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Sent via email/eFile

FEI PATTULLO GAS LINE REPLACEMENT PROJECT
CPCN EXHIBIT A-7

Ms. Diane Roy
Vice President, Regulatory Affairs
FortisBC Energy Inc.
16705 Fraser Highway
Surrey, BC V4N 0E8
gas.regulatory.affairs@fortisbc.com

Re: FortisBC Energy Inc. – Application for a Certificate of Public Convenience and Necessity for the Pattullo Gas Line Replacement Project – Project No. 1599129 – BCUC Information Request No. 2

Dear Ms. Roy:

Further to your August 31, 2020 filing of the above-noted matter, enclosed please find BCUC Information Request No. 2. Pursuant to Order G-350-20, please provide your response on or before Thursday, February 18, 2021.

Sincerely,

Original signed by:

Marija Tresoglavic
Acting Commission Secretary

/cmv

Enclosure



FortisBC Energy Inc.
Application for a Certificate of Public Convenience and Necessity
for the Pattullo Gas Line Replacement Project

INFORMATION REQUEST NO. 2 TO FORTISBC ENERGY INC.

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A. PROJECT JUSTIFICATION

**19.0 Reference: PROJECT JUSTIFICATION
Exhibit B-6, British Columbia Utilities Commission Information Request 1.1, 16.4;
Attachment 1.1, pp. 1–2
Pattullo Bridge Replacement Project**

In response to British Columbia Utilities Commission (BCUC) Information Request (IR) 1.1 for FortisBC Energy Inc.’s (FEI) application for a Certificate of Public Convenience and Necessity (CPCN) for the Pattullo Gas Line Replacement Project (PGR Project or Project) (Application), FEI provides an agreement between the Province of British Columbia (represented by the Ministry of Highways) and British Columbia Electric Company, dated April 11, 1957 (Bridge Agreement) as Attachment 1.1.

Section 3 of the Bridge Agreement states:

3. On termination of this agreement, the Company will, within a reasonable time, remove all pipeline and attachments from the said bridge and will leave it in a condition satisfactory to the Minister of Highways.

Section 6 of the Bridge Agreement states in part:

6. That after receiving notice in writing of the intention of the Province to reconstruct, alter or repair the Bridge, the Company will move or alter their pipeline or cease transmission of gas if same is necessary for the safe completion of the reconstruction, alteration or repairs. All such alteration by the Company shall be carried out at their own expense.

In response to BCUC IR 16.4, FEI states:

As per Section 3 of the Bridge Agreement, FEI is responsible for removing the gas line

and its attachments from the existing Pattullo Bridge. This includes all asset retirement activities including decommissioning, dismantling and removal costs related to the Pattullo Gas Line. Unless FEI reaches an agreement with MoTI providing otherwise, FEI is responsible for all costs associated with removing the gas line.

19.1 Please confirm, or otherwise explain, whether FEI is responsible for all costs associated with the decommissioning, dismantling and removal of the Pattullo Gas Line as a result of Section 6 of the Bridge Agreement.

19.1.1 If not confirmed, please identify and provide reference to the relevant section(s) of any agreements in place which require FEI to be responsible for all the costs for the decommissioning and removal of the Pattullo Gas Line.

19.1.1.1 If no agreements require FEI to be responsible for all costs associated with the decommissioning, please explain how it was determined that FEI should be responsible for the costs. Please provide any supporting documents or agreements.

19.2 Please discuss whether FEI has entered, or plans to enter, into negotiations with Ministry of Transportation and Infrastructure (MoTI) with respect to the removal of the gas line under the Pattullo Bridge.

19.2.1 If yes, please provide the status or outcome of the negotiations to date.

19.2.2 If not, please explain why not.

**20.0 Reference: PROJECT JUSTIFICATION
Exhibit B-6, BCUC IR 2.2
Pattullo Bridge Replacement Project**

In response to BCUC IR 2.2, FEI states:

As such, FEI is currently working towards a target date of commissioning the new gas line and decommissioning the existing gas line by March 31, 2023 (excluding removal of the decommissioned gas line from the Pattullo Bridge).

20.1 Please explain when FEI expects to remove the decommissioned gas line from the Pattullo Bridge.

**21.0 Reference: PROJECT JUSTIFICATION
Exhibit B-6, BCUC IR 5.4
Significance of the Pattullo Gas Line to the Metro Vancouver Distribution System**

In response to BCUC IR 5.4, FEI states:

FEI is continuing to evaluate alternatives to restore system resiliency in the Metro Vancouver area which is currently provided by the LMIPSU Project. Until the scope of the Project is better defined, FEI is unable to provide additional information about any follow-up project(s) to restore resiliency at this time, including project overview, timing, or anticipated cost.

21.1 Please explain when FEI expects to be able to provide additional information about any follow-up project(s) to restore resiliency, including project overview, timing, or anticipated cost.

B. ALTERNATIVES EVALUATION

**22.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-1-1, Section 4.3.5, pp. 37–38
Alternative 5 – Peak Shaving Facility / Virtual Gas Line**

On page 37 of the Amended Application, FEI states:

Under peak demand conditions (approximately minus 12°C), the peak shaving facility or virtual gas line would need to deliver approximately 100,500 standard cubic metres per hour (Sm³/hr) of gas into the system.

