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April 14, 2016

British Columbia Utilities Commission
Sixth Floor
900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Ms. Laurel Ross, Acting Commission Secretary and Director

Dear Ms. Ross:

Re: FortisBC Energy Inc. (FEI)

Project No. 3698840

2015 System Extension Application (the Application)

Response to the British Columbia Utilities Commission (BCUC or the Commission) Panel Information Request (IR) No. 1

On December 17, 2015, FEI filed its Reply Submission in regard to the Application referenced above. On March 24, 2016, the Commission issued Exhibit A-10 in response to FEI's request for clarification from the Commission on a number of Panel IRs, and a suspension of the Regulatory Timetable.

In Appendix 1 to Exhibit A-10, the Panel:

- determined that FEI was no longer required to respond to Panel series 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, and 1.9; and 1.16.2;
- invited FEI to provide alternative proposals to Panel IR series 1.2, 1.4, and Panel IR 1.16.1;
- revised Panel IRs 1.11.13, 1.12.3, 1.13.10, 1.13.11, and 1.14.2.1; and
- added Panel IRs 1.14.2.1.1, 14.2.2, 14.2.3 and 14.2.4.

FEI hereby submits the attached response to Panel IR No. 1, as adjusted by Appendix 1 to Exhibit A-10. FEI has also attached its responses to the Panel IRs for which FEI was invited to provide alternative proposals, although FEI was still not able to respond to Panel IR 1.13.10 and 1.13.11. As such, it is not necessary for FEI to provide a timeline for items 1 and 2 of Exhibit A-10.

Identification of Key Information in Panel IRs

The Commission Panel IRs can be broadly grouped into three categories: (1) IRs enquiring whether the appropriate costs and revenues are included in the Rate Impact Analysis (RIA), (2) IRs directed at verifying the appropriate inputs and methodology is used in the MX test and SLCA, and (3) IRs directed at how variances in past cost and consumption estimates should be quantified, understanding the cause of variances, and examining whether/how they should be addressed prospectively. In order to assist the Commission in its review of the IRs, FEI provides the following information regarding where key information on these topics can be located.

1. Inclusion of Relevant Costs and Revenues in Rate Impact Analysis

FEI has responded to a number of Panel IRs confirming that the RIA represents an accurate and fair representation of the costs, benefits and impacts on new and existing customers. The IRs deal with the following specific points.

- **Sustainment Costs:** Commission Panel IR Series 2 enquires about the appropriateness of including sustainment capital in the RIA. FEI's responses to that series includes the following information:
    - Sustainment capital does not increase linearly as customers are added. The Commission should exclude the sustainment costs from the RIA in order to be consistent with the underlying rationale of presenting an accurate and fair representation of the costs, benefits and impacts on new and existing customers. (Panel IR 1.2.1.)
    - The approach being taken in the RIA with regard to sustainment costs is consistent with the evidence provided in the PBR proceeding. (Panel IR 1.2.1.)
    - Inclusion of sustainment capital in the RIA shows little impact and does not change the fundamental conclusion of the RIA that existing customers have benefitted from the addition of new customers. (Panel IR 1.2.1.)

- **New Customer Additions:** Panel IR series 4 asks a number of questions regarding the relevance of using 85,348 in the RIA to represent the number of new customers added to FEI's system. The number of new customer additions is relevant in the context of the RIA because the actual number of customers and the consumption of those customers are main drivers in the determination of the revenue calculated in the RIA. FEI identified in the response to Panel IR 1.4.1 four reasons why the number of 85,348 is appropriate.

- **Consumption of New Customers:** The Panel sought clarification in Panel IR 1.7.1 series of whether the consumption of new customers was used in the RIA. FEI has confirmed that is the case and has cross-referenced other information on the record where this is discussed.

2. MX Test and SLCA Inputs and Methodologies

Some of the questions in Panel series 10 to 15 seek clarification on the service line cost estimate and variance methodologies, while others in those series are focused on the inputs used in reporting. FEI has sought to break them out below, dealing first with the inputs in the MX Test and SLCA. The overall point to be gleaned from the IR responses is that the Company has applied appropriate cost estimating methodologies, consistent with the approved methodologies. Specifically:

- ***MX Test inputs:*** Panel IR series 10 addressed MX Test inputs. FEI's responses confirm that all relevant costs associated with installing infrastructure from the existing main to the gas meter are included in the MX test. The methodology used by the Company reflects the approach approved by the Commission in 1996 and more recently in 2007. Since cost contingencies are not direct capital costs, they are not (and were not in the original approved methodology) included in the MX Test. (Panel IR 1.10.2)

- ***SLCA inputs:*** Panel IR 12 series inquired regarding SLCA inputs. FEI has confirmed that it has included all relevant "components, elements and resources" in the derivation of the recommended SLCA of $2,150 for both residential and commercial customers and has explained the differences between the SLCA and the MX Test in response to Panel IRs 1.12.3 and 1.12.5.1 and specifically in Attachment 12.3. The costs included in the analysis are consistent with the methodology approved by the Commission in 1996 and 2007.

- ***Different SLCA for residential and commercial:*** In the response to Panel IR 1.12.4, FEI separated residential and commercial inputs into the SLCA calculation at the Panel's request to derive what could be considered separate SLCA values for residential and commercial customers of $2,200 and $10,000 respectively. The calculations performed follow the methodology previously approved by the Commission, apart from considering customer classes separately. FEI indicated it would not object to either one combined SLCA value of $2,150 or, separate SLCA values of $2,200 and $10,000 for residential and commercial customers.

3. Variances in Past Service Line Cost and Main Extension Commercial Consumption Estimates and Whether/How They Should be Addressed Prospectively

Service Line Cost Estimate Variances

FEI has consistently followed the approved MX Reporting format in describing cost estimate performance, and FEI has explained in the Application and past IRs why it has concerns regarding that format. The Commission IRs and Panel IRs have introduced six new methodologies directed at assessing the variances in the service line costs.

- ***Six new re-forecasting methodologies for assessing the service line cost variance summarized:*** The six new methodologies (in addition to the one required by the annual MX reports) introduced in IRs to assess service line cost variance are summarized in Panel IR 1.14.2.4. Five of the six methodologies still involve re-forecasting, but use new assumptions. FEI has identified issues with the use of re-forecasting rather than actual data, as well as the specific inputs. Of the six methodologies introduced the approach reflected in the table presented in Panel IR 1.13.8 provides a fair measure of service line cost variance as it uses actual data and does not attempt to re-forecast future service line cost variance.

- ***Results of variance analysis:*** The variance in service line costs for FEI and FEVI based on the approach in Panel IR 1.13.8 are presented in that response. The response shows improvement over time.

Main Extension Commercial Consumption Variances

The Panel also seeks explanation for commercial consumption variances. FEI's responses to Panel IRs 1.16.1 and 1.16.4, in particular, describe (a) why identifying a variance to the consumption credit value in the MX test is an "apples to oranges" comparison, and (b) the unique circumstances facing each commercial project and the inherent variability of consumption.

Addressing Cost and Consumption Variances Prospectively

The Panel explores in Panel IR series 16 and 17 options for addressing consumption variances prospectively.

- ***Options for addressing consumption variances:*** The main IRs on this topic are as follows:
  - The reasons why changes to FEI's consumption credit methodology are not required are addressed in the response to Panel IR 1.16.4
  - The reasons why security is not required to address consumption variances is discussed in the response to Panel IR 1.16.4.
  - Panel series 17 inquires whether FEI should be responsible for variances between forecast and actual results. FEI has explained why this approach would not be appropriate, both for legal and policy reasons.

- ***Consumption and cost variances in context:*** The Panel IRs have focused on variances in service line costs and variances in consumption forecasts in isolation in only one or two years of a main's life. FEI's response to Panel IR 1.14.2.4 addresses (a) how variances in all of the MX Test components need to be considered together, as higher costs can be more than offset by higher consumption than forecast, and (b) the role of the RIA in that context.

Submission on Further Process

The Commission further requested that FEI provide submissions on whether a Streamlined Review Process (SRP) was still appropriate, and if so, FEI should identify the issues it proposes be covered by an SRP, and if so, provide proposed dates. To date the Company has answered a total of 800 IRs regarding the System Extension Policy Application. In addition to the Application itself, the Company also held four main extension policy workshops attended by both Commission staff and traditional and non-traditional interveners throughout the year leading up to the MX Application. Therefore the Company respectfully submits that an SRP would not provide any additional benefit or new information at this time given the substantial amount of information already on the record. FEI submits that the process to date is sufficient to proceed to a decision unless the Commission has technical questions regarding the responses to Panel IRs. In that case, FEI would prefer a face-to-face discussion involving stakeholders and the Panel to follow up on Panel IRs (more along the lines of a technical conference than a SRP).

If further information is required, please contact Brent Graham at 604-592-7857.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachment

cc (email only): Registered Parties

Table of Contents **Page No.**

A. RATE IMPACT ANALYSIS – COSTS

1.0 Costs of installing meters and regulators

1.1 Is the cost of installing meter and regulators included in the 2008–2014 Rate Impact Growth Amount?

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

1.1.1 If not, please explain why not. Please also provide the growth capital cost of installing meter and regulators for the 2008–2014 period and rerun the Rate Impact Analysis including the cost of installing meters and regulators and comment on the results.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

2.0 Sustainment and Other capital costs

Reference: SYSTEM EXTENSION POLICY REVIEW

Exhibit B-9, BCUC IR 2.30.4; Exhibit B-1, Appendix D, p. 18

FEI 2014–2019 Multi-Year Performance Based Ratemaking Plan Decision dated September 15, 2014 (PBR Decision), pp. 118-119;

2014–2019 PBR Plan – Annual Review for 2015 Rates (2015 Annual Review);

IR Appendix A, FortisBC Energy Utilities 2012/2013 Revenue Requirements and Natural Gas Rate Application, Exhibit B-1, Appendix D-6

In response to BCUC IR 2.30.4 FEI explains that Rate Impact Analysis excludes Sustainment/Other capital because "Sustainment/Other capital is not linearly related to customer growth but is required over time."

Pages 118 to119 of the PBR Decision state: "With regard to FEI's sustainment and other capital, B&V notes that in actual fact, sustainment and other capital costs are driven by both customers and capacity."

Exhibit B-1, Appendix D, page 18 shows 2014 MX Test parameter system improvement charges of $0.24/GJ for FEI and $0.40/GJ for FEVI.

2.1 Please reconcile FEI's response to BCUC IR 2.30.4 to the PBR statement and the allocation of System Improvement costs in the MX test.

Response:

Per Commission letter (Exhibit A-10) in response to FEI's clarification request, "While the Panel understands that it is difficult to estimate the impact on sustainment capital of adding new customers in any specific period, the Panel is concerned that exclusion of sustainment capital over the entire Rate Impact Analysis period may not fully reflect the impact of adding new customers. The calculations requested in the Panel IR 1.2 series were an attempt to consider the sensitivity of the Rate Impact Analysis to sustainment capital using a factor consistent with the PBR plans. The Panel is open to reviewing other proposals that FEI considers will address the concerns outlined above."

With that clarification, FEI provides its response to requests 2.1 through 2.4 below. In summary,

- When read within the context that each of the responses/statements were made, FEI believes that the above statements from BCUC IR 2.30.4 and the PBR Decision are consistent.

- FEI does not believe that sustainment capital should be included in the Rate Impact Analysis[1]; however, to be responsive to the question, FEI has included a portion of sustainment capital (using the Commission's suggestion) in the Rate Impact Analysis in this response.

- The outcome of the Rate Impact Analysis with those adjustments still indicates a significant benefit to all customers associated with customer growth.

FEI elaborates on these points below.

Consistency with the PBR Evidence

FEI believes that the above statements from BCUC IR 2.30.4 and the PBR Decision are consistent when the statements are read within the context that each was made.

Sustainment capital is required regardless of whether or not new customers are attaching to the system. New customers do not drive immediate sustainment capital (system improvements notwithstanding). FEI agrees that there is an impact to sustainment capital over time from adding customers because it changes the overall number of customers, and that is reflected in the PBR formula. The distinction between costs being driven directly by customer growth and being driven by / related to the total number of customers is reflected more clearly in the following IR response from the PBR proceeding[2]:

> *Please fully explain why the growth capital component does not cover growth in customers.*
>
> *Response:*
>
> *The growth capital component represents the capital costs required to connect new customers to the system and, as such, does cover the growth in customers. The customer growth is reflected through the "Service Line Additions" driver of the Growth Capital Formula and the formula is directly connected to customer additions.*
>
> *In contrast, sustainment capital pertains to capital work required to sustain the system for all customers (existing and new). The customer driver for the sustainment capital spending recognizes that as more customers are added to the system, the overall size of the system will increase, meaning that more capital of a sustaining nature is needed to serve the larger system. This is why the sustainment capital portion is driven by the*

[1] FEI notes that the MX Test does include a component of sustainment capital through the system improvement charge. This is appropriate for the MX Test to have this charge because it is intended to reflect the total impact of new customers over the life of the facilities, whereas the RIA is designed to assess the incremental costs associated with new customers over a short term period.

[2] Exhibit B-6 in the PBR proceeding, response to BCPSO IR 1.21.3.

average number of customers rather than the driver used for growth capital which is service line additions (which is in turn based on customer additions).

Pages 118 to 119 of the PBR Decision reference sustainment/other capital and that it is related to customers and capacity but does not go so far as indicating that it grows linearly with either of those two parameters. Over the six year PBR term FEI required an index to apply to sustainment/other capital; it would not have been possible to hold sustainment/other capital flat over the six year term because the overall number of customers and system size was increasing.

The response to BCUC IR 2.30.4 speaks to the nature of the Rate Impact Analysis (RIA). The RIA quantifies the near term customer growth impact on rates. The response recognizes that sustainment/other capital is required over time but also acknowledges that other factors can influence those expenditures, not just customer growth.

EES developed the RIA to address the Commission's concerns regarding the impacts of capital growth on existing customers. The EES Report articulated the underlying theory of the RIA as follows:

> The underlying theory of the approach [RIA] is that while customers cause the utility to incur additional costs, that is offset by the fact that many costs of the utility are fixed in nature and do not increase as customers are added. When more customers and sales are added to the system, those fixed costs are spread out among more customers and that benefits all ratepayers. The rate impact analysis attempts to model both the added costs and the added benefit of the additional sales to new customers.[3]

EES Consulting elaborated:

> While the MX test is designed to ensure individual projects meet an economic test, a rate impact model was developed to quantify the actual impacts associated with growth that has occurred over the past several years. This provides a more global view of the impact to customers than the individual MX test calculations.[4]

The focus is on the near term because the RIA is intended to be a substitute for the current MX reporting requirements that are focused on the short-term, but have methodological flaws.

As sustainment capital is not an incremental cost associated with new customers, it should be excluded from the RIA; sustainment capital is required regardless of whether or not new customers are attaching to the system and, it does not increase linearly as customers are added.

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[3] Exhibit B-1, Appendix A, EES Consulting-FortisBC Energy Inc. System Extension Policy Review, June 2015, p.23

[4] IBID, p.1

Results of the Commission's Approach Still Indicates Significant Benefit to Existing Customers

FEI has performed the RIA using the approach outlined by the Commission Panel in Panel IR 1.2.2. Using this approach, FEI has completed the tables as was requested in Panel IR 1.2.2 and has included references and assumptions below.

Line 4 of the table below uses capital expenditures (net of CIAC) for all three utilities and subtracts from it the growth capex from the response to BCUC IR 2.30.2 to calculate sustainment and other capex on Line 6. FEI used average customers from its annual reports to calculate customer growth on Line 13. In 2012, FEI switched customer service systems and consequently changed its algorithm for counting customers; this change resulted in a customer count adjustment of approximately 18,000 customers (reduction). To properly reflect the growth from year to year within this response, FEI has restated 2008 – 2011 average customer counts on Line 11. FEI excluded both capital expenditures and customer counts from Whistler (FEW) for 2008 and 2009 since Whistler was serving its customers using propane at that time.

Sustainment and Other Capital

Line		Reference	2007	2008	2009	2010	2011	2012	2013
1	Total FEI CapEx	Years 2008 - 2012: FEI's 2014 - 2018 PBR Application - BC PSO IR Response 1.19.1; Year 2013 - FEI Annual Report		$ 78,707	$ 86,353	$ 82,365	$ 95,662	$ 102,591	$ 147,100
2	Total FEVI CapEx	Year 2008: FEVI Annual Report Tab 2.0.0; Year 2009: FEVI Annual Report Tab 2.1.0; Year 2010 - 2013: Proposal to Include FortisBC Energy (Vancouver Island) Inc. (FEVI) and FortisBC Energy (Whistler) Inc. (FEW) within the PBR Plan - Table 4		24,959	22,867	17,375	17,939	20,117	23,857
3	Total FEW CapEx	Year 2008 - 2009: Propane plant was in service, therefore zero; Year 2010 - 2013: Proposal to Include FortisBC Energy (Vancouver Island) Inc. (FEVI) and FortisBC Energy (Whistler) Inc. (FEW) within the PBR Plan - Table 4				475	490	313	264
4	Total CapEx	Sum of Lines 1 through 3		$ 103,666	$ 109,220	$ 100,215	$ 114,091	$ 123,021	$ 171,221
5	New Customer Capital	MX Test Application response to BCUC 2.30.2		36,609	24,306	25,755	25,882	30,297	27,263
6	Sustainment & Other Capital ($000)	Line 4 - Line 5		$ 67,057	$ 84,914	$ 74,460	$ 88,209	$ 92,724	$ 143,958
7									
8	Average Number of Customers FEI	FEI Annual Report Page 18.1	816,421	825,693	832,751	839,017	845,282	834,888	841,175
9	Average Number of Customers FEVI	FEVI Annual Report Tab 4.1.0	89,305	96,241	98,924	98,924	101,123	101,602	102,276
10	Average Number of Customers FEW	FEW Annual Report Tab 4.1.0				2,586	2,604	2,626	2,643
11	Average Number of Customer Adjustment from CIS application (re-state historical)	FEI's 2014 - 2018 PBR Application Appendix E4	(18,009)	(18,009)	(18,009)	(18,009)	(18,009)		
12	Total Average Number of Customers	Sum of Lines 8 through 11	887,717	903,925	913,666	922,518	931,000	939,116	946,094
13	Growth	Line 12: Current year / Previous year - 1		1.8%	1.1%	1.0%	0.9%	0.9%	0.7%

Customer Growth Sustainment and Other capital - 100% of Customer Growth

Line		Reference	2008	2009	2010	2011	2012	2013	Total
14	Total Sustainment and Other Capital ($000's)	Line 6	$ 67,057	$ 84,914	$ 74,460	$ 88,209	$ 92,724	$ 143,958	
15	Growth in the average number of customers (%)	Line 13	1.8%	1.1%	1.0%	0.9%	0.9%	0.7%	
16	Customer Growth Sustainment and Other capital ($000)	Line 14 x Line 15	$ 1,224	$ 915	$ 721	$ 811	$ 808	$ 1,070	**$ 5,550**

Customer Growth Sustainment and Other capital - 50% of Customer Growth

Line		Reference	2008	2009	2010	2011	2012	2013	Total
17	Total Sustainment and Other Capital ($000's)	Line 6	$ 67,057	$ 84,914	$ 74,460	$ 88,209	$ 92,724	$ 143,958	
18	50 % of Growth in the average number of customers (%)	Line 13 x 50%	0.9%	0.5%	0.5%	0.5%	0.4%	0.4%	
19	Customer Growth Sustainment and Other capital ($000)	Line 17 x Line 18	$ 612	$ 458	$ 361	$ 405	$ 404	$ 535	**$ 2,775**

Based on the customer growth sustainment developed for the years 2008 through 2013, the RIA was adjusted to reflect the addition of the amounts based on both 100% and 50% of the total added capital, as requested in Panel IRs 1.2.3 and 1.2.4. The results are as follows:

- Adding 100% of the customer growth sustainment capital resulted in a change in the RIA from an average savings (benefit to existing customers) of $10.45 per customer per year to an average savings of $9.61 per customer per year.
- Adding 50% of the customer growth sustainment capital resulted in a change in the RIA to an average savings of $10.03 per customer per year.

