Energy at work

CALL US

1-888-592-7704

EMAIL US

okanaganupgrade@fortisbc.com

ASK US

Ask a question

Stay in the loop

Subscribe to learn more about FortisBC related news, project updates and discussion topics.

About us Contact us

Energy at work FORTIS BC™

Appendix H-7
BILL INSERT

Energy at work

FORTIS BC™

Enhancing our natural gas system

Okanagan Capacity Upgrade

As a critical energy infrastructure provider, we're continuing to advance projects that support the energy needs of our customers while adapting to the challenges of the current health crisis.

Driven by increasing demand in the Okanagan region, we're planning to increase our natural gas capacity by adding approximately 30 kilometres of new gas line. It will connect to our system along Penticton's eastern border and extend north just beyond Chute Lake.

We're in the early planning stages of the project. As we prepare to submit an application to our regulator, the British Columbia Utilities Commission (BCUC), we're engaging with the community. If approved, we expect construction will take place between 2021 and 2023.

At this time, we expect the average rate impacts over the course of this project to be minimal.

We encourage you to learn more and provide feedback.
Visit **talkingenergy.ca/Okanagan.**

To learn about the BCUC regulatory process, visit **bcuc.com.**

Connect with us

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Energy at work

(20-034.4 04/2020) *MCC# 904097*

Appendix H-8
PAID ADVERTISEMENTS

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You're invited to a telephone town hall

Okanagan Capacity Upgrade

As a critical energy infrastructure provider, we're continuing to advance projects that support the energy needs of our customers while adapting to the challenges of the current health crisis.

Driven by increasing demand in the Okanagan, we're planning an expansion to our natural gas system with close to 30 kilometres of new gas line connecting to our existing system along Penticton's eastern border and extending north just beyond Chute Lake.

We're engaging with the community before we file an application with our regulator, the B.C. Utilities Commission. We'd like to hear from you as we continue with the early planning stages of this project.

Let's talk:
Dial-in: **1-888-300-0053**
April 30, 2020, 5 to 8 p.m., conference ID: **3639199**
May 6, 2020, 3 to 6 p.m., conference ID: **4575204**

Register at **talkingenergy.ca/infosession**

Questions?
Call us **1-888-592-7704**
Email **okanaganupgrade@fortisbc.com**
Visit **talkingenergy.ca/okanagan** to learn more.

Energy at work

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You're invited to a telephone town hall

Okanagan Capacity Upgrade

As a critical energy infrastructure provider, we're continuing to advance projects that support the energy needs of our customers while adapting to the challenges of the current health crisis.

Driven by increasing demand in the Okanagan, we're planning an expansion to our natural gas system with close to 30 kilometres of new gas line connecting to our existing system along Penticton's eastern border and extending north just beyond Chute Lake.

We're engaging with the community before we file an application with our regulator, the B.C. Utilities Commission. We'd like to hear from you as we continue with the early planning stages of this project.

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Email **okanaganupgrade@fortisbc.com**
Visit **talkingenergy.ca/okanagan** to learn more.

Energy at work

FORTIS BC™

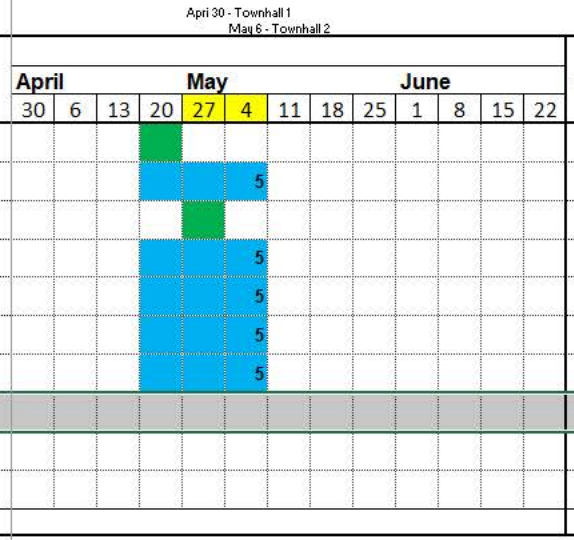
We're planning to upgrade our natural gas line

Energy at work

FORTIS BC™

We're planning to upgrade our natural gas line

Fortis BC
OCU Info Sessions
4/3/2020



Campaign	Element	Market	Description		# of Weeks
Phase 1	Print	Penticton	Penticton Herald	Half page, BW - 10.44" w x 10.71" h	1
	Digital	Penticton	Penticton Herald	300x250, 728x90	3
	Print	Penticton	Penticton Western News	Half page, BW - 10.33" w x 6" h	1
	Digital	Penticton	Penticton Western News	300x250, 320x50, 970x90, 300x50, 300x600	3
	Digital	Penticton, Naramata	Weather Network	300x250, 728x90, 320x50	2
	Digital	Penticton	Castanet	Penticton Front Page Banner - 728x90	2
	Digital	Naramata	MyNaramata	Display Banner - 220x220 - front page right column, rotating sponsor	2
	Digital		Ad Serving		

Appendix H-9
OCU E-BILL CUSTOMER TILE AD


We're planning to increase natural gas capacity in the Okanagan.
Learn more

Appendix H-10
TELEPHONE TOWN HALL PRESENTATION

Okanagan Capacity Upgrade Project (OCU)

Telephone Town Hall Sessions

April 30, 2020 & May 6, 2020

Energy at work FORTIS BC

Your FortisBC Host

Hayley Newmarch, Community Relations Manager, Major Projects

Agenda

- About FortisBC
- Proposed Project Overview
- Project Need
- Proposed Route
- Engaging the Community
- Questions

About FortisBC

- More than 2,400 employees serving about 1.2 million customers in 135 communities with electricity, natural gas, propane, or alternative energy.
- ~49,000 km of natural gas transmission and distribution pipelines
- ~7,260 km of electric transmission and distribution power lines

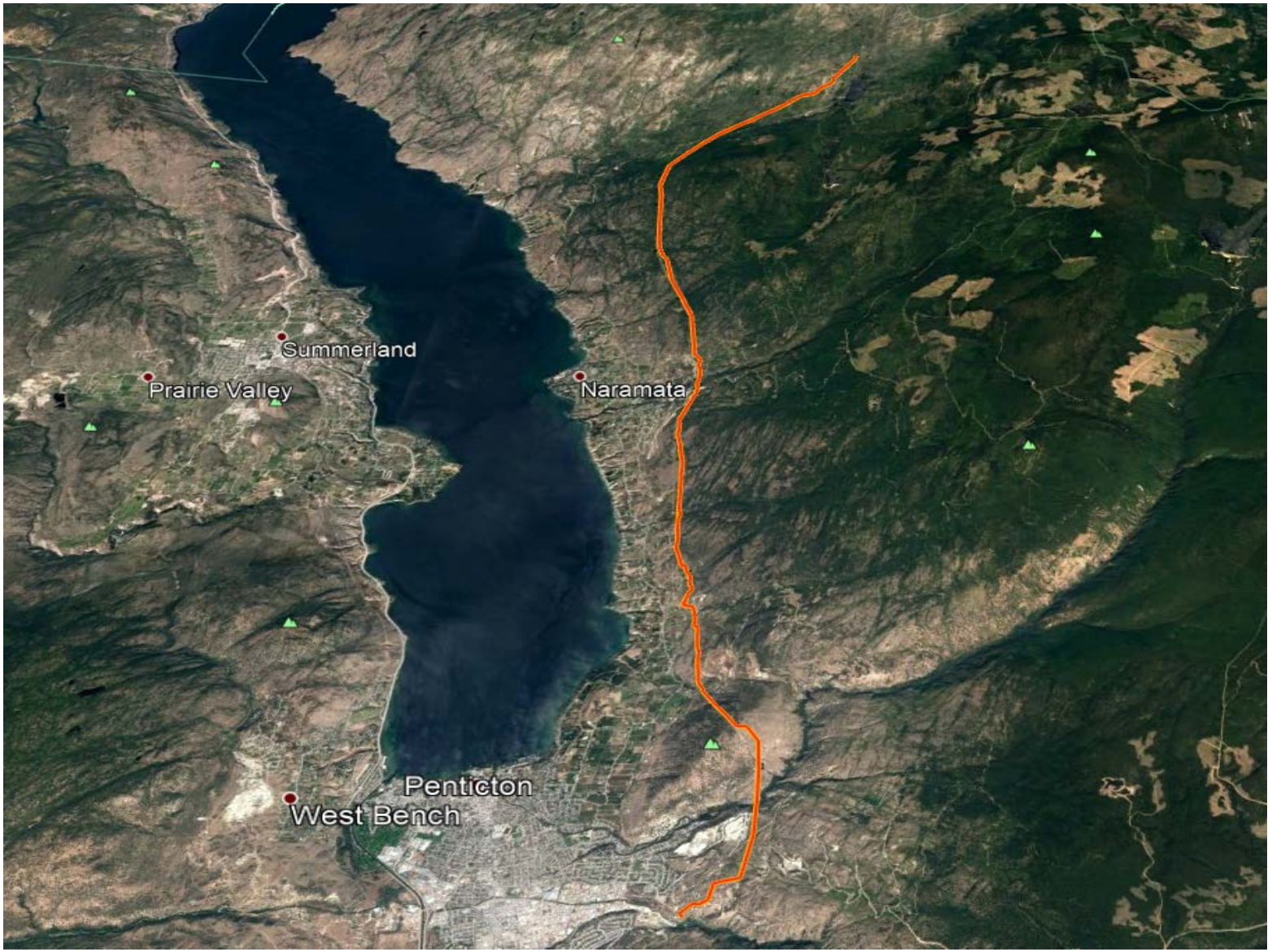
Proposed Project Overview

- Install 30km of new 16-inch gas line in the South Okanagan, connecting to our system along Penticton's eastern border and extending north just beyond Chute Lake
- If approved, the new gas line will be installed and commissioned by 2023
- File for Certificate of Public Convenience and Necessity (CPCN) - 2020

The Need for the Project

- We are increasing our gas capacity in the Okanagan to serve the region and keep pace with growth
  - This project is driven by five year demand, based on forecasts of continued growth in the region as a whole
  - Some communities in the Okanagan are expected to grow by 40% in the next two decades
- This expansion will also allow us to meet long-term capacity requirements as the region continues to grow

Proposed route



Existing Right of Ways

Engaging the Community

- Continue to work with local governments, Indigenous communities, landowners, and residents
- Community information sessions via telephone town halls
- Local media outreach and advertisements to the community
- Visit **talkingenergy.ca/okanagan** to learn more about the project

Thank you

Energy at work FORTIS BC™

For further information, please contact:

Hayley Newmarch, Community Relations Manager

Phone: 1-888-592-7704

Email: okanaganupgrade@fortisbc.com

Find FortisBC at:

Fortisbc.com

talkingenergy.ca

604-576-7000

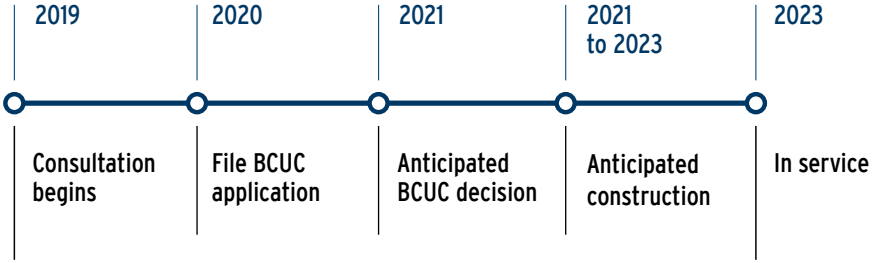
Appendix H-11
INFORMATION CARD

Energy at work

FORTIS BC™

Enhancing our natural gas system

Okanagan Capacity Upgrade



To keep pace with growth in the Okanagan region, we're planning to increase our natural gas capacity by adding approximately 30 kilometres of new gas line. It will connect to our system along Penticton's eastern border and extend north just beyond Chute Lake.

