CREATIVENERGY

November 8, 2018

Via Email

Mr. Patrick Wruck
Commission Secretary
BC Utilities Commission
Fourth Floor, 900 Howe Street, Box 250
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

Re: Creative Energy Application – Application for Certificate of Public Convenience and Necessity for the Expo–Beatty Plants and Reorganization IR 2 Submission

With this letter, Creative Energy is filing a completed set responses to the following information requests and asks that each response be filed as a separate exhibit:

1. BCUC Non-confidential
2. BCUC Confidential; and
3. CEC;

Should you require any further information, please do not hesitate to contact Kelsey Devine at 604-692-2118.

Yours truly,

(Original Signed)

Krishnan Iyer
President & CEO
Creative Energy Vancouver Platforms Inc.

REQUESTOR NAME:	**BCUC**
INFORMATION REQUEST ROUND NO:	**2**
APPLICANT:	**Creative Energy Vancouver Platforms Inc.**
DATE:	**November 8, 2018**
PROJECT NO:	**1598962**
APPLICATION NAME:	**Creative Energy Vancouver Platforms Inc. Application for a CPCN for the Beatty-Expo Plants and Reorganization**

Creative Energy Vancouver Platforms Inc.
Application for a Certificate of Public Convenience and Necessity
For Beatty-Expo Plants and Reorganization

CREATIVE ENERGY VANCOUVER PLATFORMS INC.
RESPONSE TO INFORMATION REQUEST NO. 2

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A. ASSESSMENT OF THE EXISTING PLANT

83.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1 (Application), Section 6.2, pp. 18-25; Exhibit B-5, IRs 1.2, 1.2.1, 1.2.2, 1.3, Attachment 1.2
Assessment of boilers and other major equipment Condition of Existing Plant

In response to British Columbia Utilities Commission (BCUC) Information Request (IR) 1.2 Creative Energy Vancouver Platforms Inc. (Creative Energy) listed significant changes it has made to the Beatty Plant between 2013 and 2017:

- Boiler #2 update of controls and addition to Delta V system;
- Boiler #4 burner management system upgrade;
- 1 new air compressor installed;
- water softener resin replaced in one of the three water softeners;
- new work platform on top of Boiler #3, access to steam flow meter;
- Boiler #6 new oxygen analyzer;
- Boiler #5 new steam flow and drum transmitters;
- new UPS systems for Boilers #2 and #4 and for the Delta V system;
- new operator station and monitors for Delta V system;
- major service of electrical transformer;
- new air header distribution to all boilers; and
- Sofame drain line repipe to plant sump.

83.1 In the absence of the Proposed Project, please discuss any significant changes or work that would be required to maintain the Beatty Plant over the next 5 years.

Response:

In the absence of Proposed Project, Creative Energy would propose to pursue the In-situ Equipment Replacement Alternative outlined in section 14 of the Application. The major components of the Alternative are outlined in section 14.

83.1.1 If Creative Energy has not assessed the work required, please explain why not.

Response:

Please see the response to BCUC IR 2.83.1.

In response to BCUC IR 1.2 Creative Energy provided a copy of the Fosdick & Hilmer 2013 Condition Assessment Report (Attachment 1.2).

In response to BCUC IR 1.2.1, which requested a comparison of the key findings of the 2013 and 2017 Fosdick & Hilmer Condition Assessment Reports, Creative Energy stated: “there are no significant changes.”

83.2 Given the significant changes, Creative Energy has undertaken between 2013 and 2017 and the fact that there are “no significant changes” to the key findings of the 2013 and 2017 Condition Assessment Reports, please confirm, or explain otherwise, that the condition of the Beatty Plant has not deteriorated over the period 2013 to 2017.

Response:

Not confirmed. The condition of the Beatty Plant equipment has deteriorated over the period from 2013 to 2017 consistent with normal aging and wear and tear of operating the system. There have been a number of changes to the plant which are in keeping with normal maintenance of the system, but these changes cannot be considered to be sufficient to stave off plant deterioration.

An important perspective is that the ancillary parts of the plant can be maintained or replaced on an ongoing basis, which prolongs the life of the overall plant somewhat, but there are major components, such as boilers and dearators, which eventually need to be replaced. At the heart of the Proposed Project is the need to replace the end-of-life boilers.

In regard to the condition of the boilers, Fosdick & Hilmer indicate in their most recent report (Appendix A at pp. 12-13) that their 2017 observations are based on a tour of the plant and the same 2010 to 2012 boiler inspection results as they used for their 2013 report. Fosdick & Hilmer was not asked to update their observations on boiler condition. Had there been significant items of deterioration outside the course of normal aging and wear and tear, Fosdick & Hilmer would have been requested to address such changes in condition in the 2017 report.

Fosdick & Hilmer note in their 2017 report the significant limitations (plant age, plant capacity, reliance on key boilers, air emissions, and cost to maintain aging equipment) and challenges (confined space and layout of retrofitted building) with the plant. These issues existed in 2013 and there have been no significant changes in relation to these long-standing issues (neither improvement nor decline) except that the plant has aged further and been subjected to further wear and tear, and major boilers are now at the end of their expected life.

83.2.1 If confirmed, please explain why, from a technical perspective, the Proposed Project is required at this time.

Response:

Please see the responses to BCUC IRs 2.83.2, 2.83.2.2, 2.83.3 and 2.83.4.

83.2.2 If not confirmed, please provide information on how the condition of the Beatty Plant has deteriorated over the period 2013 to 2017, such that the Proposed Project is required at this time.

Response:

The following outlines the deterioration and obsolescence of major plant equipment over the last several years. However, addressing the age and deterioration of these pieces of equipment is not the only driver for the Proposed Project. There are long-standing issues with the plant and the building that need to be addressed. The opportunity of proceeding with the Proposed Project now addresses multiple needs simultaneously and is better for customers and the public than the Alternative of continuing to rely on the existing plant and in-situ replacements and upgrades.

Boilers #1 and #2 are now more than 50 years old, and their condition includes but is not limited to the following deteriorations:

- **Their refractories inside and on the front burner wall need to replaced**
- **Any work on the front burner wall would be expected to be upgraded as well at this time**
- **Boiler #1 controls are outdated and would need a significant upgrade**
- **Both Boiler #1 and #2 should have new up to date Burner Management systems installed if they were to be retained**
- **Both burners could also be upgraded to Low NOx burners from an emissions stand point**

The backup foil oil tanks are also 50 years old:

- **Tank upgrades are required**
- **All pumps and controls replaced for Fuel Oil firing (upgraded)**

Boiler #5 should also be upgraded

- **Controls are outdated and should be upgraded**
- **Burner management system (BMS) and burner is out of date and upgraded BMS would increase efficiency and reduce NOx emissions**

83.2.2.1 Please explain why this deterioration is not addressed in the Fosdick & Hilmer Condition Assessment Report.

Response:

Please see the response to BCUC IR 2.83.2.

In response to BCUC IR 1.3, Creative Energy stated:

> Three of the six boilers in the plant are at or near the end of life. Additional benefits from the replacement of these boilers and upgrades to the building and office space include improving efficiency, reducing GHG emissions, improving local air quality, improving operability of plant, easing future replacement of remaining equipment, maintaining reliability and mitigating risks to staff, the public and customers posed by catastrophic failure.

83.3 Please confirm, or otherwise explain, that the reason that the Proposed Project is required at this time is three of the six boilers are at or near the end of life.

Response:

There are multiple drivers for the Proposed Project, including but not limited to the age of three of the six boilers (refer to section 9 of the Application). While Creative Energy may be able to continue to rely on the existing plant for a few more years, proceeding with the opportunity of the Proposed Project now address multiple needs simultaneously and is better for customers and the public than the Alternative of continuing to rely on the existing plant and in-situ replacements and upgrades by Creative Energy.

83.4 Please explain how the conditions of the three boilers have deteriorated.

Response:

Section 6.2 of the Application (pages 20 to 22) provides Creative Energy's assessment of each of the six boilers. Operations staff have reduced the functional capacities of both Boilers #1 and #2 because they show significant stress to the internal and external casings, and refractory between casings and within the furnace itself. Boilers #1 and #2 show evidence of boiler tube stress if operated at or near

full fire. The Boiler #4 tubes become plugged yearly due to scale accumulation creating significant annual maintenance issues.

83.5 Please explain why the boilers were not replaced from 2013 to 2017.

Response:

Creative Energy has been exploring options for refurbishing or replacing the end-of-life components of the steam plant for a number of years. The company had been unable to find a solution that addresses all the needs satisfactorily prior to identifying the Proposed Project, which has been in development since mid-2016. Further, replacing the boilers without the other elements of the Proposed Project and benefits of the larger redevelopment would have resulted in higher costs and more risk for ratepayers, and would not have left the seismic risk largely unchanged.

83.6 Please explain what assessment Creative Energy has undertaken to determine the viability of extending the life of the three boilers.

Response:

No formal assessment has been undertaken. Creative Energy considers that relying on extending the life of the 50-year old boilers would pose significant risk of service interruption for customers, including the risk of catastrophic failure. The approach would not be prudent in the context of the Creative Energy system, which has a single plant and does not have N+1 redundancy. Adding redundancy would reduce the risk from aging equipment but would also entail additional costs to ratepayers, without the other benefits of the Proposed Project.

83.6.1 If no assessments have been undertaken, please explain why.

Response:

In the professional operating experience of Creative Energy staff, no investment in extending the life of the boilers can provide the same benefits as replacing the boilers. Moreover, the options are limited.

84.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1, Section 9.1, p. 31; Appendices G to A, p. 16; Exhibit B-5, BCUC IR 2.1, 2.2, Attachment 1.2, p. 12; Exhibit B-6, CEC IR 62.9
Maintain reliable service to customers

In response to BCUC IR 2.1 Creative Energy stated:

> Appendix A of Appendix G of the Application provides a condition assessment of the plant, including Fosdick & Hilmer's views on the risks of the existing plant.

Page 16 of the 2018 Fosdick & Hilmer Condition Assessment Report provides the following risk level allocation:

CHDL	Risk Level Allocation			
	1	2	3	
Evaluated Disciplines				
Plant Capacity		X		Firm capacity short of peak demand.
Staffing & Operations		X		Good day-to-day management and operations team Heavy dependence on the two boilers connected to the condensing economizer
Environment		X		Future low NOx emission requirements relative to existing burner capabilities; age and materials of construction leave existing fuel oil tanks vulnerable to leak and cleanup hazards
Maintenance	X			No major maintenance items observed.
Control Systems	X			Outdated pneumatic controls on boilers no. 1 and 2. Not all auxiliaries on plant DCS.
General Condition	X			Plant is generally well kept given less than optimal layout of boilers and auxiliaries

Page 12 of the 2013 Fosdick & Hilmer Condition Assessment Report provides the following risk level allocation:

CHDL	Risk Level Allocation			
	1	2	3	
Evaluated Disciplines				
Plant Capacity		X		Firm capacity short of peak demand.
Staffing & Operations		X		Good day-to-day management and operations team Heavy dependence on the two boilers connected to the condensing economizer
Environment		X		Future low NOx emission requirements relative to existing burner capabilities; age and materials of construction leave existing fuel oil tanks vulnerable to leak and cleanup hazards
Maintenance	X			No major maintenance items observed.
Control Systems	X			Outdated pneumatic controls on boilers no. 1 and 2. Not all auxiliaries on plant DCS.
General Condition	X			Plant is generally well kept given less than optimal layout of boilers and auxiliaries

84.1 Given that three of the six boilers in the Plant are at or near the end of life, and with reference to your response to IR 83.4, please explain why the Risk Level Allocation has not changed between 2013 and 2017.

Response:

On page 3 of the front part of Fosdick & Hilmer's 2018 report, Fosdick & Hilmer highlight the several significant limitations of the plant, including equipment age. Please also note Fosdick & Hilmer's observations beginning on pages 6 and 12 of Appendix A of the report.

In regards to the risk level allocation above, there is a combination of factors at play including the age of the boilers, the ongoing efforts of operating staff to inspect and maintain the boilers, the inspection result, and so on. On page 12, Fosdick & Hilmer note that they reviewed boiler inspection results from 2010 to 2012, which were the same results reviewed for the 2013 report. Please refer to the response to BCUC IR 2.83.2.

In response to BCUC IR 2.2 Creative Energy stated

> Creative Energy has not calculated the probability of steam plant failure. Please see the response to BCUC IR 1.2.1. The consequences of equipment failure could be high because Creative Energy provides service from a single plant with minimal internal redundancy. In the event of a catastrophic plant failure, recovery could take a long time given the lead time for major equipment and difficulty of removal and installation of equipment within the constrained layout of the current plant.

Commercial Energy Consumers Association of British Columbia (CEC) IR 62.9, requested an explanation as to whether Creative Energy has developed any key objectives when negotiating the Trust and Development Agreement. In response, Creative Energy stated:

> Creative Energy's primary objectives for the negotiations were to secure major upgrades to the plant and office space at the least possible cost and risk to ratepayers in order to:
> - replace equipment at or near end of life equipment,
> - maintain reliability,
> - <u>reduce risks of catastrophic failure</u> [Emphasis added]

84.2 Given that the probability of steam plant failure has not been calculated, please discuss how Creative Energy assesses, monitors and mitigates the risks associated with steam plant failure.

Response:

Creative Energy is a First Class thermal plant, regulated by Technical Safety BC. Creative Energy employs full-time operations staffing in combination with a 'Delta V' control system to continuously monitor and safeguard the plant. The operations staff monitor a large number of operating parameters to detect out-of-balance conditions. In addition, annual maintenance is conducted in keeping with industry best practices, including inspections by Technical Safety BC inspectors of all pressure vessels. The diligent, meticulous nature of these programs is intended to assess, monitor and mitigate the operating risks of the steam system.

84.2.1 Please discuss how these risks were addressed in the negotiation of the Trust and Development Agreement.

Response:

In addition to risks associated with the aging steam plant, the building housing the plant does not conform to modern seismic and fire safety standards. A significant seismic event could damage the building and render the plant inoperable for a period of time. A temporary replacement solution could also have considerable cost and lead time.

An additional risk to steam service arises from the fact the plant currently does not have sufficient redundancy to meet the load without Boiler #4. The lack of redundancy increases the risk of an extended outage, as discussed on page 6 of Appendix A to Fosdick & Hilmer's report. The risk is compounded by the lead time to procure and replace boilers of this size and type, and by the current plant layout.

The projects pursuant to the Trust and Development Agreement reduce these risks by replacing equipment at or very near the end of its life, removing the building housing the plant and replacing it with modern housing with improved access to remaining equipment for ease of future replacement, distributes generating equipment in two plants that will be built / upgraded to modern seismic standards. And the Trust and Development Agreement does this at considerably less cost and less risk than in-situ replacements and upgrades of the existing

plant by Creative Energy. This is true even if those upgrades were deferred for several years, which Creative Energy does not believe is prudent.

85.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1, Section 6.2 p. 23; Section 10.4.1, p. 41; Exhibit B-5, BCUC IRs 3.3.2, 3.4, 15.1, Attachment 3.1, pp. 6, 9; Attachment 15.3, p. 3
Assessment of boilers and other major equipment
Clear Sky Economizer

On page 41 of the Application, and with specific reference to the Expo Plant, Creative Energy states: The boiler package will also include primary and secondary economizers, further increasing the efficiency of the steam production.

85.1 Please explain whether the Beatty Plant will include primary and secondary economizers as part of the Proposed Project.

Response:

No, this has not been included in the schematic design work for the Beatty Plant.

85.1.1 If so, please provide details of the proposed economizers.

Response:

Please see the response to BCUC IR 2.85.1.

85.1.2 If not, please explain why.

Response:

The base assumption is that the Expo Plant will provide base load generation as it will have all new equipment providing enhanced efficiency, emissions and reliability. The renovated Beatty Plant will be used primarily as a peaking and backup facility.

Moreover, with the passage of time and/or if there is load growth, the boilers at Beatty will need to be replaced. It makes more sense to install economizers at the time of boiler replacement so that they can be designed to work well for the full life of the boilers.

In response to BCUC IR 3.3.2 Creative Energy stated: "The Sofame unit performance expectation is a fuel to water efficiency of 99%, as see [sic] in the two letters provided. Current measurements by operations staff show a typical estimated efficiency of 80%."

85.2 Please provide the two letters referenced in the response to BCUC IR 3.3.2.

Response:

The two letters were provided as Attachment 1.10 and Attachment 1.10.1 to the response to BCUC IR No. 1.

85.3 Please provide the calculations and the data used to estimate the 80 percent efficiency.

Response:

The calculation is as follows:

Total Steam Flow OUT (Distributed for the month) * 0.01178 (1178 Btu's /# steam at 185 psig) * 100/ Fuel Therms purchased for the same month

In response to BCUC IR 3.4 Creative Energy stated:

> Creative Energy does not have specific information on the original design life of the Clear Sky economizer, except that the economizer was installed pursuant to an ESCO-type agreement that expires on December 31, 2019. <u>It is reasonable to assume that the contract term reflects the design life of the unit</u>. Additionally, there is no residual book value for the unit in 2020 as the original cost was paid by the service provider and the unit will be returned at no cost to Creative Energy at the end of the contract term. [Emphasis added]

85.4 Please discuss whether Creative Energy also considers it reasonable to assume that the contract term reflects Clear Sky Energy Ltd.'s desired financial rate of return for the unit.

Response:

It is possible; however, Creative Energy could only speculate about Clear Sky Energy's desired financial return.

Page 9 of the Energy Services Agreement between Clear Sky Energy Ltd. and Central Heat Distribution Limited (Creative Energy) states:

> This contract shall commence on the date of execution hereof and continue until:
> (a) December 31, 2019. An additional contract term extension may be made if mutually agreed by the Client and the ESCO.

85.5 Please explain whether, in the absence of the Proposed Project, Creative Energy would extend the contract term with Clear Sky Energy Ltd.

Response:

This has not been determined at this time. If the Proposed Project does not proceed, Creative Energy will assess the economic and environmental consequences of the listed options.

85.5.1 If not, please explain why.

Response:

Please see the response to BCUC IR 2.85.5.

On page 23 of the Application, Creative Energy states: "Creative Energy has not separately costed a new economizer, but based on the cost of the original Clear Sky unit, the cost of a replacement economizer is estimated to be $1.4 million."

85.6 Please confirm, or explain otherwise, that the capital cost and the installation cost for the existing economizer was the responsibility of Clear Sky Energy Ltd.

Response:

Clear Sky Energy Ltd. paid for the entire purchase and installation costs of the economizer. Creative Energy pays the maintenance costs.

85.6.1 If not confirmed, please provide the costs borne by Creative Energy.

Response:

Creative Energy/CHDL did not pay for the purchase of or any of the installation costs.

85.7 Please confirm, or explain otherwise, that the estimated cost of $1.4 million for the replacement of the economizer assumes that Creative Energy would own and operate the new economizer.

Response:

Confirmed.

85.7.1 If confirmed, please discuss why, in the absence of the Proposed Project, an ESCO agreement would not be considered by Creative Energy.

Response:

In the absence of the Proposed Project, this would be considered. For the purposes of costing out this alternate, Creative Energy estimated the cost by the method described on page 23 of the Application. An ESCO arrangement could have been assumed in the Alternative presented in the Application, but it would not materially change the outcome of the analysis as costs would have been shifted from a one-time capital expense to a long term increase in operating costs.

85.7.2 If not confirmed, please provide a breakdown for the estimated $1.4 million replacement costs.

Response:

The $1.4 million cost estimate is based on the cost of the original unit adjusted for inflation.

In response to BCUC 15.1, Creative Energy stated:

In the absence of the Proposed Project, at the end of the Clear Sky agreement, Creative Energy would evaluate options for the Clear Sky unit, including:

a. Leaving the existing unit in service and investing capital to extend its life, restore the performance and maintain or improve the functionality
b. Replacing the existing unit with a new economizer either of this style or a more conventional technology
c. Removing the existing unit

The evaluation would consider environmental factors including performance, emissions reductions and water use, as well as economic, technical and operational factors. Significant analysis would be required to confirm a solution which meets the environmental, safety and economical objectives.

Creative Energy has elected to use a baseline with the Clear Sky unit removed at the end of the contract term. Another approach would be to assume the Clear Sky economizer unit would be replaced or capital invested to upgrade the existing unit as part of the baseline, and then treat the avoided capital cost as one of the benefits of the Proposed Project. Either approach could be used as the baseline for comparing the Proposed Project.

85.8 Please explain whether option (a) assumes that Creative Energy would extend the existing agreement with Clear Sky Energy Ltd.

Response:

For clarity, the referenced response indicates that in the absence of the Proposed Project, Creative Energy would evaluate the listed options and the factors that would have to be considered. The options have not been assessed at this time.

85.8.1 If so, please explain whether the capital costs required to extend and restore the life of the economizer would be borne by Creative Energy or Clear Sky Energy Ltd.

Response:

Please see the response to BCUC IR 2.85.8.

85.8.1.1 If Creative Energy, please explain why.

Response:

Please see the response to BCUC IR 2.85.8.

85.9 Please explain whether option (b) assumes that a new economizer would be procured under a similar ESCO type agreement to that of the existing Clear Sky Energy Ltd. agreement.

Response:

For clarity, the referenced response indicates that in the absence of the Proposed Project, Creative Energy would evaluate the listed options and the factors that would have to be considered. The options have not been assessed at this time. Option (b) does not assume any particular form of agreement. If an ESCO type agreement were offered, it would be assessed and selected if it provided more benefit to customers than a conventional procurement.

85.9.1 If not, please explain why not.

Response:

Please see the response to BCUC IR 2.85.9.

85.10 Please explain the circumstances under which Creative Energy would remove and decide not to replace the existing unit.

Response:

For clarity, the referenced response indicates that in the absence of the Proposed Project, Creative Energy would evaluate the listed options and the factors that would have to be considered. The options have not been assessed at this time.

Removing and not replacing the unit would happen if the costs of the unit significantly exceeded the economic payback of the efficiency improvements on an NPV basis over the life of the equipment. Other considerations would be similar to the drivers of this project – safety, reliability and air emissions.

85.11 Given Creative Energy states that in the absence of the Proposed Project it would "evaluate options for the Clear Sky unit" and that two of the three options identified in response to BCUC IR 15.1 propose to replace the economizer, please discuss whether Creative Energy considers it reasonable for the current plant gate efficiency of 82.7 percent to be used as the Baseline Efficiency for the Application.

Response:

Creative Energy has elected to use a baseline with the Clear Sky unit removed at the end of the contract term. Another approach would be to assume the Clear Sky economizer unit would be replaced or capital invested to upgrade the existing unit as part of the baseline, and then treat the avoided capital cost as one of the benefits of the Proposed Project. Either approach could be used as the baseline for comparing the Proposed Project, and the outcome would be unchanged.

85.11.1 If not, please explain why.

Response:

Please see the response to BCUC IR 2.85.11.

Page 3 of Fosdick & Hilmer's Efficiency Evaluation for Existing & Future Steam System report states:

Clear Sky Project Impact

The effect of the secondary economizer on the plant gate efficiency was determined based on energy metering provided with this equipment versus plant fuel usage for 2017 on a month by month basis. With this equipment a 2.73 percent fuel savings was realized in 2017.

85.12 Please provide the calculation(s) (in Microsoft Excel) used to determine the 2.37 percent fuel savings.

Response:

Please see Confidential Attachment 85.12.

85.12.1 Please provide the supporting data used in the calculation(s) provided in response to IR 85.12.

Response:

Please see the response to BCUC IR 2.85.12.

86.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1, Section 6.3 p. 23; Section 10.5.1, p. 51; Section 12, p. 61; Appendix A of Appendix G, pp. 13-14; Exhibit B-5, BCUC IR 4.4, 4.5, 4.10, Attachment 1.16, p. 12, Attachment 1.22; Exhibit B-5-2, BCUC IR 4.11
Assessment of boilers and other major equipment
Contamination

In response to BCUC IR 4.4 Creative Energy stated:

Please see Attachment 1.16 and Attachment 4.6. In 2013 a Stage 2 site investigation was conducted to assess as to whether or not contaminants exist in the soil and groundwater on the site. No significant contaminants were discovered. [Emphasis added]

Page 12 of the Limited Stage 2 Preliminary Site Investigation report prepared by PHH ARC Environmental Ltd. (Attachment 4.6) states:

> Localised, low level arsenic concentrations have been reported above the respective standard within the groundwater. It is considered that further investigation will be required to clarify the source of the arsenic at the time of Site decommissioning and/ or Site redevelopment. Further, investigation of APECs not assessed during this limited Stage 2 PSI, including internally located aboveground storage tanks (ASTs), should also be investigated at this time. [Emphasis added]

86.1 Please reconcile the two statements "[n]o significant contaminants were discovered" and "[l]ocalised, low level arsenic concentrations have been reported above the respective standard within the groundwater."

Response:

Creative Energy interpreted Attachment 4.6, the Stage 2 Preliminary Site Investigation report to indicate that the arsenic levels were sufficiently low as to not merit any significant action in advance of the site works at Beatty. The Stage 2 Preliminary Site Investigation report Executive Summary includes the above quote regarding low level arsenic and also advises that "there is no evidence of soil contamination above the CSR Industrial, Commercial or Residential Land Use standards".

86.2 Please explain whether Creative Energy has conducted further investigation(s) to clarify the source of the arsenic, as recommended by PHH ARC Environmental Ltd.

Response:

No investigation into the source of arsenic has yet been completed.

86.2.1 If so, please provide the results of the investigation(s).

Response:

Please see the response to BCUC IR 2.86.2.

86.2.2 If not, please provide the anticipated date for conducting further investigation(s).

Response:

Prior to start of work on the Beatty site.

86.2.3 If Creative Energy does not intend on conducting any further investigation(s), please explain why.

Response:

Please note that further investigations are the responsibility of the Developer. Creative Energy expects that the Developer will conduct further investigations prior to start of work on the Beatty site.

Page 12 of the PHH ARC Environmental Ltd. report further states: It is considered that the Client will be required to obtain a [Certificate of Compliance] from the [Ministry of the Environment], prior to any redevelopment.

86.3 Please confirm that Creative Energy is required to apply for a Certificate of Compliance (CoC) from the Ministry of the Environment (MOE).

Response:

Creative Energy is not, however we understand the Developer is required to make such application. While detailed construction sequencing has not been finalized, further investigations and application to the MOE for a CoC would be planned to be completed by the Developer in advance of the Beatty shutdown.

86.3.1 If confirmed, please provide the following:

a) name of party responsible for the application;

Response:

Please see the response to BCUC IR 2.86.3.

b) actual (or anticipated) application date;

Response:

Please see the response to BCUC IR 2.86.3.

c) copy of the application, if submitted;

Response:

Please see the response to BCUC IR 2.86.3.

d) anticipated application processing time;

Response:

Please see the response to BCUC IR 2.86.3.

e) anticipated approval date;

Response:

Please see the response to BCUC IR 2.86.3.

f) date by which the approval is required; and

Response:

Please see the response to BCUC IR 2.86.3.

g) risk to the Proposed Project in the event of a delay.

Response:

The financial risk to the Proposed Project is zero, as the Developer is responsible for the costs of investigated, remediating, obtaining approvals, and any delays arising from remediation. As the remediation work would be planned to complete in advance of Beatty shutdown #1, service risk to customers is also zero.

86.3.2 If confirmed, please explain whether the CoC would be required prior to commencing construction of the Expo Plant.

Response:

A CoC is not required for construction of the Expo Plant.

86.3.3 If not confirmed, please explain why a CoC is not required from the MOE.

Response:

Please see the response to BCUC IR 2.86.3.

In response to BCUC IR 4.5, Creative Energy stated: "The main risk associated with a leaking fuel tank is that the fuel has reached groundwater and migrated. If leaked fuel has migrated off site or under buildings, the costs of remediation will increase significantly."

86.4 In the event of ground contamination from the fuel tanks, please provide the party responsible for the following:

a) direct costs (e.g. ground remediation);

Response:

The Developer.

b) indirect costs (e.g. delay to schedule, personnel costs etc.)

Response:

The Developer.

87.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1, Section 6.3 p. 23; Section 10.5.1, p. 51; Section 12, p. 61; Appendix A of Appendix G, pp. 13–14; Exhibit B-5, BCUC IRs 4.4, 4.5, 4.10, Attachment 1.16, p. 12, Attachment 1.22; Exhibit B-5-2, BCUC IR 4.11
Assessment of boilers and other major equipment
Fuel oil storage

BCUC IR 4.10 requests details of any permits or approvals required for the removal of the existing fuel oil storage tanks. In response Creative Energy stated: "In 2008 Central Heat Distribution had a permit in place to remove the existing tanks and replace them with new under-ground fiberglass tanks. Please see Attachment 1.22."

87.1 Please confirm, or explain otherwise, whether the tanks were removed and replaced in 2008.

Response:

The tanks were not removed or replaced in 2008. The original 50-year old tanks remain in place.

87.1.1 If not confirmed, please explain why.

Response:

Creative Energy has no formal records to explain the rationale for this decision over a decade ago but operating staff from that period recall that the replacement costs were considered too high to justify the replacement.

87.1.2 If not confirmed, please explain whether the 2008 permit provided in Attachment 1.22 is still valid. Please provide the expiry date, if applicable.

Response:

Creative Energy does not have confirmation on the status of the 10-year old permit.

87.1.2.1 If so, please explain whether the permit applies to the replacement of the existing tanks as part of the Proposed Project.

Response:

The Developer will obtain a new building permit including permission to remove and replace the existing tanks.

87.1.2.2 If not, please explain why a permit was required in 2008 and is not required for the Proposed Project.

Response:

Please see the response to BCUC IR 2.87.1.2.1.

In response to BCUC IR 4.11 Creative Energy stated: "BC Fire Code requirements govern fuel oil storage tanks. Otherwise, no permits are expected to be required specifically for the fuel oil storage tanks."

87.1.3 Please provide details of any permits or approvals required under BC Fire Code Requirements.

Response:

Conformance with BC Fire Code is captured within the code compliance of the project, and approvals are granted by the City of Vancouver as part of the building permit issuance.

88.0 Reference: ASSESSMENT OF THE EXISTING PLANT
Exhibit B-1, Section 6.4 p. 24; Section 9.4, p. 34; Exhibit B-5, BCUC IR 5.2; Attachment 5.1, p. 3
Assessment of boilers and other major equipment
Air emissions

Page 3 of Attachment 5.1 to Exhibit B-5 provides Metro Vancouver's Emission Fee Details for the existing Beatty Plant:

Emission Fee Details for Permit Number GVA1041

Effective Date: January 01, 2018 to December 31, 2018

SOURCE	CONTAMINANT	DISCHARGE (t/y)	RATE $	AMOUNT $
01 Six boilers	Ammonia	2.793	30.00	83.79
01 Six boilers	Combustion Condensible Particulate Matter	4.956	300.00	1,486.80
01 Six boilers	Combustion Filterable Particulate Matter	1.659	300.00	497.70
01 Six boilers	Combustion Volatile Organic Compound	4.788	100.00	478.80
01 Six boilers	Methane	2.016	30.00	60.48
01 Six boilers	Nitrogen Oxides	243.894	50.00	12,194.70
01 Six boilers	Sulphur Oxides	1.785	100.00	178.50
			Total $	14,980.77

*Pro-Rated Discharge rounds tonnes per year to 3 decimal places.

88.1 Please explain which contaminants Creative Energy monitors for each boiler.

Response:

Creative Energy does not have Continuous Emissions monitoring on any of the existing boilers, and does not conduct any regular emissions testing.

88.1.1 If Creative Energy does not monitor or measure any of the contaminants listed in the table above, please explain how the discharge rates are estimated and provided to Metro Vancouver.

Response:

Creative Energy does not make estimates of the discharge for Metro Vancouver. Metro Vancouver makes its own calculations.

88.1.1.1 If Creative Energy does not monitor or provide any data to Metro Vancouver for calculation of the Emission Fee, please explain how the discharge rates are estimated.

Response:

Metro Vancouver makes its own calculations. Creative Energy is not privy to Metro Vancouver's calculations.

88.1.2 Please explain whether Metro Vancouver, or any other party, conducts regular or random checks and measurements of the existing plant's air emissions.

Response:

No, regular or random checks of air emissions are not made by any party.

