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

Attention: Sara Hardgrave, Acting Commission Secretary

Dear Sirs/Mesdames:

Re: FortisBC Energy Inc. ("FEI")
Application for a Certificate of Public Convenience and Necessity for the Tilbury Liquefied Natural Gas Storage Expansion Project

In accordance with the regulatory timetable set for the above referenced proceeding, we enclose for filing FEI's Reply Submissions, dated December 12, 2022.

Yours truly,

FASKEN MARTINEAU DuMOULIN LLP

[Original signed by]

Matthew Ghikas
Personal Law Corporation

MTG/NR
Enclosure

BRITISH COLUMBIA UTILITIES COMMISSION

IN THE MATTER OF

THE UTILITIES COMMISSION ACT

RSBC 1996, CHAPTER 473

AND

FORTISBC ENERGY INC.

APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE TILBURY LIQUEFIED NATURAL GAS STORAGE EXPANSION PROJECT

REPLY SUBMISSIONS OF FORTISBC ENERGY INC.

DECEMBER 12, 2022

FASKEN MARTINEAU DuMOULIN LLP

MATTHEW GHIKAS AND NIALL RAND

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PART ONE: INTRODUCTION

1. FortisBC Energy Inc. ("FEI")'s October 24, 2022 Final Submissions ("Final Submissions") anticipated and addressed many of the specific arguments raised by interveners. These Reply Submissions focus on the main arguments raised, where further comment is warranted.[1] FEI submits that, for the reasons set out in its Final Submissions and augmented here, the TLSE Project and related orders should be approved on the terms requested.

2. These Reply Submissions are generally organized so as to correspond with the organization of FEI's Final Submissions.

PART TWO: PROJECT NEED AND JUSTIFICATION

3. As discussed below, interveners have made important concessions on the issue of project need. Some of their arguments are difficult to reconcile with their concessions, and other arguments are not supported by the evidence.

A. INTERVENERS ACKNOWLEDGE THE POTENTIAL FOR A NO-FLOW EVENT THAT RESULTS IN CATASTROPHIC HARM

4. Interveners who addressed project need in their submissions generally acknowledge: (1) the potential for another no-flow event like the 2018 T-South Incident to occur; (2) that another no-flow event, occurring in winter months, will cause very significant harm to FEI customers and British Columbians more generally; and (3) doing nothing would lead to unacceptable outcomes. For instance:

- BCOAPO states that it cannot in good conscience suggest that FEI do nothing and hope that a catastrophic event with a significant likelihood will not occur.[2]
- BCOAPO acknowledges that the Tilbury Base Plant is at the end of its useful life.[3]

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1 FEI's silence on a particular matter should not be interpreted as agreement.

2 BCOAPO Final Argument, para. 15.

3 BCOAPO Final Argument, para. 22.

- BCSEA accepts that a no-flow event on T-South during the winter in the absence of the TLSE Project would result in very high consequences.[4]

- CEC agrees that, to the extent the Tilbury Base Plant will be needed and useful after 2040, it is economically preferable to replace the tank now.[5]

- CEC concludes that PwC's evidence regarding the economic, social and environmental impacts that could arise in the event of a disruption to the natural gas supply is "persuasive".[6]

- Sentinel states that the risk of supply chain failure is "real" and rejects a "do nothing" alternative.[7]

- RCIA, though it stands out among the interveners as debating the specific probabilities and outage duration, doesn't appear to dispute that a no-flow event could re-occur and cause a widespread outage during the winter.[8]

5. Despite these concessions, some interveners incongruously question the need for the TLSE Project or propose alternatives that do not address the underlying risk.[9] FEI responds to those arguments below.

B. RCIA'S ARGUMENTS ON RISK MISS THE 'BIG PICTURE': PROBABILITY IS MATERIAL AND CONSEQUENCES ARE CATASTROPHIC

6. RCIA states that *probability* cannot be divorced from *consequence* in the consideration of risk,[10] expressing concern about "chasing consequences with an ever-decreasing probability".[11] FEI submits that RCIA's efforts to downplay and whittle-down: (1) the probability that a no-flow

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4 BCSEA Final Argument, para. 35; see also BCSEA Final Argument, para. 34 and 37.