We're in the early planning stages of the project and are engaging with the community as we prepare to submit an application with our regulator, the British Columbia Utilities Commission (BCUC). If approved, we expect construction work will take place between 2021 and 2023.

Visit **talkingenergy.ca/okanagan** to learn more.

Call us **1-888-592-7704**
Email us **okanaganupgrade@fortisbc.com**

Connect with us

(20-034.5 03/2020)

FORTIS BC™
Energy at work

Appendix H-12

DIRECT MAILER TO PROPERTIES WITHIN 200 METERS OF ROUTE

Energy at work FORTIS BC™

Enhancing our natural gas system

Okanagan Capacity Upgrade

As a critical energy infrastructure provider, we're continuing to advance projects that support the energy needs of our customers, while adapting to the challenges of the current health crisis.

Driven by increasing demand in the Okanagan region, we're planning to increase our natural gas capacity by adding approximately 30 kilometres of new gas line. It will connect to our system along Penticton's eastern border and extend north just beyond Chute Lake.

We're in the early planning stages of the project and are engaging with the community as we prepare to submit an application to our regulator, the B.C. Utilities Commission (BCUC). If approved, we expect construction will take place between 2021 and 2023.

Let's talk

Attend one of our telephone town halls to learn more about this project and ask us questions:

April 30, 2020
5 to 8 p.m.
Dial-in: **1-888-300-0053**
Conference ID: **3639199**

May 6, 2020
3 to 6 p.m.
Dial-in: **1-888-300-0053**
Conference ID: **4575204**

There will be a short presentation about the project at the top of every hour.

Register at **talkingenergy.ca/infosession**

Questions?

Call us **1-888-592-7704**

Email **okanaganupgrade@fortisbc.com**

Visit **talkingenergy.ca/okanagan** to learn more.

Connect with us

(20-034.3 04/2020)

Energy at work FORTIS BC™

Appendix H-13
NOTIFICATION LETTERS

FortisBC Energy Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
www.fortisbc.com

July 29, 2020

FortisBC early field work

Dear neighbour,

FortisBC is committed to delivering natural gas safely and reliably to our customers. As we adapt together to the unprecedented challenges of COVID-19, FortisBC is continuing to advance critical projects to support the everyday energy needs of customers and communities. One of these projects is the Okanagan Capacity Upgrade project. This project would add 30 kilometers of new natural gas line in the Okanagan, connecting to our system along Penticton's eastern border and extending north towards Chute Lake. The new line will add capacity that will meet demand in the region both now and well into the future.

We're still in the early planning stages and we are applying to the British Columbia Utilities Commission for approval of this project. If approved, construction of the new gas line would begin in 2022, with an anticipated completion date in 2023.

Our crews are working in your neighbourhood
In preparation for the project, early engineering field work is required along the route. This includes work within our existing electric right-of-way, near Penticton Creek. Our crews will be evaluating the ground and soil conditions in this area, to help determine the construction method that could be used to cross Penticton creek. This early work will require drilling in some locations.

The work is anticipated to occur starting the week of August 10 or August 17 and will likely last up to 25 days. The work is planned to be conducted from 8:00 a.m. to 8:00 p.m., as well as Sunday between 9:00 a.m. to 6:00 p.m. During this time, you may be aware of some small vibrations, and we expect the noise to be comparable to normal construction noise levels.

We appreciate your patience as we work to complete this project safely, and as quickly as possible. To learn more about the project and for updates on work in your neighbourhood, please visit **talkingenergy.ca/okanagan**. Please also feel free to call our project phone line at 1-888-592-7704, or send an e-mail to okanaganupgrades@fortisbc.com.

Sincerely,

HNewmarch

Hayley Newmarch, Community Relations Manager

FortisBC Energy Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
www.fortisbc.com

August 28, 2020

FortisBC early field work

Dear neighbour,

FortisBC is committed to delivering natural gas safely and reliably to our customers. As we adapt together to the unprecedented challenges of COVID-19, FortisBC is continuing to advance critical projects to support the everyday energy needs of customers and communities. One of these projects is the Okanagan Capacity Upgrade project. This project would add 30 kilometers of new natural gas line in the Okanagan, connecting to our system along Penticton's eastern border and extending north towards Chute Lake. The new line will add capacity that will meet demand in the region both now and well into the future.

We're still in the early planning stages and we are applying to the British Columbia Utilities Commission for approval of this project. If approved, construction of the new gas line would begin in 2022, with an anticipated completion date in 2023.

Our crews are working in your neighbourhood

As previously indicated on July 29, in preparation for the project, early engineering field work is required along the route. This includes work outside of our existing electric right-of-way, near Penticton Creek. Our crews will be evaluating the ground and soil conditions in this area, to help determine the construction method that could be used to cross Penticton creek. This early work will require drilling in some locations.

Our crews began the early engineering field work on August 17, but stopped all activities on August 18, due to the nearby fires. We are planning to resume work in mid-September, and the work is anticipated to be completed by mid-October. Our crews will need to work 24 hours a day for approximately 10 consecutive days in one location. This location is approximately 350m away from the nearest property line (northern side of Penticton Creek). The field work at the other locations will be completed between 7:00 a.m. to 10:00 p.m., as per the City of Penticton noise bylaws. During this time, our crews will make efforts to minimize noise for nearby residents.

We appreciate your patience as we work to complete this project safely, and as quickly as possible. To learn more about the project and for updates on work in your neighbourhood, please visit **talkingenergy.ca/okanagan**. Please also feel free to call our project phone line at 1-888-592-7704, or send an e-mail to okanaganupgrades@fortisbc.com.

Sincerely,

HNewmarch

Hayley Newmarch, Community Relations Manager

Appendix H-14
OCU LAND ACQUISITION PLAN

FILED CONFIDENTIALLY

Appendix H-15
LANDOWNER NOTIFICATION LETTERS

FortisBC Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
www.fortisbc.com

March 5, 2020

«Owner_Name»
«Owner____Address»

RE: FortisBC Okanagan Capacity Upgrade Project

Dear «Owner_Name»:

FortisBC would like to notify you of a natural gas line upgrade project that may occur in your community. We are planning to increase our natural gas capacity in the Okanagan by adding approximately 30 kilometres of new gas line from Penticton's eastern border to Chute Lake. This upgrade would be an extension of our existing natural gas system and will ensure we can continue to meet the energy needs of this growing region, now and in the future.

We may need to access your property for field studies

FortisBC is currently assessing proposed route options, and we plan to carry out preliminary field studies and engagement in the coming weeks. To support these field studies, we may require access to your property. Prior to accessing your property, we will be in touch over the phone, and likely in-person to discuss the project and to obtain your permission to access your property.

If you have contact information you wish to provide, or if you have any questions about the upcoming field studies in relation to your property, please contact Chris Coady, Property Services, at Chris.Coady@FortisBC.com. We appreciate your patience and cooperation during this process.

Next steps

We are currently in the early planning stages of this project. The next steps are to engage with the local community, complete field studies, and submit an application to our regulator, the British Columbia Utilities Commission (BCUC). This application is anticipated to take place this year. If approved, we expect construction work would take place between 2021 and 2023.

Sincerely,

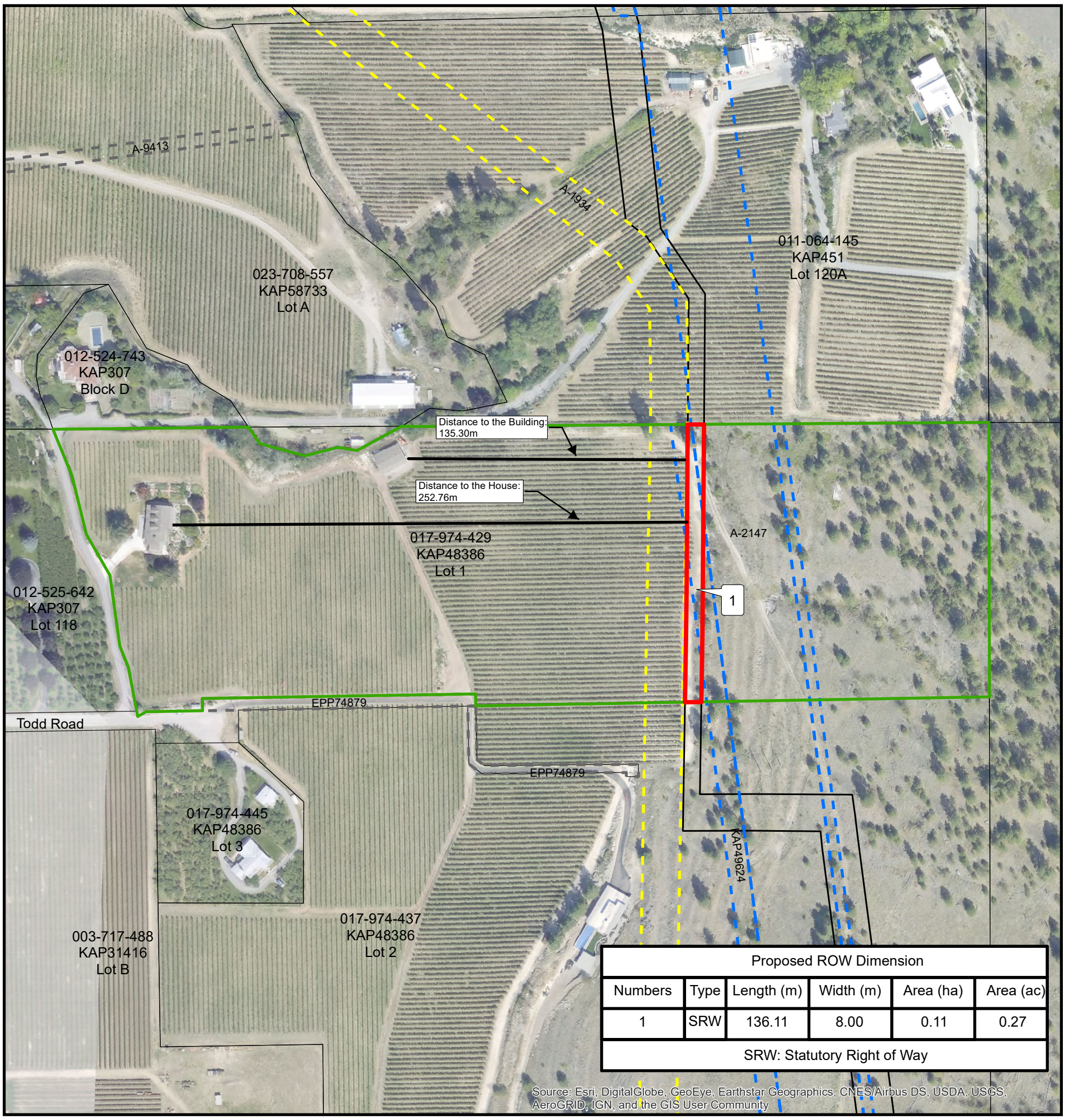
FortisBC Energy Inc.