88.2 Please explain whether the Proposed Project will result in a reduction in Emission Fees.

Response:

It is reasonable to expect so, as a large portion of the boiler capacity will be replaced with boilers which comply with current air quality standards, but Creative Energy cannot confirm at this stage of the project.

88.2.1 If so, please provide details of the cost savings, providing information on any assumptions.

Response:

Creative Energy cannot confirm or quantify the cost savings at this stage of the project. No fees reductions have been assumed in the economic analysis of the Proposed Project.

In response to BCUC IR 5.2 Creative Energy stated:

> The current project does not contemplate modifications to the existing boilers. The NOx emissions for each boiler are directly linked to the annual steam contribution and the burner technology installed on each boiler. For the three boilers which will remain at Beatty, the vast majority of the annual steam contribution will come from boiler #6, which is already equipped with a low-NOx burner. Boiler #3 will and boiler #5 have very small annual contributions going forwards, and it is expected that the Beatty plant will be compliant with the Metro Vancouver requirements. Boilers 3 and #5 will be upgraded in time as they reach their replacement years.

88.3 Please explain why the Proposed Project does not include the installation of Low-NOx burners and burner management systems at the Beatty Plant.

Response:

The Proposed Project will result in three boilers remaining at the Beatty Plant: Boilers #3, #5 and #6. The intention is to replace the remaining boilers over time as they reach end of life (to the extent possible), and at that time install burners which meet current standards. To replace the burners in advance of the boiler replacement date is very un-economic. Furthermore, the older boilers will be used in a peaking capacity, reducing their overall emissions.

Specifically:

- **Boiler #6 is equipped with a low-NOx burner.**
- **Boiler #3 is at near end of life, and will be used in a peaking capacity. It does not make economic sense to replace the burner at this stage, as the boiler may be replaced entirely in coming years.**
- **Boiler #5 is a small boiler which is largely used to serve very low demand periods and provide peaking in design winter conditions.**

88.4 Please confirm whether Creative Energy proposes to install continuous emissions monitoring at the Beatty Plant.

Response:

Confirmed, but not as part of the Proposed Project. This will be installed when the remaining boilers are replaced.

88.4.1 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.88.4.1.

88.5 Please confirm, or explain otherwise, whether Creative Energy proposes to install Low-NOx burners and state of the art burner management systems at the Expo Plant.

Response:

Confirmed.

88.5.1 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.88.5.

88.6 Please confirm, or explain otherwise, whether Creative Energy proposes to install continuous emissions monitoring at the Expo Plant.

Response:

Confirmed.

88.6.1 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.88.6.

On page 24 of the Application, Creative Energy states: "Metro Vancouver currently permits the plant to emit nitrogen oxides (**NOx**) at 80 ppm. Metro Vancouver's current general standard is significantly lower at 30 ppm."

88.7 Please confirm, or explain otherwise, whether one permit will be issued for both the Beatty Plant and the Expo Plant.

Response:

Creative Energy expect to have separate permits for each plant, but we do not have a formal decision on the matter from Metro Vancouver at this time.

88.7.1 If not confirmed, please confirm whether two separate permits will be required.

Response:

Please see the response to BCUC IR 2.88.7.

88.7.2 If not confirmed, please explain the permitting process for each plant.

Response:

Creative Energy, with support from WSP, is applying to Metro Vancouver for a permit for the Expo Plant, and leaving the existing permit for the Beatty Plant in place. When any new boiler is installed at Beatty, a new permit will be required for the plant at that time. There is a possibility that Metro Vancouver will require Creative Energy to implement changes at Beatty to improve the air emissions in advance of boiler replacement, but at this time the current permit is expected to be retained for Beatty.

88.8 Given that the Proposed Project does not include the installation of Low-NOx burners and burner management systems at the Beatty Plant, please explain how the Beatty Plant will be able to meet Metro Vancouver's "current general standard" of 30 ppm.

Response:

As there are no boilers being installed at the Beatty Plant, we do not intend to apply for a permit for that plant. A new permit will be required when a replacement boiler is installed at Beatty.

88.8.1 If the Beatty Plant will not be able to meet the 30 ppm standard, please explain the permit process for the Beatty Plant.

Response:

Please see the responses to BCUC IRs 2.88.7.2 and 2.88.8.

B. LOAD / RESOURCE BALANCE

89.0 Reference: LOAD/RESOURCE BALANCE
Exhibit B-5, BCUC IRs 9.5, 9.5.2, 10.2, Appendix G, p. 6
Ability to meet peak demand

In response to BCUC IR 10.2, Creative Energy stated that "Creative Energy has opted to use a conservative forecast of peak and energy based on known changes in customers."

Creative Energy stated in response to BCUC IR 9.5 that "Creative Energy has no basis to generate aggressive or conservative scenarios for peak and relies only on its base case peak demand forecast based on current load and available information about future additions and losses." Creative Energy further states that "The Proposed Project is intended to provide sufficient capacity to serve existing customers (with the potential for future expansion as needed)…"

Page 6 of the Fosdick & Hilmer 2018 Condition Assessment Report states:

> An optimally designed plant will have firm capacity to meet the peak demand with 10 percent reserve capacity and the ability to turn down equipment enough to reliably meet minimum demand requirements. In this case firm capacity is defined as the capacity of the steam plant with the single largest steam generator out of service.

89.1 Please complete the table below (as modified from the one requested in BCUC IR 9.5.2), assuming the conservative peak load forecast is 10 percent less than the base case, and the aggressive peak load forecast is 10 percent more than the base case. Please also provide what is the maximum peak load the system can serve, and express it as a percentage of the base case peak load forecast. Please also provide your response in a functional excel spreadsheet.

Row	#/hr	2018	2019	…	2050
1	Peak Load Forecast – conservative (-10%)				
2	Peak Load Forecast – base case				
3	Peak Load Forecast – aggressive (+10%)				
4	Functional Capacity				
5	Supply Reserve (10% of functional capacity in row 4)				
6	Effective Load Carrying Capacity (4-5=6)				
7	Capacity Surplus/Gap – conservative (6-1=7)				
8	Capacity Surplus/Gap – base case (6-2=8)				
9	Capacity Surplus/Gap – aggressive (6-3=9)				
10	Maximum peak load system can serve based on effective load carry capacity (#/hr)				
11	Maximum peak load system can serve based on effective load carry capacity (% of base case peak load forecast)				

Response:

Please see Attachment 89.1, tab labeled "Response to 89.1". This tab shows the peak load forecast scenarios described in the question, and provides the requested calculations including the "Effective Load Carry Capacity" as defined in the question.

89.1.1 Please replicate the table above, assuming the functional capacity excludes boiler #3 in row 4.

Response:

Please see Attachment 89.1, tab labeled "Response to 89.1.1". This tab shows the peak load forecast scenarios described in the question, and provides the requested calculations including the "Effective Load Carry Capacity" as defined in the question.

89.2 Based on the populated tables above, please confirm, or explain otherwise, that the Proposed Project will have firm capacity to meet the peak demand with a 10 percent capacity reserve.

Response:

With Boiler #3 in service, the Proposed Project will have firm capacity to meet the peak demand with a 10 percent capacity reserve. Without Boiler #3, it will not.

89.3 In the event the peak demand is near or above the maximum peak load that the system can serve, please discuss the available immediate solutions to Creative to meet any excess peak demand above maximum (e.g. run back-up generation in an alternate fuel source, ability for load curtailment, reduce planning reserve for reliability, ability to increase functional capacity of existing boilers, etc.), and explain approximately how much peak load each option can serve and the pros and cons of each option.

Response:

There is currently no back-up generation on the system. In the event the peak demand is near or above the maximum load the system can reliably serve, the immediate solutions are (i) to operate the

boilers at or near full fire for a short period of time in excess of their functional capacities (the problem with this option is the high level of stress on old equipment and increased risk of catastrophic failure), and (ii) curtailment of customer load voluntarily or by shutdown of a part of the system (the problem with this option is the impact to the customer and to the value of the service). Creative Energy can also bring in temporary generation with appropriate lead time.

89.4 Please explain the steps involved and the timeline for any potential future expansion, if needed.

Response:

There will be space within the renovated Beatty Plant and the Developer's office tower project for Creative Energy to install up to 75 MW of additional generating capacity in the future if needed. Creative Energy would need to decide whether to propose to install additional capacity within the Beatty Plant or at an alternative location based on the cost effectiveness of the available options. The expansion would require the appropriate BCUC approval and associated time for a hearing. A typical lead time for engineering and ordering boilers of the size and type required by Creative Energy would be about 10 months. The time to install and commission boilers could be up to 2 months.

Page 6 of the 2018 Condition Assessment Report states further states:

> Referring to Figure 1 and Table 1 above, it appears that in the winter months the plant maximum steam load can exceed 600,000 lb/hr going as high as 640,000 lb/hr. If during these load excursions boiler no.4, the highest capacity boiler, is out of service due to an outage, maintenance or for whatever reason, the plant's firm functional capacity is significantly less than 640,000 lb/hr at 450,000 lb/hr. Moreover, if any of the boilers, not just the higher capacity boilers, were out of service the plant would fall short of satisfying the load.

89.5 Please explain whether in the event of a single boiler outage, the Proposed Project's firm functional capacity would continue to be able to meet the design peak load (i.e. the plant will have an "n+1" redundancy).

Response:

No. The current steam plant does not have N+1 redundancy, and following the Proposed Project the plant will not have N+1 redundancy. Creative Energy has not historically carried that level of redundancy. Adding N+1 redundancy to the existing plant or Proposed Project would have additional costs to ratepayers. The lack of N+1 redundancy increases the importance of proactive maintenance and replacement of aging equipment. Once aging equipment is replaced, the benefits of N+1 redundancy would be reduced for some time by virtue of the newer equipment.

89.6 Please explain whether the Proposed Project will have the ability to turn down equipment to reliably meet minimum demand requirements.

Response:

Yes. The Proposed Project will have the ability to meet minimum demand requirements via equipment turn down.

90.0 Reference: LOAD/RESOURCE BALANCE
Exhibit B-5, BCUC IR 11.1
Load forecast methodology

In response to BCUC IR 11.1, Creative energy stated that "Creative Energy generates this bottom up

forecast using historical trends for each customer and further adjustments based on known or anticipated changes in customer buildings that are derived from discussions with customers."

Creative Energy further stated that "Creative Energy uses a weather-adjusted load forecast which is derived from observations of historical average demand under a range of weather conditions and judgment where there is a lack of sufficient historical data or there have been major changes recently in building use and characteristics."

Also, Creative Energy stated in response to BCUC IR 11.1:

> For the purposes of the Application, Creative Energy used the actual 2017 peak and weather-adjusted load (derived as above). The year 2017 was the most recent year that Creative Energy's system had to operate under "design conditions" as described in the response to BCUC IR 1.9.2. Creative Energy then made further adjustments for known additions and losses of load. The adjustments for design peak demand were made in direct proportion to the adjustments in annual energy, which is supported by historical observations.

90.1 Please explain how many years of data has Creative Energy relied on to derive the "historical average demand under a range of weather conditions…" as described in response to BCUC IR 11.1, and explain how Creative has determined the appropriate amount of historical data to reference.

Response:

Creative Energy relied on five years of data to derive the historical average demand. Creative Energy has used this approach in prior rate applications and in Creative Energy's view it strikes a reasonable balance between providing multiple years of information, and providing sufficiently recent information to be relevant to the current needs of Creative Energy's customers.

90.2 Please reconcile whether a historical trend analysis was used, or the actual 2017 peak and weather-adjusted load is used to produce the load and peak forecast presented in the Application.

Response:

Creative Energy acknowledges that the wording of the quoted response to BCUC IR 1.11.1 could have been more clear. For clarity, Creative Energy used historical load information to generate the load forecast (the volume of steam sales over the course of the year). Because Creative Energy operated under design conditions in 2017, Creative Energy used the actual 2017 peak to estimate peak demand. Historical peak demand data would be less useful than the most recent period during which the system had to meet design conditions. Creative Energy then generated a forward-looking forecast of peak demand, based on forecast changes in annual demand and proportional adjustments to peak demand, which is supported by historical observations.

90.3 Please confirm, or explain otherwise, that the demand and peak forecast methodology used for the purpose of this Application differs from the methodology used to produce a demand and peak forecast for other purposes.

Response:

Not confirmed. The load forecast used in this Application is, with some additional adjustments described in the Application, the same load forecast used by Creative Energy in the 2016 RRA.

The 2016 RRA did not include a forecast of peak demand, as the RRA was not concerned with adding generation capacity to meet peak demand. The current Application does include a forecast of peak demand, which is based on the peak observed in 2017 when Creative Energy was operating under design conditions, and the assumption that future changes in annual load will have a proportional impact on peak demand.

90.3.1 If confirmed, please specific what are the other methodologies used, and the purpose of the forecast produced using the various methodologies.

Response:

Please see the response to BCUC IR 2.90.3.

90.3.2 If confirmed, please explain why Creative has chosen to produce a different forecast for this application, rather than updating an existing forecast for other purposes.

Response:

Please see the response to BCUC IR 2.90.3.

91.0 Reference: LOAD/RESOURCE BALANCE
Exhibit B-5, BCUC IR 11.5; Creative Energy Vancouver Platforms Inc. 2018-2022 Revenue Requirements Application (Creative Energy RRA), Exhibit B-12, BCUC IR 45.1.1
Load forecast methodology

In response to BCUC IR 11.5, Creative Energy stated that "Creative Energy does not have weather normalized historical load."

When asked in BCUC IR 45.1.1 in the Creative Energy RRA proceeding to provide explanations for variances between 2016 and 2017 Forecast and Actual steam demand (in M#) for Core Steam Customers and NEFC, Creative Energy stated that "The variances were due to weather and in NEFC specifically the timing of customers coming online."

91.1 Please confirm that Creative Energy undertakes weather normalization analyses to determine annual variances in actual load versus forecast load, and presents this information to the BCUC as part of its filings with the BCUC, such as in its Revenue Requirements Applications.

Response:

Confirmed that to prepare the load forecast, Creative Energy developed an estimate of weather-normalized monthly load for each customer, and then made further adjustments to reflect changes in customer usage – for example due to buildings having completed major upgrades. However, as part of this process Creative Energy did not calculate total weather-normalized load for prior years, since the focus of the process was on developing a current load forecast.

91.1.1 If confirmed, please explain why it does not have weather normalized historical load.

Response:

Please see the response to BCUC IR 2.91.1.

91.1.2 If not confirmed, why doesn't Creative Energy prepare weather normalization analyses to better understand variances between actual and forecast load?

Response:

Please see the response to BCUC IR 2.91.1.

C. PROJECT DRIVERS

92.0 Reference: PROJECT DRIVERS
Exhibit B-1, Section 9.2, p. 32; Section 10.1, p. 35; Section 14, p. 76; Exhibit B-5, BCUC IRs 12.2, 12.3
Equipment replacement

In response to BCUC IR 12.2, Creative Energy stated:

> The existing fail-safes will remain for the Beatty Plant. As technology has evolved, new boilers incorporate more advanced and precise instruments and fail-safes which perform their function more quickly or with more certainty. By removing the oldest equipment, we are improving the safety of the plant. Further, the equipment installed in Expo will have modern fail-safes.

92.1 Please confirm, or explain otherwise, whether Creative Energy proposes to undertake any upgrade work to the existing fail-safes at the Beatty Plant.

Response:

Boiler fail-safes will not be upgraded at the Beatty Plant as part of the Proposed Project. The primary fail-safes are inspected and maintain/overhauled/replaced on an annual basis and are not deemed unsafe by either Creative Energy operations staff or Technical Safety BC. Other plant instrumentation may be upgraded as appropriate, but such details will not be resolved until the detailed design process. Safety can be enhanced by upgrading fail-safes or replacing with more modern equivalents, but that does not imply that the current plant is unsafe.

In response to BCUC IR 12.3 Creative Energy stated: The Lost Time Injury Frequency Rate is calculated at 0.000 (calculated against 1 million person hours worked). There are no ongoing safety concerns in the plant that are anything but procedural.

92.2 From a technical perspective, please explain the how the Proposed Project will improve the safety of the equipment which is to remain in-situ at the Beatty Plant.

Response:

The majority of the safety improvement resulting from the Proposed Project is due to the replacement of the structure housing the plant, which does not conform to modern standards for seismic and fire resistance, and the removal and abatement of hazardous materials (i.e., asbestos).

The equipment which will remain will not be made materially more safe as a result of the Proposed Project. However, a significant amount of the generation and operating hours will be shifted to a newer, more modern plant. That transfer of operations does imply a safety improvement of the Beatty Plant, but not of the remaining equipment itself.

93.0 Reference: PROJECT DRIVERS
Exhibit B-1, Section 9.2, p. 32; Appendix F, p. 8; Exhibit B-5, BCUC IRs 13.1, 13.3, 13.4, Attachment 13.1
Improve Safety
Hazardous materials – Beatty Plant

In response to BCUC IR 13.1 Creative Energy stated:

> Creative Energy has worked closely with a local Hazardous Materials abatement firm, Phoenix Enterprises, who is experienced in the abatement of asbestos insulation from steam lines, and the abatement and demolition of industrial boilers. Through the course of this work, a concept of the most practical sequence of abatement and demolition was developed, including laydown areas, hauling points, and general sequence of work. This was not documented in a formal plan, but was the basis for the Phoenix proposal, which is attached in Attachment 13.1.

Attachment 13.1 provides Phoenix Enterprises Ltd.'s quotation for the removal of hazardous materials and asbestos at the Beatty Plant:

Description
As per the below Sequence of Work from Mr. Kieran McConnell, Phoenix Enterprises Ltd. will remove all insulation (asbestos and non-asbestos) from the boilers, ducting, piping etc. including gaskets, adhesives, caulking and spray applied insulation to facilitate plant upgrades. Trucking and disposal included. Sequence of Work: a. Boiler #4 b. Feedwater piping c. Boiler #2 d. Boiler #1 e. Steam header f. Remaining piping and fittings within those removal locations. Note: PEL will work with demolition contractor to remove acm gaskets from valves and ducting during the demolition/deconstruction phase where possible. Note: Air Monitoring and Electrical/Mechanical isolations to be done by others. Note: Lead paint abatement not included in cost other than what is directly related to Sequence of Work. Note: Scaffolding and aerial lifts will be provided by PEL as needed. GST On Sales

93.1 Please explain whether Boilers #3, #5 and #6 contain any hazardous materials or asbestos.

Response:

These boilers do contain hazardous materials.

93.1.1 If so, please explain whether Creative Energy proposes to remove the hazardous materials and / or asbestos.

Response:

Creative Energy proposes to remove hazardous materials from the exterior of these boilers and all hazardous materials from associated piping, wiring etc. Creative Energy does not propose to remove hazardous materials from within these boilers as this may impact the ability of the boilers to operate. The hazardous materials within the boilers will be removed upon the replacement of the respective boiler in the future.

93.1.2 If not, please provide information on any materials that will remain in-situ.

Response:

Please see the response to BCUC IR 2.93.1.1.

In response to BCUC IR 13.3 Creative Energy stated

> We understand the report to be a good representation of the presence of hazardous materials in the plant and are confident that the unknown quantities are captured within the contingency amounts applied to the hazardous materials abatement cost item. [Emphasis added]

93.2 Please provide the contingency amount for the hazardous materials abatement cost item.

Response:

The contingency amount is $270,000.

In response to BCUC IR 13.4, Creative Energy further stated: "Pursuant to the Trust and Development Agreement, the Developer bears delay, construction cost overrun and safety risks associated with unidentified hazardous materials and the like. Creative Energy does not bear such risks."

93.3 Please identify any instances where Creative Energy could be responsible for any costs related to finding previously unidentified hazardous materials, for example indirect costs attributed to a delay in Creative Energy's scope of work.

Response:

None. Removal of hazardous materials is wholly within the Developer scope and responsibility. Creative Energy does not approve the demolition or removal of hazardous materials by the Developer, and therefore does not have any cost exposure related to this work. For greater certainty, any delay for the Developer as a result of discovery and removal of previously unidentified hazardous materials does not constitute a delay on the part of Creative Energy.

94.0 Reference: PROJECT DRIVERS
Exhibit B-1, Schedule G to Appendix A, p. 1; Exhibit B-5, BCUC IRs 14.1, 14.1.1, 14.3, 25.2
Improve safety
Hazardous materials – Expo Plant

In response to BCUC IR 14.1, Creative Energy stated that it does not have a Hazardous Building Materials Assessment Report for the Expo Plant, stating that Creative Energy has "requested any such data that PavCo may have and will file if it is available."

94.1 Please explain whether B.C. Pavilion Corporation (PavCo) has a Hazardous Building Materials Assessment Report or similar for the Expo Plant.

Response:

To the best of our knowledge, PavCo does not have any such report.

94.1.1 If so, please provide the report.

Response:

Please see the response to BCUC IR 2.94.1.

In response to BCUC IR 14.1.1 Creative Energy stated: A review was conducted with BC Place facilities staff and only a single, minor source of Hazardous Building Materials was identified, which is the gasket material in the hot water valves leading to the existing heating coils.

In response to BCUC IR 14.3 Creative Energy stated that, in the event that previously unidentified hazardous materials and asbestos require removal "[t]he risk has been considered in the development of the schedule, and is considered minimal. This risk belongs to the Developer, not Creative Energy."

The Responsibilities Matrix provided on page 1 of Schedule G to Appendix A in the Application states that Creative Energy is responsible for "Hazmat and Asbestos Removal" with Creative Energy "responsible for $100,000 of removal costs. PavCo is responsible for all other costs."

94.2 Please explain whether the $100,000 includes allowances for any indirect costs that may arise as a result of delays.

Response:

The $100,000 is a general contingency. No delays are reasonably expected and the likelihood of discovering new hazardous materials is quite low. Specifically, the space is currently nearly empty except for two large fans, a small amount of uninsulated steel piping and sheet metal louvres. PavCo expects to remove most of the equipment to be used as spare parts, leaving only the piping and sheet metal. The piping does have gaskets around the valves, which has been accounted for. Otherwise, there are no common sources of hazardous materials.

94.2.1 If not, please explain which party would be responsible for any indirect costs.

Response:

The likelihood of discovering new hazardous materials in the Expo room is quite low. If such materials are nevertheless discovered and there are delays as a result of such discovery, the Developer would be responsible for any direct or indirect costs that may arise as a result of the delays, unless such delays are caused by Creative Energy which is an extremely remote scenario.

94.3 Please provide details of any instances where Creative Energy would be liable for direct costs or costs of delays incurred from finding previously unidentified hazardous materials and asbestos at the Expo Plant.

Response:

Discovery of previously unidentified hazardous materials does not constitute a delay caused by Creative Energy. Please see the response to BCUC IR 2.94.2.1.

In response to BCUC IR 25.2, Creative Energy stated: A detailed project schedule has not yet been developed. This will be done as part of the detailed design process.

94.4 Given that a project schedule has not yet been developed, please explain to which schedule the statement "[t]he risk has been considered in the development of the schedule, and is considered minimal" refers.

Response:

The only schedule that has been developed is the schedule of milestones provide as part of this Application. This is not considered a <u>detailed</u> schedule.

94.4.1 If a project schedule has been prepared, please provide the schedule.

Response:

Please see the response to BCUC IR 2.94.4.

95.0 Reference: PROJECT DRIVERS
Exhibit B-1, Section 9.3, pp. 32–33; Appendix G, pp. 4–5; Section 6.2, p. 23; Exhibit B-5, BCUC IRs 16.2.1, 20.1; Attachment 15.5; Attachment 1.79; Exhibit B-5-2, BCUC IRs 15.3, 15.4, 21.2; Attachment 15.3 p. 2-4; Creative Energy 2016-17 RR & RD proceeding, Exhibit B-11; IR 11.1
Improve efficiency
Plant efficiency

In response to BCUC IRs 15.3 and 15.4 Creative Energy provided the Creative Energy Efficiency Evaluation for Existing & Future Steam System report prepared by Fosdick & Hilmer (Attachment 15.3).

Page 2 of Attachment 15.3 states:

> Plant Efficiency
>
> The current plant efficiency was derived based on total sales of steam in 2017 divided by total fuel input for 2017 as an estimate of system efficiency at 74.4 percent. Based on an assumed 90 percent distribution system efficiency this then yields a plant gate efficiency of 82.6 percent.
>
> Annual Contribution of Each Boiler
>
> Boiler contribution to the annual total plant steam flow was tabulated based on each boiler's steam flow meter. Total per annum steam flow was determined based on the sum of all boiler steam flow meters. This data was tracked for a period of five years from 2013 through 2017 and remained relatively consistent on a year to year basis with regard to each boiler's impact on the annual steam produced.

95.1 Please explain why the Plant efficiency was derived based on the total sales of steam over a period of one year and not, for example, over a period of 5 years.

Response:

Plant efficiency was derived based on total sales of steam over the most recent one year period because plant efficiency has been declining slightly over time due to the deteriorating performance of the Clear Sky unit. Creative Energy believes that efficiency from prior years is not representative of the efficiency of the current plant. For this reason, and as described in the response to BCUC IR 1.15.5, Creative Energy used 2017 system efficiency as opposed to earlier calculations of efficiency or an average of such earlier calculations.

In the 2016-2017 Revenue Requirements Application and Rate Design for North East False Creek Hot Water Service Application (2016-2017 RRA and RD), Creative Energy provided its methodology for calculating the energy consumed by the existing plant to meet its customer demands. In response to BCUC IR 11.1 (Exhibit B-11), Creative Energy provided details of its three step calculation, which included the assumed boiler and distribution efficiency.

Response:
It should be noted step 2 should be changed to "The estimated demand is then grossed up for boiler and distribution efficiency". Additionally, the order of Step 2 and Step 3 should be switched, as the calculation is properly expressed as:

1. An estimate of demand in M# is first determined;
2. The M# demand estimate is converted to mmBTU by multiplying the conversion factor of 1.196 mmBTU to each M# of steam generated; and
3. The estimated demand in energy units is grossed up for boiler and distribution efficiency.

Switching the order of step 2 and step 3 yields the same result, but more accurately depicts the conversion of fuel energy to steam.

2016
1. Customer Demand estimate: 1,073,439M# (inclusive of NEFC)
2. Conversion to energy units: 1,073,439M# * 1.196 mmBTU / M# = 1,283,833 mmBTU
3. Conversion to fuel input: 1,283,833 mmBTU / 75.3% = 1,704,248 MMbtu

95.2 Please explain the discrepancy between the 75.3 percent system efficiency provided in the 2016-2017 RRA and RD proceeding and the 74.4 percent system efficiency provided in the Application.

Response:

Please see the response to BCUC IR 2.95.1.

95.2.1 Please explain why the system efficiency has decreased from 75.3 percent in 2016 to 74.4 percent in 2017.

Response:

Please see the response to BCUC IR 2.95.1.

In response to BCUC IR 16.2.1 Creative Energy stated: "Due to a lack of boiler level metering, Creative Energy does not have access to consistent and accurate daily efficiency information."

Attachments 1.79 (Microsoft Excel) provide the individual boiler steam flow and the calculated plant efficiencies on a daily basis for 2013 to 2017 and on monthly basis for 2017 and up to June of 2018.

95.3 Please explain why daily metering was discontinued for 2017 and 2018.

Response:

This metering data has been discontinued as it is considered unreliable, as discussed in the following responses.

95.4 Please explain why Creative Energy does not consider the boiler steam flow data to be "consistent and accurate."

Response:

Creative Energy has attempted to reconcile the steam flows over daily, weekly, monthly and annual intervals and the steam flow totals do not add up, and therefore are considered unreliable.

95.5 Please explain why the Plant Efficiency was not derived using the total fuel input and the boiler steam flow data.

Response:

The outputs suggest boiler efficiencies which exceed what is scientifically possible for standard efficiency boilers, and therefore the data is considered unreliable.

95.6 Please provide the accuracy level of the fuel input meter.

Response:

The fuel input meter to Creative Energy's facility is a FortisBC Energy natural gas meter, compliant with regulations set forth by Measurement Canada.

95.7 Please provide representative accuracy level(s) of the customer steam meters and the cumulative accuracy for the total customer steam consumption readings.

Response:

Customer steam meters are read each month with the difference between month end readings being the total consumed for the month. Rosemount steam meters are the steam metering device of choice. The accuracy of these meters in extract from the manual reproduced below, and described in detail in at http://www.emerson.com/documents/automation/product-data-sheet-rosemount-8800d-series-vortex-flowmeter-en-73468.pdf. Accuracy is not expected to change as the cumulative totals through the year add up.

Flow accuracy

Includes linearity, hysteresis, and repeatability.

Liquids - for Reynolds numbers over 20000

Digital and pulse output

±0.65% of rate

Note

The accuracy for the 8800DR, line sizes 6- to 12-in. (150 to 300 mm), is ±1.0% of rate.

Analog output

Same as pulse output plus an additional 0.025% of span

Gas and steam - for Reynolds numbers over 15,000

Digital and pulse output

±1.0% of rate

Note: The accuracy for the Rosemount 8800DR, line sizes 6 to 12-in. (150 mm to 300 mm), is ±1.35% of rate.

Analog output

Same as pulse output plus an additional 0.025% of span

Accuracy limitations for gas and steam:

For 1/2- and 1-in. (DN 15 and DN 25): max velocity of 220 ft/s (67.06 m/s)

For 1/2- to 4-in. (DN 15 to DN 200) Dual-style meters: max velocity of 100 ft/s (30.5 m/s)

95.8 Given the meter accuracy levels provided in response to IRs 95.6 and 95.7, please discuss the appropriateness of the Plant Efficiency calculation method and the resulting accuracy of the estimated efficiency.

Response:

The methodology used to calculate the efficiencies is not perfect. It is based on a number of assumptions and does not calculate highly precise individual boiler efficiencies. However, it does provide an accurate view of the overall system efficiency and allows a decent approximation of the boiler efficiencies. Further, the knowledge of the boiler configuration, and lack of flue gas recovery on a number of the boilers does provide a ceiling on the individual boiler efficiencies.

Regardless, the Proposed Project replaces medium efficiency 50-year old boilers with modern high efficiency boilers. Creative Energy has used the entire set of data available to forecast the net efficiency improvement of the Proposed Project as accurately as possible. The final efficiency improvement may be slightly above or below the forecast figure, but we have no better means to produce a forecast. The sensitivity analysis in section 15 of the Application includes scenarios with higher and lower efficiency.

Attachment 15.5 (Microsoft Excel) titled Creative Energy's 'Estimate of Plant Gate Efficiency for 2013-2017' provides the annual Gas Purchased and Steam Sales over the 5 year period. Creative Energy assumes an enthalpy figure of 1198 BTU/lb in its calculations for Steam Sales (MWh).

Attachment 1.79 (Microsoft Excel) titled '2017, 2018 Plant Efficiency' provides the following assumptions in the sheet titled 'Efficiency':

total enthalpy at 185 psig	1198	btu/lb
total enthalpy at 15 psig	1198	btu/lb
latent	946	btu/lb
superheat	36	btu/lb
sensible	216	btu/lb
avg temp out of scavenger	150	F
% of total sales with scavenger	70%	
Load factor for scavengers	50%	
net enthalpy for customers without scavengers	982	btu/lb
net enthalpy for customers with scavengers	1031	btu/lb
net weighted enthalpy	1016.3	btu/lb

95.9 Please explain why two differing enthalpy figures have been used to calculate the steam sales.

Response:

The enthalpy figure of 1198 btu/lb is what should be employed as that is the amount of energy that the steam provides (on a mass unit basis) to a customer. The other assumptions where a lower enthalpy figure is derived are likely to understand how well a customer might use the energy, depending on whether or not they use a condensate scavenger.

95.9.1 Please confirm the enthalpy figure that is to be used to calculate the steam sales.

Response:

The figure to be used is 1198 btu/lb.

95.9.2 Where necessary, please provide updated spreadsheets (Attachments 15.5 and 1.79) as provided in response to BCUC IR 15.5 to reflect your response to IR 95.9.1.

Response:

Please see the response to BCUC IR 2.95.9.1.

Page 3 of Attachment 15.3 states: The industry standard for new distribution systems of similar size (~15 km) typically yield an efficiency between 90-95 percent as a yearly average. This specific system efficiency is estimated to be 90 percent based on a 50+ year old direct buried steam distribution system.

In response to BCUC IR 20.1, Creative Energy stated: To estimate the distribution losses, other similar systems which meter such losses and are of a comparable size and have similar operating parameters were referenced.