In both cases, the inclusion of the added capital amounts resulted in a relatively small change in the benefit that existing customers receive from the addition of new customers. The conclusions regarding customer growth remain the same: all customers see significant benefits associated with growth in customers.

Fully functional spreadsheets showing the calculations requested have been provided in Attachment 2.1.

2.2 Please complete the following tables for 2008–2013 by year. Please also include fully functional electronic spreadsheets showing the calculations and provide all assumptions.

Customer Growth Sustainment and Other capital – 100 % of Customer Growth

Line		Year
A	Total Sustainment and Other capital ($000's)	
B	Growth in the average number of customers (%)	
A x B =C	Customer Growth Sustainment and Other capital	

Customer Growth Sustainment and Other capital – 50% of Customer Growth

Line		Year
A	Total Sustainment and Other capital ($000's)	
B	50% of Growth in the average number of customers (%)	
A x B =C	Customer Growth Sustainment and Other capital	

Response:

Please refer to the response to Panel IR 1.2.1.

2.3 Please add customer growth sustainment and other capital at 100 percent into the Rate Impact Analysis and comment on the results. Please also include a fully functional electronic spreadsheet showing the calculations.

Response:

Please refer to the response to Panel IR 1.2.1.

2.4 Please add customer growth sustainment and other capital at 50 percent into the Rate Impact Analysis and comment on the results. Please also include a fully functional electronic spreadsheet showing the calculations.

Response:

Please refer to the response to Panel IR 1.2.1.

3.0 Growth O&M assumptions

Reference: SYSTEM EXTENSION POLICY REVIEW

Terasen Gas Inc. (TGI) 2008 Annual Review of 2009 Revenue Requirements and Rates (TGI 2008 Annual Review), Exhibit B-2, Section A-5, p. 1;

Exhibit B-3, BCUC IR Attachment 1.37.1

Page 1, section A-5, of the TGI 2008 Annual Review states:

> For 2009, the annual operating and maintenance expenses are based on the following formula:
>
> Gross O&M = 2008 Adjusted O&M X [(1 + customer growth) X (1 + CPI – adjustment factor)] + Pension & Insurance Variance[5]

The 2008–2009 TGI PBR methodology increased O&M by 100 percent of the annual rate of growth in customers.

3.1 Please explain why the 2014–2019 PBR methodology (one-half of the annual rate of growth in customers)is appropriate for estimating 2008–2014 growth O&M, given that the 2014–2019 PBR methodology only applies to one year in the 2008–2014 timeframe.

Response:

Commission letter (Exhibit A-10) in response to FEI's clarification request stated "The Panel has reconsidered this issue and no longer requires FEI to answer Panel IR 1.2." FEI has confirmed that this was intended to refer to Panel IR 1.3, and as such a response to this information request is no longer required.

3.2 Please update the Rate Impact Analysis by increasing O&M by 100 percent of the annual rate of growth in customers (i.e. the 2008–2009 TGI PBR methodology). Please also include a fully functional electronic spreadsheet showing the calculations and please discuss the results.

Response:

Please refer to the response to Panel IR 1.3.1.

[5] Terasen Gas Inc. 2008 Annual Review of 2009 Revenue Requirements and Rates, Section A-5, p. 1.

Reference: SYSTEM EXTENSION POLICY REVIEW
Exhibit B-9, BCUC IR 2.30.2;
IR Appendix A, FEU 2012/2013 RRA, Exhibit B-1, Appendix D-6;
FortisBC Energy (Vancouver Island) Inc. 2014 Revenue Requirement Application Decision dated May 23, 2014 (FEVI 2014 RRA), p. 60;
FEI Multi-Year PBR Plan for the years 2014 through 2018 Decision dated September 15, 2014, p. 205

2008-2014 Rate Impact Growth[6]

$	2008	2009	2010	2011	2012	2013	2014	Total
Meters/Regulators	2,770,790	2,184,905	1,945,538	2,245,354	2,492,027	2,138,851	2,386,262	16,163,726
Services	16,037,431	13,507,618	16,147,545	15,850,142	18,504,416	16,872,996	18,804,385	115,724,533
Mains	18,315,025	8,173,206	6,552,862	7,364,986	7,416,149	6,407,139	7,427,327	61,656,694
SJ	(514,285)	440,216	1,108,671	421,684	2,181,045	1,843,543	1,747,305	7,228,180
Total Growth	36,608,961	24,305,945	25,754,617	25,882,165	30,593,637	27,262,530	30,365,279	200,773,133

3.3 Please confirm that that table above includes AFUDC and capitalized overhead. If not, please update the table to include AFUCD and capitalized overhead and recalculate the Rate Impact Analysis.

Response:

Please refer to the response to Panel IR 1.3.1.

3.4 Please explain the difference between the 2008 FEI (Combined) Growth Capital (less Fort Nelson) of $46.4 million provided in Appendix A and the 2008 Rate Impact Growth Amount of $36.3 million provided by FEI in the table above.

[6] Exhibit B-9, BCUC IR 2.30.2.

Response:

Please refer to the response to Panel IR 1.3.1.

B. RATE IMPACT ANALYSIS – CUSTOMER ADDITIONS

4.0 2008–2014 customer additions

Reference: SYSTEM EXTENSION POLICY REVIEW

Exhibit B-1, Appendix A, EES Consulting – FEU System Extension Policy Review Report, pp. 25, 27; Exhibit B-9, BCUC IR 2.5.1

The EES Report dated June 2015 states: "The number of customers was taken from the detailed actual information on customers added for the 2008-2014 period."

In Exhibit B-9, BCUC IR 2.5.1, FEI confirmed that when a service is retired due to the demolition of an older home and a new home constructed on the same site, the replacement service is treated as a "new service."

4.1 The above example represents a new gross addition but a zero net customer addition. Do the 85,348 growth customers for the 2008–2014 timeframe represent gross or net customer additions? Please explain.

Response:

In Commission letter (Exhibit A-10) in response to FEI's clarification request with respect to Panel IRs 1.4.1 and 1.4.1.1, the Commission stated:

> Based on information provided by FEI in Exhibit B-11, the Panel would like FEI to confirm that the 85,348 customer additions used in the Rate Impact Analysis only represents the total population of customer additions that resulted from service line additions after application of the MX Test or the SLCA.
>
> The Panel has reviewed FEI's response to BCUC IRs 1.3.1 and 2.5.2 and would like to understand the extent to which new customer additions included in the Rate Impact Analysis represent single service line connections that simply replace a disconnection with a like reconnection (i.e. one for one) and whether it is possible for this type of addition to significantly affect the outcome of the analysis or offset other types of main extensions and service line additions that may be negatively impacting rates.

FEI confirms that the 85,348 customer additions used in the RIA only represents the total population of customer additions that resulted from service line additions after application of the MX Test of the SLCA. The number of new customer additions is relevant in the context of the RIA because the actual number of customers and the consumption of those customers are main drivers in the determination of the revenue calculated in the RIA. EES explained in its Report:

> The analysis measures the revenue requirements before and after customer additions. It also measures the annual sales or gas consumption (GJ's) before and after customer

additions. These two measurements allow us to look at the average cost per GJ and determine if it has increased or decreased as a result of the new customers.[7]

There are a number of scenarios that can result in a customer addition that is included in the RIA:

- A new connection and one customer (increase in revenues);
- A new connection and multiple customers (increase in revenues);
- A disconnection with a like reconnection (no increase in revenues); and
- A disconnection with an unlike reconnection (increase in revenues).

It is not possible for FEI to determine with certainty how many of each of these types is represented by the 85,348 because such an undertaking would require an individual analysis of each customer's situation. However, FEI is able to say with reasonable confidence that only a small percentage of that number would represent circumstances involving a disconnection (third and fourth scenarios above) where the service was newer than the relatively short period covered by the RIA (7 years).

FEI conducted an analysis of the service line abandonments for 2013 based on the original install date of the service. FEI determined that of a total of 3,633[8] abandonments, only 236 were less than 10 years old at the time, or approximately 6.5%. Within that small percentage, some would have been replaced with a like reconnection and no increase in revenues, others were likely not replaced at all (and therefore would not have been included in the 85,348), while others would have been replaced with multiple services and result in an increase in revenues (i.e. higher density or multi-family). This would leave very few cases where the estimated growth in load would not be higher than current use, and the result would be an insignificant change to the RIA.

4.1.1 If it was gross, provide the net additions for 2008–2014 and please update the Rate Impact Analysis.

[7] Exhibit B-1, Appendix A, EES Consulting-FortisBC Energy Inc. System Extension Policy Review, June 2015, p.23

[8] BCUC IR 2.5.3 provides a total of 3,670 abandonments for 2013. The difference of 37 represents records where the original age of the service abandoned could not be found.

Response:

Please refer to the response to Panel IR 1.4.1.

C. RATE IMPACT ANALYSIS – AVERAGE ANNUAL USE PER CUSTOMER

5.0 Average Use per Customer

Reference: RATE IMPACT ANALYSIS

Exhibit B-1, Appendix A, EES Consulting – FEU System Extension Policy Review Report, p. 25; Exhibit B-9, BCUC IR 2.30.5, pp. 123–124, BCUC IR 2, Attachment 30.5

In the EES Report states:

> For new customers, we assumed that average blended use for new customers was the weighted average for all new customers added in 2008-2014. The average use for each rate class and region were multiplied by the added customers for each rate class and region to determine the system-wide weighted average use of 134 GJ per customer. …The number of customers was taken from the detailed actual information on customers added for the 2008-2014 period.[9]

In the response to BCUC IR 2.30.5, FEI provided a fully functional Excel spreadsheet (BCUC 2.30.5 Attachment) which shows how the system-wide weighted average use figure of 134 GJ per customer, used in the Rate Impact Analysis, was calculated using the average use of customers broken down by rate class and region. BCUC 2.30.5 Attachment shows that 85,348 new customers were added from 2008 to 2014.

5.1 How was the average use for each rate class calculated? Please state whether the average use for each rate class was developed based on: (i) a forecast average use; (ii) the actual average use; or (iii) a combination of forecast and actual average use data. Please explain your response.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

5.2 Please confirm, or otherwise explain, that FEI used only the actual billed consumption for each of the 85,348 new customers from the years 2008 to 2014 to calculate the average use by rate class and region and then system-wide weighted average use of 134 GJ.

[9] Exhibit B-1, Appendix A, p. 25. Underline added.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

5.3 Please provide an explanation, with calculations, showing how the average use-per-customer figures for each of the years from 2008 to 2014 were used to calculate the average use figure of 85 GJ for the Lower Mainland residential rate class (LMLR1) as shown in BCUC 2.30.5 Attachment.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

5.3.1 Was the methodology provided in response to the question above used to calculate the average use figures for each of the residential and commercial rate classes listed for each region shown in BCUC 2.30.5 Attachment?

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

5.3.1.1 If not, please explain, using calculations, how the average use figure was obtained for each residential and commercial rate class in each region listed in BCUC 2.30.5 Attachment.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.0 Average use scenario analysis

Reference: RATE IMPACT ANALYSIS

Exhibit B-1, Appendix D, Table 10-2, p. 112; Table 10-5, p. 114;

Exhibit B-3, BCUC IR 1.32.6.1; BCUC IR 1.32.7, pp. 133-134; BCUC IR 1.37.1, p. 153;

Exhibit B-9, BCUC IR 2.30.5, pp. 123-124; BCUC 2.30.5 Attachment

In response to BCUC IR 1.32.6.1, FEI confirmed that population data is currently available for MX performance reporting. In response to BCUC IR 1.32.7, FEI confirmed that it "has the capability to, and does track" the actual number of connections per main extension and that it "tracks actual use per customer." FEI also indicated that it does not track the actual use per customer on a per appliance basis.

In response to BCUC IR 1.37.1, FEI provided a fully functional copy of the most recent Rate Impact Analysis model. In response to BCUC IR 2.30.5, FEI provided a fully functional excel spreadsheet showing the calculation of the average use figure used in the rate impact analysis calculation.

Tables 10-2 and 10-5 of Appendix D in the Application show five years of actual use-per-customer data for both FEI and FEVI 2009 main extension aggregate samples.

6.1 If feasible, please produce a rate impact analysis using a system-wide weighted average use based on the actual annual billed consumption of the population of 85,348 new customers added during the period 2008 to 2014. Please include with your response:

i. An updated version of the spreadsheet provided in response to BCUC IR 1.37.1.

ii. A completed version of attached Excel spreadsheet "(1) Act. Av. Use by year, class." Your response should highlight for each of the years, the cumulative number of new customers since the beginning of the rate impact analysis period and their actual billed consumption for each rate class and culminate in the calculation of the system-wide weighted average use based on actual annual consumption of only the (85,348) new customers.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.1.1 If not feasible, please explain why.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.1.2 If not feasible, please assume that the FEI and FEVI 2009 main extension aggregate samples are representative of the population, and also representative of each of the years 2008 to 2014 and, based on this assumption, please produce a rate impact analysis using a system-wide weighted average use based on the actual use-per-customer data for both FEI and FEVI 2009 main extension aggregate samples. Please include updated versions of the spreadsheets provided in response to BCUC IR 1.37.1 and BCUC IR 2.30.5 with your response. Please state any further assumptions made.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.2 Please prepare a rate impact analysis, including updated versions of BCUC 2.30.5 Attachment, for the two scenarios listed below. Please include updated versions of the spreadsheets provided in response to BCUC IR 1.37.1 and BCUC IR 2.30.5 with your responses.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.2.1 Average use figures for residential and commercial rate classes for each region are 10 percent lower than those provided in BCUC 2.30.5 Attachment; and

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

6.2.2 Average use figures for residential and commercial rate classes for each region are 20 percent lower than those provided in BCUC 2.30.5 Attachment.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

7.0 Rate Schedule 1 average annual use per customer

Reference: COMMISSION CONCERNS

Exhibit B-1, Appendix D, pp. 48, 50, 67 and 69;

Exhibit B-9, BCUC 2.30.5 Attachment

Table 1 below presents the average annual use-per-customer for Rate Schedule (RS) 1 customers using information contained in the 2014 Main Extension Report, which is Appendix D of the Application (Columns 3 through 5), and BCUC 2.30.5 Attachment that is included in FEI's response to BCUC IR 2.30.5 (Column 2).

Table 1: Average Annual Use-per-Customer for Rate Schedule 1

	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	**Region**	**Average Annual Use-per-Customer for Rate Schedule 1 (GJ)**			
Row 2		**Customers added from 2008 to 2014[1]**	**2012 Aggregate Sample Main Extensions[2]**		**2013 Aggregate Sample Main Extensions[3]**
Row 3			**Year 1 Actual**	**Year 2 Actual**	**Year 1 Actual**
Row 4	Lower Mainland	85	----	----	----
Row 5	Inland	58	----	----	----
Row 6	Columbia	67	----	----	----
Row 7	Mainland				
Row 8	Vancouver Island	34	24	24	26
Row 9	Whistler	79	----	----	----
Row 10	**FEI**		45	60	43
Row 11	**FEVI**	34	24	24	26
Row 12	**Amalgamated**	68.3			
	Sources:				
	1 - Exhibit B-9, BCUC 2.30.5 Attachment				
	2 - Exhibit B-1, Appendix D, 2014 Main Extension Report, pp. 67 and 69				
	3 - Exhibit B-1, Appendix D, 2014 Main Extension Report, pp. 48 and 50				

7.1 To determine the appropriateness of using the Rate Impact Analysis to assess the performance of system extensions, the Panel would like to understand whether use of the annual average for <u>new</u> customers in each rate class and region rather than use of the annual average for all customers would have a significant impact on the Rate Impact Analysis. The Panel is open to considering a proposal from FEI as to how this issue can best be addressed.

<u>Response:</u>

FEI confirms that the RIA already does include the weighted average actual consumption <u>based on new customers</u>, their respective rate classes and the regions of Lower Mainland, Inland, Columbia, Vancouver Island and Whistler for the period of 2008 to 2014. FEI has taken this

approach, rather than using the existing system wide customer average, so that the RIA provides an up to date depiction of the Company's capital growth expenditures and the resulting revenue from customer consumption.

The information necessary for the Panel's understanding of the annual average for new customers in each rate class and region is found in the attachment accompanying the response to BCUC IR 2.30.5.

7.2 Please reconcile the figures in Column 2 with the actual use-per-customer figures in Columns 3, 4 and 5 for each of FEI (Row 10) and FEVI (Row 11). Please provide explanations for any differences.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

8.0 Comparing 2014 MX Report data to the Rate Impact Analysis data

Reference: MAIN EXTENSION REPORT

Exhibit B-1, Appendix D, p. 16; pp. 15-125;

Exhibit B-3, BCUC IR 1.32.6.1, p. 133; BCUC IR 1.32.7, pp. 133–134;

Main Extension Report Samples

Appendix D of the Application contains the 2014 Main Extension Report, dated March 30, 2015. This report contains forecast and actual sample data regarding main extensions for the 2009 to 2014 gas years (Nov-Oct). In Appendix D, FEI explains:

> The random samples were determined by calculating a statistical sample size which meets the criteria described in Order G-152-07 and then extracting that sample from the populations for each annual data set … As a result, the 2014 FEI and FEVI populations consist of 198 and 93 completed mains respectively, with a random sample size of 50 and 39 respectively. The Companies note that the random sampling methodology is consistent with the previous reports, in which the data sets for the 2008-2013 gas [years] are also based on the random sample method.

8.1 Do the FEI and FEVI aggregate samples for each of the respective gas years included in the 2014 Main Extension Report reflect the population (are representative of the population including use-per-customer) for each of those years? Please explain your answer.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

Table 2 below outlines the format in which the 2012, 2013 and 2014 aggregate sample main extensions data is presented for both FEI and FEVI in the 2014 Main Extension Report. The 2009, 2010 and 2011 data also included in the 2014 Main Extension Report is not separated by rate class.

Table 2: Aggregate Sample Main Extensions Attachments, Consumption and Use-per-Customer

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10
Row 1	2009 Sample Main Extensions - Attachments, Consumption and Use-per-Customer									
Row 2	FEI	Attachments			Consumption (GJ)			Use-per-Customer (GJ)		
Row 3		Original Forecast	Actual or Re-Forecast	Variance (%)	Original Forecast	Actual or Re-Forecast	Variance (%)	Original Forecast	Actual or Re-Forecast	Variance (%)
Row 4	**Year 1**									
Row 5	*Rate 1*									
Row 6	*Rate 2*									
Row 7	*Rate 3*									
Row 8	**Year 2**									
Row 9	*Rate 1*									
Row 10	*Rate 2*									
Row 11	*Rate 3*									
Row 12	**Year 3**									
Row 13	*Rate 1*									
Row 14	*Rate 2*									
Row 15	*Rate 3*									
Row 16	**Year 4**									
Row 17	*Rate 1*									
Row 18	*Rate 2*									
Row 19	*Rate 3*									
Row 20	**Year 5**									
Row 21	*Rate 1*									
Row 22	*Rate 2*									
Row 23	*Rate 3*									
Row 24	**Years 1-5 Total**									

8.2 Please use the same format to complete separate tables showing the aggregate sample main extensions data for attachments, consumption and use-per-customer for each of the following: (i) 2009 Sample Main Extensions; (ii) 2010 Sample Main Extensions; and (iii) 2011 Sample Main Extensions for each of FEI and FEVI.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

8.3 Please compare and explain any differences between the Rate Schedule 1 actual figures for 2009, 2010 and 2011 Aggregate Sample Main Extensions presented in response to the question above with each of the FEI and FEVI figures in Column 2 of Table 1 in Panel IR 7.1.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

In response to BCUC IR 1.32.6.1, FEI confirmed that population data is currently available for MX performance reporting. In response to BCUC IR 1.32.7, FEI confirmed that it "has the capability to, and does track" the actual number of connections per main extension and that it "tracks actual use per customer." FEI also indicated that it does not track the actual use per customer on a per appliance basis.