On page 38, FEI explains that the two delivery alternatives liquified natural gas and compressed natural gas (LNG and CNG), by which the required demand or load could be supplied using a peak shaving facility or virtual gas line, were determined to be not feasible because they are not able to meet the large capacity requirement.

- 22.1 Please explain how FEI determined that that the peak shaving facility or virtual gas line would need to deliver approximately 100,500 standard cubic metres per hour (Sm³/hr) of gas into the system.
 - 22.1.1 Please describe any assessments to determine the potential system capacity shortfall without the Pattullo Gas Line and provide the results of these assessments.
- 22.2 Please discuss the feasibility of using a peak shaving facility or virtual gas line as a short-term mitigation method to address any potential system capacity shortfall, if the PGR Project is delayed.
 - 22.2.1 Please describe any assessments to determine the feasibility of LNG and CNG delivery, including engineering and cost studies and provide the results of these assessments.

**23.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-6, BCUC IR 10.3.2
Schedule Impacts**

In response to BCUC IR 10.3.2, FEI states:

FEI assessed the impact on the distribution system if the Pattullo Gas Line were removed in advance of the new system being in service. However, such a schedule was deemed not viable. The removal of the Pattullo Gas Line without a replacement supply leaves the remaining system incapable of providing sufficient capacity at several district regulating stations during peak winter conditions. The risk of entering a winter period with a distribution system unable to meet FEI's forecast peak demand does not meet FEI's design criteria and could result in significant customer outages, both of which are unacceptable to FEI. [*Emphasis added*]

- 23.1 Please provide details of FEI's design criteria, as referenced in the preamble above.
- 23.2 Please discuss whether FEI applies the design criteria explained in response to the IR above to its other distribution systems.
 - 23.2.1 If not, why not?

**24.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-1, Section 4.4.2.2, p. 45; Exhibit B-1-1, Section 4.4.2.2, p. 44; Exhibit B-1-1,**

**Section 4.4.4.4.2, pp. 54–55, Table 4-9; Exhibit B-6, BCUC IR 12.8
Financial Evaluation, Benchmark Comparison and Criteria Weightings**

On page 45 of the Application, FEI states it used the following financial criterion to evaluate the alternatives:

1. **Levelized Delivery Rate Impact:** Ability for an alternative to be completed with the lowest possible delivery rate impact over the approximate financial life of the asset (i.e., 73-year analysis period) for the PGR Project. Alternatives that minimize the levelized delivery rate impact to FEI's non-bypass customers score the highest. *[Emphasis added]*

On page 44 of the Amended Application, dated December 15, 2020 (Amended Application), FEI used the following financial criterion to evaluate the alternatives:

2. **Levelized Delivery Rate Impact:** Ability for an alternative to be completed with the lowest possible delivery rate impact over the approximate financial life of the asset (i.e., 68-year analysis period) for the PGR Project. Alternatives that minimize the levelized delivery rate impact to FEI's non-bypass customers score the highest. *[Emphasis added]*

On page 55 of the Amended Application, FEI provides Table 4-9 illustrating the financial comparison between Alternative 6A (Gagardi Route) and Alternative 6D (Sperling Route) in terms of levelized delivery rate impact over a 68-year analysis period to FEI's non-bypass customers.

- 24.1 Please explain why the financial analysis period was changed from 73 years to 68 years.
- 24.2 In a format similar to Table 4-9, please provide the financial analysis for Alternatives 6A and 6D over the 73-year analysis period. Please comment on any significant variances from the financial analysis over the 68-year analysis period presented in Table 4-9.

Further on page 44 of the Amended Application, FEI states:

The cost estimates were benchmarked against the LMIPSU Project. The LMIPSU Project is a particularly relevant benchmark, as it was recently completed and faced similar urban construction challenges that would be expected for the three overland routes considered for the PGR Project.

- 24.3 Please specify the analysis period used in the LMIPSU Project. If not 68-years, please explain why the PGR Project did not use the same analysis period as the LMIPSU Project.

In response to BCUC Information Request IR 12.8, FEI states:

The LMIPSU Project consists of both the Coquitlam Gate IP project (which was largely completed in late 2019, and represented the majority of the total project costs), and the Fraser Gate IP project (which is scheduled for completion in 2021). Since construction of the Fraser Gate IP project has not yet started, and the Coquitlam Gate IP project comprises most of the project costs, this response addresses only the latter project. The capital cost details, as provided in FEI's Q3 2020 Progress Report to the BCUC, including forecast (Forecast Total at Completion column - 5) and actual (Spent to Date – column 3) up to September 30, 2020, are presented below:

Description	CPCN Estimate	Revised Control Budget - Feb 2018	Spent to Date	Estimate to Complete	Forecast Total at Completion	Variance Over / (Under)	Percentage Budget Spent
	(1)	(2)	(3)	(4)	(5) = (3)+(4)	(6) = (5)-(2)/(2)	(7)=(3)/(2)
	(\$000s)					(%)	
Project Management	1,626	13,409	11,151	587	11,738	-12%	83%
EPCM	13,293	43,583	31,750	947	32,697	-25%	73%
Permits and Approvals	5,695	16,054	3,604	3,757	7,361	-54%	22%
Property and Right of Way	1,137	5,442	1,280	150	1,430	-74%	24%
Materials	29,873	27,949	26,335	0	26,335	-6%	94%
Inspection	5,157	10,641	6,934	10	6,944	-35%	65%
Construction	135,551	304,916	296,301	4,114	300,415	-1%	97%
Tie-in and Commissioning	1,049	4,553	3,643	1,129	4,772	5%	80%
Contingency	29,632	36,042	0	11,212	11,212	-69%	0%
PST	3,292	1,651	1,762	0	1,762	7%	107%
Sub-total	226,305	464,239	382,759	21,906	404,665	-13%	82%
AFUDC	12,236	28,752	17,954	0	17,954	-38%	62%
Total	238,541	492,991	400,713	21,906	422,619	-14%	81%
Demolition	4,169	3,940	669	7,259	7,928	101%	17%
AFUDC Demolition	115	178	28	89	117	-35%	16%
Total Capital Cost - Coquitlam IP	242,825	497,109	401,410	29,254	430,663	-13%	81%

[...]