Chris Coady

Chris Coady
Property Services Manager

Appendix H-16
SAMPLE IOP

INDIVIDUAL OWNERSHIP PLAN
SHOWING
PROPOSED PIPELINE R/W
WITHIN LOT 1
CITY OF PENTICTON



Proposed ROW Dimension					
Numbers	Type	Length (m)	Width (m)	Area (ha)	Area (ac)
1	SRW	136.11	8.00	0.11	0.27
SRW: Statutory Right of Way					

Legend

- PROPOSED RIGHT OF WAY
- SUBJECT PROPERTY
- ELECTRIC
- GAS
- OTHERS

SAMPLE IOP

Distances Area in Meters

This product has been created with the highest degree of accuracypossible. However, Solaris-MCI, nor any of its contractors or suppliers can be held responsible for any damages due to errors or omissions in this product. The map is a graphical representations intended for general informational purposes only.

COORDINATE SYSTEM:
NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983

SCALE:
1:2,000

Kilometers
0 0.0175 0.035 0.07 0.105 0.14

SOLARIS MANAGEMENT CONSULTANTS INC.
5588 Panorama Drive
Surrey, B.C. V3S 1B7
Phone: (604) 575-8300
Fax: (604) 575-8301
email: solaris@solaris-mci.com

FORTIS BC™

PROJECT:	EPCM DOC. NUMBER:	DOCUMENT NUMBER:
Okanagan Capacity Upgrade		P-00760-EXT-MAP-0028

REV.	DATE	ISSUE STAGE	EPCM No.	ORIGINATED	CHECKED	APPROVED
0	2/25/2020	DRAFT	FT19-03728	CYZ	WTT	AKH

Appendix H-17

AGREEMENT TO GRANT STATUTORY RIGHT OF WAY AND TEMPORARY WORK SPACE

Agreement to Grant Statutory Right of Way and Temporary Work Space
Dated for reference this ____day of _____, 2020.

Between:

<@>

(the "**Owner**"**)** [*NTD: if more than one Owner, change* this to **(collectively, the "Owner")**] **of** < address>

And:

FORTISBC ENERGY INC. ("**FortisBC**"**) of 16705 Fraser Highway, Surrey, British Columbia V4N 0E8**

1.0 Introduction

1.1 FortisBC is a natural gas utility. It is making application to the British Columbia Utilities Commission for approval to construct a natural gas line to increase and upgrade the supply of natural gas to the Penticton and Kelowna areas. The project is called the Okanagan Capacity Upgrade Project (the "**OCU Project**").

1.2 The Owner is the registered owner of the land legally described as:

P.I.D. <@>

<@>

(the "**Land**"). *[NTD: if more than one parcel, change this to **(collectively, the "Land")**.]*

1.3 FortisBC requires a statutory right of way **(**the "**SRW**"**)** and temporary work space (the "**TWS**") over portions of the Land as described in this Agreement for the purposes of the OCU Project.

1.4 On the terms of this Agreement, the Owner has agreed to grant to FortisBC a SRW and a TWS and has agreed to provide FortisBC access to and across the Land for its use of (a) the SRW Area as defined in Section 2.1 and its use of (b) the TWS Area as defined in Section 4.1. The following Schedules attached to this Agreement are incorporated in and form part of this Agreement:

Schedule 1- SRW Agreement

Schedule 2- Individual Ownership Plan

Schedule 3- Pre-Construction Work and Restoration Work Details

[Other]

For good and valuable consideration, the receipt and adequacy of which is acknowledged by both the Owner and FortisBC, the Owner and FortisBC agree as follows:

2.0 Grant of SRW and Registration of SRW Plan

2.1 The Owner agrees to grant a SRW to FortisBC for use by its officials, employees, contractors, subcontractors, agents, licensees, invitees and permittees (collectively, the "**FortisBC Personnel**"), on the terms and conditions contained (a) in this Agreement and (b) in the SRW Terms of Instrument attached to this Agreement as Schedule 1 (the "**SRW Agreement**"), over those portions of the Land approximated by the red-lined area on the Individual Ownership Plan attached to this Agreement as Schedule 2 (the "**SRW Area**").

2.2 Promptly after signing this Agreement, FortisBC will deliver to the Owner the SRW Agreement in registrable form together with any accompanying plans. Upon receipt, the Owner will promptly sign the SRW Agreement in registrable form and will either deliver the signed documents to FortisBC at the address for delivery set out in Section 8.4 of this Agreement or arrange for pick up of the signed documents by FortisBC Personnel.

2.3 FortisBC will arrange for the preparation of any applicable plans and the registration of such plans and the SRW Agreement at the appropriate Land Title Office at its cost and expense.

2.4 Until the SRW Agreement has been registered in the appropriate Land Title Office the Owner agrees that it shall not encumber, sell, transfer, assign, or otherwise alienate the Land without first obtaining the written agreement of the proposed purchaser, transferee or assignee to be bound by the terms of this Agreement, all in a form approved in writing and in advance by FortisBC.

2.5 In addition to any compensation that FortisBC agrees to pay to the Owner pursuant to Sections 3 and 4 of this Agreement, FortisBC agrees to reimburse the Owner for reasonable legal fees and disbursements the Owner incurs in relation to this Agreement in an amount not to exceed two thousand dollars ($2000) (including applicable taxes) (the "**Costs Reimbursement**"). Provided the Owner has delivered copies of its invoices and proof of their payment to support the Costs Reimbursement, FortisBC will pay the Costs Reimbursement to the Owner at the same time as FortisBC pays to the Owner the Initial Payment, as defined in Section 3.2 of this Agreement. [***NTD: ADDITIONAL LANGUAGE TO INSERT, IF NEEDED, BASED ON OWNER NOT WANTING TO PAY COST OF FORTISBC HAVING PRIORITY OVER FINANCIAL CHARGES, IF APPLICABLE***: Notwithstanding subparagraph 4 (n) of the SRW Agreement and the foregoing, the Costs Reimbursement will include an additional amount to reimburse the Owner for those reasonable expenses incurred by the Owner in securing priority for the SRW Agreement over all financial charges and encumbrances other than encumbrances registered against the title to the Land in the Land Title Office which have been specifically approved in writing by FortisBC.]

2.6 In addition to the rights granted above, from the date of the Initial Payment as defined in Section 3.2 until either (a) this Agreement is terminated in accordance with Section 3.4 or (b) the completion of the Restoration Work as defined in Section 5.2, the Owner grants to FortisBC and to FortisBC Personnel, upon providing a minimum 24 hours advance notice, a right to enter on, be within, go over, pass and repass through, labour, and work on the Land, with or without vehicles, personal property and equipment, for the purposes of conducting surveys, assessments and planning for the OCU Project and for the purposes of installing, maintaining, checking on, and uninstalling monitoring equipment on any buildings or structures located on the Land to monitor the impacts of FortisBC's operations.

2.7 For certainty, the SRW Agreement will be initially registered as a charge against title to the Land without the filing of a corresponding plan of the SRW Area. If the OCU Project is later approved by the British Columbia Utilities Commission and after FortisBC completes the initial excavation, installation and construction of its Works (as defined in the SRW Agreement), FortisBC will cause a survey of the SRW Area to be made and the resulting plan (the "**SRW Plan**") to be filed against title to the Land. Upon filing of the SRW Plan, the rights granted to FortisBC under this Agreement shall be restricted as described in paragraph 1(a) of the SRW Agreement.

2.8 If the OCU Project is not approved, the SRW Agreement will be cancelled from title to the Land as described in Section 3.4.

3.0 SRW Compensation

3.1 The Owner has agreed to execute and deliver to FortisBC this Agreement and the SRW Agreement (in substantially the form annexed hereto as Schedule 1) in consideration of FortisBC paying to the Owner the amount of <@> dollars ($<@>) plus GST, where applicable (the "**SRW Compensation**") which FortisBC will pay to the Owner in instalments as set out in Sections 3.2 and 3.3. The Owner warrants that if they are registered under the Excise Tax Act (Canada) that their GST registration number is _____.

3.2 Within thirty (30) days after the date of registration of the SRW Agreement at the appropriate Land Title Office, FortisBC will pay to the Owner an initial payment in the amount equal to <@> dollars ($<@>)(the "**Initial Payment**"). The Initial Payment represents <@>% of the SRW Compensation.

3.3 Within sixty (60) days after the date the British Columbia Utilities Commission approves the OCU Project, FortisBC will pay to the Owner the amount of <@> dollars ($<@>) (the "**Final SRW Payment**"), being the SRW Compensation less the Initial Payment.

3.4 If the British Columbia Utilities Commission does not approve the OCU Project by _____, 20___ FortisBC agrees that the Owner will keep the Initial Payment and the Costs Reimbursement and FortisBC will promptly, at its cost and expense, cause a cancellation of the SRW Agreement from title to the Land at the appropriate Land Title Office. In the event of the foregoing, both the Owner and FortisBC agree that (a) this Agreement will terminate and neither party will have any further obligation to the other party and (b) FortisBC will have no obligation to make the Final SRW Payment to the Owner.