8.4 If the main extension aggregate samples are not representative of the population, please show the actual average use-per-customer for the population of new RS 1 customers added from the years 2008 to 2014 by completing, to the best of your ability, worksheets "(1) New RS1 Av. Use Summary" and "(2) New RS1 Av. Use Details" of the attached Excel spreadsheet. Please provide your response in a functional Excel spreadsheet and as a hardcopy.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

D. RATE IMPACT ANALYSIS – COMPARISON TO ACTUAL PROFITABILITY INDEX

9.0 Actual Rate Impact Analysis vs Actual Profitability Index

Reference: RATE IMPACT ANALYSIS

Exhibit B-1, Section 3.4.3.2, p. 48;

On page 48 of the Application, FEI states: "EES [Consulting] concluded that customer rates have decreased as a result of historical system extensions, meaning that existing customers appear to have benefitted from overall system extensions that occurred from 2008 to 2014. In its most recent report, EES has determined that customer rates have gone down by over $10 per year, equivalent to $0.058 per gigajoule (GJ), as a result of customer growth."

9.1 Does FEI agree that a rate impact analysis that shows that no increase to existing customer rates due to main extension additions is equivalent to an actual aggregate profitability index of greater than 1.0 for the same main extension additions, given all other parameters remain the same? Please explain your answer.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

9.2 Would FEI expect the results of a rate impact analysis covering a specific period of time to directionally produce the same results as the actual profitability index of the population calculated using the existing main extension test formula over the same time period, if the same actual figures for new customer additions, use-per-customer and main extension costs were used? Please explain your answer.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

E. COMMISSION CONCERNS – ACCURACY OF SERVICES AND METER COSTS ESTIMATES

10.0 The Profitability Index (PI) formula - components, categories and cost elements

Reference: CURRENT SYSTEM EXTENSION CONSTRUCTS

Exhibit B-1, p. 17

On page 17 of the Application, FEI provides the following formula for its Profitability Index (PI)/MX test:

Figure 2-1: Current MX Test Formula

$$P.I. = \frac{\text{Net Present Value of Net Cash Inflows (20 Year DCF Term)}}{\text{Net Present Value of Capital Costs (5 years of Attachments)}}$$

$$\frac{\text{(Delivery Margin + Application Fees-O\&M-System Improvement –Municipal Tax-Property Tax-Income Tax)}}{\text{(Mains, Services \& Meter Costs + Overhead + Working Capital)}}$$

10.1 Please provide a detailed drawing of a typical Rate 1-3 installation showing all the required physical components necessary to provide gas to customers, from and including the main all the way to the customer. Please explain if there are any significant differences between Rate 1-3 installations. Also, if there are other customers to which FEI applies the MX test, please list those other rate schedules and provide drawings.

Response:

Each main extension project can be different, as are the service requirements of each customer. The costs and materials necessary for any distribution infrastructure will vary greatly based on factors such as:

- The size and scope of the project
- The numbers and types of customers
- The location, topography and underground encumbrances
- Individual load and pressure requirements

It is, therefore, not possible to provide a single diagram that would capture all Rate Schedule 1-3 main extensions as requested. Nevertheless, the Company has included several general diagrams that illustrate the various components that can be included in main extension projects of various types and how they would be included in the MX Test.

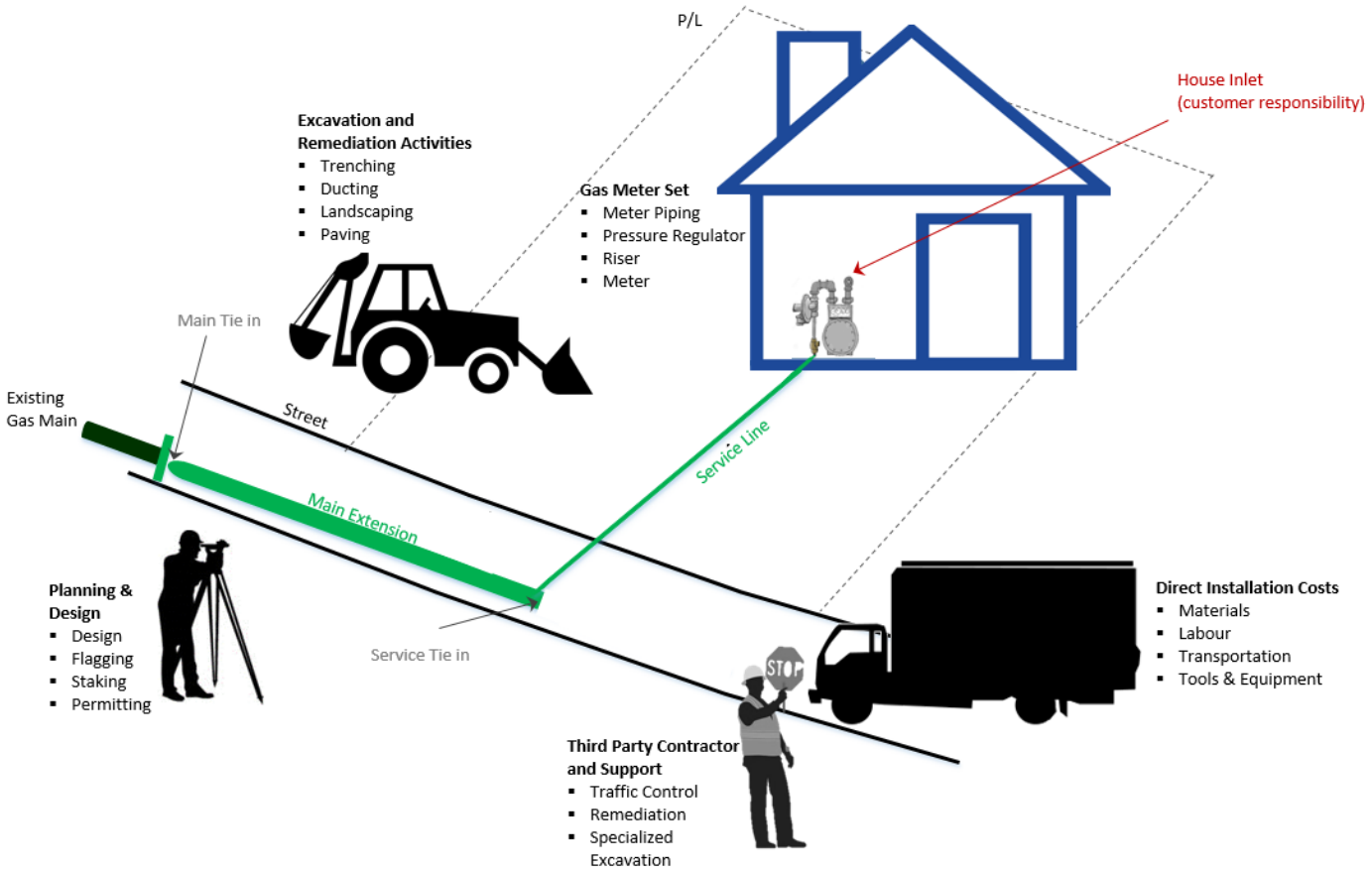
In any MX Test cost estimate, all costs associated with installing infrastructure from the existing main to the gas meter are included. The following table provides general cost categories and how they relate to the MX test formula. The costs listed in the table are identified in the diagrams below.

Diagram	Included in MX Mains Cost Estimate	Included in MX Services/Headers Cost Estimate	Included in MX Meters Cost Estimate	Significant Characteristics
Residential (RS 1)	• Main Materials • Installation Costs • Excavation and Remediation Activities • Third Party Contractor and Support • Planning & Design	• Service Materials • Installation Costs • Excavation and Remediation Activities	• Gas Meter Set • Installation Costs	There are no special characteristics for residential services as compared to other service types. For large subdivisions, cost estimates would be larger given that they are based on more attachments
Vertical Subdivision (RS 1 or RS 2)	• Main Materials • Header Materials • Installation Costs • Excavation and Remediation Activities • Third Party Contractor and Support • Planning & Design	• Inside Piping* • Installation Costs • Excavation and Remediation Activities **In cases where the gas meters are inside the buildings, the cost for the service piping to the meters is included as part of the service cost component of the MX test.*	• Multi-meter Gas Meter Set • Installation Costs	Vertical subdivisions require special planning on the meter set and manifold design. There are different options available for gas measurement, and all can result in different cost estimates based on the customer's needs. In cases where there is a large lot, "header pipes" (gas mains on private property) are often required to bring gas closer to the building before a service line is installed. Units can be individually metered or fed through a common meter, outside the building or in a meter closet, on a single floor or on each floor.
Industrial (RS 3+)**	• Main Materials • Header Materials* • Installation Costs • Excavation and Remediation Activities • Third Party Contractor and Support • Planning & Design **a header pipe is sometimes used in cases where the main must be brought onto private property for a larger industrial complex rather than a single industrial customer. The use of a header is related to the scope of the project and not all projects require them.*	• Service Materials • Installation Costs • Excavation and Remediation Activities	• Industrial Gas Meter Set • Installation Costs	The size of an industrial customer varies greatly as does the pressure and load requirements. Meter set engineering is required to ensure safe and reliable delivery of gas at a required pressure and volume specific to the intended use. For larger industrial customers, a larger size service line is often required to ensure adequate volume. Usage parameters such as the required pressure, operating BTU's, firing % per day and firing rate per year are provided by the customer's engineer and are used to select an appropriate meter set design.

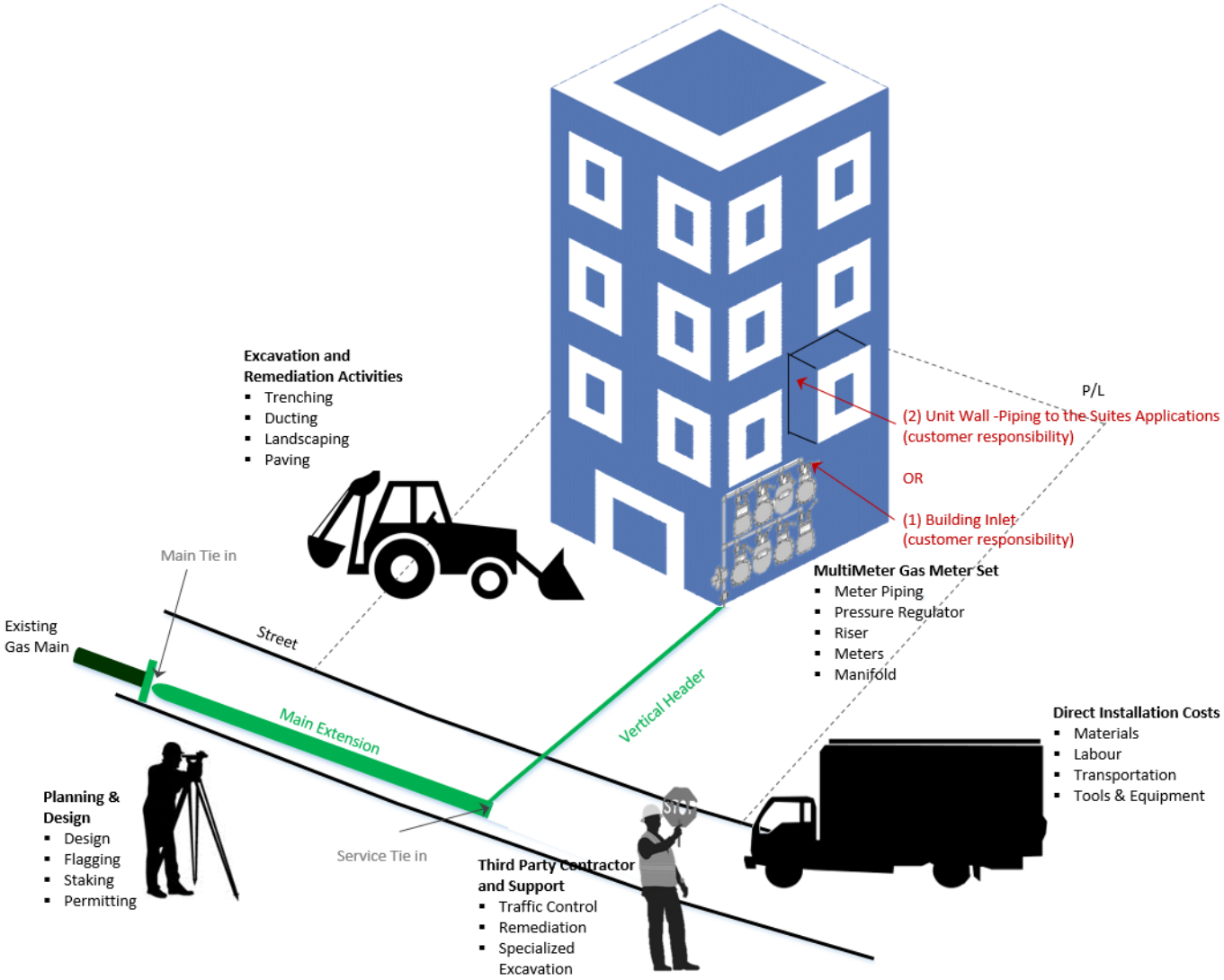
Diagram	Included in MX Mains Cost Estimate	Included in MX Services/Headers Cost Estimate	Included in MX Meters Cost Estimate	Significant Characteristics
Townhome or Commercial Complex (RS 1 or RS 2)	• Main Materials • Header Materials • Installation Costs • Excavation and Remediation Activities • Third Party Contractor and Support • Planning & Design	• Installation Costs • Excavation and Remediation Activities	• Multi-meter Gas Meter Set • Installation Costs	Townhomes or commercial complexes will often be situated on large lots with public access roadways connecting to main streets. As a result, the Company is often required to bring the gas main closer to the building. In this case a "header" pipe is used and is essentially a gas main located within the customer's property. Individual services lines are then connected at various points along this header pipe.

***All main extension requests are subject to the Main Extension Test. In addition, any Vertical Subdivision or Rate Schedule 3 or larger customer will also be subject to the test in accordance with Section 10.1(d) of the FortisBC Energy Inc. Gas Tariff General Terms and Conditions.*

Diagram 1: Residential (RS 1)



1 **Diagram 2: Vertical Subdivision (RS 1 or RS 2)**



2

3

1 **Diagram 3: Industrial (RS 3+)**

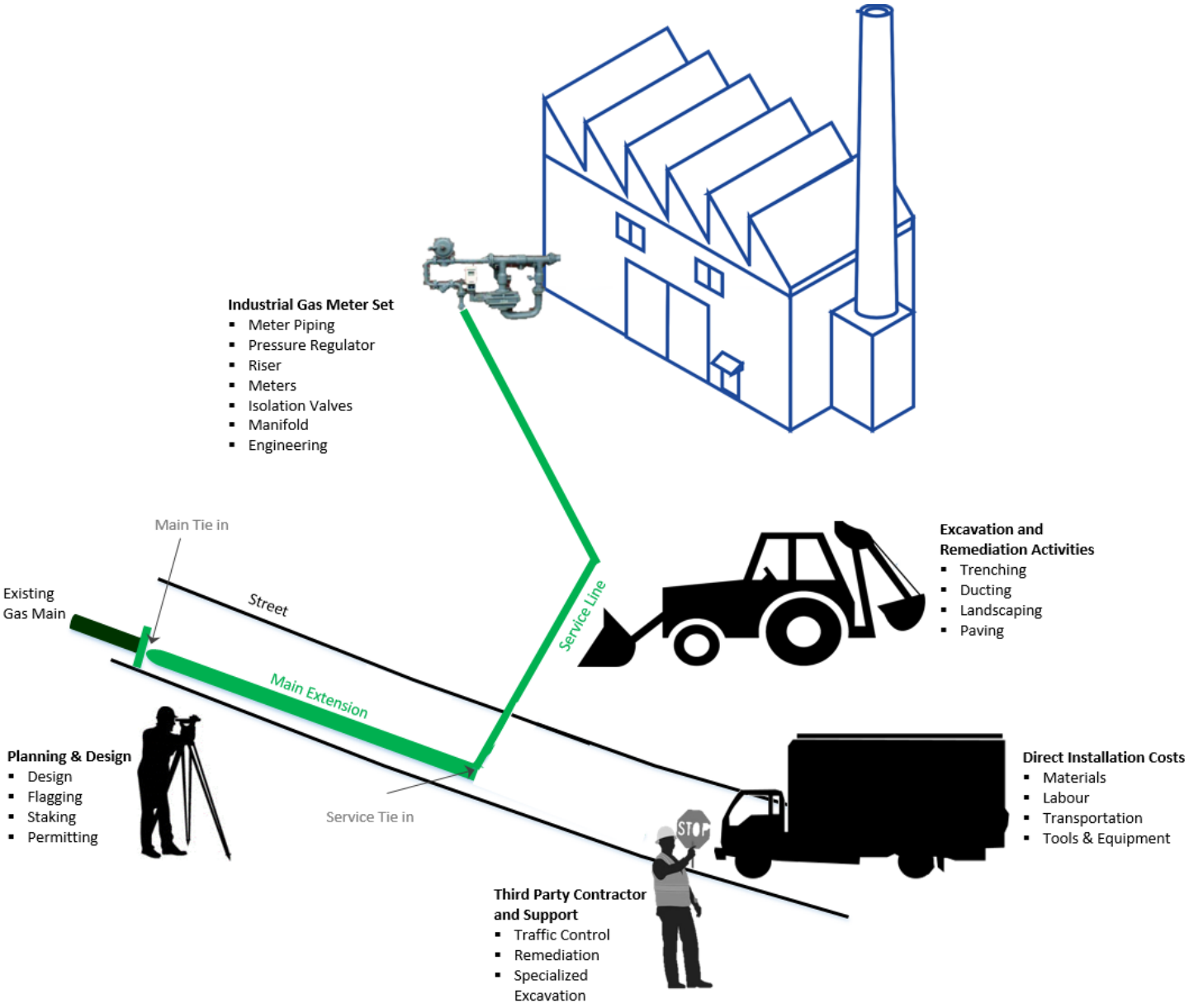
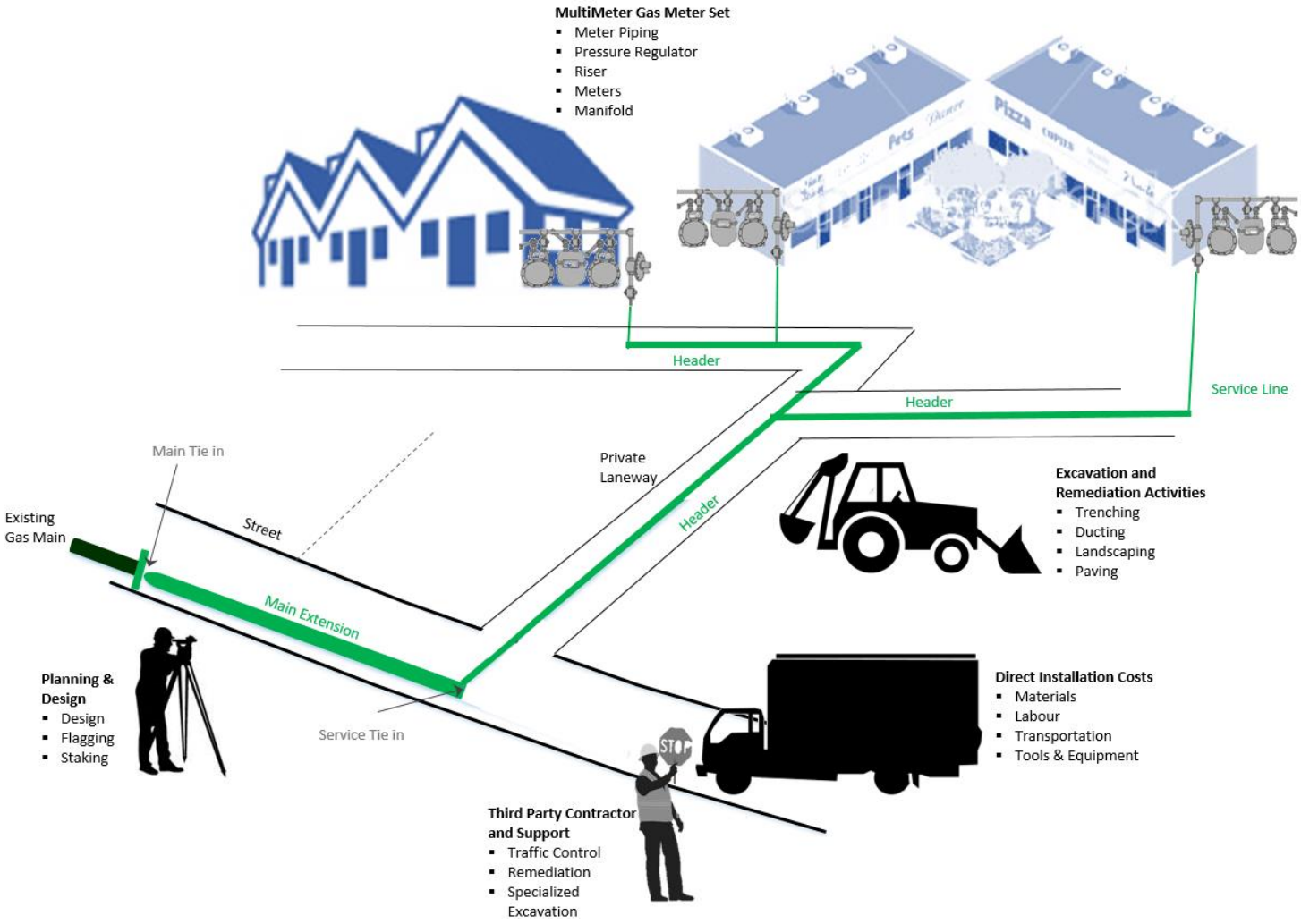


Diagram 4: Townhome or Commercial Complex (RS 1 or RS 2)



10.1.1 Please describe and show on these drawings exactly which physical components are included in: the mains cost estimate category, the service cost estimate category and meter cost estimate category in the PI formula.