95.10 Please provide the data and the source(s) for the similar systems Creative Energy referenced to estimate the distribution losses, including the size and operating parameters.

Response:

The UBC Steam System has estimated efficiency of 80%. Please see slide 9 of https://commons.bcit.ca/factorfour/files/2017/03/compressed_UBC-Steam-to-Hot-Water-Conversion-ilovepdf-compressed-ilovepdf-compressed-1.compressed.pdf

BCUC IR 21.2 requests the forecast Load Duration Curve (LDC) for the year 2023. In response to BCUC IR 21.2 Creative Energy stated: This information is not available as Creative Energy does not have reliable steam metering that collects or logs steam flows either at specific points within the plant or at the plant gate on less than a monthly basis.

95.11 Please confirm, or otherwise explain, whether the Proposed Project will resolve the metering reliability issues.

Response:

Confirmed.

95.11.1 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.95.11.

95.12 Please explain the metering arrangements for the Proposed Project. In your response please provide information on:

a) metering arrangements for the Expo Plant; and

Response:

This will be resolved during detailed design, but we do anticipate fuel and steam meters to be installed on each boiler and steam meter(s) at the plant gate.

b) metering arrangements for the Beatty Plant.

Response:

This will be resolved during detailed design, but we do anticipate fuel and steam meters to be installed on each boiler and steam meter(s) at the plant gate.

Page 4 of Attachment 15.3 estimates the plant gate efficiency for the two-plant operation (Proposed Project) to be 84%:

	Est. Gate Efficiency	% Load	Weighted Average
Beatty Street Plant	80.5%	40.0%	32.2%
Expo Plant	86.4%*	60.0%	51.8%
TOTALS		**100.0%**	**84.0%**

*Expo plant gate efficiency is greater due to improved burner efficiency (~3%), feedwater economizer (~2%), and secondary economizer (~1%)

95.13 Please confirm, or otherwise explain, whether upon completion of the Proposed Project, Creative Energy will be able to reliably meter the system efficiency and therefore verify the estimated 84% figure.

Response:

Confirmed. Metering will be resolved during detailed design, and we expect this to be the case.

95.13.1 If not confirmed, please explain how Creative Energy intends to evaluate the success of the Proposed Project, and its Project Driver to improve efficiency.

Response:

The steam and fuel meters will be read on a daily basis, and reported to management on a monthly basis, included calculations of efficiency of each boiler, each plant and the distribution system, steam use within the plant and the efficiency of the system as a whole.

95.14 Please confirm, or otherwise explain, whether the 80.5% Estimated Gate Efficiency for the Beatty Street Plant assumes the use of an economizer at the Beatty Street Plant.

Response:

No, it does not make this assumption.

95.14.1 If confirmed, please explain why the Proposed Project's scope does not include an economizer at the Beatty Plant.

Response:

The renovated Beatty Plant will largely be used in a peaking and backup capacity, which undermines the economics of installing a new economizer at Beatty. Further, it is difficult to size an economizer for both the existing boiler sizing and potential future boiler capacities. We anticipate that as boilers are replaced at Beatty in the future, technical and economic factors will be employed to determine if it make sense to install one or more economizers.

D. PROJECT DESCRIPTION – EXPO AND BEATTY PLANTS PROJECTS

96.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10, p. 35; Exhibit B-5, BCUC IR 19.1
Project description

In response to BCUC IR 19.1, Creative Energy stated:

> At this stage, as there have been different design teams working on each of the Beatty Plant, Expo Plant and interconnecting piping, there is no single, consolidated site plan showing all the project elements. This will be developed in the detailed design phase.

96.1 Please identify the party responsible for preparing the consolidated site plan.

Response:

This party has not been identified at this time.

96.2 Please provide the anticipated start date for the detailed design phase.

Response:

Shortly after BCUC approval of the Application.

96.3 Please provide the anticipated end date for the detailed design phase.

Response:

Approximately 4 months after the start of the detailed design phase.

97.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10, p. 35; Exhibit B-5, BCUC IR 19.5
Project description

In response to BCUC IR 19.5, Creative Energy stated:

> The interconnection lines - steam, condensate and fuel oil would be routed from the upper elevations of the Expo plant, across Expo Boulevard at the underside of the BC Place plaza above Expo Boulevard, into the parkade of the Beatty Street redevelopment. Within the Beatty Street redevelopment the lines would run East-West within a trench below the P3 slab and then extend vertically and tie into the main steam header.

97.1 Please confirm, or otherwise explain, whether the only public work required for the Proposed Project is the interconnection lines.

Response:

Not confirmed – new water, gas and electrical services are needed for both plants.

97.1.1 If not confirmed, please provide details of any other public works.

Response:

Please see the response to BCUC IR 2.97.1.

98.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10, p. 35; Exhibit B-5, BCUC IR 56.2.1, Attachment 31.3a
Project Description
Design report

Attachment 31.3a provides WSP's Preliminary Design Report.

98.1 Please explain if a Preliminary Design Report for the Beatty Plant will also be prepared.

Response:

No, it will not be prepared.

98.1.1 If so, please provide the report.

Response:

It will not be prepared.

98.1.2 If not, please explain why.

Response:

There is very limited design scope at the Beatty Plant. This portion of the project is largely made up of demolition, abatement and removal of the oldest equipment in the plant, and reconfiguration of the working spaces. This does not lend itself well to a design report, so Fosdick & Hilmer did not issue such report.

99.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10, p. 35; Section 13.2, p. 68; Appendix A of Appendix G, p. 4;
Exhibit B-5, BCUC IR 20.1; Exhibit B-5-2, BCUC IR 21.2
Steam generation capacity

In response to BCUC IR 20.1 Creative Energy provided the following table:

Annual Efficiencies and Capacities	Current plant with Clear Sky Economizer	2023 plant with no Economizer	Proposed Project
Estimated aggregate Boiler Efficiency	84.4%	82.4%	86.1%
Functional Boiler Capacity	630,000 PPH	630,000 PPH	740,000 PPH
Plant Load at peak demand	18,000 PPH	18,000 PPH	18,000 PPH
Efficiency at Plant Gate	82.4%	80.5%	84.0%
Steam Capacity net of plant load	612,000 PPH	612,000 PPH	722,000 PPH
Distribution Efficiency	90%	90%	90%

On page 68 of the Application, Creative Energy states that for the Proposed Project, O&M costs will increase as a result of "higher electricity consumption (increase of 1,339 MWh per year) due to replacement of some steam-powered equipment with electricity-powered equipment."

99.1 Please discuss how the replacement of some steam-powered equipment with electricity-powered equipment will impact the 'Plant Load at peak demand'.

Response:

This will free up some small amount of steam to be available for customers rather than used within the plant.

99.1.1 If the replacement is anticipated to impact the 'Plant Load at peak demand', please provide the updated figure.

Response:

This cannot be accurately calculated in the absence of accurate metering in the existing plant. We have estimated that the plant steam use is on the order of 2%, so this can be used as a proxy for the additional peak generation capacity made available through electrification.

99.1.1.1 Please explain how the figure was calculated and provide all assumptions made.

Response:

Please see the response to BCUC IR 2.99.1.1.

99.1.2 If the replacement is not anticipated to impact the Plant Load at peak demand, please explain why.

Response:

Please see the response to BCUC IR 2.99.1.1.

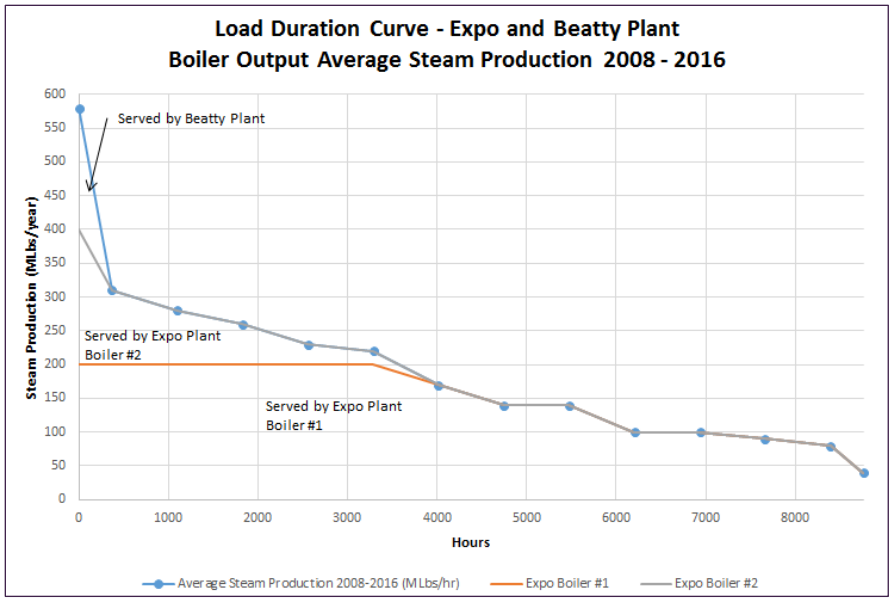
99.1.3 Please provide an updated table to reflect the information provided in response to IR 99.1.1.

Response:

The difference cannot be accurately calculated, and is very small (in the order of 2%). There is no material change to the above Table.

BCUC IR 21.2 requested that Creative Energy provide the forecast Load Duration Curve (LDC) for the year 2023 showing the estimated system demand and the proposed dispatch of the boilers for the Proposed Project. In its response, Creative Energy stated: This information is not available as Creative Energy does not have reliable steam metering that collects or logs steam flows either at specific points within the plant or at the plant gate on less than a monthly basis.

Based on the information provided on page 4 of the 2018 Fosdick & Hilmer Condition Assessment Report (Appendix A of Appendix G to the Application), BCUC Staff prepared the following chart in a Microsoft Excel spreadsheet (see Attachment).



99.2 Please review the chart and supporting assumptions and confirm, or explain otherwise, whether the LDC is representative of the Proposed Project.

Response:

Confirmed that the chart is a reasonable monthly-basis representation of how the Proposed Project would have operated over the 2008-2016 period, had the Proposed Project been in place at the time, with the caveat that the Expo Plant will be shut down in summertime. Additionally, Creative Energy considers the boiler production data collected within the plant is unreliable as explained in the responses to BCUC IRs 1.16.1, 2.95.4 and 2.95.5.

99.2.1 If not confirmed, please discuss any expected variances from the above LDC.

Response:

Please see the response to BCUC IR 2.99.2.

99.2.2 If not confirmed, please provide a revised LDC, explaining any revisions made.

Response:

Please see the response to BCUC IR 2.99.2.

99.2.3 Please provide Creative Energy's proposed operating strategy for the two plants, explaining how base and peak loads will be serviced while maintaining an N+1 standby capacity.

Response:

The current Creative Energy steam system does not have N+1 redundancy. The Proposed Project will not provide N+1 redundancy, and Creative Energy considers that the additional cost to meet N+1 is not warranted. However, the Proposed Project will make it easier to add N+1 redundancy should that be needed or desired in the future.

The Expo Plant will be operated as a baseload plant in most conditions to take advantage of the higher efficiency, safety and reduced emissions.

The Expo Plant will need to be shut down for maintenance and inspections on an annual basis. As the Beatty Plant will have Boiler #5 which is well sized to meet the summer load, the expectation is that the Expo Plant will be shut down for most of July and August for maintenance. Major maintenance on the Beatty Plant, which is required for peaking, can be undertaken in summer months when the Expo Plant is running.

99.3 Please confirm, or otherwise explain, whether the Beatty Plant will be used primarily for meeting peak demand.

Response:

Confirmed, except as described in the response to BCUC IR 2.99.2.3.

99.3.1 If confirmed, please explain the state of the Beatty Plant when peaking demand is not required (i.e. hot standby, cold standby, minimum of one boiler firing etc.).

Response:

The boilers at the Beatty Plant will be shut down and cold, but the headers will be kept hot.

99.3.1.1 If the state of the Beatty Plant will vary depending on load, season or weather, please provide details (for example, if the Beatty Plant will be called upon if the outdoor temperature falls below a certain set point, or if the load increases beyond a certain PPH of steam etc.)

Response:

The Beatty Plant will be largely used as a peaking plant, except as described in the response to BCUC IR 2.99.2.3. The Beatty Plant will otherwise be called upon when steam demand approaches the Expo Plant generation capacity limit of 400,000PPH. The trigger for Beatty start-up will be near this number but the exact figure will be refined and optimized through the operations of the system post completion.

99.3.2 If not confirmed, please explain the operating strategy for the Beatty Plant boilers, providing information on the state of the plant when it is not required (i.e. hot standby, cold standby, minimum of one boiler firing etc.). If the state of the Beatty Plant will vary depending on load, season or time of year, please provide details.

Response:

Please see the response to BCUC IR 2.99.2.3.

99.4 Please explain whether Creative Energy expects the annual plant load to be higher for the Proposed Project compared to the current plant, given the Proposed Project comprises of two plants and with reference to your response to IR series 99.3.2.

Response:

The plant load is not expected to be measurably higher.

100.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10.5.1, p. 48; Exhibit B-9, Panel IR 4.0
Boiler abatement and demolishing

Page 48 of the Application provides the following table outlining the major pieces of existing equipment which are to remain in-situ, be demolished or be relocated over the course of the Beatty Plant renovation.

BOILERS

Installed	Boiler ID	Decommision Plan
1967	Boiler #1	Abate & demolish
1968	Boiler #2	Abate & demolish
1969	Boiler #3	Retain
1973	Boiler #4	Abate & demolish
1983	Boiler #5	Retain & relocate
1991	Boiler #6	Retain

In response to Panel IR 4.0 Creative Energy stated: "Beatty Plant Shutdown #1 largely involves two major pieces of work: A) abating and demolishing Boiler #1, Boiler #2 and Boiler #3, and B) relocating the gas service to the Beatty Plant." [Emphasis added]

100.1 Please confirm which boilers are being retained and which are being demolished as part of the Proposed Project.

Response:

The response to BCUC Panel IR 4.0 contained a typo. The table on page 48 of the Application is correct.

101.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-6, CEC IR 1.3
Plant expansion

CEC IR 1.3 requests clarification as to whether the $5.25 million expenditure is effectively a payment for the additional space reserved for expansion. In its response, Creative Energy stated: "Not exactly. The expandability of the new plant is a function of both space as well as sizing of interconnections, flues and other ancillary equipment."

101.1 Please provide the design criteria (e.g. capacity) against which the interconnection, flues and other ancillary equipment have been designed.

Response:

The interconnection, flues and other ancillary equipment at the Expo Plant will be designed to accommodate 400,000 pounds per hour of steam generation and delivery.

The flues and other ancillary equipment at the Beatty Plant and the Developer's office tower project will be sized to accommodate 600,000 pounds per hour of steam generation, in a configuration of three boilers each of 200,000 pounds per hour capacity, providing excess space and capacity available for generating capacity expansion of up to 75 MW in the future.

101.1.1 Please explain the reasons for selecting the design criteria.

Response:

For the Expo Plant, the design is for capacity that can fit in the Expo space with boilers sized to match the capacity of the largest unit at Beatty (200,000 pounds per hour). This is done for a number of reasons, including achieving consistency in equipment capacity, maximizing the production in the floor space available, and creating the option of achieving N+1 redundancy in the future.

Likewise for the Beatty Plant, it makes sense to allow upgrading of individual boilers in the future to the size of the largest current piece of equipment, if the demand grows. Much of the ancillary equipment already accommodates one million pounds per hour. Providing the excess space and capacity available for generating capacity expansion at Beatty is at no cost to Creative Energy or its customers unless and until net generating capacity is expanded.

101.1.2 Please confirm, or otherwise explain, whether in the event Creative Energy decides to expand the plant beyond the design criteria, the interconnection, flue and other ancillary equipment would require upgrading.

Response:

No, the Beatty Plant and Developer's project can accommodate up to 75 MW of generating capacity expansion without upgrading the flues and ancillary equipment. Expo cannot be reasonably expanded in the future in terms of peak steam delivery. However, if some low-carbon base load was installed, this would qualify as additional capacity, but would not require upgrading the interconnection, flues or ancillary equipment.

101.1.2.1 If not confirmed, please explain what other options have been considered for expansion beyond the design criteria.

Response:

No material work has been conducted on other options.

102.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 10.1, p. 35; Section 10.2, pp. 35–36; Appendix G, p. 8; Exhibit B-5, BCUC IR 23.1
Plant staffing

Page 8 of the Fosdick & Hilmer Condition Assessment Report (Appendix G to the Application) provides a staffing breakdown as of 2013:

Department	Number of staff	Budgeted $'s (2013)	Constituents
Management & office	8	$532,375	President & GM, CFO, Accounting Mgr, Dir. Engr & Planning, Construction Mgr, Service Line Mgr, Admin Asst, Chief Engineer – 1st class
Steam plant	11	$927,435	Shift Engineers- 2nd & 4th class (8), Relief Engineers – 2nd class (2), Maintenance– 4th class (1)
Service lines	4	$426,975	Service Engineers – 3rd class (4)
Totals	**23**	**$1,886,785**	

102.1 Please provide the current staffing breakdown for the existing plant and the proposed staffing for the Beatty and Expo Plants. Please present the information in the following table. If additional roles are required, please add extra rows and update the table as necessary.

Response:

The operations staff will manage and operate both plants from the Beatty Plant.

102.1.1 If the staffing requirements vary based on seasonal requirements (for example summer / winter), please provide multiple tables as necessary.

Response:

Department	Role	Number of Staff Existing Plant	Number of Staff Proposed Project Beatty Plant	Number of Staff Proposed Project Expo Plant
Management & Office	**President & CEO**	**1**	**1**	**0**
	VP Finance & Department	**4**	**4**	**0**
	VP Engineering & Dept.	**3**	**3**	**0**
	Construction Manager	**1**	**1**	**0**
	Customer/ Regulatory Manager	**1**	**1**	**0**
	Director, Operations	**1**	**1**	**0**
Steam Plant	**Chief Engineer – 1st Class**	**1**	**1**	
	Shift Engineer – 2nd Class	**4**	**4**	
	Shift Engineer – 4th Class	**4**	**4**	
	Relief Engineer – 2nd Class	**2**	**2**	
	Maintenance – 4th Class	**1**	**1**	
Total		**23**	**23**	

In response to BCUC IR 23.1, Creative Energy stated: "The Expo plant will require full time staffing when being operated, under the overall supervision of a First Class Power Engineer, the Chief Engineer."

102.2 Please define "full time staffing when being operated". In your response please provide the following:

a) Number of hours that constitutes "full time" (e.g. 24 hours / 7 days)

Response:

The two plants will be treated as a single operating facility by Technical Safety BC as per the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation, as the two plants are connected to a common header. This has been confirmed in preliminary discussions with Technical Safety BC.

The existing plant requires two operators to be on site at all times, a 2nd class and a 4th class power engineer, under the supervision of a 1st class power engineer. The proposed project will not alter this requirement.

What may change, and has yet to be finalized, is how the operators will be spread between the two plants under various operating conditions (such as Expo operating/Beatty on standby, Beatty operating/Expo on standby or both operating.)

b) Number of staff, and their respective roles, required on-site.

Response:

Please see the response to BCUC IR 2.102.2.

102.3 Please confirm, or explain otherwise, whether the Beatty Plant will require "full time staffing" as defined in your response to IR 102.2.

Response:

Please see the response to BCUC IR 2.102.2.

102.3.1 If not confirmed, please explain the staffing requirements.

Response:

Please see the response to BCUC IR 2.102.2.

102.4 Please provide examples of circumstances where staffing would not be required at the Expo or the Beatty Plant.

Response:

Please see the response to BCUC IR 2.102.2. When one of the plants is not operating, it is not expected staffing will be required at that plant. There may be maintenance activities being conducted at a plant when it is not operating which require operator oversight or participation.

In response to BCUC IR 23.1.1 Creative Energy stated that "[e]xact details of staffing have yet to be determined."

102.5 Given that the exact details of staffing have yet to be determined, please explain how the staffing costs for the Proposed Project have been estimated and provide reference to the financial model.

Response:

Please see the response to BCUC IR 2.102.2.

102.5.1 Please detail all assumptions.

Response:

Please see the response to BCUC IR 2.102.2.

102.6 Please provide a comparison, in table form, of the operation and maintenance (O&M) requirements for the current plant compared to the O&M requirements for the Proposed Project. In your response please address each of the following items:

i. staffing requirements;
ii. staffing costs;
iii. equipment / spares;
iv. equipment costs;
v. external contractor costs;
vi. annual O&M costs for current plant; and
vii. estimated annual O&M costs for Proposed Project.

Response:

In Section 13 of the Application, Creative Energy addressed the rate and bill impacts of the Proposed Project including all areas where Creative Energy expects incremental impacts from the Proposed Project relative to current operations. The analysis does not include explicit baseline values for all components of Creative Energy's revenue requirement. Instead, the analysis calculated incremental impacts (for those costs where Creative Energy forecasts an incremental impact) relative to a baseline revenue requirement escalating at 2% per year. The results are summarized along with additional information in the response to BCUC IR 2.115.6.

Creative Energy does not have financial reporting information on the existing plant to the level of detail requested by the Commission (i.e. spending on spares, external contractors, etc.). The below table is taken from Creative Energy's 2016-17 RRA, Exhibit B-1A, Appendix A, Schedule 15. It shows the Operation and Maintenance expenses associated with Creative Energy's steam production plant.

CREATIVE ENERGY VANCOUVER PLATFORMS INC.
2016-2017 REVENUE REQUIREMENT APPLICATION
OPERATING & MAINTENANCE EXPENSES

Line #	Acct. #	Account Name	2011 Actual	2012 Actual	2013 Actual	2014 Actual	2015 Approved	2015 Unaudited	2016 Forecast	2017 Forecast
1		Steam Production-Operation								
2	500	Supervision and Labour	970,553	999,882	1,049,849	1,062,133	1,030,443	1,053,872	1,144,000	1,178,000
3	502	Steam Expenses	803,754	910,797	884,415	924,623	945,725	900,222	903,400	973,300
4		Total Steam Production-Operation	1,774,307	1,910,679	1,934,264	1,986,756	1,976,168	1,954,094	2,047,400	2,151,300
5										
6		Steam Production-Maintenance								
7	506	Structures and Improvements	10,644	8,262	4,552	12,473	6,300	3,576	9,200	9,400
8	512	Steam Prodution Equipment						0	0	0
9		Total Steam Production-Maintenance	10,644	8,262	4,552	12,473	6,300	3,576	9,200	9,400

Please note the following:

- **Creative Energy expects no change to staffing requirements as a result of the Proposed Project, and therefore no change to staffing costs (see the response to BCUC IR 2.102.2)**
- **Creative Energy does not separately track cost forecasts for equipment / spares; equipment costs; or external contractor costs. Any expenses in these categories are captured within Steam Production-Maintenance – Structures and Improvements. These costs average less than $10,000 per year and Creative Energy does not expect a material change in these costs as a result of the Proposed Project. There may be a reduction due to the Proposed Project, but given the level of current costs, any reduction would have a minimal effect on the overall impact of the Proposed Project.**
- **Steam Expenses captures steam production input costs (excluding natural gas) such as water, chemicals, and plant electricity consumption. Creative Energy does not expect any change in the cost of water or chemicals as a result of the Proposed Project or the Alternative. Creative Energy does forecast a change in electricity costs, which has been captured within Creative Energy's analysis. See the response to BCUC IR 2.115.6.**
- **Some costs associated with the current steam production plant are captured within steam plant sustaining capital, not O&M expenses. The forecast impact on sustaining capital was described in Exhibit B-1, s. 13, pp 74-75, and is also discussed in the response to BCUC IR 2.115.6.**

The below table provides 2017 forecast or actual values, and Creative Energy's forecast of the incremental impact of the Proposed Project as of 2023, relative to a baseline of 2% annual increases in the revenue requirement. This information is provided for steam plant O&M expenses, as well as for steam plant sustaining capital, and other categories of expenses not captured elsewhere such as the Expo Plant lease.

These incremental cost impacts are also described in more detail in the response to BCUC IR 2.115.6.

	2017 Forecast, Current Plant	2023 Incremental Impact Relative to Baseline due to Proposed Project	Note
Steam Production-Operation – Supervision and Labour	2017 Forecast $1,178,000	No change	Plant staffing costs. No change in staffing requirement expected.
Steam Production-Operation – Steam Expenses	2017 Forecast: $973,300	Increase due to higher electricity consumption. Increase of $159,900 in 2023.	Category includes water, chemicals, and power.
Steam Production-Maintenance – Structures and Improvements	2017 Forecast: $9,400	No change	Category includes all expensed equipment /spares and external contractor costs. No material reduction expected.

Incremental Sustaining Capital (Labeled in financial reporting as "Steam Production Plant – Boiler Plant Equipment")	**2017 Forecast additional capital: $250,000**	**Decrease in 2023 of $110,000 p.a. relative to baseline amount of $250,000 p.a.**	**See response to BCUC IR 37.4, and Exhibit B-1 p. 74.**
Expo Plant Lease	**Not a current cost**	**Increase in 2023 of $178,400 relative to status quo (no lease cost)**	
Property Taxes	**2017 Actual Value: $595,160**	**Reduction in 2023 of $474,600 relative to baseline of 2% p.a. increases**	**Large property tax increase in 2017. See p. 38 of Decision accompanying Order G-205-18.**
Administrative & General – Operation – Insurance	**2017 Forecast:** **$124,100**	**Increase in 2023 of $51,400, relative to baseline of 2% p.a. increases**	
Municipal Taxes	**2017 Forecast: $285,200**	**Increase in 2023 of $46,700 relative to baseline of 2% p.a. increases**	**Change in Municipal Access Fees is largely contingent on other changes**

102.6.1 If Creative Energy does not anticipate a change in annual O&M costs, please explain why.

Response:

Please see the response to BCUC IR 2.102.6.

103.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Sections 10.4.2,10.4.3, p. 42; Exhibit B-5, BCUC IRs 24.1, 24.1.1.1
Location of Expo Plant
Plant controls

In response to BCUC IR 24.1.1, Creative Energy stated: "There will be control rooms at both plants, but each control room will display information from both plants."

103.1 Please explain whether one of the control rooms will be considered the "main" control room and will control the other plant.

Response:

How the operators will be spread between the two plants under various operating conditions has not yet been determined.

103.1.1 If so, please state which control room will be designated the "main" control room.

Response:

How the operators will be spread between the two plants under various operating conditions has not yet been determined.

Creative Energy further stated: "The plants will be operated under a single control system, which oversees both plants."

103.2 Please discuss the safety risks associated with operating two interconnected plants in two different locations.

Response:

The two plants will be treated as a single operating facility by Technical Safety BC as per the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation, as the two plants are connected to a common header. This has been confirmed in preliminary discussions with Technical Safety BC. How the operators will be spread between the two plants under various operating conditions has not yet been determined.

103.2.1 Please discuss the consequences and Creative Energy's proposed mitigation strategies.

Response:

This has not yet been determined.

103.3 Please explain whether Creative Energy has reviewed the safety requirements for the Proposed Project with Technical Safety BC.

Response:

Yes. Creative Energy has had preliminary discussions with Technical Safety BC about the Proposed Project.

103.3.1 If so, please provide an overview of the issues raised.

Response:

Discussions have included staffing requirements, specifically:

- **Whether a second Chief Engineer is needed or not – it is not because the plants will be joined into a common header.**
- **Whether or not additional staffing will be required to operate a second plant – review of staffing still needs to be looked into in detail, but minimal extra staffing requirements are expected given the expected operation of the two plants and remote control capabilities. Further discussions are expected to focus on how the operators will be spread between the two plants under various operating conditions.**

103.3.2 If so, please explain whether Technical Safety BC's requirements will impact the following:

i. Staffing requirements; and

Response:

Please see the response to BCUC IR 2.103.3.1.

ii. Control philosophy.

Response:

The discussions with Technical Safety BC support our planned intent to have 2 control rooms (one in each plant), which 'mirror' each other. This allows flexibility in operating the plants, and staff at either plant can see the state of both plants.

103.3.3 If not, please explain why.

Response:

Please see the responses to BCUC IRs 2.103.3 and 2.103.3.1.

104.0 Reference: PROJECT DESCRIPTION AND BEATTY PLANTS PROJECT
Exhibit B-1, Section 5.1, p. 13; Section 11.1, pp. 56–57; Exhibit B-5, BCUC IR 25.2
Construction milestones

On pages 56 and 57 of the Application, Creative Energy provides Table 7 – Construction Milestones:

Table 7 - Construction Milestones

1	BCUC Approval	Dec. 31, 2018
2	Order Expo boilers	Dec 2018
3	Start of Expo Plant construction	Jan 2019
4	Early works (new fuel tanks & interconnection)	May 2019
5	Completion of Expo Plant and early works	Oct 2019
6	Phase 1 commissioning	Nov-Dec 2019
7	Relocation of office staff	Jan 2020
8	Shutdown #1 of Beatty Plant • Abatement and demolition of Boilers #1, #2 and #4 • Relocation of gas service • Relocation of feedwater pumps	April 2020
9	Restart #1 of Beatty Plant	Oct 2020
10	Demolition and excavation of east area	Oct 2020 – April 2021
11	Shutdown #2 of Beatty Plant • Relocation of BC Hydro service • Temporary water service • Install temporary flue for Boiler #3	April 2021
12	Restart #2 of Beatty Plant	Oct 2021
13	Below grade to L4 slab (below flues)	Oct 2021-April 2022
14	Shutdown #3 of Beatty Plant	April 2022
	• Extend breeching to L18 • Connect boilers to breeching • Remove temporary flues • Reinstate permanent water service	
15	Restart #3 of Beatty Plant (final)	Oct 2022
16	Complete office tower development	2023

In response to BCUC IR 25.2 Creative Energy stated: "A detailed project schedule has not yet been developed. This will be done as part of the detailed design process."

104.1 Please provide the start date for the detailed design progress for the Expo Plant.

Response:

Detailed design will start shortly after BCUC approval of this Application.

104.1.1 Please provide an update on the detailed design process, including percentage complete and the anticipated date of completion.

Response:

At this time, detailed design is 0% complete. Detailed design will begin shortly after BCUC approval of this Application and is expected to complete 4 months after commencement.

104.2 Please explain whether the start date for the detailed design process for the Expo Plant is dependent on the Certificate of Public Convenience and Necessity (CPCN) application process.

Response:

Subject to the response to BCUC IR 2.104.2.1, the start date for beginning detailed design work is dependent on the receipt of a CPCN from the BCUC.

104.2.1 If so, please confirm, or otherwise explain, that the detailed design will not commence prior to approval of the CPCN application.

Response:

Creative Energy and the Developer may decide to commence detailed design in advance of CPCN approval, depending on the Developer's comfort level with the financial risk of starting detailed design work prior to the BCUC's decision. The Developer and not Creative Energy would be responsible for these costs, even if the design work is led by Creative Energy.

104.2.2 If not, please confirm, or otherwise explain, that the detailed design will be complete prior to approval of the CPCN application.

Response:

We do not expect to complete detailed design prior to CPCN approval.

104.3 Please explain whether the start date for the detailed design process for the Expo Plant is dependent on the rezoning application process.

Response:

We expect to commence detailed design in advance of rezoning enactment and do not see these as dependent.

104.3.1 If so, please confirm, or otherwise explain, that the detailed design will not commence prior to approval of the rezoning application.

Response:

We expect to commence detailed design in advance of rezoning enactment and do not see these as dependent.

104.3.2 If not, please confirm, or otherwise explain, that the detailed design will be complete prior to approval of the rezoning application.

Response:

Detailed design is expected to complete 4 months after commencement, or around the end of April 2019. We do not know for certain whether the rezoning enactment will be complete by them because it is controlled by the City. Rezoning enactment is not required to begin construction of the Expo Plant.

104.4 Please indicate by when a detailed project schedule for the Expo plant will be developed.

Response:

A detailed project schedule for the Expo Plant will be developed within two months of CPCN approval.

104.5 Please provide an outline of the major activities for the Expo Plant project and their associated timing.

Response:

The table below provides a summary of the major activities and milestones for the Expo Plant project.