4.0 TWS Details

4.1 In addition to granting to FortisBC rights to the SRW Area, the Owner also agrees to grant to FortisBC for use by FortisBC Personnel, on the terms and conditions contained in this Agreement, rights to use portions of the Land adjacent to the SRW Area for the Works associated with the OCU Project and Restoration Work (defined in Section 5.2) on the Land. As consideration for the granting of these rights, FortisBC will make a one time payment to the Owner of <@> dollars $ < @ > (the "**TWS Fee**"). More specifically, the Owner agrees that FortisBC and FortisBC Personnel may enter on, be within, go over, pass and repass through, clear, prepare and use that portion of the Land in approximately the location shown hatched on the Individual Ownership Plan attached to this Agreement as Schedule 2 (the "**TWS Area**") during the Term (as defined in Section 8.1) with or without vehicles, personal property and equipment. The TWS Fee will be paid by FortisBC to the Owner if and when FortisBC pays to the Owner the Final SRW Payment pursuant to Sections 3.3 and 3.4.

4.2 FortisBC agrees that all vehicles, materials, personal property and equipment brought or placed upon the Land in the TWS Area will be at the risk of FortisBC in respect of loss, damage, destruction or accident unless such loss, damage, destruction or accident is due to the negligence or wilful act or omission of the Owner or those for whom the Owner is responsible at law, including any tenants or occupants.

4.3 The Owner agrees that FortisBC and FortisBC Personnel may access the TWS Area through the Land and use the TWS Area without interference from the Owner or those for whom the Owner is responsible at law, including any tenants or occupants.

4.4 FortisBC agrees to exercise its rights in such a manner that inconveniences the Owner or any tenants or occupants as little as reasonably possible.

5.0 Pre-Construction Work and Restoration Work Details

5.1 Prior to commencing the initial excavation, installation and construction of the Works associated with the OCU Project on the Land**,** FortisBC may undertake pre-construction work on the SRW Area and the TWS Area which may include clearing of trees and vegetation, removal of fences or other structures and removal of topsoil (the "**Pre-Construction Work**"**).**

5.2 Upon FortisBC's determination that the initial excavation, installation and construction of the Works associated with the OCU Project on the Land is completed, and to the extent it is practical to do so, FortisBC will, except as otherwise agreed to by the Owner pursuant to Section 5.3, restore the SRW Area and TWS Area as follows:

(a) Remove all construction material and debris and leave the SRW Area and TWS Area in a clean and tidy condition;

(b) Repair any damage to the SRW Area or TWS Area caused by FortisBC;

(c) Replace all topsoil removed from the SRW Area and TWS Area, grade and contour the soil so the disturbed area is suitable for any prior use;

(d) Re-seed the disturbed soil areas within the SRW Area and TWS Area with a seed mix approved by the Owner; and

(e) Restore any pre-existing improvements within the SRW Area and TWS Area such as fencing that are not restricted or prohibited by the SRW Agreement

(collectively, the "**Restoration Work**"**).**

5.3 The specific details for the Pre-construction Work in Section 5.1 and the Restoration Work in Section 5.2 on the Land is set out in Schedule 3. If there is a conflict between the provisions of Schedule 3 and other provisions of this Agreement, the provisions of Schedule 3 will govern.

6.0 Adjustment to SRW Area and TWS Area

In the event that FortisBC determines that the SRW Area or the TWS Area must increase in size, the SRW Compensation or the TWS Fee will be increased, as applicable, on a *pro rata* basis. The adjustment to the SRW Compensation or the TWS Fee, as applicable, will be paid by FortisBC upon completion of the Restoration Work.

8.0 Miscellaneous

8.1 Term

Unless this Agreement is terminated in accordance with Section 3.4, the term of this Agreement will commence on the date set out on page one (1) of this Agreement and will expire upon the completion of the Restoration Work **(**the "**Term**"**)**. Notwithstanding the foregoing, the expiry of the Term shall not impact the perpetual nature of the rights secured by the SRW Agreement registered against title to the Land.

8.2 Survival

Any provision which expressly or by implication from its nature is intended to survive the termination or expiration of this Agreement will continue in full force and effect after any termination or expiration of this Agreement.

8.3 Assignment

The Owner agrees that if during the Term of this Agreement, the Owner sells or otherwise divests or agrees to sell or otherwise transfer all or part of the Land, or the Owner's interest in the Land, as a condition precedent to such sale and prior to the completion of such sale, it will obtain and deliver to FortisBC an assignment and assumption agreement in favour of FortisBC. The assignment and assumption agreement will ensure that as of the date of completion of such sale the purchaser will assume the benefit of and agree to be bound by all of the terms of this Agreement

as if the purchaser had been an original signatory to this Agreement and neither FortisBC nor the Owner will have any further obligations to the other. For certainty and illustration purposes, if the Owner sells the Land at any time after FortisBC has paid the Initial Payment pursuant to Section 3.2 but before FortisBC has paid the Final SRW Payment pursuant to Section 3.3 and the TWS Fee pursuant to Section 4.1, the Owner acknowledges and agrees that FortisBC will pay the Final SRW Payment and the TWS Fee to the purchaser and not to the Owner.

FortisBC may assign its rights and obligations under this Agreement to an affiliated company without the Owner's prior written consent.

8.4 Notices

Any notice or communication contemplated by this Agreement, to be effective, must be in writing and be personally delivered, or sent by registered mail, and addressed as follows:

To the Owner:

[NTD: To be completed by FortisBC Personnel]
Attention*: [NTD: To be completed by FortisBC Personnel]*

To FortisBC:

FORTISBC ENERGY INC.
16705 Fraser Highway,
Surrey, British Columbia V4N 0E8

Attention: Chris Coady, Manager Property Services

Where a notice is delivered personally, it will be deemed to have been received the same business day. Any notice sent by registered mail will be deemed to have been received three (3) business days after the date of mailing.

8.5 Successors and Assigns

This Agreement will enure to the benefit of and be binding upon the Owner and FortisBC and their respective successors and permitted assigns, including in respect of the Owner, its successors entitled to the Land.

8.6 Governing Law

This Agreement will be governed by, and construed in accordance with, the laws of the Province of British Columbia and the federal laws of Canada applicable therein.

8.7 Severability

If any provision of this Agreement or any part thereof is determined to be void or invalid, it will be severed, and the remainder of the Agreement will be and remain in force and effect and will be construed as if such void or invalid provision or part had been deleted from it.

8.8 Time is of the Essence

Time is of the essence in this Agreement.

8.9 Further Agreements

The Owner and FortisBC acknowledge that this Agreement is executed to evidence the agreement between them and the existence or absence of any terms, obligations or conditions in this Agreement will not detract from the Owner's or FortisBC's rights and obligations under any other agreement entered into between them, whether before or after the signing of this Agreement (collectively, the "**Further Agreements**"). If there is any conflict or inconsistency between any provisions of this Agreement and any provision of the Further Agreements or in the event of the omission from this Agreement of any other matters included in the Further Agreements, the Further Agreements will govern and take precedence. There will not be any merger as between this Agreement and the Further Agreements.

8.10 Further Assurances

Each of the Owner and FortisBC from time to time will execute and deliver all such further assurances and instructions and do all acts and things as the other party may reasonably require to effectively carry out or better evidence the full intent and meaning of this Agreement and such other agreement between them.

8.11 Amendments

This Agreement may only be amended by written agreement signed by the Owner and FortisBC.

8.12 Counterparts

This Agreement may be executed in any number of counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same instrument.

8.13 Other Rights Preserved

Nothing in this Agreement will affect, diminish, prejudice or otherwise interfere with rights enjoyed by FortisBC by applicable laws or otherwise, including under the provisions of any other statutory right of way held by FortisBC or an affiliated company that encumbers the Land.

8.14 Joint & Several

Where the expression "Owner" includes more than one person, all of the covenants granted by the Owner in this Agreement will be construed as being several as well as joint.

8.15 Headings

The division of this Agreement into sections and the insertion of headings are for convenience of reference only and will not affect the interpretation of this Agreement.

8.16 Corporate Owner

Where the Owner is a corporation, the Owner represents and warrants to FortisBC that:

(a) the Owner is a corporation validly subsisting under the laws of Canada and British Columbia and has full corporate power and capacity to own land, and to enter into this Agreement;
(b) all necessary corporate action has been taken by the Owner to authorize the execution and delivery of this Agreement; and
(c) the Owner is not a non-resident of Canada for the purposes of Section 116 of the Income Tax Act.

IN WITNESS WHEREOF the parties hereto have executed this Agreement as of the day, month and year on the dates set out below.

SIGNED and DELIVERED in the presence of:	)	**[Owner Name – Each Owner to Sign]]**
_____	)	_____
Sign & Print Name	)	[Authorized Signatory if Corporation]
_____	)	[**Owner Name – Each Owner to Sign**]
Address	)	_____
_____	)	[Authorized Signatory if Corporation]
Occupation	)	Date: _____, 2020
SIGNED and DELIVERED in the presence of:	)	**FORTISBC ENERGY INC.**
_____	)	_____
Name	)	Name and Title:
_____	)	_____
		Date: _____, 20

Schedule 1- Form of SRW

[NTD: Attach form of SRW]

Schedule 2 - Individual Ownership Plan

[NTD: Attach Individual Ownership Plan with SRW Area delineated in red line and TWS Area shown hatched]

Schedule 3- Pre-Construction and Restoration Details

[NTD: Attach Pre-Construction and Restoration Details]

[Other]

Appendix H-18

STATUS OF OCU PRIVATE LANDOWNER PROPERTY ACQUISTION

FILED CONFIDENTIALLY

Appendix I
INDIGENOUS ENGAGEMENT

Appendix I-1
STATEMENT OF INDIGENOUS PRINCIPLES

Statement of Indigenous Principles

FortisBC is committed to building effective Indigenous relationships and to ensuring we have the structure, resources and skills necessary to maintain these relationships.

To meet this commitment, the actions of the company and its employees will be guided by the following principles:

- FortisBC companies acknowledge, respect and understand that Indigenous Peoples have unique histories, cultures, protocols, values, beliefs and governments.
- FortisBC supports fair and equal access to employment and business opportunities within FortisBC companies for Indigenous Peoples.
- FortisBC will develop fair, accessible employment practices and plans that ensure Indigenous Peoples are considered fairly for employment opportunities within FortisBC.
- FortisBC will strive to attract Indigenous employees, consultants and contractors and business partnerships.
- FortisBC is committed to dialogue through clear and open communication with Indigenous communities on an ongoing and timely basis for the mutual interest and benefit of both parties.
- FortisBC encourages awareness and understanding of Indigenous issues within its work force, industry and communities where it operates.
- To achieve better understanding and appreciation of Indigenous culture, values and beliefs, FortisBC is committed to educating its employees regarding Indigenous

issues, interests and goals.