The major construction challenges encountered include:

- Managing public impacts, in the form of traffic congestion, construction activity and noise;
- Delays in receiving municipal, government and third-party permits and approvals including changes to traffic control plans;
- Unanticipated third-party utilities;
- Unanticipated sub-surface conditions and obstructions encountered along trenchless crossings; and
- Schedule delays in the completion of the facilities.

24.4 Please explain whether the variance between the “CPCN Estimate” and “Forecast Total at Completion” for the Coquitlam Gate IP project is a result of the major construction challenges encountered. Please discuss any other factors that contributed to the variance.

24.4.1 Please discuss how FEI has incorporated lessons learned from the Coquitlam Gate IP project, and other past projects as applicable, to inform the development of the class 4 cost estimate of the PGR Project.

24.5 Please identify the LMIPSU cost estimates used to benchmark the PGR Project class 4 cost estimates (i.e. CPCN estimate, estimate to complete, combination, etc.), and provide the rationale for using that estimate as the basis for comparison.

In response to IR 12.8, FEI states that “[t]he actual contingency to date is shown as zero because schedule risks did not materialize and hence the associated cost impact did not occur or was recorded within each applicable line item.”

24.6 Please explain whether the contingency estimate for the Coquitlam Gate IP project only covered uncertainty of schedule risk. If yes, please discuss why other risks are not covered. If not, please elaborate on which other risks are covered under the contingency estimate.

24.6.1 Please clarify whether the contingency estimate for the PGR Project covers uncertainty of specific risks or all risks identified in the risk matrix. If specific risks, please explain why.

On page 54 of the Amended Application, FEI states:

Alternative 6A (Gaglardi Route) and Alternative 6D (Sperling Route) were developed to an AACE Class 4 cost estimate. The refined cost estimate took into consideration the development activities of each route from the technical progression as well as feedback from engagement and consultation with stakeholders, landowners and the community.

24.7 Please discuss how variations within the AACE Class 4 cost estimate range can impact the financial scores of Alternatives 6A and 6D. Include examples illustrating the impact at the extremes of the cost range.

Table 4-7 on page 48 of the Amended Application provides a summary of FEI's assessment of Alternatives 6A, 6B and 6C against all evaluation criteria. Table 4-10 on page 55 of the Amended Application provides a summary of FEI's assessment of Alternatives 6A and 6D against all evaluation criteria. FEI provides a weighting to each of the four criteria: Schedule Impacts (54 percent); Community, Indigenous and Stakeholder Impacts (22.5 percent); Environmental and Archaeological Impacts (13.5 percent); and Rate Impact (10 percent).

24.8 Please discuss how the percentage weightings for each criterion were determined.

**25.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-1-1, Section 4.4.4.1, pp. 49–50
Changes to Alternative 6A (Gaglardi Route)**

On pages 49 and 50 of the Amended Application, FEI states:

The Class 4 Gaglardi Route reflects two key changes:

- First, FEI adjusted the route to avoid the Burnaby Lake Regional Nature Park, and instead progressed on Cariboo Road and 16th Avenue in Burnaby. This route change was made primarily to avoid environmentally sensitive wetlands and riparian areas, and the Cariboo Conservation area, limiting impacts to species at risk and associated lengthy permitting requirements. However, it results in additional urban construction activities on arterial roadways causing increased cumulative traffic impacts.
- Second, in response to feedback from the City of Burnaby that it could not accommodate the location of the PRS, FEI relocated the PRS for the Gaglardi Route to the City of New Westminster. This results in an additional 500 metres of gas line construction along the route and permit requirements from two municipalities.

25.1 Please provide the incremental savings and/or costs that resulted from modifying the Gaglardi Route to progress on Cariboo Road and 16th Avenue in Burnaby.

25.2 Please provide the incremental costs for the relocation of the Pressure Regulating Station (PRS)

to the City of New Westminster.

25.3 Please elaborate on why the City of Burnaby could no longer accommodate the location of the PRS.

25.3.1 Please discuss whether other nearby locations in Burnaby were considered, and why these locations were ultimately rejected.

C. PROJECT DESCRIPTION

26.0 Reference: **PROJECT DESCRIPTION** **Exhibit B-1-1, Section 5.3, pp. 58, 59, 65** **Final Route Development**

On page 58 of the Amended Application, FEI states:

Gas line routing is an iterative process starting with a wide 'corridor of interest' and then narrows this corridor to a more defined route at each design phase as more data is acquired, resulting in a final alignment.