5 CEC Final Argument, para. 155.

6 CEC Final Argument, paras. 81 and 105.

7 Sentinel Final Argument, p. 6.

8 RCIA Final Argument, pp. 5-7, 10, 113

9 See the final arguments of BCOAPO, CEC, RCIA and Sentinel.

10 RCIA Final Argument, p. 18.

11 RCIA Final Argument, p. 18.

event would result in significant loss of load; and (2) the magnitude of the harm that would result in the event of a widespread outage, cannot obscure the fact that the probability is material and the consequences would be catastrophic.

(a) Mitigating Plausible Catastrophic Risk Is Appropriate, and the Odds Here Are Far Greater than "Plausible"

7. RCIA has mischaracterized FEI's evidence regarding the appropriate management approach to risk assessment. FEI's submission is not that the probability of an event occurring is an irrelevant consideration; rather, FEI has highlighted the expert evidence that placing too much emphasis on probability can adversely impact decision-making when considering lower-probability-high-consequence events. Guidehouse, for instance, observed that probability is important, but can be misleading in the context of assessing risk by creating biases that convince one of the unlikeliness without understanding the real severity of the risk in question.[12] As explained by Guidehouse, "low probability and high consequence events continue to be high risk events regardless of their probability."[13] The unacceptable consequences from a plausible event justifies reasonable mitigation steps regardless of calculated probability.[14]

8. The TLSE Project cannot reasonably be characterized as "chasing consequences with an every-decreasing probability", as suggested by RCIA.[15]

- In this case, FEI is seeking to address an event (i.e., a T-South no-flow event) that is not only *plausible*, but *has occurred recently*. FEI's evidence demonstrates that it was fortunate that the 2018 T-South Incident no-flow event occurred during a non-winter period, such that it avoided a widespread and prolonged Lower Mainland outage and the associated harm to customers and British Columbians generally.[16]

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12 FEI Final Submissions, para. 115.

13 Exhibit B-28, RCIA IR2 31.2.

14 FEI Final Submissions, para. 113.

15 RCIA Final Argument, para. 18.

16 FEI Final Submissions, para. 121.

- JANA calculated the cumulative probability of a rupture on the T-South system over 67 years as being between 83.1 and 97.9 percent.[17] These figures understate the cumulative probability of a multi-day no-flow event, which may also occur due to other incidents, including: the failure of a major facility, cyber-attack, sabotage or natural events, including wildfire or flood. For example, in 2021, the BCUC recognized that upstream supply through the T-South system was impacted by heavy rain and flooding.[18] While FEI is unable to determine quantitative probabilities for these incidents, they are *plausible* causes of pipeline failures, and have occurred in other pipeline operators' systems.[19]

9. RCIA observes that the cumulative probability of rupture or ignited rupture on the T-South system as calculated by JANA represents the cumulative likelihood of rupture at any point during a year (i.e., 365 days) and not in the winter when a no-flow event is most likely to result in the loss of significant Lower Mainland load.[20] RCIA's interpretation of JANA's analysis is correct; as the risk is constant throughout the year.[21] Using JANA's analysis, the cumulative probability of a rupture occurring between November 1 and March 31 over the 67-year analysis period would be between 34.6 and 40.8 percent.[22] However, that does not mean the BCUC's approach should change.

- First, the TLSE Project does provide resiliency value in non-winter months. For instance, FEI's evidence was that it survived the T-South Incident without loss of firm load by leveraging various sources of supply. Losing any one of those sources would have resulted in a corresponding loss of firm load.[23]

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17 Exhibit B-15, BCUC IR1 1.5 and Attachment 1.5C, Figure 3 (p. 6); see also FEI Final Submissions, para. 19.

18 See Confidential Letter L-38-21, dated November 28, 2021.

19 FEI Final Submissions, para. 40; Exhibit B-26, BCUC IR2 68.8.

20 RCIA Final Argument, pp. 18 and 19.

21 Exhibit 15, BCUC IR1 1.5, Attachment 1.5c.

22 Based on scaling the cumulative annual risk above by 5/12 to represent the five out of twelve months where FEI is most exposed to rupture-related no-flow events during the winter.

23 FEI Final Submissions, para. 51.

- Second, it is worth reiterating that JANA's analysis was confined to assessing the cumulative probability of rupture alone (both ignited and non-ignited). The potential for a no-flow event to occur during winter is higher than 34.6 to 40.8 percent.