Major Task	Start	Duration	Complete
Boiler Fabrication/Delivery	Jan 1, 2019	6 months	July 1, 2019
Feedwater Package Fabrication / Delivery	Jan 1, 2019	6 months	July 1, 2019
Detailed Design	Jan 1, 2019	16 weeks	May 1, 2019
PavCo design review (in parallel with detailed design)	Mar 1, 2019	8 weeks	May 1, 2019
Construction Tender	May 1, 2019	4 weeks	June 1, 2019
Construction Contracts/Ramp-up	June 1, 2019	4 weeks	July 1, 2019
Demolition, structural work, civil work	July 1, 2019	2 months	Sep 1, 2019
Gas service connection (by Fortis BC)	Sep 1, 2019	6 weeks	Oct 15, 2019
Mechanical/Electrical Install	Sep 1, 2019	4 months	Jan 1, 2020
Interconnection Lines install	Nov 1, 2019	2 months	Jan 1, 2020
Water/sewer services (by City of Vancouver)	Dec 1, 2019	4 weeks	Jan 1, 2020
Commissioning	Jan 1, 2020	6 weeks	Feb 15, 2020
Completion/Shutdown of Beatty	April 15, 2020		

104.5.1 Please discuss any other activities that are required to be completed in advance of Expo Plant construction and their anticipated completion date.

Response:

There are a number of activities that need to be progressed to manage the critical path, but are not required prior to the start of construction. These include:

- **Air Quality permit application/approval from Metro Vancouver**
- **Utility connection permits from City of Vancouver**
- **Gas service coordination with FortisBC**
- **On going discussions with Technical Safety BC**
- **Coordination between boiler vendor and the designer**

104.6 Please provide the start date for the detailed design progress for the Beatty Plant.

Response:

Detailed design of the Beatty Plant will also begin shortly after CPCN approval. It will be part of the same design package as the Expo Plant.

104.6.1 Please provide an update on the detailed design process, including percentage complete and the anticipated date of completion.

Response:

At this time, detailed design is 0% complete. Detailed design will begin shortly after BCUC approval of this Application and is expected to complete 4 months after commencement.

104.7 Please explain whether the start date for the detailed design process for the Beatty Plant is dependent on the CPCN application process.

Response:

Subject to the response to BCUC IR 2.104.7.1, the start date for beginning detailed design work is dependent on the receipt of a CPCN from the BCUC.

104.7.1 If so, please confirm, or otherwise explain, that the detailed design will not commence prior to approval of the CPCN application.

Response:

Creative Energy and the Developer may decide to commence detailed design in advance of CPCN approval, depending on the Developer's comfort level with the financial risk of starting detailed design work prior to the BCUC's decision. The Developer and not Creative Energy would be responsible for these costs, even if the design work is led by Creative Energy.

104.7.2 If not, please confirm, or otherwise explain, that the detailed design will be complete prior to approval of the CPCN application.

Response:

We do not expect to complete detailed design prior to CPCN approval.

104.8 Please explain whether the start date for the detailed design process for the Beatty Plant is dependent on the rezoning application process.

Response:

We expect to commence detailed design in advance of rezoning enactment and do not see these as dependent.

104.8.1 If so, please confirm, or otherwise explain, that the detailed design will not commence prior to approval of the rezoning application. If not, please confirm, or otherwise explain, that the detailed design will be complete prior to approval of the rezoning application.

Response:

Detailed design is expected to complete 4 months after commencement, or around the end of April 2019. We do not know for certain whether the rezoning enactment will be complete by them because it is controlled by the City. Rezoning enactment is required to begin construction of the Beatty Plant; however, construction of the Beatty Plant is not scheduled to commence until April 2020.

104.9 Please indicate by when a detailed project schedule for the Beatty plant will be developed.

Response:

A detailed project schedule for the Beatty Plant will be developed within two months of CPCN approval.

On page 13 of the Application, Creative Energy provides Table 1 – Organisations supporting the Application.

Table 1 - Organisations supporting the Application

Role	Individual / Firm
Application Lead	President & CEO of Creative Energy
Application Counsel	Lawson Lundell LLP
Project Director	Director of Engineering and Innovation, Creative Energy
Project Manager	Manager, Utility Design and Construction, Creative Energy
Construction Managers	• EllisDon (Beatty Plant) • To be determined (Expo Plant)
Engineering	• Fosdick & Hilmer (Beatty Plant) • WSP (Expo Plant) • Vibratech (interconnection)
Air quality	Gradient Wind
Controls	Spartan Controls
Financial Modelling	Reshape Infrastructure Strategies

104.10 Please provide evidence of the technical capacity of each party and / or persons involved in the Proposed Project to undertake and operate the project.

Response:

Creative Energy will be solely responsible for operating the new plants. Creative Energy has maintained and operated the existing plant successfully for 50 years with an exemplary record of reliability. Creative Energy has the requisite technical capacity to operate the new plants.

With respect to the design and construction of the new plants, this is a once-in-50-years project in the history of Creative Energy. Creative Energy has experienced project managers with successful records of project execution. Creative Energy does not have all of the skills and people internally that will be required to execute a project of this scale and complexity; neither should it given the infrequent nature of projects of this scale for the utility.

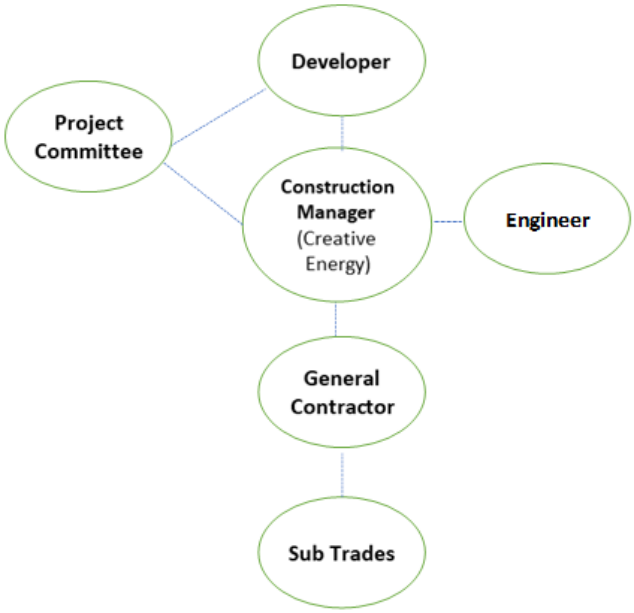
In regards to design, as owner and operator Creative Energy establishes the requirements and specifications of the utility in both the schematic and detailed design phases. Creative Energy has already engaged experienced consultants for schematic design and will also secure experienced parties for detailed design. WSP has done the schematic design of the Expo Plant and Creative Energy may decide to rely on WSP to take on the full engineering role for both plants upon CPCN approval. WSP is one of the leading engineering consultancies in Canada, with a long track record of successful industrial energy projects. Recent examples are the Carillon generating station rehabilitation and retrofit, the Cliff St boiler plant replacement (Ottawa) and the Evergreen Line. Ultimately, Creative Energy must be satisfied the design meets the utility's requirements and specifications. Given the Developer is responsible for all costs, the Developer can also request an additional external peer review (at its cost) of the detailed design and budgets.

In regards to construction, Creative Energy also intends to engage a large construction firm with experience in constructing large, complex projects to act as General Contractor (GC). This is also of interest to the Developer and this is already reflected in the current project budget. The Developer also has an interest in ensuring close coordination of all elements in Creative Energy's scope and in the Developer's scope with respect to the Utility Infrastructure.

To date, the Developer has been working with Ellis Don to prepare pre-construction materials for the Beatty Plant. It is likely that Ellis Don will act as the General Contractor for both the Beatty and Expo Plants. Ellis Don is a world-leading construction company that completes in excess of $3.5 billion of construction annually. Many of those projects are larger and more complex than this project. Comparable projects are Parq Vancouver, Rogers Centre (Toronto), Surrey Memorial Hospital Critical Care centre and the YVR Core program.

Creative Energy's role in the construction process will be that of a Construction Manager, interfacing between the GC and the Project Committee (a committee composed of Creative Energy and the Developer, as outlined in the Trust and Development Agreement). In that role, Creative Energy will manage the contract with the GC for the delivery of Creative Energy's scope. Creative Energy will have rights for approvals and oversight to ensure the final product meets the designs and specifications. The GC, in turn, will be responsible to manage all sub-trades, manage the master project schedule, ensure timely delivery of all materials, sequencing, and their budget. Creative Energy will be responsible for deciding whether to request any variance to the plans and specifications by way of written change order request to the Project Committee, as set out in Schedule F of the Trust and Development Agreement.

An illustrative diagram of the relationships is as follows:



For greater certainty, the execution of the Proposed Project does not solely rely on the experience of Creative Energy's internal resources. The Proposed Project will be executed by teams of experts with appropriate management and oversight. Moreover, ultimately the cost risk of the project execution is being borne by the Developer, not by Creative Energy or its customers.

The key Creative Energy staff on a project level will be Kieran McConnell and Amin Hassanshahi.

Kieran McConnell, P.Eng. has 18 years of engineering experience in the development and execution district energy, power generation and industrial water & energy management. Kieran oversees the development of all of Creative Energy's major projects. Kieran also played a key role in the development of the Southeast False Creek Neighbourhood Energy Utility where he was involved in the feasibility, design, construction, and commissioning of this utility on behalf of the City of Vancouver.

Amin Hassanshahi has 10 years of experience in the district energy industry. He joined Creative Energy as Utility Planning Supervisor in 2008 and in 2012 he became Manager, Utility Design and Construction, where he applies his project management skills to successfully manage all major capital projects related to the Creative Energy system and design and construction of new district energy systems.

104.11 Please provide the organizational chart of the project team, including the names of the Project Manager(s).

Response:

Please see the response to BCUC IR 2.104.10.

104.12 Please explain the project delivery method for the Proposed Project (for example, Design and Build, Contract Management at Risk etc.) from present day up to project completion in 2023.

Response:

The project delivery method will be Design-Bid Build throughout.

104.13 Please explain and provide specific details of the internal resources

Response:

Please see the response to BCUC IR 2.104.10.

104.14 Please explain whether an external party will be engaged to project manage the Proposed Project.

Response:

This is not anticipated.

104.14.1 If so, please provide details of the party's responsibilities.

Response:

Please see the response to BCUC IR 2.104.14.

104.15 Please confirm the parties responsible for the following:

i. overall schedule for the Proposed Project;

Response:

The Construction Manager.

ii. schedule for the Expo Plant; and

Response:

The Construction Manager.

iii. the schedule for the Beatty Plant.

Response:

The Construction Manager.

E. CONSTRUCTION OF THE PROJECT

105.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-1, Section 11.3, p. 59; Transcript, Volume 1, p. 86; Exhibit B-5, BCUC IRs 28.1, 28.1.4
Management of project risks

In response to BCUC IR 28.1, Creative Energy states:

> If necessary, a pre-arranged mobile steam boiler plant would be delivered to the site and operated to provide steam to customers to supplement the generation capacity of the Expo plant. The sizing of the mobile steam plant would be determined based on the extent of the expected delay and the forecast peak demand during that period.

The boiler plant would be sited on the 701 Expo lot where the land is available throughout the first shutdown of the Beatty Plant.

105.1 Please explain whether temporary boilers will be available at all times for the duration of the Proposed Project.

Response:

This is not anticipated, and is not warranted given the sequencing of the work on the Expo and Beatty Plants.

105.1.1 If not confirmed, please explain the stages of construction during which the temporary boilers will be available.

Response:

Temporary boilers are not expected to be used and will only be installed if the project falls behind such that a restart of the Beatty Plant leading into heating season is expected to be delayed.

105.2 Please provide details of the "pre-arranged mobile steam boiler plant" and the party responsible for arranging the mobile plant.

Response:

The Developer will be responsible. Discussions with one vendor have been undertaken (Nation Wide Boilers) to confirm boiler availability to suit the project's requirements and indicative pricing.

105.2.1 Please confirm, or otherwise explain, whether the party identified in your response to IR 105.2 will enter in to a contractual agreement for the mobile steam boiler plant prior to the commencement of construction.

Response:

Yes, we anticipate this to be the case.

105.2.1.1 If confirmed, please provide details of the proposed agreement.

Response:

There are no details available at this early stage. The first Beatty Plant shutdown is not scheduled until April 2020.

105.2.1.2 If not confirmed, please explain the mechanism for pre-arranging the mobile steam boiler plant.

Response:

Please see the response to BCUC IR 2.105.2.1.

In response to BCUC IR 28.1.4, in which Creative Energy was asked whether it ever needed to employ a temporary truck-mounted steam boiler, Creative Energy stated: "Yes, on several occasions but at a smaller scale for partial system shut-downs."

105.3 Please confirm, or otherwise explain, whether Creative Energy employed temporary truck-mounted steam boilers for planned outages.

Response:

Confirmed.

105.3.1 If confirmed, please provide details on any planned outages since 2013. For each planned outage, please provide details on the following:

i. date of planned outage;

Response:

October 30, 2016.

ii. reason for planned outage;

Response:

Distribution network partial shutdown to repair distribution piping.

iii. duration of planned outage;

Response:

Twelve to fourteen hours.

iv. number of temporary truck-mounted boiler(s);

Response:

One temporary steam boiler was employed.

v. capacity of temporary truck-mounted boiler(s);

Response:

The capacity was approximately 1,000-1500 pounds per hour.

vi. date of request for temporary truck-mounted boiler(s);

Response:

October 15, 2016.

vii. date of delivery of temporary truck-mounted boiler(s);

Response:

October 30, 2016.

viii. date of temporary truck-mounted boiler(s) commissioning.

Response:

October 31, 2016.

If dates for temporary truck-mounted boiler(s) are unknown, please provide the lead time in number of days.

Response:

Please see the responses above.

105.4 Please confirm, or otherwise explain, whether Creative Energy employed temporary truck-mounted steam boilers for unplanned outages.

Response:

Creative Energy has not employed temporary truck-mounted steam boilers for unplanned outages.

105.4.1 If confirmed, please provide details on any unplanned outages since 2013. For each unplanned outage, please provide details on the following:

i. date of unplanned outage;
ii. reason for unplanned outage;
iii. duration of unplanned outage;
iv. number of temporary truck-mounted boiler(s);
v. capacity of temporary truck-mounted boiler(s);
vi. date of request for temporary truck-mounted boiler(s);
vii. date of delivery of temporary truck-mounted boiler(s);
viii. date of temporary truck-mounted boiler(s) commissioning; and
ix. mitigation strategies implemented by Creative Energy during unplanned outage.

If dates for temporary truck-mounted boiler(s) are unknown, please provide the lead time in number of days.

Response:

Please see the response to BCUC IR 2.105.4.

106.0 Reference CONSTRUCTION OF THE PROJECT
Exhibit B-1, Section 13.1, p. 63; Section 15, p. 83; Schedules F and G of Appendix A;
Exhibit B-5-2, BCUC IRs 51.1, 51.6;
Project risks – costs

BCUC IR 51.1 requested clarification on whether "costs associated with/cost increases due to/costs arising" are limited to costs which are within Creative Energy's scope of responsibility (as defined in Appendix A, Schedule G) or includes costs which may be incurred within the Developer's scope of responsibility but are as result of Creative Energy schedule delays, design amendments or change orders.

In response to BCUC IR 51.1 Creative Energy stated: "Creative Energy believes that it is will not be liable for costs within the Developer's scope of responsibility."

106.1 Please elaborate on the response provided to BCUC IR 51.1, confirming whether or not Creative Energy is liable for any costs within the Developer's scope of responsibility irrespective of "Creative Energy schedule delays, design amendments or change orders."

Response:

The wording on page 63 of the Application, as referenced in BCUC IR 1.51.0, was intended to provide a summary of the responsibilities for the capital costs of the Proposed Project as between Creative Energy and the Developer; however, the specific wording of the Trust and Development Agreement (TDA) and in particular Schedule F of it govern the matter.

Pursuant to section 17 of Schedule F to the TDA,

> **Except for Creative Vancouver's obligations to pay the CEV Amount, the Developer will be responsible for the payment of all costs…**
>
> **provided, however, that in addition to Creative Vancouver's obligations to pay the CEV Amount, Creative Vancouver shall be responsible for and shall pay for the following costs…:**
>
> > **(f) costs arising from any schedule delays caused by or in the control of Creative Vancouver; and**
> > **(g) costs arising from any Creative Vancouver Design Amendment or Change Orders submitted by Creative Vancouver, where…**

Payment of costs is separate from the scope of responsibilities of each party to oversee and approve design and construction of components of the Proposed Project. For greater certainty, the Proposed Project does not include the Developer's project for which Creative Energy has no responsibility whatsoever. The Developer has direct responsibility for design and construction of certain components of the Proposed Project, as summarised on Schedule G, and approval responsibility in regards to the other components, but regardless of the division of such responsibilities the Developer pays <u>all costs</u> of the Proposed Project except as noted above.

The responsibilities of each party for completing the detailed design of the Proposed Project components within their scope of responsibility are as provided in section 3.2 of the TDA. Once the specifications, scope and detailed designs are settled and approved by each party, any amendments from time to time will be by way of written change order request subject to the approval of the other party.

Costs associated with design changes made by Creative Energy pursuant to written change order could relate to matters within the Developer's scope of responsibility as set out on Schedule G. For example, Creative Energy could submit a written request for a change to the design of the New Plant Premises (which is the structure that will house the renovated Beatty Plant) or to the New Office (which is the office space that will be returned to Creative Energy by the Developer), both of which are within the Developer's scope of responsibility. Please see sections 9 to 12 of TDA Schedule F. It is important to note that Creative Energy will <u>not</u> be responsible for increased costs associated with change order design changes by Creative Energy that are considered <u>nondiscretionary</u> (e.g., that are to accommodate changes in prudent utility practices, arise as a result of reasons of health and safety, or are required by any Governmental Authority. Such costs are the responsibility of the Developer.

Costs arising from a schedule delay caused by or in the control of Creative Energy could also relate to project components within the Developer's scope of responsibility. For example, during the construction of the New Plant Premises and the New Office, the Developer could determine that it

needs to deviate from the approved designs and specifications for such components and if so it must submit the proposed variance to Creative Energy for approval pursuant to a change order. If Creative Energy's approval of such change order was unreasonably delayed, this could result in a schedule delay caused by Creative Vancouver. Please see sections 13 and 14 of TDA Schedule F.

In response to BCUC IR 51.6 Creative Energy provides an illustrative scenario for schedule delays and resulting cost overruns: "An illustrative scenario for schedule delays and resulting cost overruns that could be caused by Creative Energy is related to the delivery of boilers to the Expo Plant."

106.2 Using the illustrative example provided in BCUC IR 51.6, where the delivery of the boilers to the Expo Plant causes schedule Developer delays and resulting cost overruns, please explain what costs would be the responsibility of Creative Energy (e.g. payment to contractors, personnel costs, contract penalties.)

Response:

Creative Energy would be responsible for costs arising directly from the schedule delay if and to the extent the schedule delay was <u>caused by</u> Creative Energy. The cost increase (such as a contract penalty for delay) would have to be demonstrably the result of a schedule delay caused by Creative Energy.

As noted in the response to BCUC IR 1.51.6, Creative Energy's responsibilities for project delivery under the TDA can generally be characterized as 'off-site' responsibilities, such as approval of plans and specifications, timely feedback on construction submittals, etc. With respect to the illustrative example, where Creative Energy is required to approve plans/specifications related to the boilers to be delivered to the Expo Plant, if Creative Energy unreasonably delayed its approval (e.g., approval was required in one week and it took Creative two weeks to grant approval for no valid reason) and that unreasonable delay caused the delivery of the boilers to be delayed which caused increases costs to the Developer (e.g., a contract penalty for delay by the boiler supplier or other supplier/contractor), Creative Energy would be responsible for such incremental cost.

Other possible examples would be of a similar nature: where Creative Energy is required to provide an approval, Creative Energy's approval is unreasonably delayed (i.e., Creative Energy has no reasonable reason for the delay) and that unreasonable delay in granting approval caused a project delay and increased costs to the Developer, Creative Energy would be responsible for such incremental cost.

Reasonable delaying are not captured, and not all unreasonable delays in granting approval would give rise to a project delay or to incremental cost. This is a typical contract mechanism for providing an incentive for the party reviewing and approving requests to remain diligent in responding to such requests. As noted in the response to BCUC IR 1.51.6, Creative Energy has planned and budgeted for sufficient resources to be dedicated to the project in order to have the capacity to meet the project obligations. These resources are part of the total cost of the project to the Developer. For these reasons, the most likely scenario is that Creative Energy will not be responsible for any additional costs.

107.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-1, Schedule G to Appendix A, pp. 1-2; Exhibit B-9, Panel IR 4.0; Project risks

Page 1 of Schedule G to Appendix A provides the Responsibilities Matrix in which Creative Energy is responsible for all items identified for the Expo Plant.

	Description	Location / Level	Management of Design/ Specifications/ Permitting	Management of Construction	Comments
Expo Plant	Hazmat and Aesbestos Removal	Expo Boulevard Level 1	Creative Energy	Creative Energy	CE responsible for up to $100,000 of removal costs. PavCo responsible for all other costs.
	Demolition and Modifications to shell space as required	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Exterior Façade of Expo Plant	Expo Boulevard Level 1	Creative Energy with the approval of the Developer	Creative Energy	Developer is required to approve the façade design of the Expo Plant due to the proximity to the 720 Beatty Redevelopment
	Major Equipment Inside Expo Plant - Boiler #1 (200,000 pound per hour steam boiler) / Boiler #2 (200,000 pound per hour steam boiler)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Secondary Equipment Inside Expo Plant - Water softeners / Feed water pumps / Chemical treatment equipment / Deaerator / Condensate receiver	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Electrical Distribution Inside Expo Plant - Medium voltage (600V) electrical distribution	Expo Boulevard Level 1	Creative Energy	Creative Energy	Electrical Power to be taken from Substation C within BC Place.
	Life Safety Inside Expo Plant - Emergency Generator (1000 kW)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Ancillary Spaces Inside Expo Plant - Control Room / Staff Lunch Room / Staff Washroom	Level 2	Creative Energy	Creative Energy	
	Flues and Piping Outside of Expo Plant - 2 x Boiler flues (routed out upper concourse) / Relief piping (routed out upper concourse)	Level 3 and above	Creative Energy	Creative Energy	

In response to Panel IR 4.0 Creative Energy provided information on Scenario 1:

> Scenario 1
> If the Developer abandons or is incapable of completing the Developer's project before the Expo Plant is commissioned, then work on the new Beatty Plant would not yet have commenced and the full generating capacity of the existing plant would remain available to service customers.
>
> Creative Energy would not yet have made its first payment to the Developer as this payment is not due until the Expo Plant is in service.

107.1 Please explain what work the Developer will undertake prior to the completion of the Expo Plant.

Response:

No details are finalized, but no work is expected which would in any way impair the function of the Beatty Plant. Some possible work might include erection of hoarding, soils remediation, installation of new fuel oil tanks (possibly in a temporary arrangement to facilitate removal of the existing fuel oil tanks).

107.2 With reference to the statement "Creative Energy would not yet have made its first payment to the Developer as this payment is not due until the Expo Plant is in service," please explain what costs Creative Energy will have incurred for the construction of the Expo Plant.

Response:

Creative Energy will not have incurred any costs at that point in time.

> 107.2.1 Please explain how Creative Energy would recover these costs.
>
> **Response:**
>
> **Please see the response to BCUC IR 2.107.2.**

In response to Panel IR 4.0 Creative Energy provided information on Scenario 2:

> Scenario 2
>
> If the Developer abandons or is incapable of completing the Developer's project during Beatty Plant Shutdown #1, the Expo Plant would be in service and available to service customers.

Beatty Plant Shutdown #1 largely involves two major pieces of work: A) abating and demolishing Boiler #1, Boiler #2 and Boiler #3, and B) relocating the gas service to the Beatty Plant.

If the work associated with A) is not completed by the scheduled Beatty Plant Restart #1, this would not impair Creative Energy's ability to provide service to customers because Boiler #4, Boiler #5, Boiler #6 and the Expo Plant would be available for service.

The work associated with B), once started, would need to be completed in order to restart Beatty Plant Boiler #4, Boiler #5 and Boiler #6 to meet peak demand requirements. The risk of completion of utility services to the plant is mitigated by careful planning and coordination between the Developer and the utility providers, and by the fact that the majority of the work is completed by the utility providers, not by the Developer.

The final mitigant is the contingency plan to bring in trailer-mounted boiler(s) to provide sufficient capacity to meet peak demand.

107.3 With reference to the statement "If the work associated with A) is not completed by the scheduled Beatty Plant Restart #1, this would not impair Creative Energy's ability to provide service to customers because Boiler #4, Boiler #5, Boiler #6 and the Expo Plant would be available for service", please discuss the structural works required to abate and demolish the boilers at the Beatty Plant.

Response:

No structural works are anticipated for abatement and demolition of the boilers.

107.3.1 Please explain whether, in the event that that the work associated with A) is not completed by the scheduled Beatty Plant Restart #1, the Beatty Plant could be safely operated to continue to provide service to customers.

Response:

As part of the abatement, deconstruction and removal of the boilers, steam, makeup water, natural gas, fuel oil and high and low voltage electrical lines will be disconnected from each of the boilers. In order to make the plant safe to operate either following this work, or in the case of partial completion of the work, each of these lines will need to be made safe. Steam, water and fuel lines would need to be capped appropriately and non-destructive testing performed. Electrical lines would need to be terminated according to code requirements.

Any temporary scaffolding and materials handling equipment on site as a result of the abatement and demolition work would have to be removed.

107.4 With reference to the statement "the majority of the work is completed by the utility providers, not by the Developer", please discuss the work that will be within the Developer's scope.

Response:

Typically work within the building, downstream of where the utility crosses the property line. Typically this would include points of isolation and distribution throughout the building.

107.5 Please explain whether Creative Energy would be responsible for the costs associated with the contingency plan to "bring in trailer-mounted boiler(s) to provide sufficient capacity to meet peak demand."

Response:

This would be the Developer's responsibility.

107.5.1 If so, please explain how Creative Energy would recover the costs incurred.

Response:

Please see the response to BCUC IR 2.107.5.

107.5.2 If not, please provide the party responsible for the contingency plan.

Response:

The Developer is responsible, with approval rights to Creative Energy. The Construction Manager would be responsible on behalf of the Developer for developing and executing the contingency plan.

In response to Panel IR 4.0 Creative Energy provided information on Scenario 3:

> Electrical and water services to the Beatty Plant will be relocated during Beatty Plant Shutdowns #2 and #3. As discussed above, the risk of completion of utility services to the plant is mitigated by careful planning and coordination between the Developer and the utility providers, and by the fact that the majority of the work is completed by the utility providers, not by the Developer. During these shutdowns the contingency plan would also be available to bring in trailer-mounted boiler(s) to provide sufficient capacity to meet peak demand.
>
> Creative Energy would not yet have made its second payment to the Developer as this payment is not due until the Beatty Plant is in service on a final basis.

107.6 Please explain whether, under Scenario 3, the electrical and water services to the Beatty Plant would still need to be relocated.

Response:

If the existing services have been disconnected, the new services would have to be completed. The precise sequencing has not yet been determined.

107.6.1 If so, please explain why.

Response:

Please see the response to BCUC IR 2.107.6.

107.7 With reference to the statement "the majority of the work is completed by the utility providers, not by the Developer, please discuss the work that will be within the Developer's scope.

Response:

The utility providers typically are not responsible for work on the customer's side of the point of interconnection downstream of the utility's meter.

107.8 Please explain whether Creative Energy would be responsible for the costs associated with the contingency plan to "to bring in trailer-mounted boiler(s) to provide sufficient capacity to meet peak demand."

Response:

No. Such costs would fall to the Developer.

107.8.1 If so, please explain how Creative Energy would recover the costs incurred.

Response:

Please see the response to BCUC IR 2.107.8.

107.8.2 If not, please provide the party responsible for the contingency plan.

Response:

The Developer is responsible for the costs. The Construction Manager would be responsible on behalf of the Developer for developing and executing the contingency plan.

In response to Panel IR 4.0, Creative Energy stated: "If the Developer is in default under its financing and the lender commences realization proceedings, then the lender will be required to complete the construction of the Beatty Plant."

107.9 Please explain how "complete the construction of the Beatty Plant" is defined. In your response, please discuss the work that must be accomplished in order for the construction of the Beatty Plant to be considered "complete."

Response:

Please refer to Section 6.2 (a) (v) of the Trust and Development Agreement which states that any lendors or creditors must covenant as part of any financing to the Developer that upon default of the Developer "…the lenders or creditors will be responsible for and will forthwith complete all of the obligations of the Developer under this Agreement relating to:

(A) the completion and delivery of the New Plant Premises to Creative Vancouver, including the creation of the Airspace Parcels; and
(B) the completion and delivery of the New Office to Creative Vancouver, including the creation of the Airspace Parcels, and the provision of the Alternate Office prior to such delivery, or the provision of adequate premises in lieu of the New Office satisfactory to Creative Vancouver acting reasonably having regard to the Developer Plans for the New Office,

to the same extent and effect as if such lender or creditor was the Developer…"

Creative Energy notes that any lenders or creditors would not be able to complete the larger development without completing the Beatty Plant and they would also not be entitled to receive Creative Energy's second payment under the terms of the Trust and Development Agreement until the Beatty Plant is commissioned and in service, which includes installation and commissioning of all Utility Infrastructure. Finally, the lenders or creditors would assume all interim responsibilities of the Developer, which include among other things paying for temporary office space until Creative Energy is able to occupy the New Office Space. There is no time limit to this obligation if Creative Energy has already vacated the existing office space at the time of default by the Developer.

107.10 Please confirm, or explain otherwise, whether the "complete construction of the Beatty Plant" includes the construction or acquisition of a new office space.

Response:

Confirmed. Please see the response to BCUC IR 2.107.9.

107.10.1 If not confirmed, please explain whether Creative Energy would be responsible for the construction or acquisition of a new office space.

Response:

Please see the response to BCUC IR 2.107.9.

107.10.1.1 If so, please explain how Creative Energy would recover the costs incurred.

Response:

Please see the response to BCUC IR 2.107.9.

108.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-1, Section 11.3, pp. 58 to 60; Schedule F to Appendix G, pp. 4-5, p. 18; Exhibit B-5, BCUC IR 29.1; Attachment 29.1
Project risks

In response to BCUC IR 29.1, Creative Energy stated:

> Creative Energy developed a project risk register as part of the schematic design process for the whole project. The intent of the risk register is to begin to catalogue and quantify the major risks on the project. The risk register is intended to be updated at every stage of the project, as the project design definition increases, and the level of project understanding increases. Regular reviews are undertaken with consultants, contractors, vendors, PavCo and other stakeholders.
>
> The risk register developed previously is quite preliminary, but appropriate given the degree of project definition at this stage. The risk register is Attachment 29.1. The risk register will be updated with more detail as the project proceeds and will eventually address all the items identified above.

Creative Energy provided its Risk Register for the Proposed Project in Attachment 29.1:

CREATIVENERGY

Risk Register

Project Name: Creative Energy Plant Redevelopment | Project Manager: Kieran McConnell | Review date: Dec 27, 2017

Name	Company	robabilit	Impact:	Priority Score = Probability Score x Impact Score
Amin Hassanshahi	Creative Energy	5 > 75%	= Critic	Very high - immediate action required
Kieran McConnell	Creative Energy	4 > 50%	= Sever	High - high risk, action needed
Richard Neindorf	Creative Energy	3 > 25%	3 = Major	Medium - action to be delegated to correct authority
Phil Jones	EllisDon	2 > 10%	2 = Mod.	Low - monitor and manage via routine procedures
	EllisDon	1 > 0%	1 = Minor	Very low - managed by routine procedures

108.1 Please confirm that the Risk Register, dated December 27, 2017, as provided in Attachment 29.1, is the latest version of Creative Energy's Risk Register for the Proposed Project.

Response:

Confirmed.

108.1.1 If not confirmed, please provide the latest version of the Risk Register.

Response:

Please see the response to BCUC IR 2.108.1.

108.1.2 If confirmed, please discuss the appropriateness of the current Risk Register given that construction is planned to commence in January 2019.

Response:

The risk register will be a fluid document that is revised continuously throughout the stages of the project leading up to start of construction. Creative Energy confirms that the existing risk register is not sufficiently refined for commencement of construction.

108.2 Please confirm, or otherwise explain, whether Creative Energy intends to update the Risk Register for the Proposed Project.

Response:

Confirmed.

