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March 4, 2021

British Columbia Public Interest Advocacy Centre
Suite 803 470 Granville Street
Vancouver, B.C.
V6C 1V5

Attention: Ms. Leigha Worth, Executive Director

Dear Ms. Worth:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599152

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

Response to the British Columbia Public Interest Advocacy Centre representing the British Columbia Old Age Pensioners' Organization, Active Support Against Poverty, Disability Alliance BC, Council of Senior Citizens' Organizations of BC, and the Tenant Resource and Advisory Centre *et al.* (BCOAPO) Information Request (IR) No. 1

On November 16, 2020, FEI filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-335-20 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCOAPO IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

1.0 Reference: Exhibit B-1-2, page 2

The referenced page states:

> 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.

1.1 Please provide any data FEI has access to regarding the population of Kelowna for any year(s) subsequent to 2016.

Response:

The following table shows actual (2017-2019) and projected (2020-2036) population totals for Kelowna. The data is from a report prepared for FortisBC Inc. by BC Stats and is based on the BC STATS P.E.O.P.L.E. 2020[1] forecast. The data shown was received in February 2021.

Year	Population
2017	147,641
2018	151,451
2019	154,413
2020	156,509
2021	158,281
2022	160,280
2023	162,425
2024	164,611
2025	166,797
2026	168,979
2027	171,160
2028	173,338
2029	175,509
2030	177,665
2031	179,808
2032	181,943
2033	184,061
2034	186,159
2035	188,243
2036	190,311

[1] https://bcstats.shinyapps.io/popProjApp/.

2.0 Reference: Exhibit B-1-2, pages 20-21 and Exhibit A-3, BCUC 5.0 preamble – peak forecasting formula

2.1 Does the referenced formula take into account whether the weather in the three years for which data is used was normal, colder than normal, or warmer than normal? If so, please explain how and if not, please explain why not.

Response:

No. The formula for calculating a customer's UPC_{peak} for any customer uses the customer's billing history and actual weather conditions at the customer's premise for the two calendar years preceding. The objective is to determine the customer's consumption under very cold conditions, much colder than in a normal year, by determining the relationship between the customer's actual consumption and the temperature at the time. The assumption is that the customer daily and peak hour consumption will be consistent on any day where the prevailing temperature is the same whether that day is part of a normal year or a colder than normal year or a warmer than normal year.

The reference to three years in the cited formula relates to the average of the current year result of the rate schedule UPC_{peak}, along with the results of the previous year and the year before that to dampen any anomalous variations in the data.

2.2 Please provide the actual system peak day demands for each of the past 10 years and the dates on which these were incurred.

Response:

The peak day demand for the ITS is represented in the table below. These values are daily values and are not modified by the transient factor to account for system line pack. These can be directly compared with the "Peak Day Flow (unadjusted)" forecast curve provided in the figure in the response to BCUC IR1 3.1.2.

ITS Peak Day Demand, Coldest winter Day, 2011-2020

		Kelowna Weather		Actual System Peak
Year	Date	(°C)	(DD)	(TJ/day)
2011	Feb 25, 2011	-12.8	30.8	180
2012	Jan 18, 2012	-18.7	36.7	224
2013	Dec 7, 2013	-14.7	32.7	212
2014	Feb 6, 2014	-16.1	34.1	205
2015	Dec 31, 2015	-11.5	29.5	165
2016	Dec 16, 2016	-17.5	35.5	219

Year	Date	Kelowna Weather (°C)	Kelowna Weather (DD)	Actual System Peak (TJ/day)
2017	Jan 11, 2017	-17.8	35.8	220
2018	Feb 21, 2018	-13.6	31.6	192
2019	Feb 5, 2019	-15.8	33.8	221
2020	Jan 14, 2020	-18.9	36.9	252

2.3 To FEI's knowledge, is there a correlation between colder than normal weather in a given year and the magnitude of the peak demand in that year?