- More fundamentally, FEI submits that the BCUC should be no more willing to accept a 40+ percent cumulative probability of catastrophic harm than an 83.1 to 97.3 percent probability. Even if, hypothetically, the probability was 10 percent, that is still a material risk of catastrophic consequences. It is easy to make such distinctions when you are not answerable for the consequences when the risk materializes. FEI, and ultimately the BCUC, would be the ones answering questions about why they considered it appropriate to make that bet given the associated consequences. FEI's own assessment, based on risk management principles endorsed by experts in this proceeding, was that mitigating the risk is appropriate.

10. In short, risk management principles call for mitigating plausible catastrophic risks. In this case, the risk is more than plausible. There is a high likelihood that the TLSE Project will be called upon at least once, and a still considerable probability that being able to access the TLSE resiliency reserve will avoid what would otherwise be catastrophic harm.[24] These probabilities underscore the need for risk mitigation.

(b) Shortening the Outage Duration to Some Extent Would Still Mean Catastrophic Harm

11. Although RCIA accepts that "the response to a T-South outage is complicated",[25] it recommends that FEI find a way to incorporate Ryall Engineering Limited ("REL")'s recommendations so as to shorten the restoration time following a no-flow event on the T-South system.[26]

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[24] Exhibit B-26, BCUC IR2 68.10.

[25] RCIA Final Argument, p. 24.

[26] RCIA Final Argument, p. 24.

12. FEI's evidence is that it will take the steps that it can reasonably and safely take to accelerate restoration;[27] however, customers can reasonably expect to be without gas for up to nine or ten weeks even in circumstances that are very favourable to the restoration work.[28] Regardless, the consequences would still be unacceptable even if the outage duration could be reduced somewhat, as illustrated by the 150 hypothermia related deaths during a several day outage in Texas in 2021.[29] CEC recognizes this point, stating : "In the CEC's view, the difference between whether a total outage is 4 weeks versus 9 weeks does not substantially alter the justification for the Project in that 4 weeks is a substantial period – particularly during cold weather." [30]

13. Moreover, although FEI agrees with CEC that a 4 week restoration period is still "substantial", CEC's position that the TLSE Project justification should be based on a 4 week outage[31] is unreasonable. As FEI explained in its Final Submissions, restoring service within 4 weeks is "highly improbable" and could only occur: (1) with AMI in place; (2) where 75 percent of customers were willing and able to perform their own relights (which would require coordination between customers and the utility to ensure it was now safe to undertake); and (3) these customers promptly tell FEI once they have completed a relight. While illustrative of a best case scenario, it remains unrealistic.[32]

C. THE GAS DELIVERY SYSTEM REMAINS AN INTEGRAL PART OF THE ONGOING ENERGY TRANSITION

14. BCSEA, CEC and Sentinel question the long-term need for the TLSE Project by citing the impact of the ongoing transition to a low-carbon economy in British Columbia on future demand.[33] Put simply, some of these interveners assume that FEI's gas delivery system will cease

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27 FEI Final Submissions, Part Three, Section F; see also Exhibit B-46-1, Rebuttal Evidence to RCIA.

28 FEI Final Submissions, para. 76.

29 Exhibit B-15, BCUC IR1 8.4 referring to https://www.dallasnews.com/news/weather/2021/04/30/number-oftexas-deaths-linked-to-winter-storm-grows-to-151-including-23-in-dallas-fort-worth-area/.

30 CEC Final Argument, para. 99,

31 CEC Final Argument, para. 100.

32 FEI Final Submissions, para. 97.

33 BCSEA Final Argument, paras. 16-17; CEC Final Argument, paras. 1-3 and 117-123; Sentinel Final Argument, p. 2-5 and 11.

to have any role at some point before the TLSE Project reaches its 67-year expected service life. FEI submits that, for the reasons discussed below, these submissions are inconsistent with the evidence and FEI's ongoing statutory duty to provide safe and reliable service. The cumulative probability of a rupture occurring on the T-South system prior to 2050 is still significant, at between 68.9 and 80.2 percent.[34]

(a) The Evidence Shows a Long-Term Role for the Gas Delivery System

15. FEI's Final Submissions in this proceeding summarize the evidence regarding future demand, which is based on the scenarios in FEI's Long-Term Gas Resource Plan ("LTGRP"). FEI's Planning scenario contemplates a continued role for FEI's delivery system.[35]

(b) The TLSE Project Fulfills FEI's Duty to Serve, Both Upon Completion and into the Future

16. The TLSE Project is consistent with FEI's statutory duty under the *Utilities Commission Act* ("UCA") to provide safe and reliable service to customers, both today and in the future.