- FortisBC will ensure that when interacting with Indigenous Peoples, its employees, consultants and contractors demonstrate respect, and understanding of Indigenous Peoples' culture, values and beliefs.
- To give effect to these principles, each of FortisBC's business units will develop, in dialogue with Indigenous communities, plans specific to their circumstances.

Progressive Aboriginal RELATIONS COMMITTED Canadian Council for Aboriginal Business (https://www.ccab.com/programs/progressive-aboriginal-relations-par/)

Natural gas
1-888-224-2710 (tel:18882242710)

Monday-Friday
7 a.m. to 8 p.m.

Electricity
1-866-436-7847 (tel:18664367847)

Monday-Friday
7 a.m. to 7 p.m.

Media line
1-855-FBC-NEWS (tel:18553226397) or 1-855-322-6397 (tel:18553226397)

Contact us (/contact-us)

Contact us (/contact-us)

Energy solutions for transportation (https://www.fortisbc.com/est)

FortisBC Alternative Energy Services (https://www.fortisbc.com/aes)

Talking Energy - FortisBC's projects (https://talkingenergy.ca/)

(https://www.facebook.com/fortisbc)
(https://twitter.com/intent/follow?source=followbutton&variant=1.0&screen_name=FortisBC)
(https://www.instagram.com/fortisbc/)
(https://www.linkedin.com/company/fortisbc)
(https://www.youtube.com/user/fortisbc?sub_confirmation=1)

Privacy policy (/privacy-policy)

Terms of use (/terms-of-use)

Site map (/sitemap)

Appendix I-2
SOE REPORT

SOE Report

Report Name: Report
Report Date: Mon Jun 17 12:23:10 PDT 2019
Shape Name: unnamed
Linear Width: 5.0
Adjacency Buffer: This feature was not buffered.

CAD contact information for the area that was queried is displayed below. Note that a single First Nation boundary may have multiple contacts. As a result it is possible for a contact to show up in the list more than once.

Conflicting Features:

Contact Name	Okanagan Indian Band
Contact Title	Chief and Council
Contact Organization	Okanagan Indian Band
Contact Address	12420 Westside Road
Contact City	Vernon
Contact Province	BC
Contact Postal Code	V1H 2A4
Contact Phone	2505424328
Contact Fax	2505424990
Contact Email	okibreferrals@okanagan.org

Contact Name	Penticton Indian Band
Contact Title	Referrals Coordinator
Contact Organization	Penticton Indian Band
Contact Address	RR 2 Site 80 Comp 19
Contact City	Penticton
Contact Province	BC
Contact Postal Code	V2A 6J7
Contact Phone	2504930048
Contact Fax	2504932882
Contact Email	referrals@pib.ca

Contact Name	Okanagan Nation Alliance
Contact Title	Tribal Council
Contact Organization	Okanagan Nation Alliance
Contact Address	#101, 3535 Old Okanagan Hwy

Contact City	Westbank
Contact Province	BC
Contact Postal Code	V4T 3L7
Contact Phone	2507070095
Contact Fax	2507070166
Contact Email	onareception@syilx.org

Contact Name	Nooaitch Indian Band
Contact Title	Chief and Council
Contact Organization	Nooaitch Indian Band
Contact Address	2954 Shackelly Rd
Contact City	Merritt
Contact Province	BC
Contact Postal Code	V1K 1N9
Contact Phone	2503786141
Contact Fax	2503783699
Contact Email	reception@nooaitchband.ca

Contact Name	Esh-kn-am Cultural Resource Management
Contact Title	Esh-kn-am Cultural Resource Management
Contact Organization	Esh-kn-am Cultural Resources Management Services
Contact Address	#311-230th Street - Coldwater IR 1 PO Box 2159
Contact City	Merritt
Contact Province	BC
Contact Postal Code	V1K 1B8
Contact Phone	2504582224
Contact Fax	2503150084
Contact Email	eshknam.arch@gmail.com

Contact Name	Lower Similkameen Indian Band
Contact Title	Chief and Council
Contact Organization	Lower Similkameen Indian Band
Contact Address	1420 Hwy 3
Contact City	Cawston
Contact Province	BC
Contact Postal Code	V0X 1C3
Contact Phone	2504995528
Contact Fax	2504995538
Contact Email	referrals@lsib.net

Contact Name	Westbank First Nation
Contact Title	Chief and Council
Contact Organization	Westbank First Nation
Contact Address	201-515 Hwy 97
Contact City	Kelowna
Contact Province	BC
Contact Postal Code	V1Z 3J2
Contact Phone	2507694999
Contact Fax	2507692443
Contact Email	referrals@wfn.ca

Contact Name	Upper Nicola Band
Contact Title	Chief and Council
Contact Organization	Upper Nicola Band
Contact Address	P.O. Box 3700
Contact City	MERRITT
Contact Province	BC
Contact Postal Code	V1K 1B8
Contact Phone	2503503342
Contact Fax	2503503311
Contact Email	nrtech1@uppernicola.com

Layers Queried Successfully:

CAD contact information for the area that was queried is displayed below. Note that a single First Nation boundary may have multiple contacts. As a result it is possible for a contact to show up in the list more than once.

Disclaimer:

The Consultative Areas Database (CAD) Public Map Service Report provides preliminary contact information for First Nations who may have with aboriginal interests identified within the area queried.

These contacts are based on knowledge currently available to the Province. Those choosing to provide information and involve First Nations early in a proposed project have the opportunity to develop mutual understanding of the interests around the project. This can be important to successful business planning and project development. CAD Public Map Service users are encouraged to explore making this contact prior to submitting an application for government authorization. This approach gives support to the Provincial consultation process and the goals of the New Relationship.

The information provided is not intended to create, recognize, limit or deny any aboriginal or treaty rights, including aboriginal title, that First

Nations may have, or impose any obligations on the Province or alter the legal status of resources within the Province or the existing legal authority of British Columbia. The Province makes no warranties or representations regarding the accuracy, timeliness, completeness or fitness for use of any or all data provided in the reports.

Appendix I-3
OCU PROJECT NOTIFICATION LETTERS

Shelley Martens
Community & Indigenous Relations

FortisBC Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
Tel: 250-868-4525
shelley.martens@fortisbc.com
www.fortisbc.com

November 18, 2019

Penticton Indian Band
741 Westhills Drive
Penticton, BC V2A 6J7

Attention: James Pepper, Community & Environmental Services, JPepper@pib.ca

Re: FortisBC Okanagan Capacity Upgrade Project

FortisBC Energy Inc. (FEI) would like to notify Penticton Indian Band of a potential natural gas upgrade project that we are considering within your traditional territory. This upgrade would be an extension of our existing natural gas system and is intended to meet capacity requirements in the Okanagan. Due to significant population growth in the region, these works will ensure that we can continue to provide energy supply to our customers, now and in the future.

FortisBC is currently assessing a number of proposed route options, and will carry out field studies and engagement in the months ahead to inform our decision. We acknowledge the importance of the environmental and archaeological sensitivities in this area, and the importance of your community as knowledge holders. We endeavor to take a collaborative approach when developing all our projects and that is why we are reaching out now.

As part of the analysis work, our contractors will be completing environmental assessment work along these potential route alternatives. Beginning in the coming weeks, these consultants may contact your community about the possibility of working together. As you are aware, to support early engagement we have been working collaboratively with Penticton Indian Band Natural Resources and Traditional Ecological Knowledge Keepers throughout the preliminary project assessment. We will continue to engage with rights holders such as yourselves, to ensure we incorporate the important knowledge of traditional land use and cultural history from all communities that will help inform our route selection and project planning.

In order for this project to proceed, FortisBC will first require regulatory approval from the British Columbia Utilities Commission (BCUC). We are planning to submit an application to the Commission in Spring 2020. Following preliminary engineering, archaeological and environmental investigations, more detail regarding the project will be available in the coming months.

We look forward to continuing to work with Natural Resources and TEKK but if you should have any additional questions regarding the project, please don't hesitate to contact me directly.

Sincerely,

Shelley Martens
Community & Indigenous Relations Manager

cc. Referrals Clerk, referrals@pib.ca

Hayley Newmarch
Community & Indigenous Relations

FortisBC Energy Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
Tel: 250-469-8063
hayley.newmarch@fortisbc.com
www.fortisbc.com

May 4, 2020

First Nation
Address
City/ Post

Attention: Contact Email: email

Re: Update on FortisBC Okanagan Capacity Upgrade (OCU) Project: Preliminary Field Reconnaissance

This letter follows recent correspondence on FortisBC's proposed Okanagan Capacity Upgrade project in the Penticton area. We are writing to provide you with the latest information on upcoming assessment activities.

FortisBC will be working with Golder Associates Ltd. on early archaeological investigation activities required along the proposed route and within existing rights of way. Our consultant will be in contact with you regarding a Preliminary Field Reconnaissance (PFR), to support the Archaeological Overview Assessment for the project. .

If you have questions regarding this project and/or would like to speak further, you can contact me directly at 250.469.8063 or at Hayley.Newmarch@fortisbc.com. Looking forward to speaking in the near future.

Sincerely,

HNewmarch

Hayley Newmarch
Community Relations Manager
Major Projects, OCU

Hayley Newmarch
Community & Indigenous Relations

FortisBC Energy Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
Tel: 250-469-8063
hayley.newmarch@fortisbc.com
www.fortisbc.com

June 4, 2020

Penticton Indian Band
741 Westhills Drive
Penticton, BC
V2A 6J7

Attention: James Pepper Email: jpepper@pib.ca

Re: Update on FortisBC Okanagan Capacity Upgrade Project: Geotechnical Assessment

As a follow up to our letter on May 4, 2020 regarding FortisBC's proposed Okanagan Capacity Upgrade project in the Penticton area, we are writing to provide you with the latest information on planned assessment activities.

In preparation for the project, early engineering and construction works are required along the route. This includes work within and outside of our existing right-of-ways. Our crews will be evaluating the ground and soil conditions, to help determine our construction methods for the project. This early work will require borehole drilling in some locations.

In order to proceed with this assessment work, we have engaged Golder Associates Ltd. to complete the Archaeological Impact Assessment activities at the planned geotechnical investigation locations, as shown on the attached map. Golder will be contacting Penticton Indian Band to provide notification of their assessment, which will be completed under a blanket *Heritage Conservation Act* permit.

If you have questions regarding this project and/or would like to speak further, you can contact me directly at 250.469.8063 or at Hayley.Newmarch@fortisbc.com. Looking forward to speaking in the near future.