On page 59 of the Amended Application, FEI states:

Figure 5-1 below shows a map of the identified corridor shaded in yellow, with the existing FEI Lower Mainland Intermediate Pressure System Upgrade (LMIPSU) NPS 30 gas line in blue at the top and the existing trunk distribution system in blue at the bottom. The objective of the PGR Project is to construct a north to south gas line connection between these two systems within the identified corridor.

On page 65, of the Amended Application FEI states, "The routing process and ranking indicated that the preferred route includes Sperling Avenue for Segment 1, the Nursery Street crossing of TCH1 for Segment 2, and Lakefield Drive for Segment 3."

Later, on page 65 of the Amended Application, FEI states:

The final stage of the routing process will occur during the detailed design phase, which is scheduled for completion as shown in Table 5-10 below. This will involve a detailed field investigation of the route and the environment in which the gas line is to be constructed....

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

26.1 Please provide a map of the preferred route described in the preamble indicating the three route segments.

26.2 Please explain whether FEI is seeking approval of a CPCN to construct and operate the PGR Project based on the preferred route described in the preamble or based on any potential routing within the identified corridor shown in Figure 5-1.

26.2.1 If the preferred route, please explain what changes to the preferred route would require or trigger a new CPCN or other review and approval by the BCUC.

26.2.2 If any potential routing within the identified corridor, please explain how the BCUC is to evaluate the public convenience and necessity of the PBR Project and the associated

consultation, environmental and technical considerations when the preferred route has not yet been identified.

- 26.3 Please explain, with rationale, at which stage in the design phase (30%, 60% or 90%) the route for the PGR Project will be finalized.
- 26.4 Should information be acquired which leads FEI to change or finalize its preferred route prior to the close of the evidentiary record in this proceeding, please confirm, or otherwise explain, that such information will be provided to the BCUC.

27.0 Reference: PROJECT DESCRIPTION
Exhibit B-1-1, Section 4.4.4.2, p. 51, Section 5.4.2.8, p.69
Major Crossings

On page 51 of the Amended Application, FEI states:

The Sperling Route ties into the newly constructed NPS 30 (762 mm) LMIPSU gas line at Loughheed Highway and Sperling Avenue. The IP gas line would then continue south along Sperling Avenue towards TCH1 and cross the BNSF Railway and Still Creek. The gas line would then cross TCH1 between Sperling Avenue and Nursery Street by an auger bore and proceed along Lakefield Drive and 4th Street and continue to the inlet of the PRS near the intersection of 16th Avenue and 4th Street. A short 700 kPa gas line would connect the PRS to the trunk distribution system. Refer to Figure 4-13 below for a map of the route.

On page 69 of the Amended Application, FEI states:

The majority of the crossings required for the PGR Project will be constructed using open cut trench methods. Major crossings will utilize trenchless or aerial crossings.

- 27.1 Please identify each major crossing on the Sperling route and explain FEI's preferred crossing method for each of these major crossings.
- 27.2 Please explain whether each of the preferred crossing methods described in response to IR 27.1 have been finalized.
 - 27.2.1 If not, when does FEI anticipate finalizing the crossing method for each major crossing?
 - 27.2.2 If not, please explain whether FEI is seeking approval of a CPCN to construct and operate the PGR Project based on the preferred crossing method for each major crossing.
 - 27.2.2.1 If yes, please explain whether a change in crossing method would require or trigger a new CPCN or other review and approval by the BCUC.
 - 27.2.2.2 If no, please explain how the BCUC is to evaluate the public convenience and necessity of the PBR Project and the associated consultation, environmental and technical considerations when the preferred crossing methods have not yet been identified.
- 27.3 Should information be acquired which leads FEI to change or finalize its preferred method for major crossings prior to the close of the evidentiary record in this proceeding, please confirm, or otherwise explain, that such information will be provided to the BCUC.

28.0 Reference: PROJECT DESCRIPTION

Exhibit B-1-1, Section 4.4.4.2, p. 52
Burnaby Lake Area

On page 52 of the Amended Application, FEI states:

FEI's investigation into the Sperling Route identified a number of technical and stakeholder challenges requiring several studies and discussions. The poor soil conditions in the Burnaby Lake area are characterized by very soft peat (i.e. potentially unstable soils) and a high ground water table presenting challenges during construction and ongoing operations and maintenance of the gas line. The route would also impact assets managed by MoTI, BC Hydro and traverse Metro Vancouver's Burnaby Lake Regional Park.

- 28.1 Please describe the construction and ongoing maintenance challenges associated with poor soil conditions in the Burnaby Lake area.
- 28.2 Please describe any investigations and studies required to address the technical challenges associated with the Burnaby Lake area and provide a timeline for when they will be completed.

29.0 Reference: PROJECT DESCRIPTION
Exhibit B-1-1, Section 5.6, p. 75
Early Works Permits

On page 75 of the Amended Application, FEI states:

The preliminary Project execution schedule is based on receiving a BCUC decision by Q3 2021, an early works program after the BCUC decision, and an assumed construction start of Q2 2022.

- 29.1 Please describe the early works program and associated regulatory process for obtaining permits for early works.
- 29.2 Please explain whether FEI requires the BCUC's decision to obtain permits for early works.

30.0 Reference: PROJECT DESCRIPTION
Exhibit B-1-1, Section 5.9.2, p. 80
BC Oil and Gas Commission - New Gas Line Application

On page 80 of the Amended Application, FEI states:

The construction, operation and decommissioning activities of the Project are governed by the Oil and Gas Activities Act. The Project will require a new gas line application, which FEI plans to file in Q3 of 2021. A gas line 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 application. Each component must receive BCOGC approval prior to the start of construction. The current schedule assumes a 5-month approval period from the time of filing.