17. Section 38 of the UCA sets out FEI's duty to serve:

> 38 A public utility must
>
> (a) provide, and
>
> (b) maintain its property and equipment in a condition to enable it to provide,
>
> a service to the public that the commission considers is in all respects adequate, safe, efficient, just and reasonable.

18. Making investments that mitigate the risk of the entire Lower Mainland losing service for an extended period of time is an integral part of ensuring that FEI continues to meet its duty. Conversely, FEI submits that rejecting the TLSE Project on the basis of assumptions about lower demand decades in the future would be detrimental to safe and reliable service.

19. The danger inherent in these intervener submissions is highlighted by considering how those same arguments would play out in the context of an integrity-related capital project.

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[34] Exhibit 15, BCUC IR1 1.5, Attachment 1.5c.

[35] See e.g., Exhibit B-39, BCUC Panel IR1 1.1.

Integrity-related capital projects can also have long service lives. Would it really be in the public interest to avoid making system integrity investments based on speculation that the system will no longer have a role decades in the future? The answer is clearly "no" – *it would be inappropriate and contrary to the public interest for the utility to allow the system to deteriorate because of an outcome that may or may not occur decades in the future*. The BCUC implicitly recognized this in the recent FEI Application for a CPCN for the Coastal Transmission System Transmission Integrity Management Capabilities ("CTS TIMC") Project proceeding, in which the BCUC approved the project despite the Panel's concerns about the impact of hydrogen blending and the continued viability of natural gas as an energy source.[36]

20. The cost of the TLSE Project is higher than a typical integrity project, but so is the potential harm from not addressing the associated risk. There is a clear risk of catastrophic harm today, and the risk will remain unless investments are made to mitigate it. FEI submits that the harm is so significant that, whether the rate impacts are considered over 30 or 50 years, the investment is amply justified.

21. The TLSE Project will also provide ongoing gas supply and operational benefits that are currently provided by the Tilbury Base Plant. As the Base Plant reaches its end of life, which will be long before 2050, FEI will need to replace those commercial benefits. The TLSE Project, with a 3 Bcf tank, replaces those functions and avoids the cost of acquiring those gas supply and operational functions through commercial means.[37]

(c) Interveners Are Unduly Influenced by their Perception that the Risk is Remote

22. It is apparent that BCSEA and CEC are influenced by a belief that a winter no-flow event on the T-South system is unlikely to occur before the time when they expect the gas delivery system will be rendered obsolete.[38] None of them seriously questions the catastrophic

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[36] The BCUC has addressed the energy transition risk, not by refusing to approve the project, but by identifying the potential for accelerated depreciation to be used to mitigate cost recovery risk in the future. Decision and Order C-3-22, dated May 18, 2022, p. 40-41. Online: https://docs.bcuc.com/Documents/Proceedings/2022/DOC_66603_C-3-22-FEI-CTS-TIMC-CPCN-Decision.pdf.

[37] FEI Final Submissions, paras. 11, 185 and 193-197.

[38] BCOAPO Final Argument, paras. 42-43; CEC Final Argument, para. 251.

consequences that will result from a no-flow event occurring. As such, one expects that none of these interveners would balk at the TLSE Project cost if they expected another no-flow event to occur 10 years from now which, FEI submits, is plausible given the variety of events that can disrupt flows on T-South.

23. This is an illustration of the perception bias that can lead to poor decision-making when it comes to catastrophic risks. FEI submits that the following passage it provided in its Final Submissions from JANA's paper *Managing Low Probability – High Consequence Pipeline Risk* is apt:

> …while we may know the probability of an event occurring, due to the complexity of the system, we will not be able to predict it in terms of where and when. This need not imply that we need to be a victim of the situation. We can take action to change our risk position.

24. The fact that the consequences of a plausible event are so catastrophic, in and of itself, calls out for mitigation so as to reduce the risk to tolerable levels. The JANA analysis shows that the risk of another no-flow event is a lot higher than just plausible.