Response:

Please refer to the response to Panel IR 1.10.1.

10.1.2 Please confirm that all physical components necessary to provide gas to customers, from and including the main all the way to the customer, are included in the three categories listed in the PI formula (i.e. mains, services and meter costs).

Response:

Confirmed.

10.1.2.1 If not confirmed, please explain and justify why not and identify the physical components that are missing. For example, where and how are regulators accounted for in the formula?

Response:

The response to Panel IR 1.10.2 was confirmed.

10.1.3 Please also confirm that not only are all the physical components cost estimates included in the three cost estimate categories in the PI formula, but also the cost estimates for all the other cost elements/resources required to install all of these components, for example, labor and contingency.

Response:

Please refer to the response to Panel IR 1.10.2 for a listing of the costs that are included in the PI formula, which includes labour but not contingency.

10.1.3.1 If not confirmed, please explain and justify why not and list the cost elements/resources that are missing.

Response:

Please refer to the response to Panel IR 1.10.2.

10.2 Please confirm, or otherwise explain, that FEI allocates contingency for its mains cost estimates, its service cost estimates, and its meter cost estimates.

Response:

Not Confirmed. The Company adheres to Commission Orders G-152-07 and G-06-08 when developing cost estimates. Page 11 of Order G-152-07 provides a table detailing the different components of the MX Test (provided below for reference).

Revenue		
	Consumption Estimates	From Residential End User Study
	Revenue (based upon Consumption)	Specific to each utility and Rate Class. Revenues are for distribution margin only and do not include the cost of commodity
	Application Fee	$85
Capital Costs		
	Installation Costs	Direct Capital Cost for the Main Extension, Service Line and Meters/Regulators. Based upon geographical costing model.
	Overhead Rate	Incremental indirect capital costs – currently 32%.
	Service Line Installation Fee	$215
Incremental Operating Costs and Expenses		
	Operation & Maintenance	Yearly incremental O&M by Rate class
	Property Tax- 1% in Lieu of General Municipal Taxes	1% of gross revenues (including commodity costs)
	Property Tax – General, School and Other	2% of assessed value of mains and services
	System Improvements	Currently $0.35/GJ for TGI (Rates 1 and 2), $0.50/GJ for TGVI
	Income Taxes	Combined federal and provincial corporate income tax rate (including surcharges and/or capital taxes, if applicable.) Capital Cost Allowance – as per applicable CCA rates
Other Factors		
	Discount Rate	Incremental weighted average cost of capital (real, after-tax)

As indicated above, the Company only allocates the estimated direct capital costs of installing a main and service and does not include contingencies. This is also consistent with the approved FEI Tariff.

10.2.1 If confirmed, please provide the amount of contingency and the reason(s) for the amount selected for each category.

Response:

Please refer to the response to Panel IR 1.10.2.

11.0 Historical MX reporting cost variance – average service line cost estimate

Reference: COMMISSION CONCERNS

Exhibit B-1, p. 74; Exhibit B-3, BCUC IR 1.1.1, 1.1.3; Exhibit B-9, BCUC IR 2.3.4, 2.3.8; FEI Final Argument, p. 47

On page 74 of its Application, FEI provides a table which it titles Historical MX Reporting Cost Variance. This table shows a 9.5 percent average variance.

However, in response to BCUC IR 1.1.1, FEI revises this table, indicating that it has identified an error in the table, which was caused by a Microsoft Excel Linking issue. FEI reports the corrected table as follows:

Revised Table 5-1

	Forecast Cost	Actual Cost	Variance	Variance (%)	Comments
2008 FEI	$ 891,766	$ 970,334	$ 78,568	8.8%	MX reporting complete
2008 FEVI	$ 546,720	$ 640,757	$ 94,037	17.2%	
2009 FEI	$ 2,093,186	$ 2,496,469	$ 403,283	19.3%	Year 5 of cost reporting
2009 FEVI	$ 1,336,265	$ 1,614,962	$ 278,697	20.9%	
2010 FEI	$ 883,607	$ 1,022,728	$ 139,121	15.7%	Year 4 of cost reporting
2010 FEVI	$ 829,198	$ 821,133	$ (8,065)	-1.0%	
2011 FEI	$ 1,475,371	$ 1,614,217	$ 138,846	9.4%	Year 3 of cost reporting
2011 FEVI	$ 859,365	$ 873,305	$ 13,940	1.6%	
2012 FEI	$ 1,166,451	$ 1,683,334	$ 516,883	44.3%	Year 2 of cost reporting
2012 FEVI	$ 568,885	$ 558,529	$ (10,356)	-1.8%	
2013 FEI	$ 1,131,636	$ 1,314,614	$ 182,978	16.2%	Year 1 of cost reporting
2013 FEVI	$ 614,218	$ 570,460	$ (43,758)	-7.1%	
			Average Variance	**12.0%**	

On page 47 of FEI's final argument, FEI explains: "The overall main extension cost variance is reasonable. Cost variances should be examined in conjunction with revenues, not in isolation. For instance, the average variance of 9.5% in recent years is distorted by a significant cost variance in 2012 (44% for FEI) that was the product of a greater than forecast number of attachments."

11.1 Please confirm, otherwise explain, that the 9.5 percent average variance FEI provides in its final argument should be the 12 percent FEI provided in response to BCUC IR 1.1.1.

Response:

Confirmed; the value in the final argument should show 12 percent as provided by the Company in response to BCUC IR 1.1.1. This clarification does not change the essence of what was

being conveyed in FEI's final argument, namely that the historical cost variance is reasonable and variances need to be viewed in the proper context.

11.2 Please confirm, otherwise explain, that the forecast and actual costs columns in the Revised Table 5-1 above includes all the costs for all three categories; mains, services and meter costs; used in the PI formula.

Response:

Confirmed.

In response to BCUC IR requesting FEI to disaggregate between FEI and FEVI service territories and between service lines and mains, FEI provides the following tables for mains:[10]

[10] Exhibit B-3, BCUC IR 1.1.1; Exhibit B-9, BCUC IR 2.3.4.

FEI - Includes assumed result

Table Includes Forecast to Actual Main Extension Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative MX Spend to Date	4. Estimated Remaining MX Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 352,046	$ 437,819	$ -	$ (85,773)	24.4%	$ 437,819
2009	$ 873,525	$ 944,648	$ -	$ (71,123)	8.1%	$ 944,648
2010	$ 458,129	$ 453,092	$ -	$ 5,037	-1.1%	$ 453,092
2011	$ 634,248	$ 728,259	$ -	$ (94,011)	14.8%	$ 728,259
2012	$ 585,584	$ 713,526	$ -	$ (127,942)	21.8%	$ 713,526
2013	$ 498,166	$ 768,151	$ -	$ (269,985)	54.2%	$ 768,151
Sum	**$ 3,401,698**	**$ 4,045,495**	**$ -**	**$ (643,797)**	**19%**	**$ 4,045,495**

FEVI - Includes assumed result

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative MX Spend to Date	4. Estimated Remaining MX Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 264,194	$ 298,877	$ -	$ (34,683)	13.1%	$ 298,877
2009	$ 796,757	$ 951,042	$ -	$ (154,285)	19.4%	$ 951,042
2010	$ 467,152	$ 482,629	$ -	$ (15,477)	3.3%	$ 482,629
2011	$ 513,670	$ 558,939	$ -	$ (45,269)	8.8%	$ 558,939
2012	$ 367,763	$ 366,389	$ -	$ 1,374	-0.4%	$ 366,389
2013	$ 366,502	$ 352,995	$ -	$ 13,507	-3.7%	$ 352,995
Sum	**$ 2,776,038**	**$ 3,010,871**	**$ -**	**$ (234,833)**	**8%**	**$ 3,010,871**

11.3 Please confirm, otherwise explain, that the columns titled "2. Total Forecast MX Cost Estimates Used in Original MX Tests" and "3. Total Actual Cumulative MX Spend to Date" in the above tables only includes forecast and actual costs associated with the mains category of the PI formula.

Response:

Confirmed.

11.4 Please confirm, otherwise explain, that no mains related costs have been omitted from either of the above tables, be they labour, missing components, or otherwise.

Response:

Confirmed.

11.4.1 If not confirmed, please reproduce the above tables with these items.

Response:

The response to Panel IR 1.11.4 was confirmed.

In response to the similar BCUC IR requesting FEI to disaggregate between FEI and FEVI service territories and between service lines and mains, FEI provides the following tables for services:[11]

[11] Exhibit B-3, BCUC IR 1.1.3; Exhibit B-9, BCUC IR 2.3.8.

FEI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 539,720	$ 532,515	$ 154,000	$ (146,795)	27.2%	$ 686,515
2009	$ 1,219,661	$ 1,551,821	$ 167,000	$ (499,160)	40.9%	$ 1,718,821
2010	$ 425,478	$ 569,636	$ 58,000	$ (202,158)	47.5%	$ 627,636
2011	$ 841,123	$ 885,958	$ 147,000	$ (191,835)	22.8%	$ 1,032,958
2012	$ 580,867	$ 969,808	$ 10,000	$ (398,941)	68.7%	$ 979,808
2013	$ 633,470	$ 546,463	$ 149,000	$ (61,993)	9.8%	$ 695,463
Sum	$ 4,240,319	$ 5,056,201	$ 685,000	$ (1,500,882)	35%	$ 5,741,201

estimated service line cost based on assuming service line cost of $1,000 times the number of expected attachment.

**acutal service line cost based on actual attachments times annual average service line cost*

FEVI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 282,526	$ 341,880	$ 34,000	$ (93,354)	33.0%	$ 375,880
2009	$ 539,508	$ 663,920	$ 268,000	$ (392,412)	72.7%	$ 931,920
2010	$ 362,046	$ 338,504	$ 140,000	$ (116,458)	32.2%	$ 478,504
2011	$ 345,695	$ 314,366	$ 77,000	$ (45,671)	13.2%	$ 391,366
2012	$ 201,122	$ 192,140	$ 36,000	$ (27,018)	13.4%	$ 228,140
2013	$ 247,716	$ 217,465	$ 77,000	$ (46,749)	18.9%	$ 294,465
Sum	$ 1,978,613	$ 2,068,275	$ 632,000	$ (721,662)	36%	$ 2,700,275

estimated service line cost based on assuming service line cost of $1,000 times the number of expected attachment

**acutal service line cost based on actual attachments times annual average service line cost*

11.5 Please confirm, otherwise explain, that the columns titled "2. Total Forecast MX Cost Estimates Used in Original MX Tests" and "3. Total Actual Cumulative Service Line Spend to Date" in the above tables only includes forecast and actual costs associated with the services cost category and does not include the meter cost category of the PI formula.

Response:

Not confirmed. The table includes both services and meter costs.

11.5.1 If confirmed, please reproduce the above tables including meter costs.

Response:

The response to Panel IR 1.11.5 was not confirmed.

11.6 Please confirm, otherwise explain, that no services related costs nor meter related costs have been omitted from the above tables, be they labor, missing components, or otherwise.

Response:

Confirmed.

11.6.1 If not confirmed, please reproduce the above tables with these items.

Response:

The response to Panel IR 1.11.6 was confirmed.

11.7 Please confirm, otherwise explain, that for FEI, FEI forecasts 685 more attachments to 2008, 2009, 2010, 2011, 2012 and 2013 mains, that is 154, 167, 58, 147, 10 and 149 more attachments for each of these main years, respectively.

Response:

Confirmed.

11.8 Please confirm, otherwise explain, that for FEVI, FEI forecasts 632 more attachments to 2008, 2009, 2010, 2011, 2012 and 2013 mains, that is 34, 268, 140, 77, 36 and 77 more attachments for each of these main years, respectively.

Response:

Confirmed.

11.9 Please explain how FEI forecasted the number of expected attachments remaining. Does the number of remaining attachments include only those attachments that were forecast in the original main extension test five-year attachment window, or do they also include infill customers that FEI had originally forecast to connect after year five? Please elaborate.

Response:

The Company recognizes there may be some confusion regarding the forecasted costs and attachments used in the MX test, MX report and IR sets. Therefore, the Company has provided the table below for clarification.

	Forecast Attachments	Forecast Costs
MX Test	Includes attachments expected to occur only in the first 5 years for each individual main extension. These attachments are forecasted individually for years 1 to 5.	The MX Test includes all forecasted costs associated with each attachment on a main extension including mains, services, meters and regulators, overhead, SJ costs, taxes, and future service improvements (sustainment capital).
MX Report	The MX Report contains an aggregate sample of MX Tests and therefore contains an aggregate total of all the year 1 to 5 forecast attachments from each MX test in the sample. The Commission methodology requires that if an attachment does not occur in its respective forecast year, the attachment cannot be included in the MX Report attachment table and cannot be included in any reforecast PI's.	The MX Report contains an aggregate sample of MX Tests and therefore contains an aggregate total of all year 1 to 5 costs from each MX test. If an attachment does not occur, no costs for that attachment can be included in the report. Therefore the forecast to actual cost variance is impacted.
MX		

Panel IR's	The Company's attachment variance is reasonable and does not contain any additional infill customers. There are no panel IR's on this issue.	The Commission Panel IR's have taken the aggregate MX test data from the MX report and calculated a unit cost variance based on known forecast and actual costs. Additional IR's take this one step further and attempt to calculate a cost variance by having the Company include attachment forecasts and cost forecasts for attachments that have not yet happened.

As stated in the table above, FEI's forecast attachments include only those attachments that were forecast to attach during the five year attachment window. They do not include any additional infill customers who were not part of the original MX Test. FEI's approach is consistent with the methodology required by the Commission in Orders G-152-07 and G-06-08. It is thus consistent with how FEI originally forecast and reported on attachments in the 2009 and 2010 MX Reports and consistent with what actually occurs in a new development.

The Company has provided a fictional example below to explain how the remaining forecasted attachments were calculated.

Total Forecasted Attachments in Year 1 to 5 used in original MX Test= 100

Actual Attachments at Year 5= 80

Forecasted remaining attachments: 100-80 = 20

The above approach differs from how the Commission subsequently required FEI to report based on prescribed changes to the 2011 MX Report and onwards[12]. These reporting changes required FEI to modify the forecast from the original forecast to assume that because the "20" attachments did not occur in the calendar year in which they were anticipated to attach, that those attachments would never occur. This artificially reduced the PI in the MX Report and represents one of the several reasons why FEI is seeking to change the way in which reporting and evaluation occurs. The evidence on this point is discussed in greater detail in BCUC IR 1.8.0.

11.10 Please explain why FEI selected $1000 times the number of expected attachments as the estimated unit cost for the remaining service cost.

[12] FEI response to BCUC IR 2.4.1.

Response:

The Company selected $1,000 because it represents the most recent actual, average unit cost for a single simple new residential service (including meter costs) that captures approximately 95% of all new single residential service lines installed in 2015. The Company is assuming that the majority of services in the MX Report are residential services, consistent with the data provided in the attachment to BCUC IR 2.30.5. Therefore, the $1,000 is an estimate used to re-forecast the cost of attachments that have not yet happened so that the Company can respond to Panel IR's that combine MX Report data with the request to reforecast data and calculate a variance.[13] In summary, FEI does not agree with the premise of re-forecasting and believes that it produces misleading results, but had used the $1,000 to respond to the Commission's request.

11.11 Please list the categories, components and elements/resources included in the $1000 estimate and compare to the categories, components and elements/resources included in the PI formula.

Response:

Please refer to the response to Panel IR 1.10.1 for a drawing and data table showing the various categories, components and elements/resources included in the forecast average cost of services included in the PI formula.

11.12 Please confirm, otherwise explain, that the $1000 estimate is a combined rate schedule 1, rate schedule 2, and rate schedule 3 average service and meter cost estimate.

Response:

Please refer to the response to Panel IR 1.11.10 that describes how $1,000 represents the majority of Rate Schedule 1 new service lines and was used for calculating a re-forecasted cost variance in order to respond to a Commission request. As stated in the response to Panel IR 1.11.10, FEI believes this re-forecasting approach will produce misleading results no matter what value is selected.

[13] See table in Panel IR 11.9 for further clarification.

11.13 Please breakdown the number of expected attachments into rate schedule 1, 2 and 3 attachments for the 2012 and 2013 main years.

Response:

The requested information is provided below.

	FEI				FEVI			
	Rate 1	Rate 2	Rate 3	TOTAL	Rate 1	Rate 2	Rate 3	TOTAL
2012	0	10	0	**10**	35	0	1	**36**
2013	146	3	0	**149**	68	9	0	**77**

12.0 Service Line Cost Allowance calculation – average service line cost

Reference: SERVICE LINE COST ALLOWANCE ANALYSIS

Exhibit B-1, p. 63; Appendix D-2

On page 63 of the Application FEI explains: "Appendix D-2 provides a summary of all 2014 service line costs for Rate Schedule 1 and Rate Schedule 2 customers showing an average service line cost of $2,125."

Appendix D-2, the 2014 SLCA Analysis, includes a column titled "Average cost per service."

Footnote 1 in Appendix D-2 reads:

> 1) Total service line costs include costs that were accumulated in orders that did not have specific risers posted. (i.e. Standing Jobs). The FEU Total for 2014 was $1,747,305. This resulted in an additional $164 in added costs per service order.

12.1 Are costs associated with standing jobs and internal costs estimated in the MX test formula? If so, how are they accounted for? If not, why not?

Response:

The costs for Standing Jobs are included in the MX Test formula as part of the annual overhead rate calculation. Since standing job costs are related to costs for services, mains, abandonments, alterations and other orders types that have not yet proceeded to construction or have been cancelled or put on hold by other customers, they are considered to be indirect costs. SJ costs also contain costs for general equipment such as gloves, safety gear, welding rods, pipe tape, etc. used for all crew work including such activities as meter removal, emergency response, odor detection calls etc. Annual SJ costs are therefore included in the indirect component of the annual overhead rate calculation for the MX test. The overhead rate is applied to all customers and rate schedules as part of the MX test calculation.