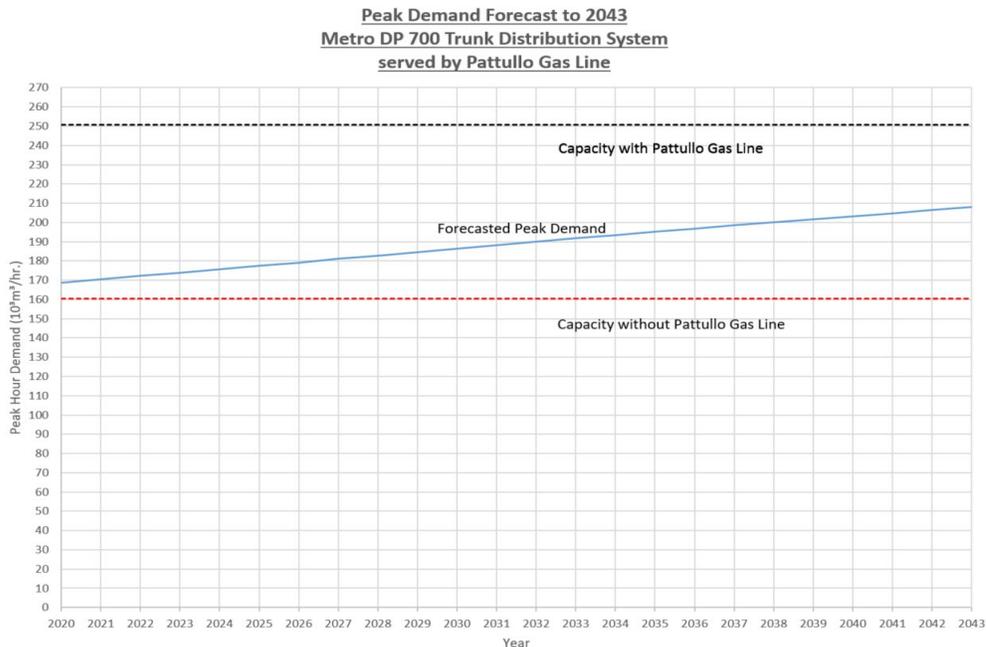
- 30.1 Please describe in detail the process for compilation and review of a new gas line application to

the BC Oil and Gas Commission (BCOGC), and provide a breakdown of the timeline for each phase of the process.

- 30.2 Please describe in detail the required deliverables for the new gas line application to the BCOGC including Indigenous and public consultation, ROW acquisition, land acquisitions, land or access rights, environmental assessments, archaeology impact assessment and design drawings.
- 30.3 Please compare the information in the PGR CPCN Application to the required deliverables for the new gas line application to the BCOGC.
 - 30.3.1 In the above response, please describe any additional information required for the BCOGC application and associated timeline for acquiring the information.
- 30.4 Please specify when FEI expects to receive approval of its new gas line application from the BCOGC.
 - 30.4.1 Given the timing described above, and that a new gas line application is required prior to construction, please explain why FEI requires a CPCN approval from the BCUC by Q3 2021.

**31.0 Reference: PROJECT DESCRIPTION
Exhibit B-9, CEC IR 5.5
System Capacity with PGR Project**

In response to CEC IR 5.5, FEI provided the following figure which shows peak demand and available system capacity, both with and without the Pattullo Gas Line.



- 31.1 Please provide a revised version of the above figure which illustrates system capacity with the PGR Project (i.e. system capacity with the proposed new gas line but without the PGL).
- 31.2 Please quantify any surplus system capacity with the PGR Project for each year from 2023 to 2043. (i.e. system capacity with PGR Project in excess of the forecasted peak demand).
- 31.3 Please discuss whether there is an opportunity for FEI to reduce the PGR Project costs by

minimizing any surplus system capacity with the PGR Project.

31.3.1 Please describe any assessments to determine the optimal pipe diameter of the proposed new gas line, including engineering and cost studies and provide the results of these assessments.

31.4 Please discuss the feasibility of modifying the existing distribution system (e.g. gas line main and pressure regulating station upgrades) as a short-term mitigation method to address any potential system capacity shortfall, if the PGR Project is delayed.

31.4.1 Please describe any assessments to determine the feasibility of debottlenecking the distribution system, including engineering and cost studies and provide the results of these assessments.

D. PROJECT COST ESTIMATE

**32.0 Reference: PROJECT COST ESTIMATE
Exhibit B-1-1, Section 5.10.1, p. 82; Exhibit B-6, BCUC IR 15.4
Base Cost Estimate**

FEI states on page 82 of the Amended Application:

FEI developed the Project cost estimate in conjunction with Mott MacDonald Canada Ltd (Mott MacDonald), based on criteria from AACE International Recommended Practices 18R-97 and 97R-18. ...

[...]

The total base Project cost estimate is \$124.333 million in 2020 dollars, which includes the sum of Mott MacDonald's estimate and FEI's portion of the base estimate.

In response to BCUC IR 15.4, FEI states:

FEI has undertaken additional preliminary constructability and other site reviews for the Gaglardi Route, and is in the process of doing the same for the Sperling Route. The modifications to the estimating methodology during development of the Class 4 cost estimate, which better define the scope of the Project and reduce uncertainties in the estimates' expected accuracy range....