25. When it comes to dam safety, the BCUC has refrained from playing the odds in the way these interveners implicitly are doing.[39] FEI submits that the BCUC should approach the TLSE Project the same way as it has with dam safety – by approving appropriate measures to mitigate catastrophic risk to tolerable levels.

(d) FEI's Evidence in this Proceeding Is Consistent With its GCOC Proceeding Evidence

26. CEC suggests that FEI's evidence in the ongoing Generic Cost of Capital ("GCOC") proceeding is inconsistent with FEI's evidence in the current proceeding when it comes to the future role of the delivery system.[40] CEC's submissions are, in effect, introducing new evidence and should be disregarded for that reason. However, if the BCUC is inclined to consider evidence from the GCOC proceeding, it should find that FEI has been consistent.

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[39] FEI Final Submissions, paras. 117-119.

[40] CEC Final Argument, para. 2 and 119-123.

27. Cost of capital proceedings are focussed on the compensation that an investor requires to attract investment, as opposed to investing elsewhere, in light of perceived risk. As encapsulated in the following passage from the GCOC opening statement of Doug Slater, FEI's Vice President External and Indigenous Relations, FEI's position in the GCOC proceeding is that it can succeed if provided with ongoing support from the regulator and policymakers:[41]

> We have strategies that, if successful, would see FEI preserving a role for itself in the Energy Transition. We hope our efforts succeed, and we think they can succeed if we have the right policy and regulatory support. But the risk that we won't succeed is real, and the need to take dramatic steps just to remain relevant in BC's energy landscape is certainly not something we ever contemplated having to face back in 2016.

28. Consistent with that, FEI has presented the same long-term load forecast scenarios in both proceedings. The scenarios show more limited growth potential than previously anticipated – which is a factor that drives a higher cost of capital. But the scenarios all show continued use of the gas delivery system in 2050. In the GCOC proceeding, FEI also pushed back on suggestions that it could adopt accelerated depreciation now to reduce energy transition risk and begin recovering the costs of the delivery system over a shorter period.

29. A finding in this CPCN proceeding that a project as vital as the TLSE Project is contrary to the public interest because of the future risk posed by the energy transition would differ markedly from the risk assumptions that underpinned FEI's proposed return on equity and capital structure, and imply that investors face even higher risk.

D. THIS APPLICATION IS CONSISTENT WITH FEI'S EVIDENCE IN THE LTGRP

30. BCSEA states that the TLSE Project is not featured as a "necessity" in the 2022 LTGRP or a "requirement" of the continued role of the gas system through the energy transition.[42] BCSEA's characterization of FEI's evidence in the ongoing 2022 LTGRP proceeding is incorrect. The TLSE Project, along with other projects (such as the RGSD and AMI projects), are described in the 2022

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41 BCUC Generic Cost of Capital Proceeding, Transcript Vol. 5A, p. 703, ll. 25-26 to p. 704, ll. 1-8. Online: https://docs.bcuc.com/Documents/Transcripts/2022/DOC_68729_2022-11-09-Proceedings-Volume-5A.pdf.

42 BCSEA Final Argument, para. 61.

LTGRP as "cornerstones" of its resiliency plan.[43] In FEI's Gas System Resiliency Plan (Appendix E to the 2022 LTGRP), FEI describes the TLSE Project as a "key component" of its portfolio approach to resiliency while providing other valuable benefits to customers.[44] The BCUC should reject BCSEA's submissions on this point.

E. DELAYING A DECISION IN THIS PROCEEDING WILL NOT BRING CERTAINTY TO LONG-TERM DEMAND

31. CEC suggests that the BCUC should delay a decision for two to three years to allow for more assessment of the extent of the demand risk facing FEI in the Lower Mainland.[45] For the reasons below, FEI respectfully submits that the BCUC should issue a timely decision so as to keep the TLSE Project on track.

32. First, it is difficult to reconcile CEC's proposed delay with its other submissions accepting: (1) the adverse economic, social and environmental impacts that could arise in the event of a disruption to the natural gas supply as set out by PwC; and (2) that there is a "significant possibility" of a multi-day no-flow event over the analysis period used by JANA.[46]

33. Second, CEC's argument is premised on FEI's strong track record of providing reliable natural gas service without the TLSE Project. The TLSE Project is aimed at resiliency, which is different from reliability.[47] Regardless of FEI's track record, the potential for a catastrophic winter no-flow event on the T-South system exists today and, without effective mitigation, will exist tomorrow, in five years from now, and beyond.