12.1.1 Please elaborate on how the standing jobs and internal costs affect the $2,125 average service line cost.

Response:

According to the SLCA methodology approved by the Commission in 1996 and 2007, the Commission requires the Company to include SJ costs as part of the costs associated with an average residential and commercial service cost. As shown in the footnote provided in the

preamble to this IR, the SJ costs were $1,747,305 in 2014. This amount was spread evenly over and above the actual costs of each service order in the analysis. The calculation is described here:

1. $1,747,305 ÷ 10,671 service orders = $164 / order
2. Add $164 to the actual cost of each order in the SLCA analysis
3. Calculate the average cost

These additional costs affect the average service line cost by increasing it above what it would be otherwise. The average cost of $2,125 includes the costs of standing jobs related to other types of orders and general equipment.

Including the SJ costs as part of the SLCA methodology (via the average cost calculation) ensures that the resulting service line cost allowance granted to customers has been reduced to properly account for any indirect costs that cannot be allocated to specific services but are incurred nonetheless.

12.2 Please confirm, otherwise explain, that average service line cost and average cost per service are synonymous.

Response:

Confirmed.

12.3 Please confirm, otherwise explain, that the formula FEI used to determine the average service line cost of $2,125 (and the average cost per service, if they are different) is the 2014 total actual service line costs divided by the combined total number of Rate Schedule 1 and Rate Schedule 2 service lines installed in 2014.

Response:

Not confirmed.

The SLCA analysis does not include the service line costs for vertical subdivisions since vertical subdivisions are subject to the MX Test, not the SLCA.

Therefore, the average service line cost of $2,125 used in the SLCA analysis is based on dividing the total residential and commercial service line costs for 2014 (excluding vertical subdivisions) including an additional $164 per order of general standing job costs (not associated with those 2014 orders) divided by the total residential and commercial service lines installed in 2014 (excluding vertical subdivisions).

$2,125 represents the average cost per service line and does not account for the fact that many service lines will have more than one customer attachment on installations such as duplexes, townhomes, low-rise and high-rise condominiums and apartment buildings, commercial centers, small industrial parks and other building types.

$2,125 will not reconcile with any MX test, nor was it ever intended to since its application relates to the SLCA, not the MX Test. As discussed in the EES Report, there are key differences in the use and methodologies in the MX Test and the SLCA:

> The SLCA amount is calculated using the MX Test, however, assumptions are standardized [such as $2,125] to provide a fixed amount that can be applied for new service lines and meters without having to run the MX Test for each new customer that connects to an existing main. When a main extension is required, both the cost of the service line and main are taken into account within the MX Test.[14]

The MX test service cost inputs use direct costs that are estimated individually based on the specifics of each service line, whereas $2,125 is the actual average of all service lines, not of a specific project.

This is explained further in Attachment 12.3.

12.4 Using the same methodology as FEI applied to develop the Rate Schedule 1 and Rate Schedule 2 average cost per service in Appendix D-2, please provide an average service line cost for: (i) Rate Schedule 1, (ii) Rate Schedule 2 and (iii) Rate Schedule 3 customers.

Response:

The Company has included a table below which shows the average service line cost and SLCA results for the following three scenarios:

[14] Exhibit B-1, Appendix A, EES Consulting-FortisBC Energy Inc. System Extension Policy Review, June 2015, P.13

A. FEI's proposal in the Application which is based on the original approved methodology where the average service line cost of both commercial and residential customers is used to calculate an SLCA based on residential consumption from 2008-2014.[15]

B. An SLCA analysis including a new average service line cost which includes only the costs associated with residential customers and uses only the consumption from rate schedule 1 for 2008-2014.

C. An SLCA analysis including a new average service line cost which includes only the costs associated with rate schedule 2 commercial customers and uses only the consumption from rate schedule 2 for 2008-2014.

Scenario	A	B	C
Average Service Line Cost	$2,125	$2,006	$4,249
Average Consumption	68.3	68.3	356.5
Resulting Service Line Cost Allowance	$2,150	$2,220	>$10,000

The higher consumption of commercial (rate schedule 2) customers allows for the MX Test to support a service line cost of over $10,000 and still maintain a PI of 1.0. Since this supported service line cost is higher than the average actual service line cost, it is unlikely commercial customers would be charged for service lines at all.

The Company cannot reliably calculate the SLCA and average service line cost for rate schedule 3 customers given the significant variation in consumption which can range from 2,000 GJs per year to hundreds of thousands of GJs per year. The service line cost also varies greatly as illustrated in the table below. Therefore, using an average cost and average consumption over such a wide variance of values would create a misleading and often inaccurate SLCA. This is one reason why rate schedule 3 and above customers are currently subject to an individual MX Test rather than the SLCA.

	2008-2014 Minimum	2008-2014 Maximum
Industrial Service Line Cost	$450	$244,464

The Company believes that the SLCA value of $2,150 in scenario A should be approved because it follows the existing Commission methodology approved in 1996 and again in 2007. Scenario A also uses a new customer consumption value of 68.3 GJs which has been derived using average actual consumption values for new customers who connected between 2008 and 2014. This ensures a sufficient mix of new customer consumption data over different dwelling types, regions and individual customer usage patterns.

[15] System Extension Policy Application. Section 4.2.2 p.62.

FEI also notes that CEC has expressed interest in a separate commercial CIAC[16]. The Company does not object to this request and, if preferable to the Commission, this could be achieved by creating a separate residential SLCA of $2,200 (scenario B), and commercial (rate schedule 2) SLCA of $10,000 (scenario C).

12.5 Please list and explain the components and elements/resources that are included in the $2,125 average service line cost (e.g. mains, services, meters, regulators, materials, labor, contingency, standing jobs, etc…).

Response:

Please refer to the response to Panel IR 1.10.1 for a detailed description of the components and elements/resources included in the average service line cost. Only the cost for the service lines for single residential and commercial services installed in 2014 are included in the $2,125 calculated as part of the Commission approved SLCA methodology.

12.5.1 How do these components and elements/resources compare with the components and elements/resources included in the PI formula for Rate Schedule 1 and Rate Schedule 2 customers? Are they the same?

Response:

The components that make up the $2,125 amount that is the average service line cost in the SLCA analysis, and the costs included in the MX Test, are the same; the primary difference is that the MX Test uses **specific forecasts** for that specific main extension and the associated services whereas the SLCA Analysis uses **averages** of all service lines. Please refer to Panel IR 1.12.3 for a discussion by EES Consulting of the differences in application and methodologies used in the MX Test and the SLCA and the rationale for using averages in the case of the SLCA.

The current approach to both the service line cost analysis cost and the PI formula captures all of the applicable costs since the service line cost analysis uses the MX test as part of the methodology. The Company has provided the table below to illustrate how the general cost components are included. The key differences evident in the table are (a) the use of averages

[16] CEC IR 2.18.1.

in the SLCA (because the amounts are smaller and connections more numerous), and the use of specific forecasts in the MX Test; and (b) how (not if) the SJ costs are reflected.

	MX Test	SLCA Analysis
Service Line Cost	Direct service line cost associated with service added in under the service cost component of the MX Test.	Average service line costs ($2,125) including SJ costs.
Meter Cost	Direct cost of meter and regulator added in under meter cost component in MX Test.	Average cost of meter and regulator (Panel IR 12.1.5) added in under the meter cost component in the MX Test.
Mains Cost	Direct mains cost associated with project added in under the mains cost component of the MX Test.	Average cost of a main added in under the mains cost component of the MX test
SJ Costs	Added in via overhead rate.	Included above under "Service Line Cost".
Other Costs	Included under MX test components	Included under MX test components

The MX Test accounts for SJ costs as part of the fixed overhead rate. Since new services (SLCA) and new main extensions (MX Test) both use the same MX test, they both include an SJ cost component through the application of the fixed overhead rate. The overhead rate includes an SJ cost component and is the same for all Rate Schedule 1 and Rate Schedule 2 customers.

The table below provides an illustration of the how the SJ component is incorporated into the MX test and SLCA calculation (uses MX Test to arrive at SLCA amount) through the overhead rate.

<table>
<tr><td rowspan="3">Planning Costs</td><td>Direct Planning Costs</td><td rowspan="4">Direct Overhead Rate*</td><td rowspan="5">Overhead Rate</td></tr>
<tr><td>Direct Overhead</td></tr>
<tr><td>SJ Costs</td></tr>
<tr><td colspan="2">Support Costs</td></tr>
<tr><td colspan="2">Capitalized Overhead</td><td>Indirect Overhead Rate</td></tr>
</table>

**Calculated as a percentage of total direct construction costs*

In general, SJ costs are not individually estimated for each customer since they are general costs and cannot be measured on a per customer basis. Therefore they are not included in the specific direct main, service line or meter cost forecast included in the MX test.

However, as shown in the table above, the MX test does include SJ costs as part of the overhead cost calculation which is based on the forecast direct costs entered into the test. The resulting total cost is then used to determine if a CIAC is required.

12.5.1.1 If they are not the same, please explain and justify why not, and explain how they could be made the same.

Response:

They are the same. Please refer to the response to Panel IR 1.12.5.1.

12.5.2 How do these components and elements compare to the components and elements included in the $1000 estimate? Are they the same?

Response:

As stated in the response to Panel IR 1.11.10, the $1,000 cost estimate is based on the actual costs for a specific subset of only residential services that were installed in 2015 and was used for the purpose of responding to the Commission's request to re-forecast the service line costs. The $1,000 cost estimate does not include any SJ (standing job) components because those costs have the following attributes:

- cannot be attributed to the actual cost of installing a new service
- are not included in original MX test service line cost estimates
- are unrelated to the current MX Reporting cost variance methodology
- are already captured in the MX Test through the overhead rate

When the MX Test is used to re-forecast a PI using the $1,000 cost estimate, the overhead component of the MX Test will gross up the $1,000 cost by approximately 26%[17]. The result will be a total cost of $1,260 being used in the MX test and therefore the re-forecast PI will take into account the SJ costs.

12.5.2.1 If they are not the same, please explain and justify why not, and explain how they could be made the same.

Response:

As explained in the response to Panel IR 1.12.5.2, they are not the same. The components that make up the difference between the $1,000 and the $2,125 are set out in the response to Panel IR 1.14.1 along with an explanation of why they should not be made the same, as they are used for two different purposes.

[17] As an example, 26% is the overhead rate used in the 2016 MX test. The overhead rate applied will be based on applicable MX test for that year.

13.0 2014 MX Report – sample average service line cost estimates and actuals

Reference: 2014 MX REPORT

Exhibit B-1, Appendix D, pp. 47, 48

The 2014 MX Report, attached as Appendix D to the Application, contain numerous tables on aggregate main extension costs for sample main extensions. Below is an example:[18]

Table 6-1: 2013 FEI Aggregate Main Extensions Costs

2013 SAMPLE MAIN EXTENSIONS - COSTS				
	Cost of Installation ($)			
FEI		Original Forecast	Actual	Variance %
Year 1	Mains	$ 2,322	$ 3,502	51%
	Service lines and meters	$ 297,092	$ 546,463	84%
	Year 1 Total	$ 299,414	$ 549,965	84%
Year 2	Mains	$ -	$ -	
	Service lines and meters	$ 135,042	$ -	-100%
	Year 2 Total	$ 135,042	$ -	-100%
Year 3	Mains	$ -	$ -	
	Service lines and meters	$ 89,619	$ -	-100%
	Year 3 Total	$ 89,619	$ -	-100%
Year 4	Mains	$ -	$ -	
	Service lines and meters	$ 62,610	$ -	-100%
	Year 4 Total	$ 62,610	$ -	-100%
Year 5	Mains	$ -	$ -	
	Service lines and meters	$ 49,106	$ -	-100%
	Year 5 Total	$ 49,106	$ -	-100%
Years 1-5 Total		$635,791	$549,965	-13%

13.1 Please confirm, otherwise explain, that the Mains row in these tables contain the same physical components and cost elements/resources as the mains category used in the PI formula and the mains category used in response to BCUC IR 1.1.1 and 2.3.4 (i.e. the Historical MX reporting cost variance tables).

Response:

Confirmed.

[18] Exhibit B-1, Appendix D, p. 47.

13.2 Please confirm, otherwise explain, that the Service lines and meters rows in these tables contain the same components and elements as the services and meter costs category used in the PI formula and the same components and elements as used in response to BCUC IR 1.1.3 and 2.3.8 (i.e. the Historical MX reporting cost variance tables).

Response:

Confirmed.

13.3 Please confirm, otherwise explain, that prior to undertaking the 2013 mains, FEI had forecasted service lines and meters costs of $297,092, $135,042, $89,619, $62,610 and $49,106 for each of the first five years of attachments, respectively.

Response:

Confirmed.

Also in the 2014 MX Report are numerous tables on aggregate main extension attachments, consumption and use per customer for sample main extensions. Below is an example:[19]

[19] Exhibit B-1, Appendix D, p. 48.

Table 6-2: 2013 FEI Aggregate Main Extensions Attachments, Consumption and Use per Customer

2013 SAMPLE MAIN EXTENSIONS - ATTACHMENTS, CONSUMPTION, and USE PER CUSTOMER									
FEI	Attachments			Consumption (GJ)			Use per Customer		
	Original Forecast	Actual or Re-Forecast	Variance %	Original Forecast	Actual or Re-Forecast	Variance %	Original Forecast	Actual or Re-Forecast	Variance %
Year 1	242	367	52%	49,923	51,338	3%	206	140	-32%
Rate 1	194	317	63%	18,383	13,672	-26%	95	43	-54%
Rate 2	48	45	-6%	31,540	18,807	-40%	657	418	-36%
Rate 3	0	5		0	18,859			3,772	
Year 2	352	477	36%	62,716	64,131	2%	178	134	-25%
Rate 1	299	422	41%	28,020	23,309	-17%	94	55	-41%
Rate 2	53	50	-6%	34,696	21,963	-37%	655	439	-33%
Rate 3	0	5		0	18,859			3,772	
Year 3	425	550	29%	69,192	70,607	2%	163	128	-21%
Rate 1	372	495	33%	34,496	29,785	-14%	93	60	-35%
Rate 2	53	50	-6%	34,696	21,963	-37%	655	439	-33%
Rate 3	0	5		0	18,859			3,772	
Year 4	476	601	26%	73,782	75,197	2%	155	125	-19%
Rate 1	423	546	29%	39,086	34,375	-12%	92	63	-32%
Rate 2	53	50	-6%	34,696	21,963	-37%	655	439	-33%
Rate 3	0	5		0	18,859			3,772	
Year 5	516	641	24%	77,509	78,924	2%	150	123	-18%
Rate 1	463	586	27%	42,813	38,102	-11%	92	65	-30%
Rate 2	53	50	-6%	34,696	21,963	-37%	655	439	-33%
Rate 3	0	5		0	18,859			3,772	
Years 1-5 Total	516	641	24%	333,122	340,199	2%	150	123	-18%

13.4 Please confirm, otherwise explain, that prior to undertaking the 2013 FEI sample mains FEI forecasted cumulative attachments of 242, 352, 425, 476 and 516, for each of the first five years of attachments to 2013 FEI sample mains, respectively.

Response:

Confirmed.

13.5 Please confirm, otherwise explain, that FEI forecasted $297,092 to make 242 attachments to the 2013 FEI sample mains in the first year.

Response:

Confirmed.

13.5.1 Please confirm that this equates to $1,228 per attachment.

Response:

Confirmed.

13.6 Please confirm, otherwise explain, that for the first five years of the 2013 FEI sample mains FEI forecasted ($297,092 + $135,042 + $89,619 + $62,610 + $49,106) for 516 attachments.

Response:

Confirmed.

13.6.1 Please confirm, otherwise explain, that this equates to $1,228 per attachment.

Response:

Confirmed.

13.7 Please confirm that FEI reports the actual costs of service lines and meters for 2013 sample mains in the first year as $546,463 and also reports it had 367 actual attachments to the 2013 sample mains.

Response:

Confirmed.

13.7.1 Please confirm that this equates to $1,489 per attachment.

Response:

Confirmed.

Using the above methodology and the 2014 MX Report data, the following table was produced (if there are any errors in the calculations, please correct them):

Table 3 Figures derived from 2014 MX Report Data (For Rate Schedule 1, 2 and 3 combined)

	1. Sample service line cost estimate total / total number of attachments forecast in $	2. Total reported sample service line costs / total reported attachments in $	3. Variance in $	4. Variance in %
2009 – FEI	993	1,462	469	47
2009 – FEVI	773	1,544	771	100
2010 – FEI	890	1,356	466	52
2010 – FEVI	901	1,292	391	43
2011 – FEI	1,433	1,560	127	9
2011 – FEVI	1,239	1,469	230	19
2012 – FEI	1,541	1,589	48	3
2012 – FEVI	1,635	1,478	- 157	-10
2013 – FEI	1,228	1,489	261	21
2013 – FEVI	1,068	1,403	335	31

13.8 Please provide comment on the variances in the above table.

Response:

The Company has reproduced the Commission's table and included it below followed by comments on the variances.

	1. Sample service line cost estimate total / total number of attachments forecast in $	2. Total reported sample service line costs / total reported attachments in $	3. Variance in $	4. Variance in %
2009-FEI	993	1462	469	47%
2010-FEI	890	1356	466	52%
2011-FEI	1433	1560	127	9%
2012-FEI	1541	1589	48	3%
2013-FEI	1228	1489	261	21%
			Average	**27%**
2009-FEVI	773	1544	771	100%
2010-FEVI	901	1292	391	43%
2011-FEVI	1239	1469	230	19%
2012-FEVI	1635	1478	-157	-10%
2013-FEVI	1068	1403	335	31%
			Average	**37%**

Comment on the methodology

The table does not include any forecast attachments or unknown costs and is based on only those costs reported in the 2014 MX Report. This is a different methodology compared to the tables that were prepared for the Company's response to BCUC IR 1.1.3 which included actual costs and an estimate of future attachments and unknown costs. By removing the estimate of unknown costs from the calculations, the table above provides a more reliable summary of the average service line cost variances included in the MX report.

Comment on the variances under this methodology

As previously discussed in the Application, the service line cost variance has improved since 2010 due to improvements to the Company's cost estimating methodologies such as the introduction of manual estimates[20].

The 2013 variances are reasonable in that they are only representative of the first year of five years of attachment reporting and therefore the average unit cost variance is based on comparing a five year average to a single year of actuals. The magnitude of the variance is therefore highly dependent on the types of attachments that occur in the first year. For instance, in 2013, FEI attached five industrial customers that were not included as part of the original forecasts. This is a positive development for existing ratepayers due to the additional annual

[20] FortisBC Energy Inc. 2015 System Extension Application, Section 5.4, page 74, line 23.

load and related revenue these customers will bring. However, it also negatively skews the service line cost variance since industrial customers generally have the highest cost to connect and these costs were not included in original forecasts because the customers were unanticipated at the time[21]. For FEVI, The Company connected 8% more residential customers than forecast in the first year. The variance would be highly impacted by the cost of the additional services installed and whether or not they were included in the original forecast.

The average actual variance is 27% for FEI and 37% for FEVI. By removing the 2009 outlier from FEVI the variance drops to 21%. These values are improvements over the original re-forecasted variance of 32% and 31% for FEI and FEVI respectively included in the response to BCUC IR 1.1.3 which used a less reliable approach incorporating a blend of forecast costs, actual costs and re-forecast costs.

13.9 If any components or cost elements/resources are missing, please add those back in to the reporting data, recalculate the above table and provide comment.

Response:

No components are missing.

13.10 Please reproduce the above table for: Rate Schedule 1 attachments only, Rate Schedule 2 attachments only, and Rate Schedule 1 and 2 combined, for the 2012 and 2013 main years, and provide comment on all tables.

Response:

Although the Panel's revision to this question to only request information for the 2012 and 2013 years has made it possible to respond to this question given enough time, in reviewing the revised requirements, the Company has concluded that it will take approximately 4 months to gather the data to complete the response. Even once completed, because the same base data is used, the result will likely be similar to what has already been provided.