32.1 In view of the modifications to the estimating methodology, please provide the expected accuracy range of the PGR Project class 4 cost estimate.

32.2 In the event that a change in project scope, schedule or other factor(s) may materially change the cost estimate to complete the project, please explain how this will be addressed in terms of internal FEI approvals

**33.0 Reference: PROJECT COST ESTIMATE
Exhibit B-1-1, Section 5.10.3, p. 84; Exhibit B-6, BCUC IR 15.5
Cost Estimate Validation**

On page 84 of the Amended Application, FEI states that the following validation of the cost estimate was completed:

An external independent review to verify and validate that the estimate, as well as

schedule, met the AACE Class 4 criteria and requirements and that a well-documented, reasonable and defensible estimate was developed;

In response to BCUC IR 15.5, FEI states that modifications to the estimating methodology during development of the Class 4 cost estimate was undertaken to better define the scope of the Project and reduce uncertainties in the estimates' expected accuracy range. The modifications included "additional independent reviews of the cost estimate(s) and estimate assumptions including a review of the materials, take-offs, productivity rates, etc."

33.1 Please elaborate on the independent reviews that have been undertaken on the Class 4 cost estimate.

33.2 Discuss any concerns raised by the independent review(s) and provide a copy of the review(s).

**34.0 Reference: PROJECT COST ESTIMATE
Exhibit B-1-1, Section 5.6.1, p. 75; Section 5.10.4, p. 84; Section 5.10.4.3, p. 85; Section 5.10.4.4, p. 86; Section 5.10.4.5, p. 88; Exhibit B-6, BCUC IR 15.6, 15.8.3
Risk Analysis and Contingency Determination**

On page 84 of the Amended Application, FEI states:

YPCI [Yohannes Project Consulting Inc.] conducted multiple workshops with the Project team to develop a risk register for the Project to identify risks that could likely occur. As the engineering advances on the Project, the probability or the consequence of several identified risks were either mitigated entirely or reduced. All of the risks associated with the Project are contained within the Pattullo Gas Line Replacement (PGR) Sperling Avenue Route - Qualitative Risk Assessment Report Class 4,...

34.1 Please comment on the likelihood of new risks emerging and how FEI is monitoring for new risks as engineering work on the PGR Project advances.

34.1.1 Please indicate if there have been any new risks identified since YPCI has completed its report. If so, please provide a description of the risk, the type of risk, activities being undertaken to mitigate or eliminate the risk.

On page 85 of the Amended Application, FEI states:

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. Validation Estimating completed a Monte Carlo simulation to determine a distribution of possible cost outcomes associated with the existing scope of the Project at different levels of confidence. The analysis derived a risk adjusted P50 cost of \$154.4 million representing a contingency of 24 percent.

34.2 Please confirm, or otherwise explain, that all the identified risks to date were (i) used in the quantitative analysis to evaluate the impact of the project specific and systemic risks, and (ii) used as inputs into the Monte Carlo simulation. If not, please explain why not.

34.3 Please confirm, or otherwise explain, that each risk identified in the risk register is classified as either a project specific risk or a systemic risk. If not confirmed, please explain why not.

34.4 Please explain whether the number and types of risks would be different if the PGR Project had a higher level of project definition. If yes, please explain how the contingency would be impacted.

34.5 Please explain the rationale for selecting a P50 level of confidence to derive the contingency amount, including a description of any analyses and/or assessments conducted to support this selection. Discuss if higher confidence levels were considered, and if so, why there were ultimately rejected.

34.5.1 Please explain how the level of project definition for the PGR Project affected the determination of the appropriate confidence level

On page 88 of the Amended Application, FEI states it “will fund escalation at \$7.7 million, which corresponds to the P50 level of confidence.”

34.6 Please clarify why a P50 level of confidence was used to fund escalation. Discuss if higher confidence levels were considered, and if so, why there were ultimately rejected.

In response to BCUC IR 15.6, FEI states it “will conduct a formal risk analysis using an integrated, hybrid method to develop cost and schedule contingency and management reserve estimates.”

34.7 Please discuss whether FEI is funding a management reserve for the PGR project. If yes, please provide the reserve amount, clarify how it was determined and how it will be managed.

In response to BCUC IR 15.7.1, FEI states, “the contingency estimate will be refined from a Class 4 cost estimate to better reflect the additional work completed.”

34.8 Please explain how the contingency has been modified to reflect the maturity in the project design.

On page 75 of the Amended Application, FEI states it “[t]he integrated team will consist of FEI, the engineering design firm and a contractor working collaboratively to deliver the Project for the lowest cost and completion prior to the schedule constraint.”

In response to BCUC IR 15.8.3, FEI states, “[a]ny expenditures in excess of the Project reserve would require additional internal approvals, which, depending on the magnitude, may include authorization from the President and CEO and/or the Board of Directors.”

34.9 With consideration to the project risks and schedule constraint, please discuss whether the contingency and/or project reserve limits FEI’s willingness to spend additional dollars.

34.9.1 If not, please discuss if there is an upper limit to FEI’s willingness to spend additional dollars to ensure a timely completion. If an upper limit exists, please provide the limit and explain why it is considered reasonable.