Sincerely,

HNewmarch

Hayley Newmarch
Community Relations Manager
Major Projects, OCU

cc. Shelley Martens, Community & Indigenous Relations Manager

BH031-04

BH031-03

BH031-02

BH031-01

Steward Creek

Penticton Creek

Penticton
Valley Bottom
Borehole

Sendero Gate

Joy Rd

Carmi Ave

Carmi Rd

Ridge Rd

Panorama

N

Imagery Date: 2019
Service Layer Credits: McElhanney, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

Legend

- Penticton Creek - Geotechnical HDD Scope
- 73L Powerline Poles
- 73L Poweline Right of Way
- Surveyed Cadastral (from McElhanney)
- 73L Powerline Centerline
- Roads
- Streams

Penticton Creek - Borehole Overview Map

COORDINATE SYSTEM:
NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983

Scale: 1:2,500

Kilometers

0 0.045 0.09 0.18 0.27 0.36

N

This product has been created with the highest degree of accuracy possible. However, Solaris-MCI, nor any of its contractors or suppliers can be held responsible for any damages due to errors or omissions in this product. The map is a graphical representations intended for general informational purposes only.

SOLARIS MANAGEMENT CONSULTANTS INC.
5588 Panorama Drive
Surrey, B.C. V3S 1B7
Phone: (604) 575-8300
Fax: (604) 575-8301

FORTIS BC™

PROJECT:
Okanagan Capacity Upgrade

EPCM DOCUMENT NUMBER:
03728-39-9000-MAP-0007

DOCUMENT NUMBER:
TBD

	ORIGINATED	CHECKED	APPROVED
BY	CYZ	WTT	
CYZ	6/4/2020	6/4/2020	6/4/2020

JOB NO.: FT19-03728 REV. 0

Date Saved: 6/4/2020 12:27:27 PM

Document Path: J:\FortisBC\Major Projects-General & Secondments\FT19-03728 Okanagan Capacity Upgrade\GIS\Maps\Borehole Overview Map.mxd

Hayley Newmarch
Community & Indigenous Relations

FortisBC Energy Inc.
1975 Springfield Road
Kelowna, BC V1Y 7V7
Tel: 250-469-8063
hayley.newmarch@fortisbc.com
www.fortisbc.com

October 15, 2020

Penticton Indian Band 741 Westhills Drive Penticton, BC
V2A 6J7

Attention: James Pepper, Natural Resource Department Director Email: jpepper@pib.ca
cc. Brody Armstrong, Natural Resources Project Manager projectmanager@snpinktn.ca

Re: Update on FortisBC Okanagan Capacity Upgrade Project: Permit Application

This letter follows previous correspondence on FortisBC's proposed Okanagan Capacity Upgrade project in the Penticton area. We are writing to provide you with the latest information on the upcoming assessment activities.

Please be advised that Golder Associates Ltd. will be submitting a Heritage Conservation Act Section 12.2 Inspection Permit application, on behalf of FortisBC for the Okanagan Capacity Upgrade ("OCU") project. The permit is expected to be submitted in early November 2020. The permit will include Archaeological Impact Assessment ("AIA") activities both pre-construction and concurrent with construction. Pre-construction AIA work is planned to begin, dependent on receipt of the permit, in Q2 2021.

FortisBC will be submitting an application for a Certificate of Public Convenience and Necessity (CPCN) to our regulator, the British Columbia Utilities Commission. Our application will be filed on October 30, 2020.

I would also like to introduce Jayms Morrison, a new member to the FortisBC team. Moving forward, Jayms will be your main point of contact specific to the OCU project; Shelley Martens will continue to be your main point of contact for FortisBC activities otherwise, and I will still be working closely with the team to transition work activities. Our team will work together to ensure you continue to be updated as planning for this proposed project continues.

If you have questions regarding this project and/or would like to speak further, you can contact Jayms directly at 250.262.8868 or at Jayms.Morrison@fortisbc.com. We looking forward to speaking in the near future.

Sincerely,

HNewmarch

Hayley Newmarch
Community Relations Manager
Major Projects, OCU

cc. Shelley Martens, Community & Indigenous Relations Manager
cc. Jayms Morrison, Indigenous Relations, Major Projects

Appendix I-4
INDIGENOUS ENGAGEMENT LOG

Indigenous Relations Engagement Log - Okanagan Capacity Upgrade					
Date	**Engagement Type**	**Indigenous Community**	**External Representatives**	**FEI Representatives**	**Summary**
28-Jun-19	In Person Meeting	Penticton Indian Band	Natural Resources Director TEKK members	Shelley Martens - Community & Indigenous Relations Manager	During a meeting regarding a different FBC project, FEI presented initial high-level overview of Okanagan Capacity Upgrade Project. Questions raised regarding age and location of existing line. Interested in learning more and understanding environmental & archaeological assessment process. Next step is to draft preliminary budget and work plan for early assessment and schedule a follow up meeting.
6-Sep-19	In Person Meeting	Penticton Indian Band	Natural Resources Project Manager	Shelley Martens -Community & Indigenous Relations Manager, Paul Chernikhowsky - Director, Integrity Management & Damage Prevention, Mark Morrison - Sr. Project Engineer	Communicated project scope, proposed routing, and timelines. Natural Resources (NR) advised of TEKK involvement requirements, advised timelines and challenges. Natural Resources process: review by TEKK; complete desktop overview (use & occupancy mapping, non-recorded sites, etc.) and Preliminary Field Reconnaissance work. Early archaeological investigation activities required along the proposed route and within existing rights of way. Agreed Cultural Workshop at En'owkin Centre for OCU Project Team will be beneficial. FBC provided funding to support PIB's initial assessment of the route. Next step is to schedule a meeting with TEKK to present more detailed information on Project to determine level of assessment needed.
4-Oct-19	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Paul Kropp - Transmission Pipeline Manager, Mark Morrison - Sr. Project Engineer, Catherine Hayes - Environmental Program Lead	Discussed Phase I Assessment findings. Four field visits and three meetings completed by TEKK to start to compile information pertaining to the land that the proposed work is to be done upon. Concerns raised regarding significance of cultural heritage and areas already impacted. Next steps are to provide archaeological/environmental contractors details to PIB and to schedule a Cultural workshop at En'owkin for OCU Project team.
15-Oct-19	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Mark Morrison - Sr. Project Engineer	Discussed Environmental Overview and Archaeological Overview assessments. Request for presentation on construction methods and overview of CPCN process. Final work plan to be approved by Chief & Council. Next steps are for FEI to confirm workshop on Pipeline & FortisBC 101; send updated kmz files and for TEKK to provide questions in advance of next meeting; review kmz files; and develop draft work plan & budget/ estimate for next phases.
28-Nov-19	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Paul Kropp - Transmission Pipeline Manager, Mark Morrison - Sr. Project Engineer	Presentation to TEKK members to address questions from previous meetings regarding who FEI is, construction practices, OCU project update and our environmental process. Well received by the group with some questions clarifying the scope of the project. Concerns raised about impacts to plants and animals due to width of right of way. Began discussions on how to incorporate traditional plants and medicines during corridor restoration to rebuild cultural picking areas and ensure animals return to the area. Agreed to continue discussions on how this could be achieved.
20-Nov-19	Email	Esh-kn-am Cultural Resources Management Services Lower Similkameen Indian Band Nooaitch Indian Band Okanagan Nation Alliance Upper Nicola Indian Band Westbank First Nation Penticton Indian Band		Shelley Martens - Community & Indigenous Relations Manager	Update on FortisBC Okanagan Capacity Upgrade Project
3-Mar-20	In Person Meeting	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	WFN identified they would like to be involved with work and view the draft reports for their area near Chute Lake. WFN to join PIB TEKK in their assessments by sending one or two people to cover their area in the north end of the route. Discussed the restoration of the corridor and to plant traditional fruit and plants over the new line. Discussed how this was accomplished with past gas projects. Ancestral remains and environmental issues are of primary concern. No Chief and Council presentation required. WFN Arch would brief them on TEKK's findings. Next steps are to notify WFN Arch Department when arch work is starting and confirm what we are planning to accomplish before CPCN filing in terms of AOA and EOA work. Service agreement (Capacity funding agreement) needed between FBC and WFN for their TEKK work on the north end of the route – WFN Arch to send us a template.
17-Apr-20	Conference Call	Penticton Indian Band	Natural Resources Project Manager Natural Resources Director	Samantha Singbeil - Manager, Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Provided a overview of the project scope and reviewed engagement activities and route change. Discussed creating liaison position between FBC and PIB within the capacity funding agreement. Discussed how COVID has impacted meetings and communication and options on how to engage in the future through the use of technology for meetings. Next steps include FEI to send PIB the timeline/milestone list before the next meeting; FEI to send the updated agreement to NR Director, along with the new FEI and PIB liaison position in it; FEI to send NR Director the telephone town hall information; and PIB NR Director to send a job description on a project manager position.
20-Apr-20	Email	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator WFN Lands Referral Officer	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Discussed the Okanagan Capacity Upgrade Project and its potential route. Sent the AOA and EOD draft documents, along with the KMZ file of the route. Followed up on agreement for the northern section of the route, which WFN has expressed interest in.
28-Apr-20	Conference Call	Penticton Indian Band	Natural Resources Project Manager Natural Resources Director	Samantha Singbeil - Manager, Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Discussed NP Director presenting on the project at next meeting to Chief & Council. FEI provided update on geo tech work/routing/planning without PIB Engagement; raising concerns and creating anxiety that we're proceeding without PIB/ TEKK involvement. Next steps are for FEI to look at and review job description; want to get up and running; start at 2 year term with extension option; modify Work Plan and budget to accommodate the position; and schedule next meeting.
4-May-20	Email	Esh-kn-am Cultural Resources Management Services Lower Similkameen Indian Band Nooaitch Indian Band Okanagan Nation Alliance Upper Nicola Indian Band Westbank First Nation Penticton Indian Band		Hayley Newmarch - Community Relations Manager	Update on FortisBC Okanagan Capacity Upgrade (OCU) Project: Preliminary Field Reconnaissance
4-May-20	Email	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator WFN Lands Referral Officer	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Discussed the Okanagan Capacity Upgrade Project and its potential route. Sent the AOA and EOD draft documents, along with the KMZ file of the route. Followed up on agreement for the northern section of the route, which WFN has expressed interest in
6-May-20	Email	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator WFN Lands Referral Officer	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Discussed the Okanagan Capacity Upgrade Project and its potential route. Sent the AOA and EOD draft documents, along with the KMZ file of the route. Followed up on agreement for the northern section of the route, which WFN has expressed interest in