The table produced above derives data from the annual MX Report and includes the estimated aggregate service line costs divided by the estimated aggregate number of attachments. This is then compared to the actual aggregate service line costs divided by the actual aggregate

[21] FortisBC Energy Inc. Main Extension Report for 2014 Year End - Section 6.2, page 50.

attachments to create a forecast to actual average cost comparison. The Commission is requesting the Company further break down these average costs by rate class for 2012 and 2013.

FEI does have the number of attachments by rate class for 2012 and 2013, as indicated in the Company's request for clarification. However, the association between the rate class attachment and the service line cost does not currently exist in the MX Report data. The currently approved MX Report format only requires aggregate cost reporting of the samples and does not require individual cost reporting by rate class and region. Therefore the data is not readily available. In order to produce the table as requested, the Company would have to look up each individual service line estimate from each MX test in the aggregate sample, determine the forecast cost of the service line and match it to the correct actual cost. Finally a rate class would have to be assigned to the service, which can create allocation issues when a service line has more than one type of customer rate class attached to it.

In general, the rate class of a customer is related to the revenue component of the MX test and not directly to the forecasted cost component. When forecasting the cost of a service line, the rate class of the customer that will be attaching to the service line is not a consideration because rate class is not a major determinant of costs. For example, the cost and general labour and materials for 10 meters of polyethylene natural gas distribution pipe would be identical for a commercial or residential customer. Any cost variances between the Rate Schedule 1 and Rate Schedule 2 customer types or any cost variances in the forecast or actual costs for each service line are instead expected to be due to factors such as:

- Differences in length of the service;
- Differences in materials, such as the need for steel pipe;
- Differences in the location or "running line" of the service;
- Unanticipated underground encumbrances or obstacles;
- Unanticipated equipment, restoration, or labour charges; and
- Project delays resulting from either the builder or developer or the Company, such as cases where the Company must leave and return due to a gas emergency.

All service lines are equally subject to the factors above regardless of the customer rate class attached and these factors are some of the primary drivers of cost variances. Since the rate class of the customer attaching does not form part of the cost forecasting process and is not a major consideration in the cost of the service line, the Company does not expect any additional insight will result from attempting to segment the MX Report average cost variance by rate class.

Finally, the data included in the table is based on the annual MX report aggregate main extension samples which are not, and were never intended to be, a representative sample of installed service lines in any given year. As such, even with the table completed as requested, no meaningful conclusions about the Company's total actual service line cost variance could be drawn.

Given the time and resources that would be required to provide the requested information, the fact that the Commission already has the cost variances amounts and percentages as shown in the table above, and the fact that FEI does not believe further granularity on those variances by rate class will provide any meaningful insight into the sources of the cost variances, the Company requests that the Panel confirm if it still requires that FEI prepare the tables as requested in this question and the following question. If the information is still required, it will cause a significant delay to the regulatory timetable that FEI is proposing with this submission.

13.11 If FEI identified other rate schedules to which the main extension test applies please also complete the above table for those customers, for the 2012 and 2013 main years, and provide comment.

Response:

The MX test applies to all rate schedules including Rate Schedule 1 and Rate Schedule 2 customers. Any new customer and their applicable rate schedule attaching to a main extension included in the MX Report sample will be captured in the annual MX Report. Since the table above is based on the 2014 MX Report it already contains the most up to date measure of costs and customer attachments by rate schedule. The Company does not have any additional data to add to the table at this time.

The response to Panel IR 1.13.10 also explains that the Company is not able to break down the table by rate class given that the data is not available and would have to be gathered over the course of four months. Furthermore, the data would not produce any meaningful results since the rate class of a customer is related to the revenue component of the MX test and not the forecasted cost component.

The table above is current and the Company has no additional comments.

14.0 Reconciliation of the average service line costs

Reference: SLCA ANALYSIS, 2014 MX REPORT, HISTORICAL MX REPORT COST VARIANCE

Exhibit B-1, p. 63, Appendix D, Appendix D-2; BCUC IR 1.1.3, 2.3.8

14.1 Please reconcile why FEI forecast $1000 per service line in the forecast to actual service line costs tables provided in response to BCUC IRs 1.1.3 and 2.3.8, but shows forecasts and actual costs per service line in the ranges shown in the tables above/responses to the preceding questions (i.e. 2014 MX Report data), and is reporting average cost per service line of $2,125 for the purposes of the Service Line Cost Allowance?

Response:

FEI can confirm that it used the most appropriate value, $1,000, in responding to the Commission's requests. This is because the MX Report shows the **direct** forecast and actual costs for the service lines, rather than the amounts including overhead/SJ costs. The higher $2,125 amount includes SJ costs (indirect costs) which are not included in the MX Reporting which is focused only on the direct controllable costs. Since there is no way to know the mix of customers[22] that will be attaching to the mains in the MX Report sample, FEI chose the value that represented the majority of its attachments in 2015 ($1,000).

The table included below provides a description of each average value cited by the Commission, its intended use, and the data it contains for further clarity.

[22] For the 2008 to 2014 attachments included in the MX Report sample there are no details available on expected service types, service lengths or other information on service line characteristics to assist with reforecasting since that is not part of the methodology in the MX Report. For the 2008 to 2011 attachments, no rate class data is available. Rate class data is available for 2012 and 2013 but is not a primary determinate of cost.

Average Cost Number	IR Reference	Logic	Use	Years Included	Rate Classes Included	Service Types Included	Includes SJ Costs from non-related work orders and equipment
$1,000 ($1,260 with overhead included)	11.1, 12.5.1	Based on average for standard new residential services attaching to new mains.	Commission MX Report aggregate sample forecast variance tables.	2015	• Residential	• New	NO
$1,489 FEI /$1,403 FEVI and $1,228 Forecast	13.5.1, 13.7	Based on the average cost of all services connected to sample new mains included in MX Report.	Calculated by Commission based on actual MX Report sample variances.	2013	• Residential • Commercial • Industrial	• New • Conversion • Multi-Meter • Vertical Subdivision	NO
$2,125	12.1.1	Based on only those service types for which the SLCA applies and reflects the most recent cost year. Includes attachments to any main, whether new or existing.	Required for Commission SLCA methodology.	2014	• Residential • Commercial	• New • Conversion • Multi-Meter	YES

1

The Company provides an explanation for the $1,000 average service line cost in response to Panel IR 1.11.10. As stated in the response to Panel IR 1.11.10, the Commission asked the Company to fill in Commission staff's forecast variance table. The Company's forecast service line cost was based on the assumption that the majority of unrealized attachments on the aggregate main extensions included in the MX Report samples are new residential services. For instance, in *Table 6-2 FEI Aggregate Main Extensions Attachments, Consumption and Use Per Customer* referenced in Panel IR 1.13.3, residential attachments make up 90%[23] of all attachments expected on the mains in the sample. Although the Company does not have rate class information available for all the samples included in the MX Report, based on past experience and actual connection data, it is reasonable to expect that the majority of attachments on the samples will be residential. Therefore, it would not be appropriate to use a blended average of residential, commercial and industrial services lines, such as $1,489.

It would also not be appropriate to use the SLCA 2014 average value of $2,125 since this includes a mix of both residential and commercial services for multi-meter and conversions as well as new services. $2,125 also includes general SJ costs which are not part of the MX Report (the MX Report only addresses direct costs), not included in the forecast costs, and do not represent the direct cost for a particular main or service installation. The use of $2,125 would result in an 'apples to oranges' type of comparison as the comparison would be between a forecast of only direct costs and a re-forecast of direct plus indirect costs.

In order to be responsive, the Company has provided the requested tables for Panel IR 1.14.2 below using the averages *chosen by the Commission* from the Commission's "*Table 3 Figures derived from 2014 MX Report Data (For Rate Schedule 1, 2 and 3 combined."* The re-forecasted cost variances are 43% and 49% for FEI and FEVI respectively.

The re-forecasted service cost variance tables do not produce any meaningful results since the Commission's approach requires the Company to use averages that:

- are a mixture of industrial, commercial and/or industrial customers;
- include a blend of various service order types; and
- are not reflective of the actual attachments expected to occur on each main in the sample.

Similar to the Commission's required re-forecasting methodologies for attachments in the MX Report[24], these averages are another variation of the point-in-time re-forecasting of costs. The appropriate approach is to look at actual information, as is done in the RIA and has been undertaken for the service cost side of the equation only in Panel IR 1.13.8.

[23] 463 Rate 1 Forecast Attachments ÷ 561 Total Forecast Attachments = 90%.
[24] FEI Final Submission for the 2015 System Extension Application. p 10-12. #24 to #28.

FEI and FEVI Re-forecasted Cost Variance Tables (Panel IR 1.14.2)

FEI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4a. Commission Calculated Average Service Line Cost	4b. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 539,720	$ 532,515	$ 1,489	$ 229,306	$ (222,101)	41.2%	$ 761,821
2009	$ 1,219,661	$ 1,551,821	$ 1,489	$ 248,663	$ (580,823)	47.6%	$ 1,800,484
2010	$ 425,478	$ 569,636	$ 1,489	$ 86,362	$ (230,520)	54.2%	$ 655,998
2011	$ 841,123	$ 885,958	$ 1,489	$ 218,883	$ (263,718)	31.4%	$ 1,104,841
2012	$ 580,867	$ 969,808	$ 1,489	$ 14,890	$ (403,831)	69.5%	$ 984,698
2013	$ 633,470	$ 546,463	$ 1,489	$ 221,861	$ (134,854)	21.3%	$ 768,324
Sum	$ 4,240,319	$ 5,056,201	$ 1,489	$ 1,019,965	$ (1,835,847)	43%	$ 6,076,166

FEVI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2009 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4a. Commission Calculated Average Service Line Cost	4b. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 282,526	$ 341,880	$ 1,403	$ 47,702	$ (107,056)	37.9%	$ 389,582
2009	$ 539,508	$ 663,920	$ 1,403	$ 376,004	$ (500,416)	92.8%	$ 1,039,924
2010	$ 362,046	$ 338,504	$ 1,403	$ 196,420	$ (172,878)	47.8%	$ 534,924
2011	$ 345,695	$ 314,366	$ 1,403	$ 108,031	$ (76,702)	22.2%	$ 422,397
2012	$ 201,122	$ 192,140	$ 1,403	$ 50,508	$ (41,526)	20.6%	$ 242,648
2013	$ 247,716	$ 217,465	$ 1,403	$ 108,031	$ (77,780)	31.4%	$ 325,496
Sum	$ 1,978,613	$ 2,068,275	$ 1,403	$ 886,696	$ (976,358)	49%	$ 2,954,971

14.2 Please reproduce the forecast to actual service line costs tables provided in response to BCUC IR 2.3.8 using the 2013 FEI total reported sample service line costs / total reported attachments (i.e. column 2 in Table 3) (adjusted for inflation and productivity, if FEI prefers) and provide comment on the new variances.

Response:

The tables are provided in the response to Panel IR 1.14.1

14.2.1 Please confirm that Rate Schedule 1 and Rate Schedule 2 customers are both relevant to the MX test and are the only customers included in the calculation of $2,125.

Response:

FEI confirms that Rate Schedule 1 and Rate Schedule 2 customers are both relevant to the MX test and are the only customers included in the calculation of $2,125.

However, the question appears to be mixing up aspects of the SLCA and the MX Test. The value of $2,125 is not used in, or relevant to, the MX Test. It is relevant to the determination and calculation of the SLCA.

The SLCA average service line cost calculation of $2,125 is based on an average of residential and commercial service line cost for 2014 only (excluding vertical subdivisions) and also includes indirect standing job costs not associated with a particular customer's service line costs.

This value is a *single step* in the derivation of the proposed SLCA of $2,150 included the Application[25] and is designed to represent a cost for all customers who are subject to the SLCA.

For reference, the current SLCA value of $1,535 was derived in the 2007 Application[26] using an average service line cost of $1,161 and $1,573 for FEI and FEVI respectively. None of these average service line cost components are used in the Company's MX Test pricing methodologies since they are not related to a particular customer, and the MX Test (unlike the SLCA) always uses customer specific inputs.

The SLCA average service line cost calculation is not a cost specific to a project and does not take into account the rate class of each customer or the proportional mix of rate classes that can occur on a main extension. The SLCA is implemented in cases for a service line where no main extension is needed and for Rate Schedule 1 and Rate Schedule 2 customers only, excluding vertical subdivisions. The SLCA average service line cost of $2,125 is not used in the Main Extension test because the MX Test (unlike the SLCA) always uses customer specific inputs.

[25] FortisBC Energy Inc. 2015 System Extension Application – Section 4.2.2 page 62 line 11.
[26] TGI-TGVI System Extension and Customer Connection Policy Changes – page 15.

FEI has provided a table in response to Panel IR 1.14.1 that clarifies how this and other values are applied, or not applied, in the MX Test and SLCA.

14.2.1.1 If not confirmed, please explain and list the other rate schedules that are relevant to the MX test and are included in the calculation of the $2,125, and reconcile the statement in Exhibit B-11 with the statement on page 63 of the Application.

Response:

Please refer to the response to Panel IR 1.14.2.1.

14.2.2 Please confirm, otherwise explain, that generally Rate Schedule 1 and Rate Schedule 2 customers represent the majority of FEI's new customers. What percentage of new customers did Rate Schedule 1 and Rate Schedule 2 customers make up in 2012, 2013 and 2014?

Response:

Confirmed. The table below provides the percentage of new Rate Schedule 1 and Rate Schedule 2 customers for 2012 to 2014.

	2012		2013		2014	
Rate Class	Added Customers	%	Added Customers	%	Added Customers	%
RATE 1	11,904	88.6%	10,878	89.1%	12,464	88.7%
RATE 2	1,445	10.8%	1,269	10.4%	1,472	10.5%

14.2.3 Please also reproduce these tables using FEI's $2,125 estimate and provide comment on the new variances.

Response:

The Company has provided the updated table below using the derived value of $2,125 from the SLCA analysis. However, this approach is not valid and produces misleading results for the reason described below.

The Commission's tables included below are attempting to compare data derived from two different pricing methodologies; the total forecast service costs included in an aggregate MX Report sample of MX tests to the average actual service line cost for a single year (included as a component in the derivation of the SLCA). The two values cannot be reconciled since they are not related to each other and therefore the calculated variance is not representative. The Company has included a description in the table below.

Comparator	Forecast Service Cost Data from MX Report	Actual Service Cost Data (SLCA Value) of 2,125
Table Column	2	4a.
Represents	The sum of the costs for individually forecasted services attaching to a sample of new main extensions.	The actual average cost of all new residential and commercial services regardless of whether they attached to a new main extension[27].
Based on	2008 to 2013 cost forecasts	2014 actual service costs
Lengths Included	Estimated based on specific length of each service and lot characteristics	Contains a mixture of all service lengths and lot characteristics
Service Types	Forecast based on specific service type, generally new services.	All service types, new, multi-meter and conversion services.
Includes SJ Costs	SJ costs are not used as a separate input because the MX Test automatically adds in these costs when applying the overhead rate. This approach ensures that SJ costs are included in the PI calculation and any resulting CIAC. The actual and forecast costs reported in the MX Report exclude the SJ costs in order to accurately measure forecast to actual variance.	Yes, SJ costs are included as required by the previously approved SLCA methodology.

[27] The SLCA average service line cost data includes conversion services to existing buildings in established neighborhoods. Conversion services are more expensive to install than new services connecting to new main extensions.

As illustrated above, the original forecasted MX Report costs for each project are not based on an average mix of service connections of varying lengths but were individually calculated each year based on expected length, cost per metre charges for the area, and the unique characteristics of each lot. They have not been increased by an SJ cost component since the MX Test adds these costs through the application of the overhead rate.

The tables included in this IR are essentially comparing a specifically derived **direct** service line cost (or aggregation of those costs) to a general average cost for all types of services **including indirect costs**, and then calculating a variance. This is not an appropriate comparison. As an analogy, this would be similar to comparing the forecast average summer temperature in Vancouver (the specific MX test service line cost inputs) to the actual average summer temperature in North America ($2,125) and then assessing the forecasting accuracy. The $2,125 SLCA average service line cost is not reflective of the actual attachments expected to occur on each main in the sample, and therefore the re-forecasted service cost variance tables do not produce any meaningful results.

FEI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4a. Commission Calculated Average Service Line Cost	4b. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 539,720	$ 532,515	$ 2,125	$ 327,250	$ (320,045)	59.3%	$ 859,765
2009	$ 1,219,661	$ 1,551,821	$ 2,125	$ 354,875	$ (687,035)	56.3%	$ 1,906,696
2010	$ 425,478	$ 569,636	$ 2,125	$ 123,250	$ (267,408)	62.8%	$ 692,886
2011	$ 841,123	$ 885,958	$ 2,125	$ 312,375	$ (357,210)	42.5%	$ 1,198,333
2012	$ 580,867	$ 969,808	$ 2,125	$ 21,250	$ (410,191)	70.6%	$ 991,058
2013	$ 633,470	$ 546,463	$ 2,125	$ 316,625	$ (229,618)	36.2%	$ 863,088
Sum	$ 4,240,319	$ 5,056,201	$ 2,125	$ 1,455,625	$ (2,271,507)	54%	$ 6,511,826

FEVI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4a. Commission Calculated Average Service Line Cost	4b. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 282,526	$ 341,880	$ 2,125	$ 72,250	$ (131,604)	46.6%	$ 414,130
2009	$ 539,508	$ 663,920	$ 2,125	$ 569,500	$ (693,912)	128.6%	$ 1,233,420
2010	$ 362,046	$ 338,504	$ 2,125	$ 297,500	$ (273,958)	75.7%	$ 636,004
2011	$ 345,695	$ 314,366	$ 2,125	$ 163,625	$ (132,296)	38.3%	$ 477,991
2012	$ 201,122	$ 192,140	$ 2,125	$ 76,500	$ (67,518)	33.6%	$ 268,640
2013	$ 247,716	$ 217,465	$ 2,125	$ 163,625	$ (133,374)	53.8%	$ 381,090
Sum	$ 1,978,613	$ 2,068,275	$ 2,125	$ 1,343,000	$ (1,432,662)	72%	$ 3,411,275

14.2.4 As FEI proposes in Exhibit B-11, please also reproduce these tables using the average actual cost for the applicable rate schedules. In doing so, please provide a spreadsheet with the source data and calculations used to determine the average actual cost for the applicable rate schedules. Please also include thorough explanations of what is included / excluded from the data, how the calculations are performed and the new variances observed in the reproduced tables.

Response:

The re-forecasted results are provided below along with a spreadsheet, provided in Attachment 14.2.4, that shows the calculations. This approach, however, generates results that are not meaningful.

The calculations conducted to respond to the Commission's request consider all service lines installed over the period of 2012 to 2014 and their respective costs. The data was extracted from the same data used to populate the RIA. The Company has included both intermediate and distribution pressure services for all rate classes and service types including Conversion services, Multi-Meter Services and New Single Services. The Company is not able to break the specific service types listed above into their individual class since the data is not readily available for the 75,000 service lines installed over 2008 to 2014. Therefore an aggregate average was used for each rate class for FEI and FEVI.

The Company used the following methodology to complete the Commission's tables.

1. Determine the average cost for a service line for FEI and FEVI for each rate class for 2012 to 2014.

2. Determine the ratio of customer attachments per service line to account for the fact that one service line often has multiple customers.

3. Divide the average cost for a service line by the ratio in (2) above.

Average Cost Data Table based on 2012 to 2014 Service Line Installations by Rate Class

		Rate Class	Count of Service Orders	Total Cost	Average Cost per Service Line	Customers to Service Line Ratio	Average Cost per Attachment
FEI	Resdiential	RATE 1	22,489	$ 35,032,396	$ 1,558	1.29	$ 1,208
FEI	Commercial	RATE 2	1,251	$ 4,113,718	$ 3,288	1.29	$ 2,549
FEI	Industrial*	RATE 3+	127	$ 1,476,791	$ 11,628	1.29	$ 9,015
FEVI	Resdiential	RATE 1	6,533	$ 12,204,099	$ 1,868	1.29	$ 1,448
FEVI	Commercial	RATE 2	343	$ 1,200,673	$ 3,501	1.29	$ 2,714
FEVI	Industrial*	RATE 3+	25	$ 154,120	$ 6,165	1.29	$ 4,779

*All Industrial Rate Classes including Transportation Customers

	Service Lines Additions	Customer Additions	Customers per Service Line
2012	10,545	13,436	1.27
2013	9,495	12,213	1.29
2014	10,728	14,045	1.31

1.29 Average

4. Conduct another re-forecast cost of unrealized attachments by multiplying the expected number of attachments for each rate class in (3) above.