34.9.2 If yes, please discuss how schedule delays will be addressed.

**35.0 Reference: PROJECT COST ESTIMATE
Exhibit B-1-1, Section 6.2, p. 90, Table 6-1; Exhibit B-6, BCUC IR 5.3.1, 14.1
Capital Cost Estimate**

On page 90 of the Amended Application, FEI summarizes the total PGR Project estimated capital cost in both 2020 and as spent dollars as follows:

Table 6-1: Breakdown of the PGR Project Capital Cost Estimate (\$millions)

	2020 \$	As-Spent \$	Reference
Engineering and Development	9.935	9.946	Section 5.10.1 and Confidential Appendix D (2020 \$)
Material	4.419	4.777	Section 5.10.1 and Confidential Appendix D (2020 \$)
Construction - Direct and Indirect	86.162	90.020	Section 5.10.1 and Confidential Appendix D (2020 \$)
Decommission and Abandonment	11.151	11.867	Section 5.10.1 and Confidential Appendix D (2020 \$)
Property and Right of Way	4.166	4.237	Section 5.10.1 and Confidential Appendix D (2020 \$)
Project Management and Owner's Costs	14.113	15.293	Section 5.10.1 and Confidential Appendix D (2020 \$)
Subtotal Project Capital Cost	129.946	136.140	See Note 1 for 2020 \$ and Note 2 for As-spent \$
Contingency	30.100	31.640	Section 5.10.4.4 and see Note 2 for As-spent \$
Subtotal Project Capital Costs w/ Contingency	160.046	167.779	Table 6-2; Row 10; Col 1 (2020 \$) & Col 2 (As-spent \$)
CPCN Application	0.350	0.350	Section 6.4.3
CPCN Preliminary Stage Development	2.507	2.507	Section 6.4.3
Subtotal w/ Deferral Costs	162.903	170.636	Table 6-2; Row 14; Col 1 (2020 \$) & Col 2 (As-spent \$)
AFUDC	-	7.305	Table 6-2; Row 14; Col 3
Tax Offset	-	(2.587)	Table 6-2; Row 14; Col 4
TOTAL Project Cost	162.903	175.354	Table 6-2; Row 14; Col 1 (2020 \$) & Col 5 (As-spent \$)

Notes:

1. The Project capital cost of \$129.946 million in 2020 dollars is equal to the base cost estimate of \$124.333 million (Section 5.10.1) plus \$5.612 million of capitalized development costs incurred by FEI from February to November 2020.
2. The as-spent cost is equal to the amount in 2020 dollars plus escalation. The total escalation at a P50 confidence level is \$7.733 million (Section 5.10.4.5), of which \$6.193 million is escalation on the base capital cost and \$1.540 million is escalation on contingency.

35.1 Please provide a breakdown, by cost category, of the \$5.612 million of capitalized development costs incurred by FEI from February to November 2020. Include a detailed description and the associated cost for each line item.

35.1.1 Please explain why these costs were not included in the base cost estimate.

In response to BCUC IR 14.1, FEI provided a breakdown and detailed description of the proposed work to be completed and materials to be procured prior to the expected CPCN decision.

35.2 Please reconcile the work to be completed and materials to be procured provided in response to BCUC IR 14.1 to the \$5.612 million of capitalized development costs incurred by FEI from February to November 2020, as appropriate.

35.3 Considering the work that has been completed since filing the Amended Application, please explain if there have been any other changes to the definition or key characteristics of the PGR Project. If so, please specify the changes and the associated cost.

In response to BCUC IR 5.3.1, FEI states:

Once FEI receives a favourable decision on the Application from the BCUC, and following the receipt of firm bids, a revised internal control budget is established which is used for monitoring and controlling Project actual costs. This budget (updated cost estimate) is reviewed and accepted by the executive sponsor (Vice President, Major Projects).

35.4 Please elaborate on the process and timelines of events for making the financial investment decision for the PGR Project (including review and acceptance of the budget, approval to make expenditures, BCUC approval, etc.).

**36.0 Reference: PROJECT COSTS
Amended Application, Section 5.2, p. 58; Section 5.6.6, p. 77
Pattullo Gas Line Removal**

On page 58 of the Amended Application, FEI states:

The Project scope will also include the modification, decommissioning and/or abandonment of existing infrastructure no longer required due to the removal of the Pattullo Gas Line crossing of the Fraser River. This includes:

- Abandoning and removing the Pattullo Gate Station in the City of Surrey and approximately 800 metres of NPS 20 (508 mm) gas line operating at a MOP of 700 kPa affixed to the Pattullo Bridge;
- Abandoning in place approximately 1.2 km of the remaining NPS 20 (508 mm) gas line operating at a MOP of 700 kPa from the Pattullo Gate Station to the intersection of McBride Boulevard and Royal Avenue; and
- Modifying approximately 5.5 km of the Livingston to Pattullo NPS 18 (457 mm) (LIV PAT 11 457) transmission gas line and associated work due to the removal of the Pattullo Gate Station.

36.1 Please clarify whether the gas line in on either side of the Pattullo Bridge will be abandoned in place. If not, please explain why not, and provide the incremental costs of removing the gas line as compared to abandoning in place.

36.1.1 Please explain if FEI has consulted with the municipalities on the proposed treatment of the gas line. If not, please explain why not.

36.2 Please identify, with rationale, any assets that will continue to be used and useful following the decommissioning of the gas line.