108.2.1 If confirmed, please explain whether the updated Risk Register will address the following items:

- Supply of utility service;
- Cost risks;
- Public safety / worker safety;
- Construction;
- Access;
- Schedule;
- Environmental issues such as:
    - Permits;
    - Connection of services;
    - Asbestos material removal (Beatty and Expo Plants);
    - Seismic reinforcement;
    - Updating to current codes and regulations;
    - Oil storage tank removal;
    - Oil spill remediation;
- Probability of occurrence; and
- Consequence; and mitigation strategies.

Response:

The Risk register will be updated to address all these items.

108.2.1.1 If not confirmed, please provide details of the items that the Risk Register will address.

Response:

Please see the response to BCUC IR 2.108.2.1.

108.2.2 If confirmed, please explain when Creative Energy anticipates updating the Risk Register and the frequency at which the Risk Register will be updated over the duration of the Proposed Project.

Response:

Please see the response to BCUC IR 2.108.2.1.

108.2.3 If confirmed, please explain whether Creative Energy is prepared to submit the Risk Register to the BCUC for review.

Response:

Yes.

108.2.3.1 If not, please explain why not.

Response:

Please see the response to BCUC IR 2.108.2.3.

108.2.4 If not confirmed, please explain how Creative Energy will address and monitor the project risks.

Response:

Please see the response to BCUC IR 2.108.2.1.

Among others, Creative Energy identified the following two risks related to "Budget" in the Risk Register for the Proposed Project in Attachment 29.1:

#	Identified by (initials)	Date Identified	Category	Risk Description	Probability	Impact	Priority Score	Owner (initials)	Response Type	Action
17	KM	12.27.17	Budget	Funding issues - lack of funding or delay in payments	2	4	8	KM	Reduce	Secure whole project funding in advance
25	KM	12.27.17	Budget	Counterparty risk - ie WB insolvent	1	4	4	KM	Accept	Secure funding in advance against CE project

108.3 Please clarify/explain the difference in risk between Risk #17 (i.e. "Funding issues – lack of funding or delay in payments") and Risk #25 (i.e. "Counterparty risk – ie WB insolvent") in the Risk Register.

Response:

Risk #17 may be temporary in nature, leading to contractor delays, whereas Risk #25 has broader project implications.

108.4 Please provide an update on the status of Risk #17 and #25 as it relates to securing project funding in advance.

Response:

Creative Energy has no information upon which to base an update. Creative Energy does not have access to the Developer's financial records at this time. Creative Energy will have access to such information curing the project.

109.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-1, Schedule G to Appendix A, pp. 1–2; Exhibit B-6, CEC IR 46.2
Project risks

Page 1 of Schedule G to Appendix A provides the Responsibilities Matrix which states that apart from the 'Exterior Façade of Expo Plant' in which both Creative Energy and the Developer are identified as the responsible parties for the 'Management of Design/ Specifications/ Permitting', Creative Energy is responsible for all items identified.

	Description	Location / Level	Management of Design/ Specifications/ Permitting	Management of Construction	Comments
Expo Plant	Hazmat and Aesbestos Removal	Expo Boulevard Level 1	Creative Energy	Creative Energy	CE responsible for up to $100,000 of removal costs. PavCo responsible for all other costs.
	Demolition and Modifications to shell space as required	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Exterior Façade of Expo Plant	Expo Boulevard Level 1	Creative Energy with the approval of the Developer	Creative Energy	Developer is required to approve the façade design of the Expo Plant due to the proximity to the 720 Beatty Redevelopment
	Major Equipment Inside Expo Plant - Boiler #1 (200,000 pound per hour steam boiler) / Boiler #2 (200,000 pound per hour steam boiler)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Secondary Equipment Inside Expo Plant - Water softeners / Feed water pumps / Chemical treatment equipment / Deaerator / Condensate receiver	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Electrical Distribution Inside Expo Plant - Medium voltage (600V) electrical distribution	Expo Boulevard Level 1	Creative Energy	Creative Energy	Electrical Power to be taken from Substation C within BC Place.
	Life Safety Inside Expo Plant - Emergency Generator (1000 kW)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Ancillary Spaces Inside Expo Plant - Control Room / Staff Lunch Room / Staff Washroom	Level 2	Creative Energy	Creative Energy	
	Flues and Piping Outside of Expo Plant - 2 x Boiler flues (routed out upper concourse) / Relief piping (routed out upper concourse)	Level 3 and above	Creative Energy	Creative Energy	

In response to CEC IR 46.2, Creative Energy stated:

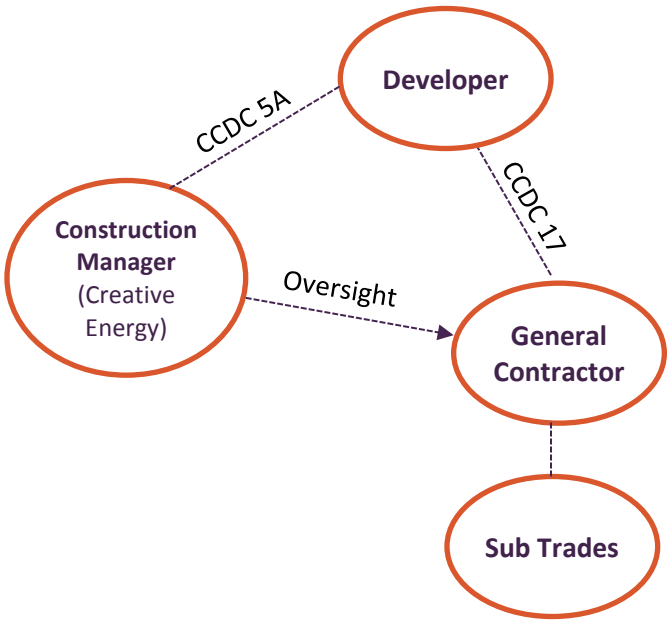
> The Developer cannot commence major work on the Beatty Plant until the Expo Plant is commissioned. The Developer also cannot receive the first installment of Creative Energy's payment until the Expo Plant is commissioned. <u>If the Developer fails to complete the Expo Plant</u> there is no immediate impact on Creative Energy ratepayers, except the lost opportunity of securing the upgrades to the Beatty Plant. [Emphasis added]

109.1 Given that the Responsibilities Matrix identifies Creative Energy as the responsible party for the Expo Plant, please explain the statement "[i]f the developer fails to complete the Expo Plant."

Response:

Ultimately the Developer must build the Expo Plant, and Creative Energy has oversight and management of the design, specification, procurement, construction and commissioning of all elements of the Expo Plant. For this reason, Creative Energy will act as Construction Manager to the Developer, but the Developer will hold the construction contracts.

An illustrative diagram of the relationships is below. The form of contracts has not been determined, but a typical approach would be for the Developer to hold a CCDC 5A Contract with the Construction Manager, and a stipulated price contract with the prime contractor such as a CCDC 17 form.



Given this structure, the Developer is still ultimately responsible for the completion of the Expo Plant, but Creative Energy maintains the critical level of oversight required to ensure the as-built plant meets the design intent.

109.2 With respect to the Expo Plant, please explain all of the specific responsibilities of the following parties:

- Creative Energy;
- The Developer;
- PavCo;
- any other party.

Response:

Please see the response to BCUC IR 2.109.1.

Creative Energy is the construction manager, with oversight of the design and specification of all elements on the plant (but for the façade).

The Developer holds the main construction contract, and is responsible for all costs (except for costs for delays caused by Creative Energy).

PavCo has rights to approve the final plans and must issue a permit to allow construction.

110.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-5, Attachment31.3a, Section 5.3.2;
Project risks

In reference to the Expo Plant, Section 5.3.2 of WSP's Preliminary Design Report states:

> 5.3.2 Project Risks
>
> Connection with Beatty Street and continuing operation through the Georgia Viaduct construction and Beatty Street Plant site redevelopment. Areas of concern includes the following:
>
> — Connection and integration of the diesel fuel system for the emergency generator. The Standby Generator will have a day tank but will not have a storage tank. There is a risk that the standby generator may run dry if the fuel supply from Beatty Street Plant site is interrupted.

110.1 Please discuss the risk to the Proposed Project and Creative Energy's ongoing ability to provide safe and reliable service to its customers in the event that fuel supply from the Beatty Plant is interrupted.

Response:

The Expo Plant will have an independent natural gas connection. The Expo Plant will also have fuel oil supply from Beatty through the interconnection with the Beatty Plant. In the event that natural gas supply is interrupted to the Expo Plant, and backup fuel oil supply via the interconnection is also interrupted, the Beatty Plant would be able to operate with its supply of natural gas (if available) or on-site fuel oil. Temporary truck-mounted steam boilers could also be employed if necessary.

110.1.1 Please provide details of consequences and mitigation strategies.

Response:

Please see the response to BCUC IR 2.110.1.

110.2 Please discuss the risk to the Proposed Project and Creative Energy's ongoing ability to provide safe and reliable service to its customers in the event that the Interconnection piping is damaged or interrupted.

Response:

In the event the interconnection piping is damaged or interrupted, the Beatty Plant would be able to operate and provide steam service to the customers up to the capability of its boilers. Temporary truck-mounted steam boilers could also be employed if necessary.

110.2.1 Please provide details of consequences and mitigation strategies

Response:

Please see the response to BCUC IR 2.110.2.

111.0 Reference: CONSTRUCTION OF THE PROJECT
Exhibit B-5, BCUC IRs 27.51, 27.7 and 27.9, pp. 46–47
Temporary and new office

In response to BCUC IR 27.5.1, Creative Energy stated that it is "focussed on continuing to grow and maintain the steam system as well as development other new energy systems. The projected growth in office staff is for additional project managers, regulatory staff and accounting staff to support the growing business."

111.1 Please provide specific details on how Creative Energy calculated its projected growth in office staff from 13 currently to 25 in 20 years.

Response:

Creative Energy owns 8,600 sqft of office space at 720 Beatty Street. A portion of this space is currently leased to third parties and available to the utility, if it needs the space, when these leases expire. The revenues and costs associated with the office space that is not used for utility purposes is not part of steam rates. The office space presently owned by Creative Energy is relevant to the amount of office space being returned to Creative Energy by the Developer at no direct cost to steam ratepayers or to Creative Energy.

Creative Energy is growing, but the current expectations are that most if not all of the growth will not be associated with service to core steam customers, and there will be no change to steam rates associated with the carrying costs for the new office space. The projected growth in staff is based on the projects currently known and projected growth of the company over the next 20 years. The details of Creative Energy's growth plans are considered commercially sensitive and confidential.

111.1.1 What specific projects does Creative Energy have planned that will contribute to this projected growth.

Response:

Current expectations are that most if not all of the growth will not be associated with service to core steam customers. The details of Creative Energy's growth plans are considered commercially sensitive and confidential.

111.1.1.1 If no specific projects are scheduled, please indicate what factors were used to project the increase in office staff from 13 currently to 25 in 20 years.

Response:

Please see the response to BCUC IR 2.111.1.1.

111.1.2 Please provide, to the best of your ability, an estimated amount of growth that can be attributed to the regulated entities.

Response:

Current expectations are that most if not all of the growth will not be associated with service to core steam customers.

In response to BCUC IR 27.7, Creative Energy confirmed "that fee simple ownership is intended. If fee simply ownership cannot be provided, equivalent tenure will be provided (e.g., 999-year lease)."

111.2 Please indicate when the ownership structure of the new office space will be finalized.

Response:

Fee simple ownership is contingent upon the City approving an air space parcel subdivision in respect of the new office space. In order to apply for air space parcel approval, there must be a space that can be surveyed (e.g., construction of the exterior walls of the office space must be complete). The parties are not in control of the timelines for City approval or whether the City will in fact grant such approval.

Both parties would like to subdivide the Lands as soon as possible. This is also noted in the Trust and Development Agreement (Section 7.2). For Creative Energy the subdivision eliminates any residual exposure from acting as bare trustee owner of the surplus assets. For the Developer, the subdivision could enable financing to be secured on more favourable terms for the remainder of the development as compared to the constraints on financing prior to subdivision as required by the Trust and Development Agreement.

A complexity is that the City does not normally approve a new air space parcel which is physically situate above an existing air space parcel. Under current practice the parties would need to apply for the plant and office air space parcels at the same time, as it is intended that the office air space parcel will vertically overlap with the plant air space parcel. This could delay the subdivision. The parties intend to discuss the appropriate course of action when the schedule for delivering the office space is better known, which will depend how much work on the office tower can be competed in parallel with the work on the Beatty Plant. Further, the parties also intend to discuss with the City options for approving the air space parcels sequentially. It would be pre-mature to approach the City at this stage of planning and approvals.

111.2.1 If fee simple ownership cannot be provided, please provide details on all possible alternatives.

Response:

To date, the parties have discussed two alternatives. The first is a long-term lease hold (e.g., 999-year lease) for the office space at nominal rent (e.g., $1). The second is to create a strata composed of two strata lots – one comprised of the new Creative Energy office space and the other comprised of the balance of the office space and common areas in the Developer's project. City approval for a strata is simpler than for an air space parcel and does not require approval at the same time as the plant air space. A strata involves co-ownership under a strata corporation. The Developer would have a much larger unit entitlement under this option and Creative Energy would want to ensure its interests are preserved in creating and amending strata corporation bylaws applicable to its office space.

The parties remain committed to an air space parcel subdivision but have identified equivalent forms of tenure with issues that would need to be resolved in setting up those forms of tenure. The parties have agreed that any alternative must provide equivalent outcomes for Creative Energy and have not gone into a more detailed design of those options because it is premature.

In response to BCUC IR 27.9, Creative Energy stated that it is "not able to estimate the future costs to operate and maintain the new office space. The amount attributed to regulated and non-regulated uses of the space will be allocated based on the projects Creative Energy is working on at the time and cannot be estimated at this time."

111.3 Please explain why Creative Energy is not able to estimate future costs to operate and maintain the new office space.

Response:

The best estimate Creative Energy can give for O&M is based on current O&M expenses for the office. These include a bi-weekly cleaner and electricity only. The cleaner is $1300 per month and electricity attributable to the office is approximately $400. Because the space will be approximately double, Creative Energy estimates the costs will be double.

111.3.1 With the information available to you, please provide an estimate of the annual operational and maintenance costs for the new office space assuming the same allocation of regulated and non-regulated space reported for 2017. Please provide justification for any assumptions made in the estimate:

Response:

Please see the table below.

New Office Space - Annual Costs											
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Operational Costs $	$4,800	$4,944	$5,092	$5,245	$5,402	$5,565	$5,731	$5,903	$6,080	$6,263	$6,451
Maintenance Costs $	15600	15600	15600	15600	15600	15600	15600	15600	15600	15600	15600
Total cost $	$20,400	$20,544	$20,692	$20,845	$21,002	$21,165	$21,331	$21,503	$21,680	$21,863	$22,051
Amount attributed to the Regulated Operations %	$10,200	$10,272	$10,346	$10,423	$10,501	$10,582	$10,666	$10,752	$10,840	$10,931	$11,025
Amount attributed to the Non-regulated %	$10,200	$10,272	$10,346	$10,423	$10,501	$10,582	$10,666	$10,752	$10,840	$10,931	$11,025

111.4 Please discuss the consequences of the operational and maintenance costs being higher or lower than current costs. In your answer please confirm if the Developer, Creative Energy's shareholders, or ratepayers will be responsible for any differences.

Response:

Operation and maintenance expenses for office spaces represent approximately 0.1% of Creative Energy's revenue requirement. Increases or decreases in these costs will have a negligible impact on rates but Creative Energy expects that any such costs will be included in the revenue requirement and rates.

111.4.1 If ratepayers are responsible, please describe how this affects the forecasted rate change of 3.8 percent.

Response:

This is not expected to impact the 3.8 percent.

F. TOTAL PROJECT COST ESTIMATE

112.0 Reference: TOTAL PROJECT COST ESTIMATE
Exhibit B-6, CEC IRs 33.1, 33.2
Project costs already incurred by Creative Energy

In response to CEC IR 33.1, Creative Energy stated that $1.45 million has already been incurred for the Project by Creative Energy.

In response to CEC IR 33.2, Creative Energy stated that it has not considered the recovery of the $1.45 million in the event the application is denied or approved with conditions.

112.1 Please provide Creative Energy's course of action regarding the recovery of costs already incurred or committed if the application is denied or approved with conditions by the BCUC.

Response:

For clarity, the costs to date for the Proposed Project have been borne by Creative Energy Canada (not the utility, Creative Energy Vancouver). Further, the response to CEC IR 1.33.2 was intended to convey that Creative Energy is not intending to seek recovery of these costs in rates if the Application is denied or approved with conditions such that the parties decide not to proceed. Creative Energy is not responsible for these costs, which are borne by others and not included in the cost estimate provided in the Application.

G. RATE AND BILL IMPACT OF THE PROPOSED PROJECT

113.0 Reference: RATE AND BILL IMPACT OF THE PROPOSED PROJECT
Exhibit B-1, Section 13.4, p. 72; Exhibit B-5, BCUC IR 39.1
Retired asset

On page 72 of the Application, Table 9 shows the estimated rate base items to be retired under the Proposed Project. Creative Energy notes, at this time, that the amounts provided are as of 2017 and will be adjusted to actual based on the actual timing of retirements:

Table 9 – Estimated Retired Assets and Land

Steam Production Plant	Net Rate Base 2017	Est. % to be Retired	Est. Retired Amount	Notes
Land	565,500*	50%	282,800	
Structures & Improvements	1,360,100	100%	1,360,100	Completely removed
Boiler Plant Equipment	3,381,100	30%	1,014,300	Boilers #1 and #2 already 100% depreciated
Boiler Tanks Equipment	42,100	100%	42,100	Completely removed
Boiler Auxiliary Equipment	235,200	50%	117,600	
Accessory Electric Equipment	110,500	50%	55,200	
Total Steam Production Plant	**5,694,500**		**2,872,200**	
Total Excluding Land	**5,129,000**		**2,589,400**	

In response to BCUC IR 39.1, Creative Energy submitted that "the proposed retirements are in the normal course of business and prudent…"

On pages 71-72 of the Application, Creative Energy states it "will submit detailed accounting and a proposal for the treatment of these costs as part of a future application." The BCUC notes it has established the Regulatory Account Filing Checklist that is applicable to regulated entities that are requesting approval to establish a new regulatory account in order to facilitate an efficient review of these applications.[1]

113.1 Please provide the criteria that Creative Energy has applied to determine if the disposition of utility assets, property and rights associated with the Proposed Project are inside or outside of the ordinary course of business.

Response:

The criteria that Creative Energy has applied are:

1) Whether the Proposed Project is the type of project that a business would typically pursue; and
2) Whether other utilities undertaking similar projects that involve the retirement of assets have recovered the book value of the retired assets from ratepayers.

Regarding the first criterion, in Creative Energy's view the Proposed Project is of a type that businesses typically pursue. Some of Creative Energy's existing assets have reached the end of their useful lives, and Creative Energy would like to replace them while taking advantage of the opportunity to implement a project with a range of benefits. In addition to providing a largely new plant which can continue to provide service to Creative Energy customers for years to come, the Proposed Project's additional benefits include:

- **reduced seismic risks;**
- **improved employee health and safety;**
- **improved operability;**
- **reduced fuel costs; and**
- **reduced GHG emissions.**

In Creative Energy's view it is common for utilities to invest in new assets when their existing assets require replacement. Additionally, it is common for utilities to do so proactively, instead of waiting for catastrophic failure to indicate that reinvestment is required. For the existing steam system, waiting for catastrophic failure is neither prudent nor consistent with the obligation to serve. Creative Energy serves approximately 200 customers from a single plant that does not have N+1 redundancy. In such circumstances, it is prudent to undertake proactive replacements of aging equipment to manage the risk of service disruptions. This is even more important given the long lead time and complexity of replacing the oldest equipment in Creative Energy's plant.

It is also common for utilities to seek opportunities to upgrade facilities and reduce their exposure to seismic risks. BC Hydro has a multi-year and multi-billion dollar program to address seismic risks.[2] FortisBC has undertaken similar projects. Creative Energy's existing building is over 80 years old and does not conform to modern standards for seismic and fire safety. There is no legal requirement for Creative Energy to upgrade the building to modern seismic standards, but in this case the need is driven by maintaining reliable service to the customers. Creative Energy serves 200 customers

[1] https://www.bcuc.com/Documents/Guidelines/2017/05-03-2017_RegulatoryAccountFilingChecklist.pdf
[2] https://www.bchydro.com/energy-in-bc/operations/dam-safety/seismic-hazards.html

(including a major hospital) from a single plant located in a seismically active zone. Under the Proposed Project, Creative Energy can now deal with this important risk in a cost-effective manner.

The Proposed Project creates the opportunity to improve employee health and safety and the operability of Creative Energy's facilities, and in Creative Energy's view it is ordinary course of business to pursue these benefits where cost effective to do so – for example, as part of a larger project.

Seeking to reduce fuel consumption and GHG emissions is also typical utility practice under both an emerging global consensus about the tremendous risks posed by climate change and also the energy objectives contained in B.C.'s *Clean Energy Act*.

Finally, the Proposed Project seeks to reduce the cost (and risk) to ratepayers of delivering these multiple objectives through piggy backing on the development of surplus property. Creative Energy considers it is also ordinary course of business to consider advancing upgrades or retirements where this would reduce the costs and risks of those projects.

Regarding the second criterion, in Creative Energy's view similar projects by other utilities have also involved retirement of assets, and the net book value of those retirements has been recovered from ratepayers. While Creative Energy has not conducted an exhaustive review of other utility practices or proceedings, Creative Energy would like to note two recent upgrade projects by BC Hydro which involved recovery of the remaining net book value of existing assets from ratepayers.

1) **John Hart Generating Station Replacement Project**
   BC Hydro applied for this replacement project in May 2012 based both on the age of the plant and seismic concerns. The Commission approved the project in February of 2013. In its Application (Exhibit B-1, page 4-7), BC Hydro noted (emphasis added):

   "The Expected Amount is $1,014.3 million and the P90 Amount is $1,158.9 million. The estimates include contingency, Interest During Construction (IDC) and capital overhead but <u>do not include $15 million net book value expense….. This net book value expense relates to those assets that will be retired as part of the Project. The remaining net book value of those assets to be retired will be expensed to the Amortization and Depreciation account.</u>"

   BC Hydro's rate impact analysis also included the effects of this treatment on customer rates. Creative Energy could find no IRs from the Commission or Intervenors related to this treatment and no determination in the Commission Decision that rejected the recovery of the remaining net book value of existing assets. There is no difference in principle between Creative Energy's proposal and BC Hydro's. Further, Creative Energy is not seeking a specific deferral period until the final design of the project is complete and timing of retirement is known so that the specific assets and remaining book value at the time of retirement can be confirmed.

2) **BC Hydro Ruskin Dam and Powerhouse Upgrade Project**

   BC Hydro applied for this replacement project in February 2011 based both on the age of the plant and seismic concerns. The Commission approved the project in March of 2012. In its Application (Exhibit B-1, page 2-30), BC Hydro noted (emphasis added):

   "The Project Expected Amount is $718.1 million and the Authorized Amount is $856.9 million. Estimates also include contingency, Interest During Construction (IDC) and capital overhead <u>but do not include $10.5 million net book value expense….. This net book value expense</u>

relates to those assets that will be retired as part of this project. The remaining net book value of those assets to be retired will be expensed to the Amortization and Depreciation account."

Creative Energy could find no IRs from the Commission or Intervenors related to this treatment and no determination in the Commission Decision that rejected the recovery of the remaining net book value of existing assets. There is no difference in principle between Creative Energy's proposal and BC Hydro's. Further, Creative Energy is not seeking a specific deferral period until the final design of the project is complete and timing of retirement is known so that the specific assets and remaining book value at the time of retirement can be confirmed and rate impacts assessed.

In Creative Energy's view the above-cited projects confirm that Creative Energy's approach is within the normal course of business and typical for utilities in British Columbia. It is not realistic to expect that significant upgrade or replacement projects to deal with multiple objectives can be delayed until all impacted assets are 100% depreciated, and designed in a manner that retains all equipment that is not fully depreciated. Other utilities do not do so, and there is no apparent reason why Creative Energy would be treated differently. The Proposed Project retains useful equipment (e.g., three of the largest and newest boilers), but it is not reasonable to expect Creative Energy would retain all ancillary equipment (e.g., controls and supply piping) when replacing large pieces of equipment (e.g., major boilers) or constructing a seismically upgraded structure.

Creative Energy also notes that the BC Hydro projects highlighted above were primarily driven by seismic concerns, with little evidence that they provide other significant benefits. The Proposed Project provides not only seismic benefits, but also GHG reductions, improved employee health and safety, fuel cost reductions and O&M cost reduction benefits.

Creative Energy also refers to the Commission's Order G-44-12 Decision in relation to the FortisBC Energy Utilities 2012 – 2013 Revenue Requirements and Rates. In that proceeding, the FortisBC Energy Utilities applied for recovery in rates of an outstanding asset retirement loss balance of approximately $149 million associated with mains, services, regulator and meter installations, and meters. The Commercial Energy Consumers Association of B.C. (the CEC) supported the utility's request with the following submission:

> **"the asset losses represent costs for assets which customers have used (or were to use) for an expected life and therefore the amounts are recoverable from customers."**

The CEC also encouraged the Commission "…to consider a phased-in approach to allow for a longer period of collection of these amounts." In its Decision, the Commission approved the recovery of these accounting losses at current depreciation rates for the asset categories in question. The Panel noted in its Decision that a utility still has a responsibility to ratepayers for asset management beyond making prudent asset purchases – e.g., ongoing maintenance and repair in order to achieve their prudently intended value in use. The Panel suggested that "…failure to prudently maintain and/or use assets appropriately could affect such assets' useful lives, and in such cases, the utility should bear responsibility."

There is no suggestion in this current proceeding that Creative Energy has failed to prudently maintain and/or use assets appropriately. Creative Energy is not removing assets that have failed prematurely due to inadequate maintenance or otherwise. These retirements are part of a larger project to address risks to service while reducing GHG emissions, O&M costs and fuel costs, all at considerably less cost and risk to ratepayers by leveraging the Developer's project rather than dealing with these replacements on Creative Energy's own when individual assets reach the end of their accounting life and/or a catastrophic failure occurs.

Finally, neither the existing nor pending shareholders of Creative Energy considered that they might be required to absorb these accounting losses when negotiating the Trust and Development Agreement and in particular its financial terms. If this request is rejected, Creative Energy will need to evaluate whether to proceed with the Proposed Project or seek further commitments from the Developer. The Developer has not indicated whether it would be willing or able to absorb these costs.

113.1.1 Please discuss Creative Energy's view of the impact of the disposition of assets and rights being inside or outside of the ordinary course of business as it relates to Creative Energy's request to establish the proposed deferral account for future recovery from ratepayers.

Response:

Creative Energy considers the Proposed Project prudent and within the normal course of business and in ratepayer interests, and under the fair return standard Creative Energy should be entitled to recover remaining book value of the retired assets.

113.1.2 Should the BCUC consider that it is the choice of Creative Energy to retire the assets at this time in determining if the disposition is in the normal course of business?

Response:

Absent a catastrophic failure, it is always a decision when to retire, dispose of and/or upgrade an asset. This applies to assets that are fully depreciated or not yet fully depreciated. The decision must consider multiple objectives beyond remaining book value, including risks of catastrophic failure, reliability, GHG reductions, operability, and cost or savings to ratepayers (including both O&M impacts but also savings in the ultimate cost of asset replacement).

Replacement of these assets at this time provides benefits to ratepayers. Creative Energy has secured an opportunity to deal with the issues proactively and at considerably less cost and risk then waiting. Finally, the project must be viewed as whole. It is not realistic to expect utility to retain ancillary equipment that is nearly but not fully depreciated when replacing a central element of a system (e.g., replace a boiler but retain aging controls). Further, seismic upgrades to the structure and replacement of certain plant components cannot be done without removing other equipment.

113.2 Please provide a detailed breakdown of the amounts in the column "Est. Retired Amount" by individual asset in Table 9.

Response:

Creative Energy currently only has the totals by asset category. We do not have details on the individual assets within each category. We will need to go through manual ledgers to identify the original and remaining net book value of individual assets. This is underway but will not be completed in the timeframe of this proceeding and it will not be completed until the detailed design to confirm which assets will be retired and when. Creative Energy has and will continue to endeavour to retain as much of the existing equipment as reasonable during the detailed design process. Creative Energy has provided a top-down estimate of the remaining net book value of assets that are expected to be retired based on the schematic design, with the details to come in a subsequent application.

113.3 Please provide a detailed breakdown of the amount of annual depreciation expense associated with the assets which are expected to be retired under the Proposed Project.

Response:

The depreciation rates for the various categories in Table 9 from the Application are as follows:

Structures and Improvements – 1.5%
Boiler Plant Equipment – 2.5%
Auxillary Equipment and Electrical Plant – 5%

Table 9 was based on 2017 values. The total annual depreciation in 2018 for the categories of equipment included in Table 9 (based on total rate base in these categories) is $228 thousand.

113.3.1 Please confirm whether or not savings from the removal of the annual depreciation expense noted in the IR response above have been included in the NPV analysis for the Proposed Project.

Response:

No, the indicative bill impact and NPV analysis do not reflect removal of the depreciation expense associated with the retired assets. Both the NPV analysis and the bill impact analysis for the Proposed Project assumes that the retired assets will be moved to an account that will be amortized at current depreciation rates. An accelerated amortization would result in some additional near-term rate impacts (and lower rates in long-term). There would be no or minimal impact on the NPV of the Proposed Project since the PV of an accelerated vs. extended write-off should be about the same assuming the same discount rate (Creative Energy WACC) for the PV analysis and for financing costs of the deferral account. Creative Energy is not taking any position in this proceeding regarding an appropriate amortization. This will depend on the remaining book value of specific assets at the time they are retired and other factors driving rates at the time a subsequent application is made.

113.4 In order to determine the appropriateness of the proposed regulatory deferral account and in line with the Regulatory Account Filing Checklist, Creative Energy is requested to provide the following information and supporting rationale:

1. Whether, or to what extent, the subject of the deferral account is outside of management's control;

2. The term (i.e. length of time) for which the regulatory account should be approved;

3. The mechanism for recovery;

4. The proposed carrying cost for the balance in the deferral account and why it's appropriate;

5. The materiality of the costs;

6. The timing of additions to the proposed account.

Response:

Creative Energy understands the above criteria are focused on requests for approval of regulatory accounts for unplanned, material costs outside management's control. Creative Energy is seeking to establish a regulatory account to ensure Creative Energy is able to recover the remaining net book value of costs incurred in some cases decades ago. Expensing these costs, like in the examples from BC Hydro in the response to BCUC IR 2.113.1, is not appropriate given the size of the expense and this

utility. Creative Energy is only seeking approval in principal to recover these costs in rates (per past practice and other decisions by the Commission) and, in a future application, to amortize the recovery in order to minimize rate impacts. While Creative Energy has provided a realistic estimate of these costs, Creative Energy considers that a decision on how long to amortize them should be made when the costs are finalized, which will depend on the detailed design and detailed schedule of the Proposed Project. The requested regulatory account is not intended for any purpose other than to transfer historical costs between accounts to enable Creative Energy to recover the net book value in the future.

114.0 Reference: RATE AND BILL IMPACT OF THE PROPOSED PROJECT
Exhibit B-1, Section 13.2, pp. 68–69; Exhibit B-5, BCUC IR 17.1
O&M

On page 68 of the Application, Creative Energy states that O&M costs will increase because of "higher electricity consumption (increase of 1,339 MWh per year) due to replacement of some steam-powered equipment with electricity-powered equipment (electricity rates are assumed to escalate at 3% per year)."

In response to BCUC IR 17.1, Creative Energy stated: "this cost/benefit analysis has not been developed at this stage of the project. The analysis will be conducted in the detailed design stage of the project, where the optimum balance of steam-driven and electrically driven equipment will be determined. The analysis will consider capital and operating costs, operating flexibility, efficiency and emissions associated with both options."

114.1 If Creative Energy hasn't performed an analysis of the balance of steam-driven and electrically driven equipment, what assumptions have been made in the financial model regarding higher electricity consumption? Please provide all supporting calculations and assumptions for the 1,339 MWh/year figure.