The re-forecasted results in the table below indicate a re-forecasted cost variance of 51% and 69% for FEI and FEVI respectively. No meaningful conclusions can be drawn from this value since:

1. They are based on a re-forecast of attachments that have not yet happened.

2. The actual costs of these future attachments are not known.

3. The actual final number of attachments on each future service line is not known.

4. The average actual unit cost used to re-forecast the future costs includes a blend of all attachment types and lengths whereas the original forecast would have been associated with a specific attachment type and specific service length. (The Company does not have individual forecast service line data available at this time as it was never included as part of the annual MX Report format designed by Commission Staff.)

FEI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 539,720	$ 532,515	$ 327,250	$ (320,045)	59.3%	$ 859,765
2009	$ 1,219,661	$ 1,551,821	$ 354,875	$ (687,035)	56.3%	$ 1,906,696
2010	$ 425,478	$ 569,636	$ 123,250	$ (267,408)	62.8%	$ 692,886
2011	$ 841,123	$ 885,958	$ 312,375	$ (357,210)	42.5%	$ 1,198,333
2012	$ 580,867	$ 969,808	$ 25,494	$ (414,435)	71.3%	$ 995,302

	Re-Forecast	Avg Unit Cost	Total
2012 R1	0	$ 1,208	$ -
2012 R2	10	$ 2,549	$ 25,494
2012 R3+	0	$ 9,015	$ -

2013	$ 633,470	$ 546,463	$ 183,970	$ (96,963)	15.3%	$ 730,433

	Re-Forecast	Avg Unit Cost	Total
2013 R1	146	$ 1,208	$ 176,322
2013 R2	3	$ 2,549	$ 7,648
2013 R3+	0	$ 9,015	$ -

Sum	$ 4,240,319	$ 5,056,201	$ 1,327,214	$ (2,143,096)	51%	$ 6,383,415

**estimated service line cost based on actual average service line cost for each rate class including a factor to account for multi-meter service lines*

**acutal service line cost based on actual attachments times annual average service line cost*

1

FEVI

Table Includes Forecast to Actual Service Line Costs included in MX Reporting Years 2008 to 2014

1. MX Year	2. Total Forecast MX Cost Estimates Used in Original MX Tests	3. Total Actual Cumulative Service Line Spend to Date	4. Estimated Remaining Service Costs	5. Variance (in MX Year $) 2- (3+4)	6. Variance (in %) [2-(3+4)]/2	7. Total Expected MX Costs (3+4)
2008	$ 282,526	$ 341,880	$ 72,250	$ (131,604)	46.6%	$ 414,130
2009	$ 539,508	$ 663,920	$ 569,500	$ (693,912)	128.6%	$ 1,233,420
2010	$ 362,046	$ 338,504	$ 297,500	$ (273,958)	75.7%	$ 636,004
2011	$ 345,695	$ 314,366	$ 163,625	$ (132,296)	38.3%	$ 477,991
2012	$ 201,122	$ 192,140	$ 55,469	$ (46,487)	23.1%	$ 247,609

	Re-Forecast	Avg Unit Cost	Total
2012 R1	35	$ 1,448	$ 50,689
2012 R2	0	$ 2,714	$ -
2012 R3+	1	$ 4,779	$ 4,779

2013	$ 247,716	$ 217,465	$ 122,907	$ (92,656)	37.4%	$ 340,372

	Re-Forecast	Avg Unit Cost	Total
2012 R1	68	$ 1,448	$ 98,482
2012 R2	9	$ 2,714	$ 24,425
2012 R3+	0	$ 4,779	$ -

Sum	$ 1,978,613	$ 2,068,275	$ 1,281,250	$ (1,370,912)	69%	$ 3,349,525

**estimated service line cost based on actual average service line cost for each rate class including a factor to account for multi-meter service lines*

**acutal service line cost based on actual attachments times annual average service line cost*

FEI has provided the requested information but has concerns about the value of the request in the context of the amount of information already on the record that speaks to variances.

As part of this System Extension Application process, the Commission has requested MX Report cost variance tables in six IRs, with each request requiring a different re-forecast of an original forecast methodology. That is, the Panel IRs have focused on variances in service line costs and variances in consumption forecasts in isolation in only one or two years of a main's life. Regardless of the methodology used to assess performance, the Company believes that its cost estimation variance is reasonable and any variances should be considered in the context of the number of attachments that have occurred on a main or group of mains. This is how the MX Test itself is designed – to consider all of the components together.

To illustrate the concern with viewing cost variances in isolation, a higher aggregate total service cost variance as a result of having more customers attach than anticipated[28] could actually have a positive impact on existing ratepayers due to the additional consumption and revenue. This would also result in a higher re-forecast PI.

This is one of the primary benefits of the RIA in that it considers both actual costs and actual consumption together, rather than providing an incomplete picture by looking at them in isolation of one another. FEI believes it is the RIA that is the most practical tool available to the Company and the Commission. A comparison of the actual revenue and cost, provided by the RIA, illustrates that the impact of system extensions on new and existing customers is favourable by a wide margin (a PI of 1.25). Increases to the forecast cost or decreases to the forecast consumption, all things equal, will result in an even greater benefit being provided to existing customers. The changes proposed in FEI's Application are designed to bring balance to the benefits realized by existing customers. Therefore, if the forecast costs are increased or the consumption credits are reduced in the Test, other factors must be changed (amortization period increased, capital overhead decreased etc.) to re-balance the benefits. In other words, changes in forecasts that work to reduce the PI in the MX Test must be accompanied by offsetting mechanisms to increase the PI to arrive at no net change from what FEI has proposed in this Application.

For ease of reference, the six different methodologies that have been requested are:

IR	Requirement
BCUC IR 1.3.0	Initial requirement to change the existing and approved MX Report cost variance tables to include a re-forecast unit cost for attachments that have not yet happened and compare the forecast to a re-forecast and calculate a variance.
BCUC IR 2.3.8	Remove data from tables for 2014 and revise the resulting re-forecasted variance.
Panel IR 13.8.0	Comment on new methodology using forecast to average unit costs based on data from the 2014 MX Report sample years 2009 to 2013 only.
Panel IR 14.2.0	Re-calculate the tables assuming the average MX Report 2013 service cost for FEI and FEVI respectively and revise the resulting re-forecasted variance.
Panel IR 14.2.3	Re-calculate the tables assuming the Service Line Cost Allowance average service line cost and revise the resulting re-forecasted variance.
Panel IR 14.2.4	Re-calculate the tables assuming an average unit cost based on each rate class and revise the resulting re-forecasted variance.

In Panel IR 1.13.8 the Commission produced a table that provides the forecast to actual unit cost variance for the service lines included in the MX Report. The resulting aggregate average variance for FEI and FEVI of 27% and 37% respectively contain no re-forecasted cost estimates

[28] More customers, means more services lines. If these additional customers were over and above the forecast customers included in the original MX test it would appear as though the Company under-forecast costs in the MX Report tables.

and are reflective only of the services contained in the annual MX Report. FEI believes the methodology in Panel IR 1.13.8 has merit as it does not involve re-forecasting cost variance. This MX Report cost variance is consistent with the variance provided by the Company in the original request for BCUC IR 1.1.3 of 32% and 31% for FEI and FEVI respectively.

FEI respectfully submits that additional re-forecasting exercises associated with these MX Report tables beyond that produced in 1.13.8 have reached the point of diminishing returns. First, these methods are producing significantly different results, illustrating that the re-forecast variance is a function of the average cost assumption used to produce the results. This is to be expected since the re-forecasts have used different inputs. This alone demonstrates the flaw in using a re-forecast to assess forecasting performance. Second, services included in the MX Report tables are not representative of the actual number of services installed by the Company, although the Company recognizes the tables represent the extent of the information available at this time.

There will always be a variance in the forecast to actual cost of a service line. The Company believes that the variance should be considered within the context of the average cost of attaching a new customer. Based on the data for 2008 to 2014 included in the RIA, the average cost of providing a gas service line to a customer is $1,629[29]. Given this relatively low capital cost, efforts to improve the cost variance must also be weighed against the cost of those efforts to create a more accurate forecast for over 10,000 service lines a year. Consideration also needs to be given to the fact that despite this variance, the Rate Impact Analysis still shows a positive impact for existing customers.

[29] **From BCUC 1.37.1: ($16,163,726 Meters & Regulators + $115,724,533 Services + $7,228,180 SJ Costs) ÷ 85,348 Customers = $1,629.** This value is also overly conservative as it assumes all SJ costs in the Rate Impact study are allocated only to the installation of service lines. When in reality, SJ costs are blend of all work types including general equipment and materials. The calculation does not include mains cost since the response is in regards to service line cost variance only. The Company's main cost variances are reasonable.

15.0 Alternative ways to estimate services and meter costs

Reference: SERVICE LINE COST ESTIMATES

Exhibit B-1, p. 21

In the Application FEI explains the process by which it makes its cost estimates as follows:

> The estimated cost to install mains, services and meters is dependent on the individual circumstances of the customer. Factors such as the number of dwellings or businesses, the distance of the main extension required and any potential encumbrances impact the cost estimate.
>
> The Company uses a combination of a Geographic Code pricing model (geo pricing) and manual estimates to derive cost estimates. Geo pricing represents an average cost per metre in a particular region, typically used for simpler projects. Manual pricing or estimating refers to a more manually intensive estimate derived by FEI's planning department in conversation with the customer.

15.1 Please explain the process for preparing and overseeing FEI estimates for services and meter costs for the purposes of the MX test.

Response:

The following response applies to Panel IRs 1.15.1 to 1.15.3.

Service and meter cost estimates included in an MX Test are derived by the Company's Planners with oversight provided by FEI Management. Management approves the cost and revenue estimate for every MX Test performed by the Company as described in the response to BCUC IR 1.1.8.

In a project requiring an MX Test, Planners exclusively use manual estimates for service lines which involve factoring in the following:

- The distance of the service line multiplied by the actual capital cost per metre derived from FEI's pipeline suppliers. As required, FEI factors in larger diameter piping to match the load for Rate Schedule 2 or 3 customers, however, this is less common and has a relatively minor impact on the cost.

- The labour and equipment used to install the service lines which take into account any environmental considerations such as the terrain, weather and any encumbrances that may impact the cost. Actual hourly rates are used in the labour estimates

For meter costs estimated in an MX Test, the Company determines the required size of the meter based on the forecast load then applies actual meter costs from manufacturers.

The Company believes that its current cost estimation process is more appropriate and superior to using averages (total services and meter costs/total number of services installed) as suggested in Panel IR 1.15.2. For example, the unique environmental circumstances of each MX Test project would be missed by using a simple preceding year or 3 year rolling average cost methodology.

Since it is more appropriate to use the current manual estimate practice versus averages, it is not necessary to have different additional averages for rate schedules 1 to 3 as suggested in Panel IR 1.15.2.1, as the Company already factors in any expected variance in a detailed fashion and averages would be less accurate.

FEI actively promotes the use of conservative estimates by its Planners through training and the MX Test project approval process described in the response to BCUC IR 1.1.8. Based on the reasonable cost variance results since 2008, FEI believes this practice should continue and there is no advantage to customers of introducing a contingency percentage for new MX Test projects as suggested in Panel IR 1.15.3.

15.2 Please discuss the appropriateness of using actual average costs (i.e. total services and meter costs / total number of services installed) from the immediately preceding year, for the purposes of the services and meter cost estimates in the upcoming year's PI formula. Please also discuss the appropriateness of using a three-year rolling average of actual average services and meter costs (i.e. total 3-yr cumulative services and meter costs / total 3-yr cumulative number of services installed).

Response:

Please refer to the response to Panel IR 1.15.1.

15.2.1 If either of the above were required, would it be appropriate to have different averages for each of Rate Schedule 1, Rate Schedule 2, and Rate Schedule 3 services and meter costs? Why or why not? What about other rates? Please discuss.

Response:

Please refer to the response to Panel IR 1.15.1.

15.3 Please discuss on the appropriateness of requiring FEI to include a contingency percentage for services and meter cost estimates in the PI formula estimates equal to the current contingency percentage FEI uses plus the prior year's variance in percent (i.e. year$^{(n-1)}$ contingency + year(n-1) variance = year(n) contingency).

Response:

Please refer to the response to Panel IR 1.15.1.

F. COMMISSION CONCERNS – COMMERCIAL CONSUMPTION ESTIMATES

16.0 Commercial consumption variance

Reference: CURRENT SYSTEM EXTENSION CONSTRUCTS

Exhibit B-1, Section 2.2.1.1.1, p. 19; Section 5.4.3, p. 79; Appendix A, p. 14;Appendix D, Table 6-2, p. 48; Table 6-5, p. 50, Table 7-2, p. 67, Table 7-5, p. 69; Table 10-2, p. 112; Table 10-5, p. 114;

In the Application, FEI explains that the consumption per customer reflects a credit each new customer receives for gas that will be consumed by them. On page 19 of the Application, FEI explains that for commercial and industrial customers, "… consumption is determined based on the specific business needs and/or operational requirements of each customer."

On page 14 of the EES Consulting report, Appendix A of the Application, EES Consulting states, "For commercial/industrial customers, the usage forecast is customized and reflects discussions with the potential customer about the installation. FEI is also consistent with the other utilities in this regard."

On page 79 of the Application FEI states: "… in a main extension project where there is a mix of both residential and commercial customers, the actual consumption figures and use per customer are subject to significant variation from the forecast if just one of the larger commercial customers delays the attachment, given that the usage of a large business is generally much greater than several single family dwellings."

In Appendix D of the Application, FEI presents forecast and actual data for the 2012 and 2013 FEI and FEVI aggregate sample main extensions segmented by rate class.

16.1 Please explain the commercial consumption variances for each of RS2 and RS3 customers for each of the years with actual results as shown in the following tables:

- Exhibit B-1, Appendix D, Table 6-2, 2013 FEI Aggregate Sample Mains Extensions, p. 48
- Exhibit B-1, Appendix D, Table 7-2, 2012 FEI Aggregate Sample Mains Extensions, p. 67
- Exhibit B-1, Appendix D, Table 6-5, 2013 FEVI Aggregate Sample Mains Extensions, p. 50
- Exhibit B-1, Appendix D, Table 7-5, 2012 FEVI Aggregate Sample Mains Extensions, p. 69

Response:

Exhibit A-10 stated "The Panel would like to give FEI the opportunity to provide, where possible, explanations for commercial consumption variances that have occurred during 2012 and 2013. As such, FEI can address Panel IR 1.16.1 by elaborating on the "variety of reasons why consumption is different than forecast" for each of the circumstances listed or alternatively, the Panel is open to other proposals that FEI considers will address the concerns outlined."

Consumption is a credit in the MX Test, with no intent to compare the credit to actual consumption, regardless of the rate class of the customer. As stated in FEI's reply argument, and endorsed by interveners, "*The consumption value is not an assumption about the expected consumption of new customers."*[30] As such, the referenced variances are the result of comparing apples to oranges.

Nevertheless, FEI endeavors to respond to the concerns identified by the Panel below.

Every commercial project has unique circumstances and inherent variability based on a variety of variables. Customers often don't have control over these variables, and, hence, they estimate consumption based on their industry experience. The Company collaborates with commercial customers by adding its industry experience in order to develop the best estimate possible.

Variances from consumption values derived with commercial customers may vary based on the following two general reasons:

1. The ramp up rate of consumption may be accelerated or delayed depending on the timing and scale of the launch of the business; and

2. The consumption use rate may be more or less than expected. For example, a rate schedule 2 or 3 customer may be using more or less energy than forecast depending on the activity level of the business and the way in which natural gas appliances and equipment are operated and maintained.

More specifically, consumption for each appliance used in a commercial project can vary considerably. The Company uses the following formula to derive annual consumption credits for each commercial appliance:

Capacity (measured in British thermal unit or "BTU" per hour) x firing rate (measured in hours of operation per year)

[30] Section E: Consumption Value Input, p. 8.

The resulting BTU per year value is then converted to GJ per year. This formula is used for each commercial appliance and the sum of the individual consumption values are input into the MX Test.

Since the capacity of the appliance is listed on the technical specifications provided by the manufacturer, the greatest source of consumption variability is in the derivation of the firing rate. For example, for a multi-family dwelling (MFD) project using a boiler, each building would have a unique BTU requirement based on its geographical location and climate, the number of windows and doors in the home, and the quality and amount of insulation in the walls and ceilings. The derivation of the firing rate would also need to consider the following:

- The number of occupants;
- The occupancy rate of the owners and/or tenants (i.e. how often do they live in the dwelling each year); and
- The number and duration of applications requiring hot water (e.g. heat, faucets, showers, dishwashers, pool, and hot tub).

HVAC contractors and builders don't control these variables, and, hence, they estimate consumption based on their industry experience. The Company works in collaboration with the commercial customer by adding its industry experience in order to develop the best estimate possible.

The derivation of consumption used in the MX Test is further complicated in this MFD example. In addition to inputting commercial appliances such as a boiler in the MX Test, the Company also factors in individual appliances located within each MFD suite. For instance, fireplaces, cooktops and barbeques are often installed in MFD suites. As has been described in previous IRs, the consumption credits for these types of appliances are derived via the Residential End Use Study (REUS) and, there is always going to be expected variability between the consumption of new customers and the values taken from the REUS.

The Company provides additional discussion of commercial consumption variances in the response to Panel IR 1.16.4.

16.2 Tables 10-2 and 10-5 in Appendix D contain five years of actual data for the 2009 Aggregate Sample Main Extensions for FEI and FEVI respectively. This data was not segmented by rate schedule. Using Table 10-2 as a template, please provide the commercial customer (RS 2 and RS 3) main extension data, including each of the five years of actual data for:

i. 2009 FEI Sample Aggregate Main Extensions

ii. 2009 FEVI Sample Aggregate Main Extensions

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

16.2.1 Please provide an explanation for any significant commercial consumption variances that occurred during each of the five years for each of the tables provided in response to the previous question. In your response, please address the attachment variance and use-per-customer variance components separately.

Response:

Pursuant to the Commission letter (Exhibit A-10) in response to FEI's clarification request, a response to this information request is no longer required.

16.3 Please confirm, or explain otherwise, that the actual commercial consumption variance typically has a more significant impact on the total consumption variance for the aggregate main extension samples as shown throughout Appendix D of the Application.

Response:

This cannot be confirmed. A commercial customer can have lower consumption than some residential customers depending on their appliances and use rates or can use up to 2,000 GJ per year at the high end. Simply having a variance in a commercial customer's consumption may or may not have a significant impact on the total consumption variance for the aggregate main extension samples. The variance would depend on the commercial customer's expected annual consumption as compared to the consumption forecast and actuals for the rest of the main extension customers.

The total consumption variance is impacted by the mix of customers in the aggregate main extension sample. For instance, the consumption variance for one commercial customer would

have little impact if there were a substantial number of residential customers or a few industrial customers in the forecasted attachment profile.

16.4 Please list and explain any methods that FEI could use to reduce the commercial use-per-customer forecast variances as shown in the samples throughout Appendix D.

Response:

The following response applies to Panel IRs 1.16.4 to 1.16.7.

The Company believes its methods used to estimate the consumption credits are reasonable and should continue. As discussed in the response to Panel IR 1.16.1, consumption is a credit in the MX Test, with no intent to compare the credit to actual consumption, regardless of the rate class of the customer.

Nevertheless, FEI endeavors to respond below to the concerns identified by the Panel in this series of questions.