36.3 Please discuss whether any above-ground assets will be abandoned in place. If yes, please provide rationale.

36.4 Please discuss the level of restorative work, if any, that will be completed following the removal or abandonment of the gas line.

36.4.1 Explain if this restorative work is included in the cost estimate. If included, please identify the estimated costs for the restorative work. If not included, please explain why not, and provide the cost estimate for the restorative work.

On page 77 of the Amended Application, FEI states:

Decommissioning and abandonment of the existing Pattullo Gas Line is scheduled to be complete by the end of Q1 2023. Any other existing infrastructure modifications that do not affect the timelines associated with the Pattullo Bridge Replacement project schedule will continue and be complete by Q3 2023.

36.5 Please discuss the modifications that are not timeline dependent and will be completed by Q3 2023.

36.5.1 Please explain the risks and consequences if these modifications are not completed by Q3 2023.

**37.0 Reference: ACCOUNTING TREATMENT
Amended Application, Section 1.3, p. 9; Exhibit B-6, BCUC IR 17.3
PGR Application and Development Costs deferral account**

On page 9 of the Amended Application, FEI states:

For the Application costs, FEI has estimated \$350 thousand related to expenses incurred by FEI for the preparation and regulatory review process for the Application. For the Preliminary Stage Development costs, FEI is proposing to record \$2.507 million, which are the actual costs to January 31, 2020, less the tax deduction available for certain capitalized development costs incurred by FEI after January 31, 2020. The Application and Preliminary Stage Development costs are recorded in the proposed non-rate base deferral account on a net-of-tax basis, attracting FEI's weighted average cost of capital (WACC) until transfer to 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.

In response to BCUC IR 17.3 FEI states, "no approval of the proposed deferral account is required prior to the BCUC's decision on the CPCN for the PGR Project."

- 37.1 Please explain whether the Application and Preliminary Stage Development costs are currently recorded in the proposed deferral account.
- 37.1.1 If yes, please provide the authority under which FEI is currently deferring these costs.
- 37.1.2 If not, please provide the accounting treatment of the costs, the journal entry(ies), and reference to the relevant US GAAP standard supporting the treatment of these costs.
- 37.2 Under a scenario where the proposed deferral account is not approved by the BCUC, please explain how FEI will treat the Application and Preliminary Stage Development costs.
- 37.2.1 Please clarify whether the timing of the decision impacts the treatment of the costs for accounting purposes.

E. ENVIRONMENT AND ARCHAEOLOGY

**38.0 Reference: ENVIRONMENT AND ARCHEOLOGY
Exhibit B-1-2, Appendix H-1, Section 6.3, pp. 52–53
Environmental Permitting and Approvals**

Table 6.3 on page 52 to 53 outlines the potential regulatory approvals and timelines for the selected alignment. The required approvals include a request for project review to Fisheries and Oceans Canada (DFO) and an application for the Waste Discharge Authorization to the BCOGC.

- 38.1 Please clarify if FEI has submitted a request for project review to DFO. If yes, please provide the date of submission. If not, please provide the anticipated date of submission.
- 38.2 Please clarify if FEI has submitted an application for the Waste Discharge Authorization to the BCOGC. If yes, please provide the date of submission. If not, please provide the anticipated date of submission.

F. CONSULTATION

**39.0 Reference: CONSULTATION
Exhibit B-1-1, Section 8.3.4, p. 125; Section 8.3.3, p. 123; Appendix J-7
FEI's Engagement with Indigenous Groups to Date**

FEI states on page 125, "At the time of filing, Indigenous groups have not raised any concerns directly related to the Sperling Route."

FEI states on page 123 that no formal position regarding the engagement process thus far has been received from Indigenous groups. As the Project is still early in its development, FEI is in discussion with Indigenous groups regarding the type of funding to support their engagement activities and the framework of an agreement between FEI and these groups.

The engagement log with Indigenous groups regarding the Sperling Route in Appendix J-7 shows two sets of emailed updates to the Indigenous groups on October 2 and October 8 regarding updates on the Sperling Route, including references to items such as the need for Heritage Investigation Permits which had previously been granted to FEI for the PGR Gaglardi Route.

- 39.1 Please provide an update on the status of funding to support engagement by Indigenous groups, and any currently anticipated impact on project timeframes.
- 39.2 Please provide an update with regards to any feedback which has been received from Indigenous groups relating to the Sperling route, including any concerns raised, plans to address these concerns and any potential project impacts.

**40.0 Reference: CONSULTATION
Exhibit B-1-1, Section 8.2.5.3, pp. 117–118
Terms of Reference with the City of Burnaby**

FEI states on pages 117 and 118 of the Amended Application:

In an effort to achieve Project acceptance, including obtaining the rights and approvals for the necessary statutory right-of-way and temporary workspace, FEI again discussed jointly coordinated projects proposed by the City. These projects, in the context of the Sperling Route, include the construction of a bike path along the gas line alignment. On December 11, 2020, FEI and the City signed an agreement (Terms of Reference) setting out the terms on which FEI would construct the Project along the Sperling Route Corridor in the City of Burnaby. The City is supportive of the Sperling Route. The Terms of Reference is attached as Confidential Appendix J-19.

- 40.1 Please explain the basis for requesting that the entire Terms of Reference document be held confidential.
 - 40.1.1 If possible, please file a redacted version as a public exhibit.
- 40.2 Please explain for how long FEI requests confidentiality be maintained for the Terms of Reference.