Response:

The assumption made in the financial model is that electricity consumption increases by 1,339 MWh per year, due to some plant loads being met with electrically-driven equipment. This value was provided by Fosdick & Hilmer as part of their assessment of the Proposed Project. Creative Energy has not performed an analysis of the balance of steam-driven and electrically-driven equipment to determine the optimal mix of steam-driven and electrically-driven equipment. This analysis will be conducted at the detailed design stage of the project. The cost impact of this increase in electricity consumption is to increase electricity costs by $159,900 in 2023[3].

Creative Energy has not developed alternative scenarios for the balance of steam-driven and electrically-driven equipment and does not have cost estimates for alternate scenarios. Generally, higher reliance on electrically-driven equipment will increase electricity costs and decrease natural gas costs. Creative Energy considers this to be a detailed design issue.

114.1.1 Please discuss how the assumptions identified above impact the O&M costs.

Response:

Please see the response to BCUC IR 2.114.1.

[3] Exhibit B-1, Table 8, p. 69, "Net Change in Electricity Cost".

114.2 Please provide other feasible scenarios regarding the balance of steam-driven and electrically driven equipment. Please provide all supporting calculations and assumptions.

Response:

Please see the response to BCUC IR 2.114.1.

114.2.1 Please discuss how the various scenarios above impact the O&M costs.

Response:

Please see the response to BCUC IR 2.114.1.

On pages 68 and 69 of the Application, Creative Energy states: "O&M costs will decrease due to a reduction in Creative Energy's property tax liability at the Beatty Plant as the property taxes for the site will be spread over a larger pool of users," and that the net change in the Beatty Street property tax will be minus $474,600.

114.3 Please provide the supporting calculations and assumptions for the estimated $474,600 decrease in property taxes.

Response:

Please see Exhibit B-5-1, response to BCUC Confidential IR 3.4.

H. ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT

115.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-1, Section 9, p. 31; Section 14, p. 76; Exhibit B-5, BCUC IR 41.1.1
Feasibility assessment criteria

In response to BCUC IR 41.1.1, Creative Energy stated:

> Creative Energy did not prepare a final feasibility analysis document. The options were assessed in an iterative manner. Both the Proposed Project and the Alternative project meet the criteria of being able to be constructed while maintaining steam service. The Proposed Project is considerably more attractive than the Alternative from the standpoint of economic and first-cost considerations, before including in the Alternative the cost of new office space. The Proposed Project is also expected to better improve the reliability of the system as it replaces a greater proportion of end-of-life assets.

115.1 Please explain how Creative Energy conducted the alternative assessment in an iterative manner.

Response:

While developing the concept for the Proposed Project, Creative Energy also developed a cost estimate for the Alternative of in-situ equipment replacement.

The iterative approach refers to two things. First, Creative Energy iterated between the costing of the Proposed Project and the costing of the Alternative. This is because many of the project elements are similar (e.g., the cost of replacement boilers and replacement infrastructure). Creative Energy was able to rely on detailed engineering and costing estimates prepared at the Developer's cost (and under the direction of Creative Energy) to also consider the cost of its Alternative. The design of the Proposed Project also provided insight on some of the issues related to the Alternative (e.g., issues

associated with removing existing boilers, status of ancillary infrastructure, etc.) This is an appropriate approach given the size of the Proposed Project and also size of Creative Energy and available staff resources.

Second, the iterative approach refers to the fact that Creative Energy did not attempt to include or cost all of the elements of an Alternative to the Proposed Project. Instead, Creative Energy started with a limited scope and stopped further analysis when it was satisfied there was *sufficient* evidence of the preferability of the Proposed Project. This is an appropriate approach in relation to the gap between the cost-effectiveness of the Proposed Project versus the Alternative, and the costs of further more detailed analysis.

For example, even without including the cost of new office space, the Alternative is considerably less attractive than the Proposed Project. It therefore was not worth incurring the expense to estimate the cost of new office space for the Alternative.

As a small utility with limited resources, an iterative approach allowed Creative Energy to exclude a less-economical option without having to invest in detailed feasibility analysis. In Creative Energy's view, the information presented in the Application and in the response to BCUC IR 1.46.5 is sufficient to conclude that the Alternative (In-Situ Equipment Replacement) is not a better solution than the Proposed Project. There are input assumptions for the Alternative that could be refined, but there would be additional cost to undertaking these refinements and they would only increase the cost of the Alternative so Creative Energy stopped studying the Alternative once there was the analysis was *sufficient* to effectively rule out the Alternative.

Likewise, Creative Energy considered the Construct a New Plant in a Different Location option and had sufficient information to conclude that it would be less attractive than the Proposed Project even before refining cost estimates for all project elements. This option was also viewed as considerably more complex and risky (cost and schedule risks as well as the added complexity of finding another site and partner to co-develop a site which would need to include other uses to offset land costs). And it is completely theoretical because Creative Energy has not identified an alternate location (which is required for a detailed cost estimate). This option is discussed in more detail in the response to BCUC IR 2.120.1.

115.2 Please explain whether Creative Energy assessed other alternatives, in addition to the 'Alternative' project and the 'Construct a New Plant in a Different Location' options.

Response:

No. Creative Energy did not assess other options because Creative Energy believes there are no other options.

Given the age of the existing steam plant, some reinvestment in the plant is required. The Developer spent several years assessing ways to develop the surplus property while meeting the needs of the utility. The Proposed Project and the Alternative are two approaches to redeveloping the plant at its current site. The Construct a New Plant in a Different Location option involves building a new steam plant elsewhere. The best solution is reflected in the Proposed Project. Creative Energy considers that there is no other cost-effective scenario to develop the surplus property while protecting utility customers from risks.

115.2.1 If confirmed, please provide details.

Response:

Please see the response to BCUC IR 2.115.2.

115.2.2 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.115.2.

115.3 Please provide the results of the iterative assessment.

Response:

The results of the iterative assessment are provided in Section 14 of the Application and in the response to BCUC IR 1.46.5.

115.4 Please discuss how the BCUC should review the iterative assessment process.

Response:

It is not clear why the Commission would need to review the process. In considering the merits of the Proposed Project, Creative Energy is of the view that the BCUC should consider and apply the criteria specified in the *Utilities Commission Act* to determine whether the Proposed Project is in the public convenience and necessity. Part of this consideration ought to be whether there is a better (more cost effective) alternative that meets the criteria of being able to be constructed while maintaining steam service. Creative Energy believes that the Proposed Project is considerably more attractive than any alternative. The cost of the Proposed Project to Creative Energy and its ratepayers is less than one-third of the actual cost of the project. There is no scenario where the utility can deliver comparable benefits for less cost without piggy backing on the Developer's project.

115.5 Please provide the criteria Creative Energy used to assess the alternatives with respect to ongoing operation and maintenance costs.

Response:

Creative Energy assessed the Proposed Project and the Alternative with respect to ongoing O&M costs using the forecast impact on ongoing O&M costs relative to a baseline. Creative Energy did not develop an assessment of the ongoing O&M costs of the 'Construct a New Plant in a Different Location' option. Please see the response to BCUC IR 2.115.6.

115.5.1 Please provide a table comparing the operation and maintenance benefits for the Proposed Project, the 'Alternative' project and the 'Construct a New Plant in a Different Location' alternative.

Response:

Please see the response to BCUC IR 2.115.6.

115.6 Please explain which of the alternatives considered is estimated to have the lowest operation and maintenance costs on an annual basis.

Response:

Creative Energy has assumed that this and the other questions in this series are addressing O&M costs not including natural gas costs, as natural gas costs are addressed elsewhere.

The Proposed Project is estimated to have the lowest impact on operation and maintenance costs. Information on the incremental operation and maintenance costs for the Proposed Project and the Alternative, as well as all supporting calculations, was included in Exhibit B-5, responses to BCUC IRs 1.37.2 and 1.46.4. For completeness, a summary is provided below. The question does not specify a particular year for which the information is requested. Creative Energy submits that the present-value of all O&M cost impacts over a 30 year analysis period using a 5.78% discount rate is an appropriate metric to compare O&M costs between the options. Creative Energy's analysis is of incremental cost impacts from the Proposed Project and the Alternative, not absolute values.

The table below provides the present value over a 30 year analysis period (2020 – 2049) of the incremental impact of the Proposed Project, and the Alternative, relative to the baseline, for all non-fuel expenses. This includes a wide range of costs, some of which are categorized as "O&M" in Creative Energy's financial reporting but which have been grouped together in this summary. This summary also includes information on sustaining capital impacts.

Key assumptions are:

- **Electricity cost. As described in Exhibit B-1, s. 13, p. 68 and in Exhibit B-5-1, response to Confidential IR 2.2. Creative Energy does not expect a meaningful difference between the optimal balance of steam-driven and electrically-driven equipment for the Proposed Project, compared with the Alternative, so the analysis assumes the same increase in electricity costs for both the Proposed Project and the Alternative. Electricity costs are currently captured within Creative Energy's O&M Expense under Steam Production-Operation – Steam Expenses.**
- **Expo Plant lease. As described in Exhibit B-1, s. 13, p. 68 and discussed in Exhibit B-5-1, Confidential IRs 3.1 and 3.2. There is no Expo Plant lease for the Alternative.**
- **Property tax. As described in Exhibit B-5-1, responses to Confidential IRs 3.4 and 3.5. There is no savings in property taxes for the Alternative. Property taxes are currently tracked as a separate item within Creative Energy's revenue requirement.**
- **Insurance. As described in Exhibit B-5-1, response to Confidential IR 3.6. Insurance costs for the Alternative are calculated using the same methodology, but based on the capital cost of the Alternative as described in Exhibit B-1, S. 14, Table 11, pp 78-79. Insurance costs are currently captured within Creative Energy's O&M Expense under Administrative & General – Operation – Insurance.**
- **Municipal Access Fees. As described in Exhibit B-1, s. 13, p. 68. Creative Energy's municipal access fees are calculated based on Creative Energy's overall revenue requirement (excluding natural gas costs), so an increase in the revenue requirement will increase municipal access fees. The formulas calculating these increases are provided in Exhibit B-5, responses to BCUC IRs 37.2 and 46.4. Municipal Access Fees are currently tracked as a separate item within Creative Energy's revenue requirement under "Municipal Taxes".**
- **Sustaining Capital. As described in Exhibit B-1, s. 13.5, pp 74-75 and in Exhibit B-5, response to BCUC IR 37.4.**

Present Value of 2020-2049 Incremental Cost Impact Using 5.78% DR			
		Proposed Project	Alternative
Expenses			
	Electricity	$2.6 M	$2.6 M
	Expo Plant Lease	$3.1 M	-
	Beatty Plant Property Tax	($6.7 M)	-
	Insurance	$0.8 M	$0.6 M
	Municipal Access Fees	$0.5 M	$1.4 M
	Total Expenses	$0.3 M	$4.6 M
Sustaining Capital			
	Sustaining Capital Impact	($1.0 M)	($1.0 M)

Apart from natural gas consumption (which is addressed separately), these are the only O&M expenses and sustaining capital costs for which Creative Energy is forecasting changes. For information on Creative Energy's current total O&M expenses and a discussion of those O&M expenses which are not expected to change as a result of the Proposed Project, please see the response to BCUC IR 2.102.6.

Creative Energy did not generate an estimate of incremental O&M impacts for the Construct a New Plant in a Different Location option. Creative Energy does offer the following qualitative comparison of that option, relative to the Proposed Project. Based on this qualitative assessment, Creative Energy does not expect the Construct a New Plant in a Different Location option to result in lower O&M costs than the Proposed Project.

Qualitative Comparison of 'Construct a New Plant' option with the Proposed Project		
Expenses		Qualitative Comparison
	Electricity	Optimal mix of steam- and electric-driven equipment likely to be similar
	Expo Plant Lease	No lease payment
	Beatty Plant Property Tax	No property tax reduction unless project is co-located with other users
	Insurance	Incremental insurance cost will be higher due to interconnection from new site to 720 Beatty St
	Municipal Access Fees	Increase likely – magnitude depends on other increases
	Total Expenses	
Sustaining Capital		
	Sustaining Capital Impact	Reduction in sustaining capital likely to be similar

115.6.1 Please provide the calculation(s) and data used to estimate the operation and maintenance costs.

Response:

Please see the response to BCUC IR 2.115.6.

Creative Energy further stated: "The Proposed Project and the Alternative are expected to have similar impacts on system efficiency."

115.7 Please explain why it is assumed that the system efficiency for the Alternative is the same as the Proposed Project.

Response:

The Alternative is In-Situ Replacement at the existing plant site. Under the Alternative, Creative Energy would rely on a combination of its existing boiler capacity, as well as 300,000 PPH of new boiler capacity. It would install a new economizer, but due to the configuration of the plant, not all boiler flue gases would be routed through the economizer. Because the Proposed Project also includes a combination of new boiler capacity (slightly more capacity at 400,000 PPH vs 300,000 PPH under the Alternative), and would include an economizer for some of Creative Energy's boilers, Creative Energy considers it is reasonable to assume the same system efficiency for the Alternative as for the Proposed Project for purposes of the analysis. Creative Energy has not conducted a detailed assessment of the efficiency of the Alternative but, given the level of new boiler capacity to be installed, considers it unlikely that the Alternative would have greater efficiency than the Proposed Project.

115.7.1 Please provide all the assumptions used to determine the system efficiency of the Alternative.

Response:

Please see the response to BCUC IR 2.115.7.

Section 9 of the Application provides the primary drivers for the Proposed Project. The primary drivers are stated to be:

- Maintain Reliable Service to Customers;
- Improve Safety;
- Improve Efficiency;
- Improve Emissions;
- Improve Staff Work pace and Accessibility.

115.8 Please provide, in table form, a comparison of how the primary project drivers are met by each of the following alternatives:

i. Proposed Project;
ii. 'Alternative' project; and
iii. 'Construct a New Plant in a Different Location.'

Response:

Please see the below table.

	Proposed Project	**Alternative (In-Situ)**	**New Plant, Different Location**
Maintain Reliable Service	**Yes**	**Yes**	**Yes**
Improve Safety	**Yes**	**Yes**	**Yes**
Improve Efficiency	**Yes**	**Yes**	**Yes**
Improve Emissions	**Yes**	**Yes**	**Yes**
Improve Staff Work Spaces and Accessibility	**Yes**	**Only if new office space is included. Not included in current estimate.**	**Only if new office space is included. Not included in current estimate.**

116.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-1, Section 14, pp. 76-78; Exhibit B-5, BCUC IRs 42.7, 42.9
In-situ Equipment Replacement ("Alternative") - Scope

In response to BCUC IR 42.7, Creative Energy stated: "If Creative Energy were to decide to continue to operate the plant in-situ, major capital renewal would be required as soon as possible, as major equipment has passed its design life. The time to obtain approvals, complete design, procure and install equipment is roughly three years."

116.1 Please provide a table comparing the construction milestones for the Proposed Project versus the Alternative project, according to the time required to:

a) obtain approvals;
b) complete design;
c) procure equipment; and
d) install equipment.

Response:

Creative Energy has not developed a schedule of construction milestones for the Alternative. Please see the response to BCUC IR 2.115.1.

BCUC IR 42.9 requests clarification as to whether Creative Energy has explored the Alternative with any other real estate developers. In its response Creative Energy stated: "The main impediment to redeveloping the site is the operating steam plant and associated equipment and facilities on the site. Please see the response to BCUC IR 1.42.8, and Creative Energy's August 24, 2018 submission to the Commission regarding the terms of reference for the independent appraiser."

116.2 Please confirm, or explain otherwise, whether Creative Energy has approached any other real estate developers to discuss the Proposed Project or any other alternative.

Response:

Creative Energy has not approached any other developers. Creative Energy is not the business of marketing and developing property.

Creative Energy has existing property which has determined to be surplus to the needs of the utility and which the shareholder of Creative Energy intends to develop. The development of the remaining property at 701 Expo Boulevard and the air space over the plant, in turn, will be easier and less costly if coordinated with the development of the existing surplus property (parking lot). Further, Creative Energy is not aware of any other developer that would have the same understanding and acceptance of the needs of the utility or willingness to undertake development over an operating steam plant that has public utility obligations, including the requirements for constraints on financing, schedule, and indemnities Creative Energy has imposed on the Developer.

117.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-1, Section 14, p. 80; Exhibit B-5, BCUC IR 43.1
In-situ Equipment Replacement ("Alternative") - Risks

In response to BCUC IR 43.1, Creative Energy stated: "Put simply, the Proposed Project has the lowest cost and the lowest risk to customers as compared to any alternative. The two alternatives noted would

have much higher costs to customers, and higher risks including risk of service interruption and/or cost overruns."

117.1 Please discuss the risk of service interruption for the following:

i. Proposed Project;
ii. Alternative project; and
iii. Construct a New Plant in a Different Location alternative.

Response:

The Proposed Project risk of service interruption has been well reviewed the responses to BCUC IRs 1.28, 1.29 and 1.30. In summary, the risk of service interruption is well mitigated by the terms of the Trust and Development Agreement and the residual risk will be well mitigated by a comprehensive contingency plan.

The Alternative project has a higher level of service interruption risk. The same contingency plan can be prepared but the unmitigated risk is higher as the project would have to be conducted within an operating plant, where work is more difficult and any mistakes affect the single point of steam generation. As a simple example, electrical work say, wiring in a new pump, leading to a short circuit might trip the entire plant. This is significantly more risky than the Proposed Project because work occurs at one non-operating plant site while the other plant is operating.

The Construct a New Plant in a Different Location alternative has a higher level of service interruption risk assuming that it includes removal of the entire steam manifold at Beatty to vacate the property. The manifolds are a key part of maintaining the steam supply pressure balanced across the distribution network. The Proposed Project entails removal of 3 boilers, and tie-in of the Expo Plant to the existing manifolds at Beatty. The Construct a New Plant in a Different Location alternative would entail decommissioning and removal of the existing manifold and installation of new manifolds elsewhere, which would have to somehow be tied into the existing steam headers on Georgia on Beatty Streets. The additional risk of service interruption due to this piece of work is significant.

118.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-6, BCUC IR 62.18
In-situ Equipment Replacement ("Alternative") - Benefits

In response to BCUC IR 62.18, Creative Energy stated:

> If the Commission does not approve the Application, the Trust and Development Agreement would be terminated. Creative Energy and its customers would lose the benefits of the Proposed Project. This might leave Creative Energy and its customers with the only feasible alternative to the Proposed Project (being the Alternative project described in section 14 of the Application), which is much more costly, <u>has less benefits</u> and has a higher present value cost. [Emphasis added]

118.1 Please provide a table comparing the benefits of the Proposed Project and the Alternative Project.

Response:

The below table compares the benefits of the Proposed Project and the Alternative. It is not an exhaustive list of all benefits and does not consider costs, but does include the key points of differentiation between the Proposed Project and the Alternative.

	Proposed Project	Alternative (In-Situ Replacement)
Improved safety	**Yes**	**Yes**
Improved efficiency	**Yes**	**Yes**
Reduced emissions	**Yes**	**Yes**
Multi-plant redundancy	**Two plants increase CE's redundancy, providing reliability benefits to customers**	**Continued reliance on single plant**
Office space	**Includes new office space for CE staff**	**Does not currently include new office space**
New capacity	**Provides 400,000 PPH in new capacity**	**Provides 300,000 PPH in new capacity**
Extension to stacks	**Includes extension of stacks**	**Does not include extension of stacks**
Improvements to public realm	**Includes upgrades to public realm around CE plant**	**Not included**

119.0 Reference: NPV ANALYSIS OF PROPOSED PROJECT
Exhibit B-1, Section 9.3, p. 33; Section 13.5, pp. 72–75; Exhibit B-5, BCUC IRs 45.1, 45.2
Avoided natural gas consumption

In response to BCUC 45.1 Creative Energy stated that the plant gate efficiency used to calculate the cost benefits of $8,584,000 in avoided natural gas consumption is 84%.

119.1 Please confirm, or otherwise explain, that the cost benefit of $8,584,000 in avoided natural gas consumption is estimated against the Baseline (2023) efficiency of 80.4%.

Response:

Confirmed that it is estimated against a 2023 baseline plant gate efficiency of 80.4%, compared with a Proposed Project plant gate efficiency of 84.0%.

119.1.1 If confirmed, please provide the cost benefit for avoided natural gas consumption based on the current Plant Gate Efficiency, stated to be 82.7%.

Response:

Creative Energy has assumed that the question is requesting the present value of savings against a baseline plant gate efficiency of 82.7%, as opposed to 80.4%. The present value of savings against a baseline plant gate efficiency of 82.7% would be $3.1 M instead of $8.6 M.

In response to BCUC IR 45.2, Creative Energy stated:

> The present value avoided cost of natural gas consumption for the alternative depends on the year in which the alternative is completed. The below table shows the present value of the benefit of avoided gas consumption for the alternative, for the selected years used in the Application to illustrate the alternative[28]

	Present Value of Benefit of Avoided Natural Gas Consumption (Alternative)
2020 Completion	$8.1 M
2025 Completion	$6.7 M
2030 Completion	$4.8 M
2035 Completion	$3.2 M

119.2 Please provide the plant gate efficiency used to estimate the Present Value of the Benefit of Avoided Natural Gas Consumption (Alternative).

Response:

The plant gate efficiency used to estimate the values shown in the response to BCUC IR 1.45.2 is 84.0%.

119.2.1 Please provide the assumptions used to determine the Alternative project plant gate efficiency.

Response:

Creative Energy has not developed a detailed model of how the Alternative project would operate. Under the Alternative, Creative Energy would rely on a redeveloped Beatty Plant that would include a combination of existing assets and new assets, and would include a new economizer. The current configuration of the flues and stacks in the plant does not allow all boilers to take advantage of the existing economizer. Creative Energy has assumed that under the Alternative, this would continue to be the case. Because the plant would have a combination of new and existing boilers (including boilers that would be retained in the Proposed Project), and would have an economizer serving some but not all boilers, Creative Energy has assumed that the plant-gate efficiency under the Alternative would be comparable to the plant gate efficiency under the Proposed Project at 84.0%, and has used that value to assess the Alternative.

119.3 Please confirm, or otherwise explain, whether the cost benefit of $8.1 M in avoided natural gas consumption is estimated against the Baseline (2023) efficiency of 80.4%.

Response:

Confirmed.

119.3.1 If confirmed, please provide the cost benefit for avoided natural gas consumption based on the current Plant Gate Efficiency, stated to be 82.7%.

Response:

Creative Energy has assumed that the question is requesting the present value of savings against a baseline plant gate efficiency of 82.7%, as opposed to 80.4%. The present values of savings against a baseline plant gate efficiency of 82.7% are shown in the below table, as well as the values shown in the response to BCUC IR 1.45.2. The value shown in the response to

BCUC IR 1.45.2 for 2020 Completion has been corrected from $8.1 M to $9.1 M based on a calculation error.

	Present Value of Avoided Natural Gas Consumption (Alternative) – Using Baseline Plant Gate Efficiency of 80.4%	Present Value of Avoided Natural Gas Consumption (Alternative) – Using Baseline Plant Gate Efficiency of 82.7%
2020 Completion	**$9.1 M (corrected)**	**$3.3 M**
2025 Completion	**$6.7 M**	**$2.4 M**
2030 Completion	**$4.8 M**	**$1.7 M**
2035 Completion	**$3.2 M**	**$1.2 M**

Creative Energy further stated: "Creative Energy does not have a calculation of the benefit of avoided natural gas consumption for the Construct a New Plant in a Different Location option. Creative Energy expects that it would be comparable to the results shown above for the alternative."

119.4 Please confirm, or explain otherwise, whether Creative Energy would expect the plant gate efficiency of a New Plant, as part of the Construct a New Plant in a Different Location option, to have a higher plant gate efficiency than the Proposed Project and the Alternative Project.

Response:

Confirmed that a new plant (built as part of the Construct a New Plant in a Different Location option) could have a higher plant gate efficiency than the Proposed Project and the Alternative. The ultimate efficiency depends on the configuration of the new plant.

119.4.1 If not confirmed, please discuss the reasons why the plant gate efficiency would not be higher than those estimated for the Proposed Project and the Alternative project.

Response:

Please see the response to BCUC IR 2.119.4.

120.0 Reference: ANALYSIS OF THE ALTERNATIVE PROJECT
Exhibit A-15, p. 78; Exhibit B-1, Section 13.3, p. 71; Exhibit B-5, BCUC IRs 47.4, 47.4.1
Cost of constructing a new plant in a different location

In response to BCUC IR 47.4 Creative Energy stated:

For the sale of the land to give a financial outcome comparable to the Proposed Project, it would need to sell for at least $80 million as shown below.

Low-Bookend Capital Cost Estimate for New Plant – New Site	$75+ million	Excludes or under-estimates some items

Target Impact on Ratepayers	$15 million	Equivalent to Proposed Project
Required Revenue from Sale of Land (Net of Capital Gains Tax)	$60+ million	$75+ M - $15 M
Required Land Sale Price	$80+ million	Grossed up 25% for Capital Gains Tax Impact

Page 78 of Grover, Elliott & Co. Ltd.'s report titled 'An Appraisal of A Redevelopment Site Located at 720 Beatty Street & 701 Expo Boulevard Vancouver, British Columbia' states:

> As at September 19, 2018, and based on the Commission's allocation of land areas, we estimate the market value of the lands as follows.

Parcel	Non-regulated Area (%)	Non-regulated Value $	Regulated Area (%)	Regulated Value $	Total Value $
720 Beatty Street	24.2%	43,867,983	75.8%	137,712,017	181,580,000
701 Expo Boulevard	0.0%	-	100.0%	4,060,000	4,060,000
Total	16.3%	43,867,983	83.7%	141,772,017	185,640,000

120.1 Given that the market value of the lands is assessed to be in excess of $80 million, please discuss the impact of the increased land value on the viability of the 'Construct a New Plant in a Different Location' alternative.

Response:

The value of the lands has not been assessed to be in excess of $80 million. The most recent assessed value (by B.C. Assessment) associated with the land attributed to utility uses is $41 million.

There is a highly caveated opinion from Grover Elliot based on a very limited set of "comparables" (one third of which are outside the downtown core) with a very large spread. The opinion of Grover Elliot is being tested in IRs and the BCUC Panel has not received or considered arguments regarding the relevance of weight to be given to this opinion.

More importantly, the caveated opinion of Grover Elliot does not change the financial viability of the New Plant at a Different Location alternative because such viability does not depend on the value of 720 Beatty and 701 Expo Boulevard alone; its financial viability requires a large difference between that value and the cost to acquire an alternative suitable site nearby.

The previous analysis of Creative Energy (indicating that for the sale of the lands to give a financial outcome comparable to the Proposed Project the lands would need to sell for at least $80 million) was based on the assumption that Creative Energy could acquire sufficient suitable land for a new plant nearby in False Creek Flats for $9.7 million. If Grover Elliot is correct that the 720 Beatty and 701 Expo lands if vacant are worth $185.6 million, which is not agreed, there is no way equivalent land could be purchased a short distance away in False Creek Flats for the previously assumed $9.7 million.

For the New Plant in a Different Location alternative to have a financial outcome comparable to the Proposed Project, the sale price for 720 Beatty and 701 Expo would have to be in excess of $70 million more than the cost of acquiring equivalent land nearby for the new plant, assuming such land is even available.

Creative Energy also notes that the previous analysis was simplified and did not account for significant unquantified costs to the New Plant in a Different Location option. Quantification of these costs would require more detailed work, which Creative Energy does not believe is a prudent use of resources. Furthermore, full quantification would require that Creative Energy identify an actual site for a new plant (and possibly acquire an option to purchase) in order to confirm the land value of an alternate site and to establish a viable alignment and cost for a new steam interconnection between the new plant and the existing steam distribution network headers that would need to remain at Beatty.

Creative Energy has not identified an actual site for a New Plant in a Different Location. Notwithstanding the lack of an identified site to conduct detailed feasibility, actually pursing this option would carry considerable complexity and risk. There would be carrying costs for acquiring and holding a new site through the considerable development process. The sales price for the current property would be affected by the considerable and uncertain time to develop a new plant at a new site prior to decommissioning the existing plant. One issue would be whether ratepayers bear the risk of market volatility in real estate values (both for the existing site and replacement site) during the period of several years it would take to build the new plant, decommission the old plant and dispose of 720 Beatty and 701 Expo.

Creative Energy also notes that, relative to the Proposed Project, the New Plant in a Different Location option would require writing down a larger share of Creative Energy's existing assets (the recoverability of which could possibly be an issue based on the BCUC's IRs in this proceeding). The Proposed Project seeks to retain as much existing equipment as possible, which is also prudent and less risky for ratepayers. Finally, the lead time for the New Plant at a Different Location alternative would extend the period of time that customers are exposed to service disruption associated with risks at the current plant.

120.2 Please provide a comparison of the financial outcome of the 'Construct a New Plant in a Different Location' alternative compared to the Proposed Project, given the increased land value.

Response:

Please see the response to BCUC IR 2.120.2.

120.2.1 Please discuss whether Creative Energy has reassessed feasibility of the 'Construct a New Plant in a Different Location' alternative based on the increased land value.

Response:

Please see the response to BCUC IR 2.120.2.

120.2.1.1 If so, please provide details of the reassessment.

Response:

Please see the response to BCUC IR 2.120.2.

120.2.1.2 If so, please provide a comparison of the reassessment results compared to the Proposed Project.

Response:

Please see the response to BCUC IR 2.120.2.

120.2.1.3 If not, please explain why.

Response:

Please see the response to BCUC IR 2.120.2.

In response to BCUC IR 47.4.1 Creative Energy stated:

> Locating the new plant at BC Place was considered at an early stage, but discarded for a number of reasons.
>
> Creative Energy conducted a joint review of available space within BC Place with PavCo facilities staff, to develop a comprehensive list of possible plant locations. Spaces which were undersized or did not allow installation and future replacement of boilers were screened out as non-functional. Following the screening, the current proposed location was the only space which offered functional boiler plant space. The current space is only large enough to accommodate two 200,000 lb/hr steam boilers. [Emphasis added]

On page 71 of the Application, Creative Energy states:

> The secondary payment would only be payable in the event new net generating capacity of any form is installed within the Beatty Plant. It does not apply to replacing existing generating capacity, or to any capacity added to the system outside the Beatty Plant (including any expansion of capacity at the Expo Plant).

120.3 Please discuss the opportunities for expansion at the Expo Plant referred to in the Application.

Response:

There are other un-used spaces within BC Place that might be available for expansion of steam equipment, if PavCo were willing to make them available. There is another fan room, similar to the space being taken for the Expo Plant, but it is on the radially opposite side of the stadium (that is, the opposite side of the stadium from the Beatty Plant). There is also a space along Expo Boulevard which is not enclosed, and has a number of beams running through it. It would not be useful for large steam boilers due to the conflicting structural elements, but might be useful for small boilers or a different technology.

120.3.1 If there is sufficient space for expansion at the Expo Plant, please provide details of the possible locations and the anticipated additional capacity that could be realised.

Response:

Please see the response to BCUC IR 2.120.3. Creative Energy has not undertaken detailed investigation of these opportunities.

121.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-5, BCUC IR 46.5
Cost of in-situ equipment replacement (the "Alternative")

In response to BCUC IR 46.5, Creative Energy stated that "it has made one revision to the methodology used to calculate the values in Table 12 of the Application. The calculation has been revised to include a terminal value of the new plant. The below table has corrected values for Table 12…"

121.1 Please clarify what is meant by the term "terminal value" of the new plant in the above preamble. Please also explain how the calculation has been revised to account for the terminal value of the new plant.

Response:

The phrase "terminal value of the new plant" refers to the remaining value of the new plant at the end of the analysis period. The analysis in the response to BCUC IR 1.46.5 is a complement to the

analysis used in Exhibit B-1 in sections 13.5 and 14. It is a present value analysis that uses the present value of unlevered capital costs, and the present value of all O&M impacts.

Section 14 of Exhibit B-1 showed the present value cost of the Alternative for a number of different years of completion using a 30 year analysis period, and BCUC IR 37.5 requested that the analysis also be provided using a 40 year analysis period. If the analysis does not include a credit for terminal value, then the results would be biased against the Alternative (particularly the configurations with a later year of completion), since the analysis would capture 100% of the capital cost of the Alternative, but would not reflect all of the savings that would occur over the life of the project. For example, for a 30 year analysis period and a project in 2035, the analysis would only capture 15 years of fuel cost savings.

One possible approach to deal with this is to lengthen the analysis period, but this becomes complicated since the analysis is comparing different years for implementing the project, and it would be challenging to get all analysis periods to line up with capital investments.