Response:

FEI has not observed a correlation between colder than normal weather in a given year and the magnitude of the peak demand in that year. Extreme cold weather days which determine FEI's peak demand do not necessarily occur in colder than normal weather years. Short periods of extreme low temperatures can occur even in warmer than normal weather years.

3.0 Reference: Exhibit B-1-2, page 37, Figure 4-1

3.1 Please provide the data shown in the referenced figure in tabular form.

Response:

Please refer to the response to RCIG IR1 17.1.

4.0 Reference: Exhibit B-1-2, pages 79 and 90, and Exhibit A-3, BCUC IR 26.0 series

4.1 Has FEI or any contractor for FEI taken any core samples where the HDD phase is proposed in order to get some idea with respect to existing sub-surface conditions? If so, please provide the results of any such sampling; if not, please explain why not?

Response:

FEI retained an HDD design consultant to evaluate the geotechnical feasibility for constructing the Penticton Creek crossing, including taking core samples. The geotechnical investigation consisted of drilling, sampling and logging of four geotechnical boreholes, in order to evaluate subsurface conditions at the crossing location. Borehole location information is provided in Attachment 4.1.

Results from the drilling program indicate the general overburden profile consists of sand and gravel deposits overlying bedrock. The bedrock was identified as gneiss. Soapstone and migmatite are also described in BH-03 with the increasing depth.

Select samples were submitted to a geotechnical lab to ascertain/confirm identified soil parameters. Results of the testing indicate that the clay has a liquid limit of around 30 percent and a plasticity index of around 11 percent, with a moisture content of 22.3 percent. The bedrock has a tested unit weight from between 2568 to 2817 kg/m^3; with a tested compressive strength between 28.2 to 195.8 MPa.

An electrical resistivity tomography (ERT) survey was conducted at the Penticton Creek crossing between November 10 and 13, 2020. The ERT survey was used to supplement the obtained borehole data and provide additional information on subsurface conditions along the crossing alignment. Interpretation of the ERT survey and borehole data provides information on the depth, thickness, geometry, and characteristics of surficial overburden soil types, as well as profile information on the upper bedrock surface. In general, the ERT results match the geotechnical borehole data encountered during drilling along the crossing alignment. The thick overburden soils encountered from BH-02 and BH-04 were confirmed by the ERT survey.

Based on the evaluation of the encountered site conditions, the HDD design consultant indicated to FEI that the crossing using HDD methods for Penticton Creek is geotechnically feasible. It was noted that consideration should be applied to the natural variation of sub-surficial conditions and the inherent issues attached to inferring continuity between borehole locations. While these conditions are not expected to vary significantly, some variation is possible. This applies to the areas both vertically and horizontally beyond the area of investigation.

5.0 Reference: Exhibit B-1-2, page 91, Table 5-12

5.1 Please provide precise definitions for each of the column headings "Probability of Underrun" and "Indicated Risk Funding."

Response:

The Probability of Underrun Or Overrun is defined in AACE RP 10S-90 *Cost Engineering Terminology* as follows: "In risk analysis and contingency estimating, the chance that the cost or time will be less (underrun) or more (overrun) than a given cost or time from the distribution of outcomes of the risk analysis model".

The Indicated Risk Funding is the distribution of outcomes (in dollars) from the risk analysis. Table 5-12 in the Updated Application shows the distribution of outcomes for the two independent reserve risks (HDD Failure and Market Risk) and the funding that is required, should either of the reserve risks occur, to achieve a given probability of underrun (or not overrunning).