Indigenous Relations Engagement Log - Okanagan Capacity Upgrade					
Date	**Engagement Type**	**Indigenous Community**	**External Representatives**	**FEI Representatives**	**Summary**
6-May-20	Conference Call	Penticton Indian Band	Natural Resources Director	Samantha Singbeil, Manager - Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager, Darren McElhinney - Project Manager for OCU	Reviewed the Capacity Funding Agreement with the NR Director and he will update the document with edits and send back to FEI. FEI to work with legal on finalizing the agreement before our meeting on May 12th. Next steps are to review edits of the capacity funding agreement and finalize before Chief and Council meeting on May 13, 2020 and to schedule another meeting to review the agreement on May 12, 2020.
12-May-20	Conference Call	Penticton Indian Band	Natural Resources Director Natural Resources Project Manager	Samantha Singbeil - Manager, Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Reviewed comments and edits from PIB on the Capacity Funding Agreement. Next step is to finalize agreement for PIB to present to Chief and Council on May 13, 2020.
3-Jun-20	Conference Call	Penticton Indian Band	Natural Resources Director	Samantha Singbeil - Manager, Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Reviewed comments and edits from PIB on the Capacity Funding Agreement. Band council resolution was signed.
4-Jun-20	Email	Esh-kn-am Cultural Resources Management Services Lower Similkameen Indian Band Nooaitch Indian Band Okanagan Nation Alliance Upper Nicola Indian Band Westbank First Nation Penticton Indian Band		Hayley Newmarch - Community Relations Manager	Update on FortisBC Okanagan Capacity Upgrade Project: Geotechnical Assessment
9-Jun-20	Conference Call	Penticton Indian Band	Natural Resources Director	Samantha Singbeil - Manager, Indigenous Relations, Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Reviewed comments and edits from PIB on the Capacity Funding Agreement. Band council resolution was signed. Finalized agreement sent to PIB for the Chief's signature.
12-Jun-20	Conference Call	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator	Hayley Newmarch - Community Relations Manager, Shelley Martens - Community & Indigenous Relations Manager	Discussed the Capacity Funding Agreement and reviewed any outstanding items. Sent the AOA and EOA Service agreement for their review. Review due July 13, 2020. Sent Capacity Funding agreement for their legal team to review. Next step is to book a follow up meeting to discuss any questions with the agreement.
17-Jun-20	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Provided information to the TEKK members on the new proposed route and gave them an update on construction timelines and next steps. Well received by the group with some questions clarifying the scope of the project. Concerns raised about impacts to plants and animals, scheduling next meetings, as well as the different naming conventions. Agree to continue discussions on the project and how we can continue to collaborate. Next steps are to send a copy of the fly over video map of the route and schedule follow up meeting on July 10, 2020.
24-Jun-20	In Person Meeting	Okanagan Training & Development Council (WFN)	Employment and Training Facilitator with WFN contracted with Okanagan Training and Development Council.	Shelley Martens, Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Erinn Mah - Indigenous Talent Specialist	Discussed employment opportunities for Okanagan Nation communities in the central Okanagan for the OCU project. Discussed addressing local and regional labour market, community needs and priorities through the delivery of employment, training, programs, and services. Okanagan Training & Development Council (OTDC) Service Areas consist of six First Nation Community memberships: Okanagan Indian Band, Westbank First Nation, Penticton Indian Band, Osoyoos Indian Band, Upper Similkameen Indian Band and Lower Similkameen Band. Next steps are to follow up with OTDC once we have a construction schedule.
10-Jul-20	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Discussion around the cumulative effects on the plants, animals, and water were of top priority in the meeting. Discussion about how to protect the sacred areas along the routes from construction and trespassers. Electric and gas ROW distances from the centerline. Next step is to schedule a follow up meeting for July 24.
23-Jul-20	Conference Call	K'ul Group - Previously known as PIBDC (Penticton Indian Band Development Corporation)	CEO, K'uL Group CEO, ReGen Global, K'uL Platform Partner	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Meeting between K'ul Group and OCU Project team to discuss opportunities to learn more about K'ul Group and the businesses currently available and what is being developed for future opportunities. This will help provide a better outline of procurement and construction potential specific to the OCU project as the plans continue to be developed.
24-Jul-20	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager	Reviewed the fly over video of the proposed route. Discussed upcoming preliminary geotechnical work that will be taking place in August.
25-Aug-20	In Person Meeting	Penticton Indian Band and Traditional Ecological Knowledge Keepers	Natural Resources Project Manager TEKK members	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Discussed the preliminary findings along the route and the next steps for TEKK. Next step is to schedule a follow up meeting via phone the week of September 14, 2020.

Indigenous Relations Engagement Log - Okanagan Capacity Upgrade					
Date	**Engagement Type**	**Indigenous Community**	**External Representatives**	**FEI Representatives**	**Summary**
25-Aug-20	Conference Call	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager	Discussed the Capacity Funding Agreement and reviewed any outstanding items. Next step is to book a follow up meeting to discuss any questions with the agreement.
15-Sep-20	Conference Call	Penticton Indian Band	Natural Resources Project Manager Natural Resources Director	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Bi-weekly progress update meeting. Discussed interim TEKK report which is due on November 1, 2020.
30-Sep-20	Conference Call	Penticton Indian Band	Natural Resources Project Manager Natural Resources Director	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager, Jayms Morrison - Indigenous Relations Manager	Bi-weekly progress update meeting. Discussed interim TEKK report which is due on November 1, 2020.
6-Oct-20	Email	Westbank First Nation	WFN Archaeology Supervisor WFN Archaeology Project Coordinator	Hayley Newmarch - Community Relations Manager	Followed up with WFN on the Capacity Funding Agreement and their lawyers contact information. Faskens to follow up with WFN's legal team on final comments on the agreement
15-Oct-20	Email	Esh-kn-am Cultural Resources Management Services Lower Similkameen Indian Band Nooaitch Indian Band Okanagan Nation Alliance Upper Nicola Indian Band Westbank First Nation Penticton Indian Band		Hayley Newmarch - Community Relations Manager	Update on FortisBC Okanagan Capacity Upgrade Project: Permit Application
20-Oct-20	Conference Call	Penticton Indian Band	Natural Resources Director	Shelley Martens - Community & Indigenous Relations Manager, Hayley Newmarch - Community Relations Manager, Darren McElhinney - Project Manager	Bi-weekly progress update meeting. Discussed interim TEKK report which is due on November 1, 2020, safety plans and training opportunities.

Appendix I-5

OIB CONSULTATION RESPONSE LETTER

FILED CONFIDENTIALLY

Appendix I-6
ESH-KN-AM CONSULATION RESPONSE LETTER

From: Eshknam CRMS Archaeology
To: Newmarch, Hayley
Cc: paulmitchellbanks@gmail.com; Martens, Shelley
Subject: [External Email] - Re: Update on FortisBC Okanagan Capacity Upgrade Project: Geotechnical Assessment
Date: Saturday, June 27, 2020 3:02:59 PM
Attachments: image001.png

Good afternoon Hayley, Esh-kn-am CRMS has no concerns with the FortisBC Okanagan Capacity upgrade project moving forward.

Thank you,

Crystal

Referral Response Team
Esh-kn-am Cultural Resources Management Services
#311-230th St., Coldwater IR 1
PO Box 2159
Merritt, BC V1K 1B8
phone: (250) 315-0085
fax: (250) 315-0084
email: eshknam.arch@gmail.com

On Fri, Jun 5, 2020 at 8:10 AM Newmarch, Hayley <Hayley.Newmarch@fortisbc.com> wrote:

> Good morning,
>
> My name is Hayley Newmarch and I am a Community Relations Manager with FortisBC, working on the Okanagan Capacity Upgrade project. Please see the attached letter and map outlining the upcoming geotechnical assessment work, as well at a KMZ map for the OCU project. If you have questions regarding this project and/or would like to speak further, you can contact me directly at 250.469.8063 or at Hayley.Newmarch@fortisbc.com
>
> Kind regards,
>
> **Hayley Newmarch**, MM
>
> Community Relations Manager, Major Projects
> 250-469-8063 | Hayley.Newmarch@fortisbc.com

Appendix J
DRAFT ORDERS AND UNDERTAKING OF CONFIDENTIALITY

Appendix J-1
DRAFT PROCEDURAL ORDER

bcuc
British Columbia
Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
bcuc.com

P: 604.660.4700
TF: 1.800.663.1385
F: 604.660.1102

ORDER NUMBER
G-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Energy Inc.
Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

A. On November 16 2020, FortisBC Energy Inc. (FEI) submitted an application to the British Columbia Utilities Commission (BCUC) for, among other things, of a Certificate of Public Convenience and Necessity (CPCN) pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA) for the Okanagan Capacity Upgrade (OCU) Project (Application);

B. In the Application, FEI requests approval to:

   i. Construct, install and operate approximately 30 km of new 406 mm pipeline that will operate at a Maximum Operating Pressure (MOP) of 7,826 kPa at kilometre point 30.8;

   ii. Construct, install and operate a new Chute Lake Pressure Control Station at kilometre point 60.8 with a 406 mm pig barrel and pressure regulated tie in to the existing VER PEN 323 pipeline set at 5,171 kPa for gas flowing north to Kelowna and 4,826 kPa for gas flowing south to Penticton;

   iii. Construct, install and operate a new above ground 406 mm Block Valve Station at kilometre point 36.1; and

   iv. Deactivate 1,200 m section of the existing OLI PEN 406 pipeline between the tie in location at kilometre point 30.8 and the Ellis Creek Pressure Control Station.

C. FEI also seeks BCUC approval, pursuant to sections 59 to 61 of the UCA, to establish a non-rate base deferral account, entitled the OCU Application and Preliminary Stage Development Costs Deferral Account, to be amortized over three years and costs recorded in this deferral account to attract an after-tax weighted average cost of capital return;

D. FEI requests that Appendices A, B, C, E, H-14, H-18 and I-5 to the Application relating to engineering, cost estimates, risk assessments, negotiations with private landowners and response from indigenous groups engagement be treated as confidential due to their private and commercially sensitive nature and to maintain the safety and security of FEI assets; and

E. The BCUC has commenced review of the Application and finds that that a regulatory timetable for the review is warranted.

NOW THEREFORE the BCUC orders as follows:

1. A written hearing is established for the review of the Application in accordance with the regulatory timetable attached as Appendix A to this order.

2. FEI is to publish the Public Notice in print/display-ad format by the week of January 18, 2021, attached as Appendix B to this order, in appropriate news publications, such as, but not limited to, local and community newspapers as to provide adequate notice to those parties who may have an interest in or be affected by the Application.

3. As soon as practicable, FEI is directed to publish, together with any supporting materials, the Application, this order and the regulatory timetable by using appropriate communication methods, including FEI's website and social media accounts.