It is too early to draw conclusions about the consumption patterns of these commercial customers. The data referenced in the IR comes from the 2014 Year End MX Report which is limited to years one (Tables 6-2 and 6-5) and two (Tables 7-2 and 7-5) of the 60+ year life of a main extension. FEI expects that over time, consumption patterns will stabilize as these businesses mature and, it is also likely that additional infill customers, not a part of the original MX Test, will attach to the extension.[31] FEI notes that there is significant variability in the tables, both positive and negative, from 83% above the consumption credit (Table 6-5: Year 1 Rate 2) to 67% below the credit (Table 6-5: Year 1 Rate 3).

The only way to truly assess the economic impact of the main extensions in question would be to assess the actual number of customers, including RS2 and RS3, the actual consumption and the actual costs to serve these customers over the entire life of the main. Given the impracticality of performing this exercise, the Company has proposed the use of the RIA which factors in all actual main extensions from 2008 to 2014, including those referenced in the IR, to show that customer rates have gone down as a result of capital growth during this time frame.[32]

[31] FEI Final Argument, November 27, 2015, p.12.
[32] IBID, p. 14.

Security

As noted in the Application record[33], FEI collects security from commercial customers on a case by case basis and is not proposing any changes in this practice. It is technically feasible to require potential commercial customers to provide a security deposit in support of their consumption forecasts, which could be fully reimbursed at a later date, once the customer has achieved a certain level of consumption. FEI has in the past required security of commercial customers where warranted. The primary issues from FEI's perspective are cost, resources and detrimental effects on all customers, and the absence of a sound rationale to warrant accepting these negative impacts, as opposed to technical feasibility.

No Rationale for Blanket Security Requirement

FEI believes its customers provide reasonable consumption credit estimates. When FEI develops consumption credit estimates for the MX Test, it may adopt techniques such as using floor space and energy use intensity factors, BTU requirements of equipment, firing rates of equipment, all developed in conjunction with customers who hire professionals for such matters including architects, mechanical engineers, and equipment manufacturers. This is described in the response to Panel IR 1.16.1. There will always be consumption variances from the expected load of a commercial consumer as the building or facility occupants and processes may vary compared to the design expectations, but the estimates provided by the professionals are the best available at the time using the best available information and the combined knowledge of the professionals and FEI. FEI believes that the process and resultant load expectations are reasonable.

FEI does not have empirical data to suggest that the past security practices have resulted in a detrimental impact to existing customers. The Company believes that introducing more stringent security requirements, when there is not a practical or empirically driven reason to require additional security, would unnecessarily dampen growth and therefore have a negative effect on existing customers' rates.

Implementing a blanket requirement for commercial customers to provide security would be treating new customers in a different manner than existing customers as existing customers do not have a volume requirement; in fact, FEI specifically encourages existing commercial customers to use less gas through energy efficiency programs.

Practical and Cost Considerations Regarding Security

Instituting such a requirement would introduce the following issues:

- A significant administrative burden would arise since a monitoring and refunding process would have to be designed, implemented and managed. This would require customized information systems to track consumption for each commercial customer project along with the human resources to oversee such as process. As provided on the record, the cost to provide the annual MX report is already $100,000 per annum.

[33] IBID pp. 53-54.

Providing additional consumption monitoring, oversight and reporting would add to this amount.

- There is a practical question of how long the consumption would need to be monitored and refunded. For example, it could be for 5 years (the current forecast window in the MX Test), 20 years (the current DCF term) or 60+ years (the life of a main extension)

- There is another practical question as to whether the refund amount would need to take into account the consumption of infill customers that materialize over the life of the main (i.e. consumption that was never contemplated in the original MX Test)

- Rates would eventually rise since commercial customers would decide against the use of natural gas if they had to tie up capital in the form of a consumption security deposit. When fewer customers have to pay for the cost of service, all else equal, rates go up

- Refunds would be impractical in instances when customer consumption is higher than forecast. Specifically, in order to treat all customers fairly, the Company would have to refund amounts over and above the security deposit if consumption was higher than forecast

- A problem with misplaced accountability would develop with FEI's commercial customers since the Company would in effect be requiring them to be responsible for variables beyond their control such as the owner/tenant occupancy rate and appliance usage by owners in MFDs for example. The Company expects that the marketplace and some interveners would object to this requirement

- Lastly, once on the system, the new commercial customer may take advantage of energy efficiency programs which would reduce their consumption. This would lead to a paradox whereby the customer receives incentives to reduce consumption but then is not able to receive a refund of their security deposit because their consumption is too low.

Benefits and Risks of Forecast Variances

As far as the benefits and risks of over-forecasted and under-forecasted commercial consumption to the commercial customer and to FEI (Panel IR 1.16.7), FEI cannot conduct a financial analysis without specific information on an individual main extension. In general terms, over-forecasting of commercial consumption will reduce the CIAC and result in higher costs being added to rate base, and under-forecasting commercial consumption will increase the CIAC and result in lower costs being added to rate base at the time the main is completed. Over the life of the main, however, the over-forecasting or under-forecasting of consumption during the relatively short (5 or 10 year) consumption forecast term of the MX test is not as relevant to the actual benefits and risks. It is the consumption that is added over the life of the main that ultimately drives the benefit of the main extension, and the more the revenue collected over the life of the main extension exceeds the original costs to install the main, the greater the benefit for customers. As discussed above, the RIA is the recommended measure of the actual

risks and benefits to new and existing customers since it factors in actual consumption over an extended time frame, including consumption of commercial customers.

16.5 Please explain the feasibility of FEI requiring potential commercial customers to provide a security deposit in support of their consumption forecasts, which could be fully reimbursed at a later date, once the customer has achieved a certain level of consumption.

Response:

Please refer to the response to Panel IR 1.16.4.

16.6 Please explain the feasibility of FEI using floor space areas and energy use intensity factors, in a similar manner to thermal utilities, to aid internal checks of consumption forecasts submitted by potential commercial customers.

Response:

Please refer to the response to Panel IR 1.16.4.

16.7 Please discuss the benefits and risks of over-forecasted commercial consumption and under-forecasted commercial consumption to (i) a potential commercial customer; and (ii) FEI. Please include a discussion of financial benefits and risks with your response.

Response:

Please refer to the response to Panel IR 1.16.4.

G. COMMISSION CONCERNS – FORECASTING ACCURACY

17.0 Committing to forecasts

Reference: SQUAMISH GAS CO. LTD. MAIN EXTENSIONS

IR Appendix B, Squamish Rate Stabilization Agreement dated July 13, 1992;

IR Appendix C, Commission Letter dated February 28, 1994;

Letter L-46-94 dated December 22, 1994

On July 9, 1992 the Province of British Columbia (Province) and Squamish Gas Co. Ltd. (Squamish Gas) entered into a Squamish Rate Stabilization Agreement which, among other matters, established competitive fuel prices for each customer class, a requirement for Squamish Gas to report the actual annual results for Commission review and that Pacific Coast Energy Corporation would pay Squamish Gas any deficiencies that arise when the Squamish Gas revenue is less than the cost of service.

By letter dated February 28, 1994 the Commission acknowledged that in order to mitigate the risk on the Rate Stabilization Facility (RSF), Squamish Gas made a commitment to be responsible for the variance between forecast and actual results for capital costs, customer consumption and attachments on approved mains extensions. To establish the validity of the undertaking the Commission required Squamish Gas to provide a review of all approved extensions on a year by year basis.

By letter L-46-94 dated December 22, 1994 the Commission noted that major extensions impose a higher risk on the RSF and therefore more clearly defined the form of the year-end review. The year-end RSF impact analysis was to report on the extensions completed in the year showing the results on the RSF draw/repayment schedule from actual construction costs, customer additions and volume additions. Settlement of the RSF draw variance was expected to be made at the end of five years for small extensions or when the variance exceeds $10,000 for large extensions.

17.1 Would FEI be willing to commit to be responsible for the variance between forecast and actual results for capital costs, customer consumption and attachments in future main extensions? If not, why not?

Response:

This IR addresses Panel IRs 1.17.1 and 1.17.3.

No, FEI would not be willing to commit to the above noted responsibilities. That requirement would be contrary to the well-established principle that prudently incurred costs are recoverable in rates. In BC, prudence is assessed based on information known at the time a decision is

made, and without the benefit of hindsight. Provided that FEI is taking reasonable steps to forecast costs and consumption in the context of the MX Test, then these investments are prudent and recoverable by definition.

FEI has explained how it forecasts costs and determines the consumption input, and why it takes that approach. FEI believes that the approach taken is reasonable and proportional given the size of the extensions typically involved. In the event that the Commission is concerned about past variances and these practices, the most practical approach is for the Commission to provide its views of other cost effective measures that could be taken. While those measures would not be mandatory given that they are properly operational decisions left to the utility, it would provide an indication of the Commission's view of prudent activity.

The analogy to the Terasen Gas (Squamish) Inc. ("Squamish") situation has superficial appeal, but it is actually a different scenario due to the unique framework that governed the utility at the time.

In short, the regulatory construct for Squamish was significantly different than FEI. Squamish was operated under a variety of agreements with the Provincial government that not only set rates (which included provisions for the Province to pay the difference between what rates recovered and the actual utility revenue requirement) but also laid out the MX mechanisms. These agreements included:

- The Vancouver Island Gas Pipeline Act
- The Vancouver Island Gas Pipeline Agreement
- The Rate Stabilization Agreement

Squamish rates were not cost of service rates but used prices of competing energy sources (oil and electricity) as proxy from which the natural gas rate was set. The natural gas rate was set to be lower than either the oil or electricity price. In practice the price of natural gas was set as a discount to oil (as electricity was priced higher).

As the rate was not cost of service based, if the revenues that resulted from the rate were lower than the cost of service, the Rate Stabilization Agreement (RSA) provided that the Province fund this variance via the Rate Stabilization Fund (RSF); thus keeping the utility whole.

To mitigate the potential liabilities to the province, unlike FEI, all main extensions were reviewed and approved by the Commission. Squamish had its own Commission approved MX Test that was different from FEI's test. The Commission reviewed and approved main forecast costs, forecast attachments and forecast consumption.

To the extent that the main extensions were underperforming, Squamish was required to pay back the Province (as noted above), but only when Squamish was drawing on the RSF. If the RSF was in a positive position there was no requirement to pay the Province. It is important to

note that the price of oil and gas played a large role in the RSF. If oil was substantially higher than gas the rate Squamish customers paid for gas could be substantially higher than the cost of service (which includes the cost of gas). However, if the oil price is low and the price of gas is high the RSF would likely be in a draw position because the rate Squamish was able to charge customers would not recover the cost of service. In this second scenario, Squamish also would be in a position to pay the Province for underperforming mains. In the first scenario, the RSF was in a positive position and no payment to the province was required regardless of the performance of a main.

It is therefore not possible to compare, or draw a parallel between the mechanisms and regulatory construct in place with Squamish and what FEI is proposing today.

With the benefit of hindsight it is also possible to now see the flaws in the Squamish model as well. These are outlined below:

1. The RSF was affected by oil and electricity pricing and the resultant Squamish rate setting. As such any draw or surplus position is a result of timing of these market prices and the relationship to the Squamish rate. Therefore any repayment to the Province was affected by this interplay. In fact, because of the dramatic drop in gas prices in 2008, the payment made to the Province at the time of amalgamation would not have occurred had Squamish not amalgamated at the time.

2. Similar to the arguments in this proceeding, reviewing a forecast to actuals early in the life of the main cannot result in a reasonable understanding of what may occur on a main by the end of the life of the main. In other words no consideration is given for the added attachments that occur over the life of the main. Forecasts for future revenues and costs must be made that will invariably be incorrect. Therefore making a payment as a result of a forecast of future activities is rife with potential for speculation. For example, in 2007, the Brackendale main extension in Squamish was underperforming (costs were higher and consumption was lower). This impacted the position of the RSF and as such Squamish ended up paying the province over $1 million as part of the amalgamation of Squamish because of this lower performing main. However, not only did the price spread between gas and oil change which likely would have resulted in a surplus position in the RSF therefore causing payments to not occur, but the Brackendale main continues to add customers that were not forecast in the original application. The Brackendale main was also integral to the Squamish-Whistler pipeline. The Brackendale main is still less than 20 years old, and has over 40 years of life left (see also FEI response to BCUC IR 1.3.1). It is expected that additional attachments will continue to occur over the life of the main. These considerations were not acknowledged or reviewed as part of the forecast to actual reviews in 2007.

Please also refer to FEI's response to Panel IR 1.17.2.

17.2 Does FEI agree that main extensions results should be evaluated at the end of five years to determine the impact on future revenue deficiencies caused by those components which are FEI's responsibility namely the variance between forecast and actual results for capital costs, customer consumption and attachments?

Response:

No, an automatic review of the nature described is unwarranted and is at odds with the presumption of prudence that underlies utility rate regulation. There must be evidence that first rebuts the presumption of prudence for the Commission to conduct a prudence review. Additionally, reviewing a main in year five of the 60+ year life of the main, cannot provide an accurate view on the economic performance of the main.

FEI is proposing to conduct the RIA (an analysis that does not rely on forecasts but uses actual costs and revenues) periodically to determine whether attaching customers has resulted in a net benefit to existing customers (although in the current RIA, only the first 1-7 years of costs and revenues are reviewed, far short of the life of the main). The primary rationale for conducting the RIA is to assist in determining whether changes should be made to the MX Test on a prospective basis. A negative RIA result could also provide a reasonable basis for the Commission to examine why this was occurring (i.e., it might rebut the presumption of prudence). However, as described in the response to Panel IR 1.17.1, prudence must ultimately be assessed without the benefit of hindsight. There are a variety of potential causes for variances in costs or revenues unrelated to imprudent conduct on the part of the utility.

17.3 The commitment by Squamish Gas to be responsible for the variance between forecast and actual results for capital costs, customer consumption and attachments mitigated the potential impacts on the RSF. If the Commission is concerned about the potential impacts on customer rates from FEI mains extensions, what is FEI's view if the Commission was to require FEI to be responsible for the variance between forecast and actual results for capital costs, customer consumption and attachments in future main extensions?

Response:

Please refer to the responses to Panel IRs 1.17.1 and 1.17.2.

Attachment 2.1

REFER TO LIVE SPREADSHEET MODELS

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

Attachment 12.3

The MX test and SLCA are two completely different pricing mechanisms. The Company has recognized there may be some confusion around the mechanisms and how various numbers are being used throughout this IR set and has therefore provided the explanation, diagrams and accompanying table below to provide context.

In Appendix A of the Application EES consulting stated:

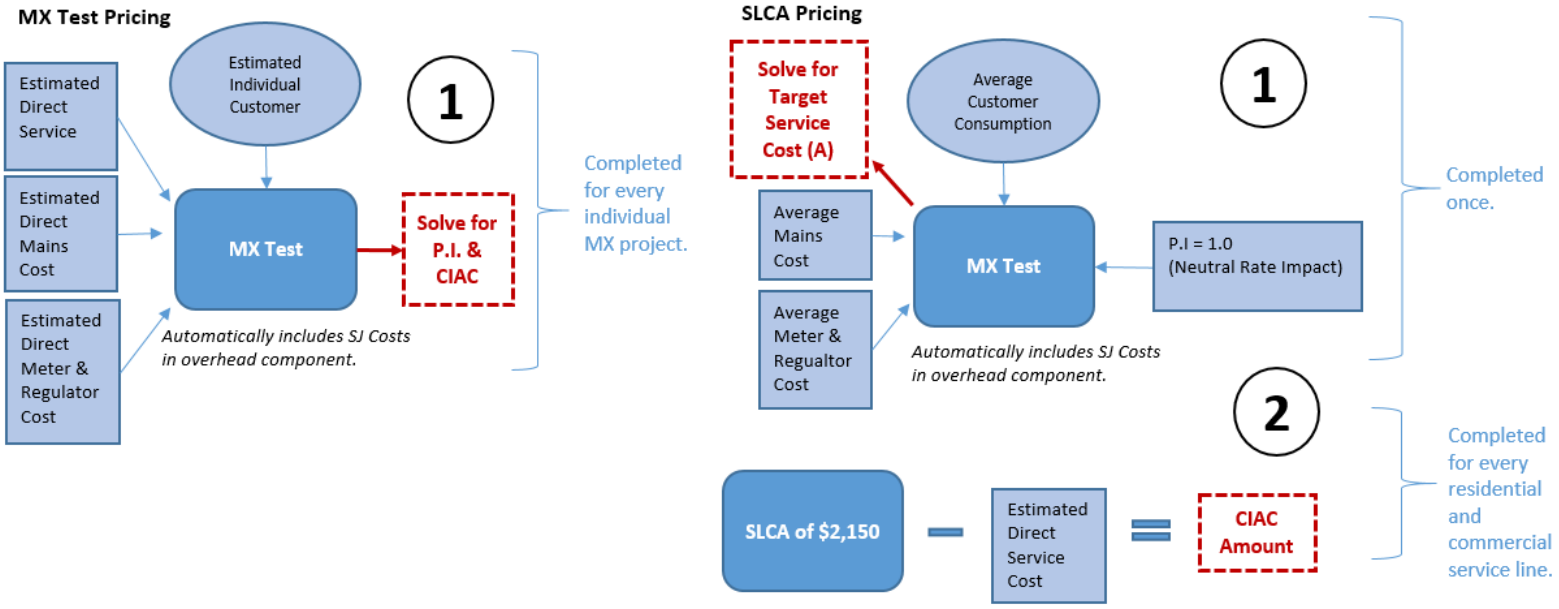
> When a main extension is not needed, there is a service line cost allowance (SLCA) that is applicable. The SLCA amount is calculated using the MX test, however, assumptions are standardized to provide a fixed amount that can be applied for new service lines without having to run the MX test for each new customer that connects to an existing main.[1]

The MX test provides a more detailed approach to gas service pricing than the SLCA approach does. However, because of the complexity, it is cost prohibitive to conduct an MX test for each service line installed by the Company since there are well over 10,000 per year; the MX Test is only performed when there is a main installed. Therefore the SLCA was developed as a cost effective alternative of determining a CIAC for a new service line. The SLCA analysis essentially determines an MX test for an average customer that is based on an average of the actual costs and consumption for the most recent historical year of data that results in a PI of 1.0 (neutral impact).

The MX test run using average costs results in a target service line cost value that is used to set the SLCA amount. The SLCA is then used as a benchmark for the cost of each new service line. If the new service line cost will be more than the cost supported by the average MX test, then a CIAC will be required by the customer to bring the Company's cost back to the average.

The two diagrams and the table below illustrate the primary difference between the MX Test (using specific inputs and solving for a PI) and the SLCA pricing methodology (using a PI of 1.0 and solving for the target service cost).

[1] FortisBC Energy Inc. (FEI) 2015 System Extension Application – Appendix A: EES Consulting – FEI System Extension Policy Review Report. p.13.



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	MX Test	SLCA Analysis
Use	Used to connect main extensions and vertical subdivisions. (Larger capital amounts and lower number per year)	Used to connect service lines where no main extension is required. (Smaller capital amounts and large number per year)
Type	Separate, before the fact estimation for each customer to determine a PI and CIAC amount.	Combined, after the fact analysis based on all service lines and customers to determine an average MX test.
Costs Included	Forecast individual direct costs for mains, services, meters and regulators.	Actual average direct costs for mains and meters and regulators. The service cost is determined by the MX test as an output (see diagram above)
SJ Costs	Automatically included in overhead component of MX test.	Automatically included in overhead component of MX test. Also included again in determination of SLCA amount.
Consequence of Including SJ costs	The individual PI of each customer's MX test is reduced due to the extra costs and this increases both the likelihood and the amount of a CIAC.	The SLCA offering is reduced below what it otherwise would be by including SJ costs.
End Result	The MX Test calculates a PI value for each customer.	Each new service line is assessed against the SLCA amount.
Customer Impact	The customer pays a CIAC if this PI is less than 0.8.	The customer pays a CIAC if their service cost is greater than the SLCA.

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Attachment 14.2.4

REFER TO LIVE SPREADSHEET MODEL

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