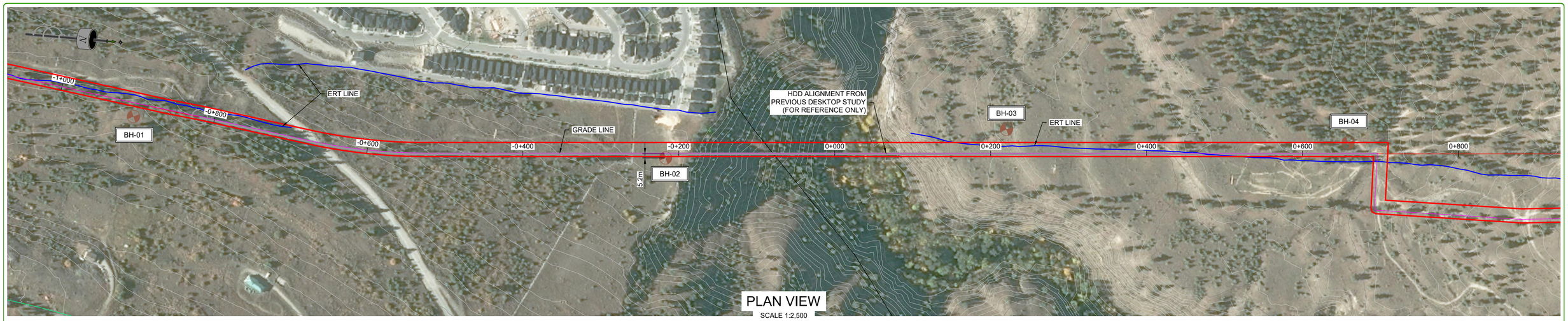
Table 5-12 was used to establish the management reserve amount and the rationale is provided in Confidential Appendix C-4 - Risk Funding Memo, page 2.

5.2 With respect to Market Risk, please provide a comprehensive list of the contractual tools FEI has (or could have) available in order to minimize the Market Risk for FEI and its ratepayers.

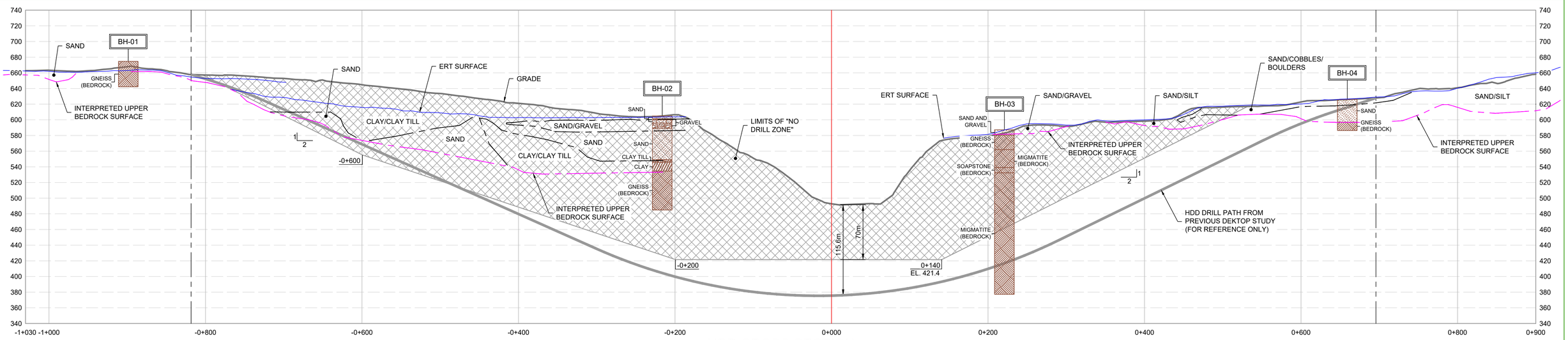
Response:

The market risk arises from the uncertainty associated with contractor capacity and availability and is not manageable through contractual tools. As described in the response to BCUC IR1 29.1.1, FEI will monitor this risk through periodic contractor communications. FEI will also manage the risk by utilizing a design-bid-build project delivery method which ensures that the party entering into contract with FEI is offering competitive, fair, reasonable, and market based pricing. By utilizing a competitive process with multiple proponents, FEI will endeavor to minimize the impacts of market risk for the Project and for ratepayers.