Creative Energy's preferred approach is to calculate a terminal value that reflects the remaining undepreciated value of the alternative plant at the end of the analysis period, in present value terms. The methodology used here is to calculate the net book value of the Alternative, then calculate the present value of that future net book value at the end of the analysis period using the discount rate. This value is subtracted from the NPV analysis.

The below table provides the book value in year 30, and the present value, for each year of completion of the Alternative. The table provides the values used in the 30 year analysis period version of the results, and the 40 year analysis period. The values in the columns labeled "Present Value at 5.78% Discount Rate" are the values that were subtracted from the NPV analysis to produce the results shown in the response to BCUC IR 46.5. The calculations are shown in Exhibit B-5-1, Attachment 46.4, "Alternative" tab, rows 64 and 65.

Note that the capital cost for the Alternative varies depending on the year of completion, as the calculation includes the impact of inflation on later years of completion.

	30 Year Analysis Period		***40 Year Analysis Period***	
	Book Value at Year 30	**Present Value at 5.78% Discount Rate (Terminal Value)**	**Book Value at Year 40**	**Present Value at 5.78% Discount Rate (Terminal Value)**
2020 Completion	**$9.8 M**	**$1.6 M**	**$0.9 M**	**$0.1 M**
2025 Completion	**$15.8 M**	**$2.6 M**	**$5.9 M**	**$0.6 M**
2030 Completion	**$22.9 M**	**$3.8 M**	**$12.0 M**	**$1.1 M**
2035 Completion	**$31.3 M**	**$5.2 M**	**$19.3 M**	**$1.8 M**

The term "terminal value" is this context is different from residual value or salvage value as used in ASPE Section 3061. There is no assumption in the analysis that the plant would have reached the end of its life or the end of its useful life. The terminal value is the present value of the book value of the asset at the end of the analysis period, and it has been included in the NPV analysis to avoid biasing the results against the Alternative.

121.1.1 For clarity, please compare/contrast the meaning and application of "terminal value" provided in the IR response above, to the definition and application of the terms: i) "residual value"; and ii) "salvage value" in ASPE Section 3061 (Property, plant and equipment) paragraphs .03 and .16.

Response:

Please see the response to BCUC IR 2.121.1.

121.2 Please provide the amount used by Creative Energy with respect to the "terminal value of the new plant."

Response:

Please see the response to BCUC IR 2.121.1.

121.2.1 Please explain how the amount for the "terminal value of the new plant" was determined.

Response:

Please see the response to BCUC IR 2.121.1.

122.0 Reference: ANALYSIS OF ALTERNATIVE TO PROPOSED PROJECT
Exhibit B-5, BCUC IR 47.4; Exhibit A-15
Cost of constructing a new plant in a different location

In reply to BCUC IR 47.4, Creative Energy stated that the required land sale price needs to exceed $80+ million in order to consider building a new plant in a different location.

Exhibit A-15 contains the independent appraisal report conducted by Grover, Elliott & Co. Ltd. which was requested to assess the market value of the regulated and non-regulated lands. The table below summarises the analysis:

Parcel	Non-regulated Area (%)	Non-regulated Value $	Regulated Area (%)	Regulated Value $	Total Value $
720 Beatty Street	24.2%	43,867,983	75.8%	137,712,017	181,580,000
701 Expo Boulevard	0.0%	-	100.0%	4,060,000	4,060,000
Total	16.3%	43,867,983	83.7%	141,772,017	185,640,000

122.1 Please discuss, and provide appropriate justification, whether Creative Energy now considers the alternative of building a new plant in a different location as an economical alternative to the Proposed Project given that the Grover, Elliott & Co. Ltd. assessment has estimated that the land value exceeds the $80+ million approximation.

Response:

Please see the response to BCUC IR 2.120.1.

I. SENSITIVITY ANALYSIS

123.0 Reference: SENSITIVITY ANALYSIS
Exhibit B-5, BCUC IR 51.2; Exhibit B-1, Schedule G of Appendix A
Sensitivity of capital cost risk to Creative Energy

In BCUC IR 51.2, the BCUC requested that Creative Energy (i) "explain the scope and definition of 'schedule delays caused by Creative Energy'" and (ii) to confirm if various scenarios would be included in this definition. The BCUC notes that Creative Energy answered only the latter of the two questions.

Schedule G of the Trust and Development Agreement indicates Creative Energy is responsible for various aspects of the project for the Beatty Plant, Expo Plant, and Interconnection including the management of design, specifications, permitting, and management of construction.

123.1 Please explain the scope and definition of "schedule delays caused by Creative Energy." Please provide a variety of examples in response.

Response:

Please see the responses to BCUC IR 2.106.1 and 2.106.2.

123.2 In the view of Creative Energy, please provide the scope/definition of "management of design, specifications, permitting, and management of construction" of the various aspects of the Proposed Project that is the responsibility of Creative Energy. Please provide a variety of examples in response.

Response:

Please see the response to BCUC IR 2.104.10.

J. OTHER APPROVALS REQUIRED

124.0 Reference: OTHER APPROVALS REQUIRED
Exhibit B-1, Section 16, p. 86; Exhibit B-5, BCUC IR 53.1
Fuel oil pipeline

In response to BCUC IR 53.1 Creative Energy stated: "The fuel oil line will not require BC Oil and Gas Commission approval. The regulation of oil and gas lines which are associated with heating boilers falls to Technical Safety BC. "

124.1 Please explain any permits or approvals that are required from Technical Safety BC with respect to the fuel oil pipeline.

Response:

This is under the jurisdiction of Technical Safety BC. Generally, if a line is under 3 inch diameter and under 150PSI operating pressure, it would not trigger any permit requirements with Technical Safety BC. If it exceeds those parameters, it becomes registered piping and needs to be registered with Technical Safety BC. Creative Energy would have to submit stress analysis, weld inspection reports and invite a Safety Officer to witness non-destructive testing of the piping.

125.0 Reference: OTHER APPROVALS REQUIRED
Exhibit A-15, Part Three, p. 46; Exhibit B-1, Section 11.1, p. 55; Section 19.1, p. 98; Exhibit B-5, BCUC IR 52.1
Rezoning and permit Applications

Page 55 of the Application states: "The construction of both the Expo and Beatty Plants will not commence prior to approval of this Application by the Commission and approval of rezoning for 720 Beatty Street by the City of Vancouver."

Page 98 of the Application further states:

> The steps in the proposed reorganization (**Proposed Reorganization**) are planned to occur shortly after approval in the order as set out in the slides attached to this Application as Appendix M. The slides in Appendix M show the reorganization steps

from the organization structure at time of filing this Application through to completion of the Proposed Reorganization. All steps must be completed to implement the Proposed Reorganization and prior to commencing construction of the Expo Plant.

Page 46 of Grover, Elliott & Co. Ltd.'s report titled 'An Appraisal of A Redevelopment Site Located at 720 Beatty Street & 701 Expo Boulevard Vancouver, British Columbia' states:

> Changing the land use controls requires approval by municipal council of a rezoning. Municipal staff indicate that a formal development application has not been submitted for the subject sites as the most recent application was considered incomplete because the required setbacks were not met; usually, this is a technical matter, and can be overcome with design or possibly relaxation.

125.1.1 Please confirm, or otherwise explain, that the Expo Plant does not require a rezoning application.

Response:

Confirmed.

125.1.1.1 If not confirmed, please explain whether one rezoning application will be submitted for both plants.

Response:

See the response to BCUC IR 2.125.1.1.

125.1.1.2 If confirmed, please provide details of the permits / approvals required for the Expo Plant.

Response:

A 'building permit' is required from PavCo.

In response to BCUC IR 52.1, Creative Energy provided the following table:

Approval	Authority having Jurisdiction	Site	Approval Date	Impact of Delay	Party Responsible
Air Quality Permit	Metro Vancouver	Expo	December 31, 2018	Project not likely delayed	Developer
Operating Permit	Technical Safety BC	Expo and Beatty	December 31, 2019	Project not likely delayed	Developer
Rezoning Enactment	City of Vancouver	Beatty Development	December 31, 2018	Project delayed by duration of permit delay	Developer
Development Permit	City of Vancouver	Beatty Development	July 31, 2019	Project delayed by duration of permit delay	Developer
Building Permit	City of Vancouver	Beatty Development	September 31, 2019	Project delayed by duration of permit delay	Developer
Occupancy Permit	City of Vancouver	Beatty Development	Dec 31, 2023	Project delayed by duration of permit delay	Developer

125.2 For each Approval listed in the table provided, and any other approvals required for either the Beatty Plant or the Expo Plant, please provide the actual (or anticipated) application date. Please provide your response in table format below:

Response:

Please see the table below.

Approval	**Actual (or anticipated) application date**
Air Quality Permit	**Nov 16, 2018**
Operating Permit	**February, 2020**
Rezoning Enactment	**May, 2018**
Development Permit	**Q2 2019**
Building Permit	**Q4 2019**
Occupancy Permit	**2023**

125.3 Please confirm, or otherwise explain, whether Creative Energy will commence construction of the Beatty Plant or the Expo Plant prior to attaining rezoning approval.

Response:

Completion of the Expo Plant is a prerequisite to commencing significant work at Beatty Street, and construction of the Expo Plant can commence prior to obtaining rezoning approval at 720 Beatty Street. The Developer would not commence construction of the Beatty Plant prior to a rezoning approval for 720 Beatty Street.

125.3.1 If confirmed, please discuss the likelihood of Creative Energy starting construction in January 2019 assuming the BCUC approves the CPCN Application.

Response:

Creative Energy does not expect to commence actual construction of the Expo Plant in January 2019. Creative Energy plans to place orders for major equipment for the Expo Plant and commence detailed design for the Proposed Project shortly after obtaining CPCN approval from the BCUC (that is, in January 2019) to stay on the critical path for the entire project. The Developer considers that that making such commitment would be a major risk in the absence of BCUC approval of the project. Actual construction at Expo is expected to commence in March 2019.

Please see the corrected schedule in the Restated Trust and Development Agreement (Exhibit B-1-2).

125.3.2 If not confirmed, and in the event that rezoning approval is not attained, please explain the party responsible for the costs incurred.

Response:

There is currently no reason to expect the City will deny rezoning approval, particularly given the proposed uses and improvements. The City has provided a letter of support for the project (see Appendix J of the Application). The issues to date have largely been technical in nature,

as has been reported by the Appraiser engaged by the BCUC. There is still some uncertainty related to the magnitude of final development rights or other requirements the City may impose, but rezoning is expected.

If the Developer completes the Expo Plant then Creative Energy would own it and pay the first installment payment per the Trust and Development Agreement (TDA). This plant has immediate benefits to ratepayers even if the Beatty Plant is delayed. The Expo Plant will provide modern, efficient boilers for baseload allowing the oldest boilers at Beatty to be shut down pending rezoning enactment if it is delayed. The second payment per the TDA is conditional on the Developer completing the Beatty Plant. Creative Energy notes that a rezoning is not actually required to rebuild the Beatty Plant or secure the existing density. But it is a decision of the Developer whether to proceed without a rezoning or with reduced development rights. That does not alter the benefits of the Expo Plant to Creative Energy.

125.3.2.1 Please detail any costs that would be the responsibility of Creative Energy.

Response:

Please see the response to BCUC IR 2.125.3.2.

125.4 In the event that the rezoning application is not approved, please confirm, or otherwise explain, the Proposed Reorganization would not proceed.

Response:

Not confirmed. The Proposed Reorganization is planned to occur in immediate succession shortly after BCUC approval and LGIC consent are obtained, which is expected to be prior to rezoning enactment.

There is currently no reason to expect the City will not grant rezoning approval. The discussions with City staff to date have revolved around technical and design issues which have now been largely resolved. The Developer expects to submit an updated application shortly.

125.4.1 If not confirmed, please provide details of the Proposed Reorganization.

Response:

Creative Energy assumes that this question is asking for details of the rezoning application process, and not the Proposed Reorganization, which is detailed in the Application and IR responses. Please see the response to BCUC IR 2.126.1 for details of the rezoning application process.

126.0 Reference: OTHER APPROVAL REQUIRED
Exhibit B-5, BCUC IR 52.1; Exhibit A-15, p. 46
Other government authority approvals required

In response to BCUC IR 52.1, Creative Energy provided the following information regarding government approvals for the Project:

Approval	Authority having Jurisdiction	Site	Approval Date	Impact of Delay	Party Responsible
Air Quality Permit	Metro Vancouver	Expo	December 31, 2018	Project not likely delayed	Developer
Operating Permit	Technical Safety BC	Expo and Beatty	December 31, 2019	Project not likely delayed	Developer
Rezoning Enactment	City of Vancouver	Beatty Development	December 31, 2018	Project delayed by duration of permit delay	Developer
Development Permit	City of Vancouver	Beatty Development	July 31, 2019	Project delayed by duration of permit delay	Developer
Building Permit	City of Vancouver	Beatty Development	September 31, 2019	Project delayed by duration of permit delay	Developer
Occupancy Permit	City of Vancouver	Beatty Development	Dec 31, 2023	Project delayed by duration of permit delay	Developer

Exhibit A-15 page 46 states "Municipal staff indicate that a formal development application has not been submitted for the subject sites as the most recent application was considered incomplete because the required setbacks were not met."

BCUC staff reviewed the City of Vancouver's list of current and approved rezoning applications[4] on October 24, 2018 and Creative Energy's Proposed Project is not listed.

126.1 Please confirm, or otherwise explain, whether a rezoning application for 720 Beatty St has been submitted to the City of Vancouver.

Response:

The City's website does not reflect the status of the rezoning application. Creative Energy also notes that the report from the BCUC's Appraiser contained incorrect statements on the status of the rezoning application.

The Developer submitted a formal application in May 2018. During the formal intake process the City requested revisions. Below is the background on the process so far and current status of the application.

The Developer submitted a rezoning letter of enquiry (also called an application for rezoning advice) in February of 2018. A letter of enquiry is common to get drawings reviewed and get early advice about a proposal before submitting a formal rezoning application. This development is particularly complex because of the steam infrastructure, the planned removal of the viaducts by the City, and the constraints posed by the view cone. A key issue has been set backs, which are complicated in part by the existing steam manifolds and headers that run through the site and evolving plans for the removal of the Georgia viaducts. Setbacks can also affect available development density given height constraints from the view cone. Given the high costs of developing around the steam infrastructure, this has required creative solutions to secure adequate density to make the project economic.

Following initial feedback on the proposal from City staff, a formal application was actually submitted in May 2018 through an intake meeting with staff. The standard process when a developer submits a formal application for rezoning is to have an intake meeting with the City to check off all of the

[4] https://rezoning.vancouver.ca/applications/index.htm

submission materials and accept payment for the application. After that, submission materials are circulated to staff in various departments for comment. This can take 8 to 12 weeks.

During the enquiry step, City staff had indicated that all of the setback issues had been resolved, therefore scheduling the intake meeting in May 2018. However, shortly after intake, the City raised new setback issues arising from their parallel review of the road geometries around the site as a result of the viaduct removal. As a result, the formal intake was suspended.

The Developer's architects had to find creative solutions to these new set back issues raised by the City after the initial enquiry process. At the beginning of November 2018, the Developer met with the City's planning department to discuss proposed solutions, and they accepted the new concept. A revised package is now being prepared for resubmission in mid-November.

While it is not common for the City to request revisions at the formal intake stage (particularly after a formal enquiry stage), this development has many complex issues. That being said, most City departments have now seen the proposal multiple times so the turnaround time for staff comments on the revised submission should be shorter than the normal process.

126.1.1 If confirmed, please provide the current status of the Application.

Response:

Please see the response to BCUC IR 2.126.1.

126.1.2 If not confirmed, please explain why a rezoning application has not been submitted to the City of Vancouver.

Response:

Please see the response to BCUC IR 2.126.1.

126.2 Please provide the following for each permit provided in response to BCUC IR 52.1:

1. The actual or anticipated application date;
2. A copy of the applications that have been filed;
3. The current status of each permit (e.g. application not yet filed, application filed, application under review, approval granted);
4. The actual or anticipated approval date;
    a) For anticipated approval dates please provide a range of estimates for the average approval time for each type of permit with accompanying evidence or examples to support estimates.
5. The date by which approval is required; and
6. The risk to the Proposed Project if delayed.

Response:

The details available at this stage of the Proposed Project are provided in the responses to BCUC IRs 1.52.1 and 2.125.2. As the project moves into detailed design, the permitting plan will be developed in much more detail.

126.3 Please explain in detail why the most recent rezoning application was considered "incomplete."

Response:

Please see the response to BCUC IR 2.126.1.

126.3.1 Please confirm if there is expected to be one rezoning application for each of the two properties or one application combined for the two properties.

Response:

One application for both properties with separate sub-area zonings.

126.3.2 Please confirm that the FSR for 720 Beatty was 11.68 (an 18 story office tower) and 701 Expo Blvd. was 0.54 (single-storey retail use) for the denied application, and whether those facts will remain for the revised application(s).

Response:

Confirmed with respect to 720 Beatty Street, except that the office tower will be 17 stories (not 18).

Confirmed with respect to 701 Expo Boulevard, except that the final FSR will be close to but might be slightly different than 0.54.

126.4 Based on the current status of all required permits and approval, how likely is it for Creative Energy to be able to begin construction in January 2019 assuming the BCUC approves the Application?

Response:

Please see the response to BCUC IR 2.125.3.1.

Schedule G of the Trust and Development Agreement indicates Creative Energy is responsible for permits for various aspects of the project at the Beatty Plant, Expo Plant, and Interconnection. BCUC staff note that while the matrix is not clear which permits from the above table correspond to each project element in the Responsibilities Matrix, some permits could be assumed. For example, the Responsibilities Matrix indicates that Creative Energy is responsible for all permits required for the Expo Plant and, in general, any permits pertaining to the utility-related elements of the Beatty Plant. In response to BCUC IR 52.1, Creative Energy submits the Developer is responsible for all permits.

126.5 Please clarify or reconcile the differences between the Responsibilities Matrix and Creative Energy's response to BCUC IR 52.1 as discussed in the preamble.

Response:

Please see the response to BCUC IR 2.109.1. For clarity, as the word 'responsible' is used to mean different things, Creative Energy, in its capacity as Construction Manager, will oversee and provide direction on all project elements related to utility infrastructure but is not ultimately responsible for the permits. For example, if Creative Energy applied for a new water connection permit for Beatty from the City of Vancouver, but that permit was not issued for some reason, Creative Energy is not responsible for the financial consequences.

126.5.1 If Creative Energy is responsible for any permits please confirm, or explain otherwise, that any delays to the project as a result of Creative Energy not receiving a permit (e.g., Creative Energy has not budgeted enough time for approvals) would constitute a "schedule delay caused by Creative Energy."

Response:

Creative Energy is not ultimately responsible for obtaining any permits. However, Creative Energy may make some permit applications.

K. BRITISH COLUMBIA'S ENERGY OBJECTIVES AND SOCIO-ECONOMIC IMPACT

127.0 Reference: IMPROVE EFFICIENCY
Exhibit B-1, Section 17.2, p. 92; Exhibit B-5, BCUC IR 56.2.1
Extension of flues

In response to BCUC IR 56.2.1, Creative Energy stated: "Please see the response to BCUC IR 1.36.2. Air dispersion studies were completed by Gradient Wind Engineering. Please see Attachment 31.3a."

127.1 Please provide a copy of the air dispersion studies completed by Gradient Wind Engineering.

Response:

The response to BCUC IR 1.56.2.1 contains an error. Gradient Wind has been engaged to develop air dispersion studies. This was done during the schematic design process, to support WSP's work schematic design at the Expo Plant. Gradient has produced a working model, the parameters from which WSP used to establish the initial stack sizing and refine some of the boiler requirements, such as flue gas recirculation and burner selections. This work is on-going, as Creative Energy prepares to apply for an Air Quality permit on Nov 16, 2018. It is an iterative process, as the burner and flue refinements affect the dispersion model. Following input from Metro Vancouver, the equipment details will be finalized and a final dispersion study will be produced.

This study and the associated permit is under the jurisdiction of Metro Vancouver, but Creative Energy will be pleased to share copies of both with BCUC as soon as they are available.

128.0 Reference: BRITISH COLUMBIA'S ENERGY OBJECTIVES AND SOCIO-ECONOMIC IMPACT
Exhibit B-xx, BCUC IR 54.1
Estimated Annual GHG Emissions

In response to BCUC IR 54.1, Creative Energy provided the table below:

	Estimated Annual GHG Emissions
Existing Plant	87,726 tonnes
New Plant	84,013 tonnes
Difference	3,713 tonnes

128.1 Please provide the supporting calculations and justification for all assumptions used to calculate the estimated Annual GHG Emissions.

Response:

The below table provides supporting calculations and justification for all assumptions for the information requested in BCUC IR 54.1.

The 2016 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions uses a natural gas emissions factor of 49.87 kg / GJ, equivalent to 0.17953 tonnes / MWh. This was rounded up to 0.18 tonnes / MWh for this calculation.

Line		Baseline	Proposed Project	Note
1	Steam Sales	1,004,400 M#	1,004,400 M#	BCUC IR 11.1 and attachment
2	Energy Content of Steam	1.198 mmBTU/#	1.198 mmBTU/#	Taken from steam table
3	MWh per mmBTU	0.293	0.293	Conversion factor
4	Energy Sales	352,644 MWh	352,644 MWh	Line 1 x Line 2 x Line 3
5	System Efficiency	72.4%	75.6%	Exhibit B-1, S. 13.
6	Gas Consumption	487,077 MWh	466,460 MWh	Line 3 / Line 4
7	GHG Intensity of Gas	0.18 tonnes / MWh	0.18 tonnes / MWh	See note above
8	Tonnes GHG	87,674 tonnes	83,963 tonnes	Line 5 x Line 6

The difference as calculated above is 3,711 tonnes.

129.0 Reference: BRITISH COLUMBIA'S ENERGY OBJECTIVES AND SOCIO-ECONOMIC IMPACT
Exhibit B-xx, BCUC IR 54.7
Socio-economic impact of alternatives

In response to BCUC IR 54.7, Creative Energy stated:

> The Alternative project discussed in the Application would provide none of the other socio-economic public interest benefits identified on page 92 and Figure 11 of the Application, except that it would provide some improvement to local air quality. The Alternative project would improve local air quality to a significantly lesser extent than the Proposed Project because the Proposed Project adds more new high efficiency equipment and extends the flues.

BCUC staff note Creative Energy has not discussed any additional benefits associated with the alternatives that Creative Energy has considered (e.g. Constructing a New Plant in a Different Location could result in lower local noise pollution, less GHG emissions).

129.1 Please briefly discuss the environmental and social impacts of (i) In-situ Equipment Replacement and (ii) Construct a New Plant in a Different Location.

Response:

Setting aside the risks associated with each of the two alternatives, and questions about whether the Construct a New Plant in a Different Location alternative is feasible, the impacts are as follows.

(i) In-situ Equipment Replacement

- **Environmental impacts – this alternative would have a positive impact relative to current impacts as the plant efficiency would increase by virtue of replacing aged, inefficient boilers**

with modern equivalents, including low-NOx burners. This would reduce the overall plant emissions of CO_2 and NOx.

- **Social Impacts – this alternative would not achieve the same safety (including seismic) improvements as the Proposed Project nor beautification of Expo Boulevard nor creation of a public plaza between Beatty Street and BC Place nor creation of office and retail space.**

(ii) Construct a New Plant in a Different Location

- **Environmental impacts – this alternative would have a positive impact relative to current impacts as the plant efficiency would increase by virtue of replacing aged, inefficient boilers with modern equivalents, including low-NOx burners. This would reduce the overall plant emissions of CO_2 and NOx.**
- **Social Impacts – this alternative would have a positive social benefit by delivering safety (including seismic) improvements. Beautification of Expo Boulevard, creation of a public plaza between Beatty Street and BC Place and creation of office and retail space would likely occur later when the site is vacated and redeveloped.**

L. CONSULTATION

130.0 Reference: CONSULTATION
Exhibit B-5, BCUC IRs 57.1, 57.5.2 p. 111
Public Open House

In response to BCUC IR 57.1, Creative Energy stated it presented "the entire project to City of Vancouver engineering department staff."

In response to BCUC IR 57.5.2, Creative Energy stated it "will incorporate feedback from the survey where possible. If there are large concerns from customers, Creative Energy will set up individual meetings to discuss their concerns, the Proposed Project and the Alternative."

130.1 Please clarify how "large concerns from customers" will be quantified to ensure Creative Energy is following up with those concerns.

Response:

Creative Energy would quantify large concerns as multiple customers (>10%) having a similar concern with a certain aspect of the Proposed Project. The survey was viewed by 39 individuals and only 10 responded to the survey, with the majority of those customers requesting further information and updates as the project progresses. Creative Energy is not aware of any large concerns from customers at this time.

M. PART III – CORPORATE REORGANIZATION

131.0 Reference: CORPORATE ORGANIZATION
Exhibit B-1, p. 5; Section 19, pp. 97-106; Exhibit B-5, BCUC IR 59.5p. 114
Public interest benefits of the proposed reorganization steps

Page 103 of the Application describes Step 3 as follows: "Step 3 of the Proposed Reorganization involves amalgamation of Creative Energy and Newco to form Creative Energy (2018), and Creative Canada acquiring all of the issued and outstanding shares of Creative Energy (2018). Following such merger, Creative Energy (2018) will be the public utility pursuant to the UCA. This is the second of two necessary steps in order to increase the tax cost of the land held by Creative Energy in accordance with section 88(1)(d) of the Income Tax Act.

Pursuant to subsections 53(1) and (3) of the UCA, the proposed amalgamation of Creative Energy and Newco requires that Creative Energy apply to the Commission for the LGIC's consent to the amalgamation. Pursuant to 53(4) and (5) of the UCA the Commission is to inquire into Creative Energy's application for LGIC consent to amalgamate and, if the Commission is of the opinion that the amalgamation would be beneficial in the public interest, submit its report and findings to the LGIC."

Creative Energy respond to BCUC IR 59.5, which asks Creative Energy to discuss and quantify the public interest benefit(s) resulting from the amalgamation pursuant to section 53 of the UCA. In its answer Creative Energy stated:

> In its October 20, 2017 report to the Attorney General regarding the proposed amalgamation of a public utility involving Cal-Gas Inc., the Commission determined that "Given that all steps in the Cal-Gas Reorganization will occur in immediate succession, the Panel considers it appropriate to assess the benefits of the Cal-Gas Reorganization as a whole when making its findings on the Amalgamation." Applying that finding to the Proposed Reorganization involving Creative Energy, the benefits of the Proposed Reorganization as a whole should be considered when making findings on the amalgamation step. The Proposed Reorganization as whole enables Creative Energy and the Developer to proceed with the Proposed Project, the public interest benefits of which are described in the Application.

131.1 Please confirm that the Proposed Reorganization as a whole enables both the Proposed Project and the Developer's project.

Response:

Confirmed. Please refer to pages 99 to 100 of the Application.

131.1.1 If not confirmed, please explain.

Response:

Please see the response to BCUC IR 2.131.1.

131.2 Please discuss the public interests benefits associated solely with the Developer's project.

Response:

The public interest benefits associated solely with the Developer's project include the following:

- **Improved local air quality as a result of the extension of the flues at the Beatty Plant well beyond the public realm (past the roof of the Developer's office tower development), which is part of the Developer's project.**
- **Beautification of Expo Boulevard on both sides as a result of the enhanced façade treatment of the new Expo Plant on the east side of Expo Boulevard and the office tower development on the west side, beautifying this important street in need of a transformation.**
- **Creation of a large public plaza between Beatty Street and BC Place Stadium which will allow for improved pedestrian access out of BC Place towards Georgia Street, and which will be especially important when the viaducts are removed and this site becomes a gateway into downtown Vancouver.**
- **Improvement of the site to best use, including a significant amount of additional office space in downtown Vancouver.**

- **Creation of a significant amount of retail space which will also allow for BC Place to increase their retail presence along the concourse that can thrive throughout the year, not only on game days.**

The public will benefit from the transformation of this site and surrounding area relative to the current state.

131.3 In addition to public interest benefits of the Proposed Project and the Developer's project, please discuss in detail the public interest benefits associated with the amalgamation step *only.*

Response:

It is difficult to assign benefits to an amalgamation step in isolation from other reorganization steps occurring in immediate succession and in isolation from the decisions and actions that will be enabled by the reorganization as a whole. As the Applicants in the matter of the Cal-Gas Reorganization stated, "…it is difficult to assign specific benefit to any one step [of the reorganization] (given that it is an all-or-nothing proposition and none of the benefits will be realized if the Application is not approved as a whole)…" (refer to section 2.3, page 5 of the BCUC's October 24, 2017 report to the Attorney General regarding the amalgamation involving Cal-Gas, attached to Exhibit B-10).

The benefits of an amalgamation are those improvements that the amalgamation *enables* the amalgamated organisation to implement. For example, an amalgamation of two operating companies might *enable* the amalgamated organisation to improve its overall administrative efficiency.
In the case of the Proposed Reorganization involving Creative Energy, the amalgamation is not of two operating companies and the amalgamation is not for the purpose of streamlining consolidated operations. The amalgamation is the second of two necessary steps in order to enable Creative Energy to increase the tax cost of the land it holds in accordance with section 88(1)(d) of the *Income Tax Act*. If the tax cost of the land is not increased as proposed, on any future sale of the property any gain on sale would be based on historical cost and most of the original purchase price of the shares of Central Heat Distribution Ltd. would not offset the gain resulting in double tax to the Developer. The amalgamation approach is the most efficient approach for increasing the tax cost of the land. Any alternative approach would be designed to produce the same outcome. An alternative approach was considered that involves winding-up Creative Energy and distributing the assets to the parent company; however, such approach would be more complex and less efficient than amalgamation. Accordingly, in addition to the public interest benefits of the Proposed Project and the Developer's project, the public interest benefits associated with the amalgamation step *only* are as follows:

- **Enables the tax cost of the land held by Creative Energy to be increased in accordance with section 88(1)(d) of the *Income Tax Act*, avoiding double tax to the Developer in the event of any future sale of the property. The *Income Tax Act* provides for this treatment because it is not in the public interest to subject a person to double tax.**

- **Avoids the alternative approach to increasing the tax cost of the land, which would involve the more complex and costly winding-up of Creative Energy and distribution of its assets to the parent company. Avoidance of waste is always beneficial in the public interest.**

131.3.1 If Creative Energy cannot list specific benefits associated solely with the amalgamation step, please confirm that the benefits of the amalgamation step simply arise from the public interest benefits of the Proposed Project and the Developer's project, if any.

Response:

Please see the response to BCUC IR 2.131.3.

131.4 In addition to public interest benefits of the Proposed Project and the Developer's project, please discuss in detail the public interest benefits associated with the Proposed Reorganization as a whole.

Response:

The public interest benefits enabled by the Proposed Reorganization as a whole consist of the following:

- **The public interest benefits of the Proposed Project as set out in the Application;**
- **The public interest benefits of the Developer's project as set out in the Application (section 17.2) and in the response to BCUC IR 2.131.2;**
- **The public interest benefits of the amalgamation step only as set out in the response to BCUC IR 2.131.3; and**
- **The public interest benefits of Emanate Energy's acquisition of an indirect 50% equity interest in the Creative Energy utility as set out in the response to BCUC IR 1.59.16.**

Additionally, the Proposed Reorganization itself will have no impact on the level of services to ratepayers, rates, or the authority of the Commission to regulate the utility.

131.4.1 If Creative Energy cannot list specific benefits associated with the Proposed Reorganization as a whole, please confirm that the benefits of the Proposed reorganization as a whole simply arise from the public interest benefits of the Proposed Project and the Developer's project, if any.

Response:

Please refer to the response to BCUC IR 2.131.4.

Emanate Energy

Page 5 of the Application states: "Finally, and largely independent of the Proposed Project, Emanate Energy Solutions Inc. (Emanate Energy) plans to acquire an indirect 50% equity interest in Creative Energy. The acquisition by Emanate Energy is proposed to be completed as part of a series of steps to reorganize Creative Energy to facilitate the Proposed Project."

131.5 In addition to public interest benefits of the Proposed Project and the Developer's project, please discuss in detail the public interest benefits associated with the Emanate Energy acquisition of the 50 percent interest in Creative Energy.