4. Appendices A, B, C, E, H-14, H-18 and I-5 attached to the Application will be held confidential, due to their commercially sensitive nature and to maintain the safety and security of FEI assets.

5. In accordance with the BCUC's Rules of Practice and Procedure attached as Appendix A to Order G-15-19, parties who wish to participate in the proceeding may submit a letter of comment, register as an interested party or request intervener status. Parties requesting intervener status must register with the BCUC by completing a Request to Intervene Form available on the BCUC's website by the date established in the regulatory timetable attached as Appendix A to this order. Parties requesting intervener status are to specifically state the nature of their interest in the Application and to generally identify the issues they intend to pursue and the extent of their anticipated involvement in the proceeding.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Attachment

FortisBC Energy Inc.
Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project

REGULATORY TIMETABLE

Action	Date (2021)
FEI publishes Public Notice	Week of January 18
Intervener Registration	Tuesday, January 28
BCUC Information Request (IR) No. 1	Thursday, January 28
Intervener IR No. 1	Thursday, February 4
FEI Response to IR No. 1	Thursday, February 25
BCUC and Intervener IR No. 2	Thursday, March 18
FEI Response to IR No. 2	Thursday, April 15
FEI Written Final Argument	Thursday, June 3
Intervener Written Final Arguments	Thursday, June 24
FEI Written Reply Argument	Thursday, July 9

APPENDIX B
to Order G-xx-xx

bcuc
British Columbia
Utilities Commission

We want to hear from you

FEI APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE OKANAGAN CAPACITY UPGRADE PROJECT

On November 16, 2020, FortisBC Energy Inc. (FEI) applied to the British Columbia Utilities Commission (BCUC) for approval of a Certificate of Public Convenience and Necessity for its Okanagan Capacity Upgrade Project. In the Application, FEI seeks approval to construct and operate a new gas line extension and associated facilities to increase its Interior Transmission System capacity for expected load growth so that FEI can continue to provide long-term safe and reliable gas service to customers in the Okanagan region.

More information on the application can be found at **bcuc.com** on our "Current Proceedings" page.

HOW TO PARTICIPATE

- **Submit a letter of comment**
- **Register as an interested party**
- **Request intervener status**

IMPORTANT DATES

- **Tuesday, January 28, 2021** – Deadline to register as an intervener with the BCUC

For more information on getting involved, please visit our website (**www.bcuc.com/get-involved**) or contact us at the information below. To learn more about this Application, visit https://www.bcuc.com/ApplicationView.aspx?ApplicationId=795.

GET MORE INFORMATION

FortisBC Energy Inc. Regulatory Affairs

16705 Fraser Highway
Surrey, BC V4N 0E8

E: gas.regulatory.affairs@fortisbc.com

P: 604.592.7664

British Columbia Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

E: Commission.Secretary@bcuc.com

P: 604.660.4700

Appendix J-2
DRAFT C ORDER

bcuc
British Columbia
Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
bcuc.com

P: 604.660.4700
TF: 1.800.663.1385
F: 604.660.1102

ORDER NUMBER
C-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Energy Inc.
Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project

BEFORE:
[Panel Chair]
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

A. On November 16, 2020, FortisBC Energy Inc. (FEI) submitted an application to the British Columbia Utilities Commission (BCUC) for, among other things, a Certificate of Public Convenience and Necessity (CPCN) pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA) for the Okanagan Capacity Upgrade (OCU) Project (Application);

B. In the Application, FEI seeks approval to:

1. Construct and operate a new 406 mm gas pipeline extension to the Oliver to Penticton 406 mm gas pipeline (OLI PEN 406), operating at a maximum operating pressure (MOP) of 7,826 kilopascal (kPa) approximately 30 km in length from a take off location near Ellis Creek near Penticton to a new pressure control station near Chute Lake south of Kelowna starting at kilometre point 30.8;

2. Construct and operate a new Chute Lake Pressure Control Station with a 406 mm pig barrel and pressure regulated tie-in to the existing Vernon to Penticton 323 mm gas pipeline set at 5,171 kPa for gas flowing north to Kelowna and 4,826 kPa for gas back flowing south to Penticton at kilometre point 60.8;

3. Construct and operate a new 406 mm Block Valve Station above ground valve station at kilometre point 36.1; and

4. Deactivate a 1,200 m section of the existing OLI PEN 406 between the tie-in location at kilometre point 30.8 and the Ellis Creek Pressure Control Station.

C. FEI also seeks BCUC approval, pursuant to sections 59 to 61 of the UCA, to establish a non-rate base deferral account, entitled the OCU Application and Preliminary Stage Development Costs Deferral Account, to be amortized over three years and costs recorded in this deferral account to attract an after-tax weighted average cost of capital return;

D. The BCUC established a regulatory process for the review of the Application; and

E. The BCUC has reviewed the evidence in this proceeding and finds that approval is warranted.

NOW THEREFORE pursuant to sections 45 to 46 and 59 to 61 of the UCA and for the reasons set out in the decision issued concurrently with this order, the BCUC orders as follows:

1. A CPCN is granted to FEI for the OCU Project.

2. FEI is approved to establish the OCU Project Application and Preliminary Stage Development Costs deferral account, attracting an after tax weighted average cost of capital, to record the Application and preliminary stage development costs to be amortized over a three-year period commencing January 1, 2022.

3. FEI is directed to file the following reports:

    a. Semi-annual Progress Reports within 30 days of the end of each semi-annual reporting period;

    b. A Material Change Report, in the event of a material change in FEI's plan to complete the Project that would reasonably be expected to have a significant effect on the schedule, cost or scope of that plan, such that:

        i. There is a schedule delay of greater than six months compared to the CPCN construction schedule for the OCU Project; or

        ii. There is a cost variance of greater than 10 percent of the CPCN capital estimate for the Project.

    c. Final Report within six months of the in-service date of the OCU Project.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Appendix J-3
CONFIDENTIALITY DECLARATION AND UNDERTAKING FORM

Confidentiality Declaration and Undertaking Form

In accordance with the British Columbia Utilities Commission' (BCUC) Rules of Practice and Procedure, please provide a completed form to the party who filed the confidential document and copy Commission Secretary at commission.secretary@bcuc.com. If email is unavailable, please mail the form to the address above.

Undertaking

I, __[name]___, am representing the party _____ in the matter of __FortisBC Energy Inc. Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project ~ Project No. [xx]._____

In this capacity, I request access to the confidential information in the record of this proceeding. I understand that the execution of this undertaking is a condition of an Order of the Commission, and the Commission may enforce this Undertaking pursuant to the provisions of the *Administrative Tribunal Act*.

Description of document:	Confidential materials filed in the proceeding, in unredacted form.

I hereby undertake:

(a) to use the information disclosed under the conditions of the Undertaking exclusively for duties performed in respect of this proceeding;

(b) not to divulge information disclosed under the conditions of this Undertaking except to a person granted access to such information or to staff of the Commission;

(c) not to reproduce, in any manner, information disclosed under the conditions of this Undertaking except for purposes of the proceeding;

(d) to keep confidential and to protect the information disclosed under the conditions of this Undertaking;

(e) to return to the applicant, _FortisBC Energy Inc._, all documents and materials containing information disclosed under the conditions of this Undertaking, including notes and memoranda based on such information, or to destroy such documents and materials within fourteen (14) days of the Commission's final decision in the proceeding; and

(f) to report promptly to the BCUC any violation of this Undertaking.

Signed at __[place]___ this _[day] day of [month] 2020__.

Signature: _____

Name (please print): ___[Name]_____

Representing (if applicable): _____

Appendix K
LIST OF ACRONYMS

List of Acronyms

Acronym or Term	Definition
AC	Alternating Current
AFUDC	Allowance for Funds Used During Construction
AIA	Archaeological Impact Assessment
AOA	Archaeological Overview Assessment
APC	Archaeology Project Coordinator
APEC	Areas of Potential Environmental Concern
AS	Archaeology Supervisor
BCOGC	British Columbia Oil and Gas Commission
BCUC	British Columbia Utilities Commission
CAD	British Columbia's Consultative Areas Database
CEA	*Clean Energy Act*
CEP	Construction Execution Plan
CNG	Compressed Natural Gas
CP	Cathodic Protection
CPCN	Certificate of Public Convenience and Necessity
CSA	Canadian Standards Association
EA	Environmental Assessment
EMP	Environmental Management Plan
EOA	Environmental Overview Assessment
FBC	FortisBC Inc.

Acronym or Term	Definition
FBE	Fusion Bonded Epoxy
FEI	FortisBC Energy Inc.
FLNRORD	Ministry of Forest, Land, Natural Resources Operations & Rural Development Permits
Golder	Golder Associates Ltd.
HCA	*Heritage Conservation Act*
HDD	Horizontal directional drilling
Hemmera	Hemmera Envirochem Inc.
ILI	In-line Inspection
IMP	Integrity Management Program
IOP	Individual Ownership Plans
IP	Intermediate pressure
IR	Information Request
ITS	Interior Transmission System
kP	Kilometer Point
kPa	Kilopascal
KVR	Kettle Valley Rail Trail
LNG	Liquefied Natural Gas
LSIB	Lower Similkameen Indian Band
LTGRP	Long Term Gas Resource Plan.
Mm	Millimeter
MMscfd	one million standard cubic feet per day

Acronym or Term	Definition
MOP	Maximum Operating Pressure.
MoTI	British Columbia Ministry of Transportation and Infrastructure
NPS	Nominal pipe size
NR	Natural Resources
O&M	Operations and Maintenance
OCU	Okanagan Capacity Upgrade Project
OIB	Okanagan Indian Band
OTDC	Okanagan Training and Development Council
PFR	Preliminary Field Reconnaissance
PIB	Penticton Indian Band
PV	Present Value
ROW	Right of Way
RDOS	Regional District of Okanagan-Simikameen
RTU	Remote Telemetry Unit
SARA	*Species at Risk Act*
SCP	Southern Crossing Pipeline
SMCI	Solaris Management Consultants Inc.
SMYS	Specified minimum Yield Strength
SONG	South Okanagan Natural Gas pipeline
TC Energy Pipeline	TC Energy-owned Foothills Pipeline
TEG	Thermo-Electric Generator

Acronym or Term	Definition
TEKK	Traditional Ecological Knowledge Keepers
UCA	*Utilities Commission Act*
Validation Estimating	Validation Estimating LLC, USA
VER PEN 323	Vernon to Penticton 323 mm pipeline
Westcoast System	Enbridge-owned Westcoast Energy System
WFN	Westbank First Nations
WHA	Wildlife habitat areas
YPCI	Yohannes Project Consulting Inc.