Attachment 4.1



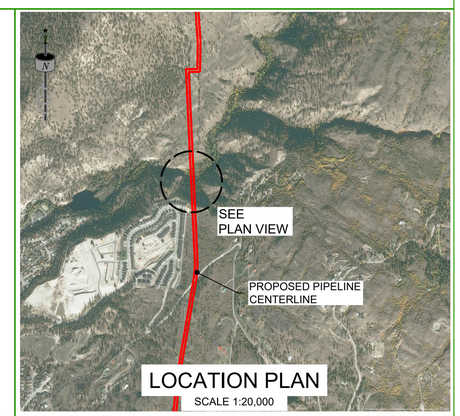
PLAN VIEW
SCALE 1:2,500



HDD CROSS-SECTION
SCALE 1:2,500 HORIZONTAL
SCALE 1:2,500 VERTICAL

NOTES:

1. THE DEPICTED OVERBURDEN AND BEDROCK STRATIGRAPHY SHOWN IS BASED ON INTERPRETATION OF DATA FROM THE FOUR BOREHOLES DRILLED DURING THE RECENT GEOTECHNICAL INVESTIGATION, GEOPHYSICAL SURVEY, AND TERRAHDD'S UNDERSTANDING OF THE LOCAL GEOLOGY. SOME VARIATION IN SUBSURFACE STRATIGRAPHY SHOULD BE EXPECTED.
2. THE RECOMMENDED "NO DRILL ZONE" PROVIDES A MINIMUM 70m OF VERTICAL COVER BENEATH THE SURVEYED RIVER CHANNEL, AND MAINTAINS THE BORE AT OR BELOW ELEVATION 421.4m, GEODETIC DATUM, BETWEEN STATIONS -0+200 AND 0+140. A SLOPE OF 2H:1V IS DEVELOPED FOR THE "NO DRILL ZONE" AT THIS CROSSING.
3. THE ACTUAL DRILL PATH MUST BE LOCATED OUTSIDE OF THE "NO DRILL ZONE" TO AVOID/MINIMIZE CONCERNS OF GROUND SETTLEMENT AND FLUID RELEASE DURING CONSTRUCTION.
4. IT SHOULD BE NOTED THAT THE "NO DRILL ZONE" SHOWN MAY NOT REFLECT THE LENGTH OR CONFIGURATION OF THE HDD. THE ACTUAL DRILL PATH WILL DEPEND ON THE ENTRY/EXIT ANGLES SELECTED BY THE DESIGNER/CONTRACTOR AND THE MINIMUM RADIUS OF CURVATURE WHICH CAN BE ACHIEVED BY THE CONTRACTOR'S EQUIPMENT AND SAFELY TOLERATED BY THE PIPE.
5. IT IS RECOMMENDED THAT THE DIRECTIONAL DRILLING CONTRACTOR INDEPENDENTLY EVALUATE THE FEASIBILITY OF DRILLING THE CROSSING, WITH DUE CONSIDERATION GIVEN TO THE SUITABILITY OF HIS EQUIPMENT AND PROPOSED CONSTRUCTION PROCEDURES.
6. GRADE IS BASED ON AVAILABLE ONLINE INFRAWORKS DATA. BOREHOLE LOCATIONS AND ELEVATIONS ARE BASED ON FIELD SURVEY DATA.



LOCATION PLAN
SCALE 1:20,000

TerraHDD SOLUTIONS INC.

DRAWING NAME	DATE
ACAD-HDD PROFILES 20191107-MODEL	-

REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	DRN	CKD	DES	ENG	APPR
01	ISSUED FOR GEOTECHNICAL INFORMATION	01-20-21	AR	YZ	-	-	SG

REVISIONS

FORTIS BC™

OKANAGAN CAPACITY UPGRADE PROJECT
PENTICTON CREEK HDD CROSSING
C 83-I / 082 E 05 TO A 4-A / 082 E 12

PROJECT NO. 20-013G	DWG NO. 20-013G-01	REV 01