Response:

Please note that Emanate Energy is not acquiring a 50% interest in Creative Energy as is stated in the question. Emanate Energy's interest in the amalgamated Creative Energy (2018) will be indirect, through Creative Energy Developments GP and LP, which hold other interests beyond Creative Energy (2018).

With the introduction of Emanate Energy as indirect shareholder, Creative Energy (2018) will have two ultimate shareholders and is expected to benefit from additional expertise, diversity of perspectives, access to capital, and an increase in accountability to two independent shareholders. Please see the response to BCUC IR 1.59.16.

131.5.1 If Creative Energy cannot list specific benefits associated with the Emanate Energy acquisition of the 50 percent interest in Creative Energy, please confirm that the benefits of the Emanate Energy acquisition of the 50 percent interest in Creative Energy simply arise from the public interest benefits of the Proposed Project and the Developer's project, if any.

Response:

Please see the response to BCUC IR 1.131.5.

Emanate Energy will contribute funding to the equity costs of Creative Energy's business, which will include Creative Energy's equity costs in regards to the Proposed Project; however, the acquisition by Emanate Energy does not facilitate and is not needed for either the Proposed Project or the Developer's project. Please see the response to BCUC IR 1.60.3.1.

For greater certainty, there is no connection between Emanate Energy's acquisition and the Developer's project. The acquisition by Emanate Energy is proposed to be completed as part of the Proposed Reorganization, but it is otherwise independent of the reorganization steps to facilitate the Proposed Project and the Developer's project.

132.0 Reference: CORPORATE ORGANIZATION
Exhibit B-9, Pane question 1.0p. 1
Risks associated with the Proposed Project

Creative Energy provided the following answer to the Panel's question 1.0 regarding risks associated with the Proposed Project:

> Section 6.2 of the Trust and Development Agreement contains restrictions in respect of the Developer's ability to finance the Developer's project. These restrictions are designed to mitigate Creative Energy's exposure to liabilities and asset exposure associated with the construction financing for the Developer's project. These restrictions require among other things that any financing for the Developer's project will include covenants from the lenders thereunder:
>
> (a) not to take any recourse, or pursue any claim or proceeding against Creative Energy, its affiliates or their respective shareholders, directors, officers, employees, agents, successors, and assigns, or against any of the utility assets;
>
> (b) to allow Creative Energy to retain the utility assets notwithstanding any realization proceedings against the Developer or foreclosure proceedings against the Developer's project;
>
> (c) if the Developer is in default under such financing and the lender commences realization proceedings, the lender will complete and deliver the new Beatty Plant and the new office space in accordance with the provisions of the Trust and Development Agreement.
>
> <u>Thus, most if not all of the risks</u> associated with the construction financing for the Developer's project are mitigated by the requirement for these specific covenants from any lenders of such financing.

It should be noted that as the registered owner of the Beatty Street lands, Creative Energy will need to execute any mortgage securing any construction financing, and it will not do so without the above covenants in place from the lender [Emphasis added].

132.1 Please list all the risks that Creative Energy deems will be mitigated.

Response:

There are risks associated with Creative Energy continuing to hold the legal title to the Trust Property (also referred to as the surplus property) the Developer will be developing (i.e., the lands, spaces and improvements located on or forming part of 720 Beatty Street and 701 Expo Boulevard that are not the Utility Assets). Creative Energy will continue to hold legal title to the Trust Property as bare trustee until the lands are subdivided when the airspace parcels are created. The key reasons for and benefits of Creative Energy retaining legal title as bare trustee are set out in the response to BCUC IR 1.61.1.

The restrictions in section 6.2 of the Trust and Development Agreement are designed to mitigate Creative Energy's exposure to liabilities and asset exposure associated with the construction financing for the Developer's project in this situation where Creative Energy retains legal title as bare trustee. Creative Energy considers that all foreseeable risks are mitigated by these restrictions.

132.2 Please list all the risks that Creative Energy considers will not be mitigated.

Response:

Please see the response to BCUC IR 2.132.1.

132.3 Please clearly identify which risks, if any, will not be isolated from the utility and its ratepayers.

Response:

Ratepayers will not bear any risks associated with Creative Energy retaining legal title as bare trustee to the Trust Property the Developer will be developing. Creative Energy considers that all foreseeable risks to Creative Energy are mitigated by the restrictions in section 6.2 of the Trust and Development Agreement. Any residual risks to Creative Energy, if any, will be borne by its shareholder.

132.4 Please confirm, or explain otherwise, that risks discussed above are associated with the Proposed Project and the Developer's project and would not exist <u>without</u> the Proposed Project and the Developer's project?

Response:

The BCUC Panel's question 1.0 relates to the response to BCUC IR 1.59.11, which discusses the potential risks to Creative Energy as a result of the transfer of the beneficial interest in the Trust Property (i.e., the lands, spaces and improvements located on or forming part of 720 Beatty Street and 701 Expo Boulevard that are not the utility assets) to the Developer and the retention by Creative Energy of legal title to the Trust Property as bare trustee.

These risks to Creative Energy will arise under any scenario that includes redevelopment of 720 Beatty Street and 701 Expo Boulevard with Creative Energy retaining legal title to the land and utility assets. These risks will therefore arise in <u>all</u> redevelopment scenarios because there is no plausible redevelopment scenario where at least the steam system distribution manifold, headers and lines do not remain on the lands. For greater certainty, this is regardless of who is the Developer. Creative

Energy does not understand why the BCUC's appraiser Grover Elliot did not consider these risks in their report, and has submitted IRs to them seeking explanation.

These particular risks would not exist if there is no redevelopment of 720 Beatty Street and 701 Expo Boulevard, and Creative Energy proceeded with the Alternative.

As stated in the responses to BCUC IRs 2.132.1 and 2.132.3, Creative Energy considers that all foreseeable risks associated with retaining legal title are mitigated by the Trust and Development Agreement and that ratepayers will not bear any such risks if the Proposed Project proceeds.

133.0 Reference: CORPORATE ORGANIZATION
Exhibit B-9, Panel question 2.0, p. 3
Indemnities

On page 3 of Exhibit B-9, answer Panels' question 2.0 regarding the indemnities from the Developer and Westbank Holdings Ltd., and the mechanism in place to ensure that the Developer and Westbank Holdings Ltd. have the ability to meet the financial requirements when exposed to the risks, Creative Energy stated:

> With respect to the Developer, it will have equity in the Trust Property, which Creative Energy will have recourse against if the Developer does not indemnify Creative Energy as required under the Trust and Development Agreement. With respect to Westbank Holdings Ltd., under section 9.3 of the Trust and Development Agreement, Westbank Holdings Ltd. is required to deliver such comfort letter or other document or statement to Creative Energy as is agreed upon in writing by Westbank Holdings Ltd. and Creative Energy from time to time in order to confirm the strength of Westbank Holdings Ltd.'s indemnity. If the reporting requirements of Westbank Holdings Ltd. are not met, then Creative Energy may require that legal title to the Beatty Street property be transferred to a nominee in order to mitigate any risk associated with holding registered title [Emphasis added].

133.1 Please provide details of the amount of equity that the Developer will have in the Trust Property.

Response:

The amount of the equity that the developer will have in the Trust Property will generally be equal to the difference between the value of the Trust Property as a whole less the amount of the construction financing for the Developer's project at any given time. Typically, construction lenders require a loan to cost ratio of 70%-75%, which means that the Developer would contribute the remaining 25%-30% of development costs as equity, and these contributions would factor into the aggregate equity the Developer has in the project, together with the difference between the value of the Trust Property as a whole less the costs of construction (both financed and paid by the Developer) for the Developer's project at any given time. It is anticipated that the Developer in this project will be required to contribute construction costs in excess of the customary 25%-30% range prior to the Stabilization Date (as defined in the Trust and Development Agreement), given the constraints placed on the construction lender under section 6.2 of the Trust and Development Agreement. This will serve to increase the amount of equity the Developer will have in the Trust Property during the periods of highest risk (i.e.: while the new plant is under construction and before the Lands have been subdivided). We do not understand why the BCUC's appraiser Grover Elliot did not consider this matter in their report, and have submitted IRs to them seeking explanation.

133.2 With respect to the recourse that Creative Energy will have against the Developer, please confirm it is for 100 percent of the equity in the Trust Property as provided in the previous response.

Response:

Confirmed.

133.3 Please confirm that Creative Energy will be willing to provide to the BCUC on a regular basis throughout the construction period of the Proposed Project, a report on the amount of equity that the Developer will have in the Trust Property?

Response:

As suggested by the response to BCUC IR 2.133.1, it would not be a simple or inexpensive matter to calculate the amount of equity the Developer has in the Trust Property on a regular basis. Creative Energy confirms in its response to BCUC IR 2.133.7 that it could provide copies of the Westbank Holdings comfort letters or other documents or statements on a confidential basis. Creative Energy considers that providing such information would be a more cost effective approach to reporting to the BCUC.

133.4 To the extent the Trust Property is not sufficient to cover Creative Energy's exposure to the financial and other risks, what other additional recourse would Creative Energy have against the Developer?

Response:

Creative Energy would have recourse against all of the assets of the Developer, which would primarily be the Developer's interest in the Trust Property. Creative Energy would also have recourse against Westbank Holdings Ltd, under the terms of the indemnities in the Trust and Development Agreement.

133.5 Please explain how "…comfort letter or other document or statement…", as noted above, provide <u>indemnification</u> to Creative Energy with respect to Westbank Holdings Ltd.

Response:

The comfort letter or other document or statement to Creative Energy as is agreed upon in writing by Westbank Holdings Ltd. and Creative Energy from time to time does not provide indemnification, <u>it confirms the strength of the indemnities</u> Westbank Holdings Ltd. has made pursuant to section 9 of the Trust and development Agreement.

133.6 Please confirm whether Creative Energy can require such "…comfort letter or document or statement…" at any time.

Response:

Confirmed. Please see section 9.3 of the Trust and Development Agreement.

133.7 Please confirm that Creative Energy will be willing to provide such "…comfort letter or document or statement…" to the BCUC.

Response:

Confirmed, on a confidential basis.

133.7.1 If not confirmed please explain why not.

Response:

Please see the response to BCUC IR 2.133.7.

133.8 What is the standard for "strength" of such documents that Westbank Holdings Ltd. needs to meet?

Response:

The Westbank Holdings Ltd. comfort letter or other document or statement is to confirm that Westbank Holdings Ltd. has the financial strength to fulfill the indemnities it has made pursuant to section 9.3 of the Trust and Development Agreement.

Under section 9.3, Westbank Holdings Ltd. is required to deliver such comfort letter or other document or statement to Creative Energy as is agreed upon in writing by Westbank Holdings Ltd. and Creative Energy from time to time in order to confirm the strength of Westbank Holdings Ltd.'s indemnity pursuant to Section 9.1(b). Details of the agreed upon comfort letter and reporting requirements will be submitted on a confidential basis to the BCUC.

133.9 Please confirm that neither the Developer nor Westbank Holdings Ltd. will provide additional financial security such as a performance bond and other assets as security.

Response:

Confirmed.

133.10 What are "the reporting requirements" of Westbank Holdings Ltd.?

Response:

The "Reporting Requirements" are the requirements for Westbank Holdings Ltd. to deliver such comfort letter or other document or statement to Creative Energy as is agreed upon in writing by Westbank Holdings Ltd. and Creative Energy from time to time in order to confirm the strength of Westbank Holdings Ltd.'s indemnity. Please see section 9.3 of the Trust and Development Agreement (Exhibit B-1-2).

133.10.1 Why are such requirements relevant and provide indemnification to Creative Energy with respect to Westbank Holdings Ltd.?

Response:

Please see the response to BCUC IR 2.133.10.

133.10.2 Please specify in which instances Creative Energy <u>may</u> require transfer of Beatty Street property to a nominee?

Response:

If the Reporting Requirements of Westbank Holdings Ltd. are not met as required by section 9.3 of the Trust and Development Agreement, and such deficiency in meeting the requirements is not cured within the specified time period, then Creative Energy will have the right to require that legal title to the Beatty Street property be transferred to a nominee pursuant to section 6.7 of the Trust and Development Agreement.

In such circumstances, Creative Energy would exercise its right to require the transfer to the nominee if Creative Energy considered that it would be at significant risk if it continued to hold the legal title. In such circumstances, Creative Energy might not exercise such right if it considered that Westbank Holdings Ltd.'s deficiency in meeting the requirements was not material.

For example, if Westbank Holdings Ltd. provided a perfectly adequate comfort letter a few days later than the cure period, it would not be reasonable for Creative Energy to require transfer of legal title. On the other hand, if Westbank Holdings Ltd. was simply unable to provide the comfort letter or other document or statement, Creative Energy would exercise its right to require the transfer of legal title.

133.10.3 Please specify in which instances Creative Energy may not require transfer of Beatty Street property to a nominee?

Response:

Please see the response to BCUC IR 2.133.10.3.

133.11 Please confirm whether the transfer of the Beatty Street property mitigates the risks associated to Creative Energy from the beginning of the Proposed Project and the Developer's Project, or does it mitigate the risks at the time of transfer.

Response:

The transfer of the Beatty Street property would mitigate risks associated with Creative Energy holding legal title as a bare trustee from the date of the transfer onwards.

133.12 Please explain how the transfer of the Beatty Street property to a nominee mitigates risks to Creative Energy and its ratepayers.

Response:

Transferring legal title to a nominee mitigates the risks to Creative Energy of retaining legal title as bare trustee. The response to BCUC IR 1.59.11 sets out these risks.

As stated in the responses to BCUC IRs 2.132.1 and 2.132.3, Creative Energy considers that all such foreseeable risks are mitigated by the Trust and Development Agreement and that ratepayers will not bear any such risks if the Proposed Project proceeds.

133.12.1 If Creative Energy deem necessary to take action for transfer of the Beatty Street property to a nominee, please describe steps Creative Energy will have to take.

Response:

There would be no costs to ratepayers. BCUC approval of this Application will provide the approval for the transfer of the property, and only the approval of the construction lender for the Developer's project would be required. The timing for this approval and for the subsequent transfer of the project would be relatively short; likely two to three weeks.

133.12.1.1 Will Creative Energy alone make the decision regarding the property transfer, or will affiliates be involved?

Response:

Creative Energy alone would make the decision regarding the property transfer.

133.12.1.2 Please discuss if Creative Energy is of the view that such property transfer will require Commission approval.

Response:

Creative Energy contemplates that BCUC approval of this Application will provide such approval.

133.12.1.3 Please indicate the anticipated time and associated cost for each of the listed steps.

Response:

There would be no costs to ratepayers. BCUC approval of this Application will provide the approval for the transfer of the property, and only the approval of the construction lender for the Developer's project would be required. The timing for this approval and for the subsequent transfer of the project would be relatively short; likely two to three weeks.

133.12.1.4 Please indicate the total time and anticipated cost of such actions to complete the Beatty Street property transfer.

Response:

There would be no costs to ratepayers. For timing, please see the response to BCUC IR 2.133.12.1.3.

134.0 Reference: CORPORATE ORGANIZATION
Exhibit B-9, Panel question 5.0, p. 7
Due diligence process re the selection of Emanate Energy Solutions Inc.

On page 7 of the Exhibit B-9, answering the Panel's question 5.0 regarding Creative Energy Canada's due diligence process resulting in the selection of Emanate Energy Solution Inc.to acquire a 50 percent indirect interest in Creative Energy, it stated:

> …Further due diligence of both parties continued throughout the development of definitive agreements. Emanate Energy was set up as the vehicle for InstarAGF's investment in Creative Energy Developments GP and LP. All definitive agreements for establishing Creative Energy Developments GP and LP were completed in late January of 2018..,

134.1 Please provide copies of all such definitive agreements between the parties for the establishment of Creative Energy Developments GP and LP.

Response:

The agreements establishing Creative Energy Developments GP and Creative Energy Developments LP are attached as Confidential Attachment 134.1. Please note that these agreements are among private companies, and Creative Energy is not party to the agreements. The agreements are considered commercially sensitive and confidential by the parties. Disclosure of the agreements would be expected to harm the commercial interests of the parties. Specific information that is particularly sensitive has been redacted in the agreements.

N. APPENDICES

135.0 Reference: APPENDIX A –TRUST AND DEVELOPMENT AGREEMENT
Exhibit B-1, Schedule C of Appendix A, p. 3; Exhibit B-5, BCUC IRs 4.1, 69.2
Beatty Plant ancillary space specifications

In response to BCUC IR 4.1 Creative Energy stated:

> The fuel oil supply enables Creative Energy to maintain continuous service to customers and purchase interruptible natural gas for the plant, generating a significant cost savings for customers. A similar strategy to maintain reliability and lower gas costs is employed by other large heating plants throughout the lower mainland, including plants serving SFU, UBC, and major hospitals.

In response to BCUC IR 69.2 Creative Energy further stated:

> Current building code limits the size of individual fuel oil tanks within buildings to 40,000usg each. Further, operational experience and analysis of the fuel oil delivery logistics indicate that 80,000USG is adequate to maintain full plant capacity indefinitely throughout a full curtailment scenario.

135.1 Please provide details of the curtailment periods the Beatty Plant has experienced over the past five years. Please provide details of the following:

a) number of curtailment periods;

Response:

One.

b) duration of curtailment periods;

Response:

Thirty-one hours.

c) amount of fuel oil used during curtailment period (USG);

Response:

74,668.49 USG, or 282,651 litres.

d) number of fuel oil deliveries during curtailment period;

Response:

Five.

e) amount of fuel oil delivered during curtailment period; and

Response:

67,318.44 USG or 254,828 litres.

f) the duration of time that the plant can continue to operate at peak system load.

Response:

The Plant can continue to operate for the intermittent time it takes to switch fuels. The Plant cannot produce the same amount of steam while firing on Fuel Oil as it does while firing on Natural Gas.

136.0 Reference: APPENDIX D
Exhibit B-1, Appendix D; Exhibit B-5, BCUC IR 72.3.1; Exhibit B-5-2, BCUC IR 72.2.1
Accounting treatment

BCUC staff note that there are a total of seven journal entries related to Creative Energy's role in the Proposed Project - these are provided in Appendix D of the Application as journal entries 1 through 6, and in response to BCUC IR 72.3.1.

Using this information, BCUC staff prepared the following T Accounts to understand the additions/subtractions (i.e. debits/credits) from the individual account balances:

Assets:

Journal Entry #	Cash/Bank Account	
1	15,000,000	
2	31,000,000	
4		46,000,000
5		9,000,000
6		6,000,000
Totals	46,000,000	61,000,000

Journal Entry #	Assets	
3	46,000,000	
BCUC IR 72.3.1		31,000,000
Totals	46,000,000	31,000,000

Liabilities:

Journal Entry #	Accounts Payable (A/P)	
3		46,000,000
4	46,000,000	
Totals	46,000,000	46,000,000

Journal Entry #	Loan Liability	
1		15,000,000
5	9,000,000	
6	6,000,000	
Totals	15,000,000	15,000,000

Shareholder's Equity:

Journal Entry #	Shareholder's Equity	
2		31,000,000
BCUC IR 72.3.1	31,000,000	
Totals	31,000,000	31,000,000

136.1 Please confirm that the T Accounts prepared above by BCUC staff are correct (i.e. they are representative of the terms and conditions of the Trust and Development Agreement and of the Proposed Project). If not confirmed, please explain and provide any amending journal entries or T Accounts which may be needed.

Response:

The T Accounts prepared by BCUC staff are correct, except for the "BCUC IR 72.3.1" entry which should be removed. There should not be a reduction in the asset account and should not be a reduction in the shareholder's equity account. The only outstanding entry would be the future repayment of the $15M loan from Westbank.

136.2 Given that there is a difference of $15,000,000 between total debits ($46,000,000) and total credits ($61,000,000) in the Cash/Bank Account, please explain how Creative Energy will finance the additional $15,000,000 which is needed.

Response:

The $15M used to repay the construction loan will be financed as part of the utility's total capital financing requirements which is a mix of debt and equity. The allowed debt component is 57.5% and the equity component is 42.5%.

136.3 Please confirm that the amount of $46 million represents the total project costs (exclusive of other amounts paid directly by the Developer) and is, therefore, only an estimate at this time.

Response:

Yes, the $46M represents the total project costs and is only an estimate at this time.

In response to BCUC IR 72.2.1, Creative Energy submitted:

> Generally, contributions in aid of construction are amounts funded by customers who agree to finance a portion of new infrastructure (for example to get connected to the distribution system) in order to receive service from the utility. The Developer is not providing the funds to get service from the utility but rather providing a subsidy to assist Creative Energy to complete the Proposed Project and to enable the Developer to complete the larger redevelopment project.

In response to BCUC IR 72.3.1, Creative Energy provided the missing journal entry below:

	DR	CR
DR: Shareholders Account	$31M	
CR: Contributions In Aid of Construction		$31M

136.4 Please reconcile the apparent differences between Creative Energy's definition of CIAC provided in response to IR 72.2.1 and the missing journal entry provided in IR 72.3.2.

Response:

The response to BCUC IR 1.72.2.1 is accurate. We apologize that there was an oversight with respect to the journal entry reported in the response to BCUC IR 1.72.3.1. There should be no debit to contributed surplus and no credit to the asset account.

137.0 Reference: APPENDIX K - PavCo STATUTORY RIGHT OF WAY AGREEMENT
Exhibit B-1, Section 10.1, p. 35; Section 10.4.4, pp. 43-44; Exhibit B-5, BCUC IR 81.2.1
SRW and licences for access

In response to BCUC IR 81.2.1 Creative Energy stated:

> The Expo plant will be located within a part of BC Place which is a separate structure from the main stadium structure. This would allow the stadium to be deconstructed and redeveloped without removal or direct impact on the Expo plant.
>
> The Expo plant will rely on BC Place for electricity supply. If BC Place were to be removed, new electrical service would have to be installed and energized prior to deconstruction of BC Place.

137.1 Please explain whether Creative Energy's Statutory Right of Way Agreement includes provisions to ensure that in the event that the stadium is deconstructed and redeveloped the Expo Plant can continue to operate at the Expo Plant.

Response:

The SRW does consider this scenario. Please see section 2.10 of the SRW Agreement.

137.1.1 If confirmed, please provide details of the provisions.

Response:

As provided in section 2.10 of the SRW Agreement, if the stadium is deconstructed or redeveloped, PavCo shall not have the right to relocate, demolish or redevelop the Expo Plant, PavCo shall ensure that Creative Energy has access to the Expo Plant at all times and PavCo shall use commercially reasonable efforts to minimize interference with Creative Energy's use of the Expo Plant. If the stadium is deconstructed or redeveloped, Creative Energy will be required (at its cost) to make such structural changes as are required to ensure the Expo Plant can stand alone and will make all arrangements for the installation of replacement utility services for the Expo Plant.

137.1.2 If not confirmed, please explain why.

Response:

Please see the response to BCUC IR 2.137.1.1.

138.0 Reference: APPENDIX K - PavCo STATUTORY RIGHT OF WAY AGREEMENT
Exhibit B-1, Schedule E of Appendix K, p. 56, Schedule D, p. 49; Schedule G to Appendix A, p. 1; Exhibit B-5, BCUC IR 82.1
Building permits

BCUC IR 82.1 requests confirmation of the party responsible for submitting and attaining the required permits for the Expo Plant. In its response, Creative Energy stated:

The Developer is responsible.

Page 1 of Schedule G to Appendix A provides the Responsibilities Matrix for the Expo Plant:

	Description	Location / Level	Management of Design/ Specifications/ Permitting	Management of Construction	Comments
Expo Plant	Hazmat and Asbestos Removal	Expo Boulevard Level 1	Creative Energy	Creative Energy	CE responsible for up to $100,000 of removal costs. PavCo responsible for all other costs.
	Demolition and Modifications to shell space as required	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Exterior Façade of Expo Plant	Expo Boulevard Level 1	Creative Energy with the approval of the Developer	Creative Energy	Developer is required to approve the façade design of the Expo Plant due to the proximity to the 720 Beatty Redevelopment
	Major Equipment Inside Expo Plant - Boiler #1 (200,000 pound per hour steam boiler) / Boiler #2 (200,000 pound per hour steam boiler)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Secondary Equipment Inside Expo Plant - Water softeners / Feed water pumps / Chemical treatment equipment / Deaerator / Condensate receiver	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Electrical Distribution Inside Expo Plant - Medium voltage (600V) electrical distribution	Expo Boulevard Level 1	Creative Energy	Creative Energy	Electrical Power to be taken from Substation C within BC Place.
	Life Safety Inside Expo Plant - Emergency Generator (1000 kW)	Expo Boulevard Level 1	Creative Energy	Creative Energy	
	Ancillary Spaces Inside Expo Plant - Control Room / Staff Lunch Room / Staff Washroom	Level 2	Creative Energy	Creative Energy	
	Flues and Piping Outside of Expo Plant - 2 x Boiler flues (routed out upper concourse) / Relief piping (routed out upper concourse)	Level 3 and above	Creative Energy	Creative Energy	

138.1 Given that Schedule G above lists Creative as the responsible party for each aspect of the Expo Plant, please clarify which Expo Plant permits and approvals are the Developer's responsibility.

Response:

Please see the responses to BCUC IRs 2.109.1 and 2.109.2.

138.2 Please clarify which Expo Plant permits and approvals are Creative Energy's responsibility.

Response:

Please see the responses to BCUC IRs 2.109.1 and 2.109.2.

138.3 Please discuss PavCo's role in any permitting / approvals process.

Response:

PavCo is responsible for reviewing Creative Energy's plans for the Expo Plant and issuing comments and subject to their satisfaction, a building permit.

138.4 Please list all permits and approvals required for the Expo Plant construction works.

Response:

Please see the response to BCUC IR 2.138.4.1.

138.4.1 For all permits and approvals identified, please provide the following:

a) name of party responsible for the application;
b) actual (or anticipated) application date;
c) copy of the application, if submitted;
d) anticipated application processing time;
e) anticipated approval date;
h) date by which the approval is required; and
f) risk to the Proposed Project in the event of a delay.

Response:

<u>Air Quality Permit</u>

a) **name of party responsible for the application; Creative Energy responsible for making application**
b) **actual (or anticipated) application date; Nov 16, 2018**
c) **copy of the application, if submitted; Not yet submitted**
d) **anticipated application processing time; 3-6 months**
e) **anticipated approval date; April 16, 2019**
h) **date by which the approval is required; and December 31, 2019**
f) **risk to the Proposed Project in the event of a delay. If the permit were delayed beyond the commissioning date, Expo would be unable to start up on time, and start of work at Beatty would be delayed.**

<u>Building Permit (to PavCo)</u>

a) **name of party responsible for the application; Creative Energy responsible for making application**
b) **actual (or anticipated) application date; April 2019**
c) **copy of the application, if submitted; Not yet submitted**
d) **anticipated application processing time; 4 weeks**
e) **anticipated approval date; May 2019**
h) **date by which the approval is required; and June 2019**
f) **risk to the Proposed Project in the event of a delay. If the permit were delayed, construction at Expo would not start on time, and the entire project would be pushed back by a corresponding amount.**

<u>Water & Sewer Connection Permits (to City of Vancouver)</u>

a) **name of party responsible for the application; Creative Energy responsible for making application**
b) **actual (or anticipated) application date; April 2019**
c) **copy of the application, if submitted; Not yet submitted**
d) **anticipated application processing time; 8 weeks**
e) **anticipated approval date; June 2019**
h) **date by which the approval is required; and December 2019**
f) **risk to the Proposed Project in the event of a delay. If the permit were delayed, construction completion at Expo would be delayed and the start-up and commissioning of Expo could be delayed by a corresponding amount. Note that these permits on not on the critical path and there is very generous schedule contingency.**

139.0 Reference: APPENDIX K – PavCo STATUTORY RIGHT OF WAY AGREEMENT
Exhibit B-1, Section 12, p. 60; Schedule D to Appendix K, pp. 49–50; Exhibit B-5, BCUC IRs 79.1.2, 79.2
Technical performance design thresholds

In response to BCUC IR 79.1.2 Creative Energy stated: "Creative Energy will tender the detailed design of the Expo plant and the selected party will be responsible for completion of a technical performance package. The timing is subject to issuance of a CPCN for this project."

Page 12 of the Application states:

> The design teams are as follows:
> - Beatty Plant – Fosdick & Hilmer
> - Expo Plant – WSP Engineering
> - Interconnections – Vibratech Engineering

139.1 Please confirm, or otherwise explain, whether WSP Engineering is responsible for the detailed design of the Expo Plant.

Response:

Detailed design has yet to be tendered.

139.1.1 If not confirmed, please provide details of the tendering process. In your response please include:

a) anticipated date of tender issuance;

Response:

November 30, 2018.

b) total time required for tendering process; and

Response:

4 weeks.

c) anticipated date of contract award.

Response:

December 29, 2018.

139.1.2 If not confirmed, please discuss the risks to the project schedule in the event that the tendering process is delayed.

Response:

The risk of delays to the tender process are very minimal, however delays to the tender process would impact project schedule.

139.2 Please confirm, or otherwise explain, whether Fosdick & Hilmer is responsible for the detailed design of the Beatty Plant.

Response:

Detailed design of the project has yet to be tendered.

139.2.1 If not confirmed, please provide details of the tendering process. In your response please include:

a) anticipated date of tender issuance;

Response:

November 30th, 2018.

b) total time required for tendering process; and

Response:

4 weeks.

c) anticipated date of contract award.

Response:

December 29, 2018.

139.2.2 If not confirmed, please discuss the risks to the project schedule in the event that the tendering process is delayed.

Response:

The risk of delays to the tender process are very minimal, however delays to the tender process would impact project schedule.

139.3 Please confirm, or otherwise explain, whether Vibratech Engineering is responsible for the detailed design of the interconnections.

Response:

Detailed design of the project has yet to be tendered.

139.3.1 If not confirmed, please provide details of the tendering process. In your response please include:

a) anticipated date of tender issuance;

Response:

November 30th, 2018.

b) total time required for tendering process; and

Response:

4 weeks.

c) anticipated date of contract award.

Response:

December 29, 2018.

139.3.2 If not confirmed, please discuss the risks to the project schedule in the event that the tendering process is delayed.

Response:

The risk of delays to the tender process are very minimal, however delays to the tender process could impact project schedule.

140.0 Reference: APPENDIX K – PavCo STATUTORY RIGHT OF WAY AGREEMENT
Exhibit B-1, Section 10.1, p. 35; Section 10.4.4, pp. 43-44; Exhibit B-5-2, BCUC IR 81.1
SRW and licences for access

In response to BCUC IR 81.1, Creative Energy stated:

> Licenses to construct, maintain and operated the steam and fuel oil services referred to as the Interconnection, are not included in the PavCo SRW which covers access for the Expo Plant within BC Place. The current design has the Interconnection piping affixed to the column bents which support the BC Place plaza above Expo Boulevard and within the parkade of the Beatty Street development. Rights will be secured from PavCo for the Interconnection piping at the appropriate juncture of the project.

140.1 Please discuss the access rights required by Creative Energy to construct, maintain and operate the Interconnection.

Response:

Creative Energy will commence negotiations with PavCo to secure a utility statutory right of way to allow for the construction, operation, maintenance and repair of the Interconnection piping on the column bents which support the BC Place plaza above Expo Boulevard. With respect to the portion of the Interconnection line located within the parkade of the Beatty Street development, this will form part of the "Ancillary Equipment" under the Trust and Development Agreement that will be subject to the statutory right of way contemplated in that agreement.

140.2 Please explain when Creative Energy anticipates securing the rights for the Interconnection piping from PavCo.

Response:

Please see the response to BCUC IR 2.137.1.1.

140.3 Please discuss the risks to the Proposed Project in the event that securing the rights for the Interconnection piping is either delayed or unsuccessful.

Response:

The risks to the Proposed Project are entirely mitigated. If Creative Energy is delayed or unsuccessful in securing the planned rights for the interconnection, Creative Energy has an alternative to put the interconnection lines under Expo Boulevard, where we have rights to do so pursuant to the Municipal Access Agreement with the City. There would be incremental costs to do so, but these costs would be borne by the Developer.

140.3.1 Please discuss any alternative solutions that would be open to Creative Energy in the event that rights to the Interconnection piping cannot be secured.

Response:

If rights for the Interconnection piping cannot be secured, Creative Energy has the right to construct the Interconnection piping under Expo Boulevard pursuant to the terms of the Municipal Access Agreement with the City of Vancouver.