34. Third, it is unreasonable to expect that the demand risk identified by CEC will be resolved within two to three years. As of today, the TLSE Project proceeding has already spanned

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[43] 2022 Long Term Gas Resource Plan Proceeding, Exhibit B-1, 2022 LTGRP Application (Exhibit B-1), p. 10-5. Online: https://docs.bcuc.com/Documents/Proceedings/2022/DOC_66503_B-1-FEI-2022-LongTermGasResourcePlan.pdf.

[44] 2022 Long Term Gas Resource Plan Proceeding, 2022 LTGRP Application (Exhibit B-1), Appendix E, p. 1.

[45] CEC Final Argument, paras. 115-116 and 251.

[46] CEC Final Argument, paras. 64, 81 and 105

[47] Exhibit B-1-4, Application, Section 2.1 (pp. 3-8).

approximately two years and the Project need has not changed over that time.[48] The energy transition remains in a state of constant evolution and will be impacted by the political and regulatory landscape in the years and decades to come. FEI has brought forward the TLSE Project based on the best available information to address a known, and very real, catastrophic risk. As FEI explained in its Final Submissions, the TLSE Project is the only solution that can do so effectively.[49] CEC's proposal would ask British Columbians to accept the known risk of an additional two to three years without the promise of real clarity regarding future demand. Given that project construction will take several years, the sooner FEI is able to commence construction of the Project, the sooner its resiliency benefits can flow to customers.

35. Fourth, despite the potential demand risk identified by CEC, FEI expects the TLSE Project will continue to be used and useful as increasing amounts of renewable natural gas ("RNG"), which is interchangeable with conventional natural gas, enter the gas system.[50] While CEC suggests that there to be "considerable risk" that the Lower Mainland system will not be using substantial qualities of methane (i.e., conventional natural gas and RNG) over the next 50 years,[51] this contrasts with provincial policy which enables the acquisition RNG to support the decarbonization of the energy delivery system.[52]

36. Finally, FEI submits that a prolonged delay in decision-making would also pose challenges for developing the TLSE Project efficiently.

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48 FEI Final Submissions, para. 18.

49 See, e.g., FEI Final Submissions, paras. 5, 124 and 137-181.

50 Exhibit B-39, BCUC Panel IR1 1.2.2 and 1.3.

51 CEC Final Argument, para. 246.

52 See, e.g., *Greenhouse Gas Reduction (Clean Energy) Regulation*, B.C. Reg. 102/2012.

PART THREE: EVALUATION OF ALTERNATIVES

37. Interveners have differing views on the issue of Project alternatives. CEC agrees that FEI has appropriately identified and evaluated key options, indicating that it did not find any evidence to suggest that any other alternative would be considerably less expensive or more suitable.[53] BCSEA, RCIA and Sentinel have advocated different approaches, none of which are supported by the evidence. BCOAPO questions whether there were more economic ways for FEI to address the age of the existing Tilbury Base Plant facility, but its suggestions would leave the project objective unaddressed.

A. REPLY TO BCSEA: FEI PROPERLY REJECTED SIGNIFICANT LOAD SHEDDING AS AN ALTERNATIVE

38. BCSEA characterizes FEI's alternatives analysis as "deficient".[54] It maintains that FEI rejected or did not consider alternatives like AMI or other load management, which BCSEA believes might be cost-effective without delivering the full functionality of the TLSE Project.[55] In fact, FEI provided considerable evidence justifying the need for the "full functionality" of the TLSE Project. FEI properly rejected disconnecting hundreds of thousands of customers and leaving them without service for an extended period of time, which is the effect of BCSEA's suggestion, as a project alterative.[56]

39. It was reasonable for FEI to target being able to withstand a 3-day interruption on the T-South system without losing significant firm load. As BCSEA acknowledges, the potential exists for a multi-day no-flow event on the T-South system, similar to what has already happened.[57] The 2018 T-South Incident no-flow period lasted two days, despite Westcoast's response time being shortened by favourable conditions. Further, JANA's analysis confirmed that three days is typically required to restore service after an integrity-related disruptions.[58]

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53 CEC Final Argument, paras. 144 and 150.

54 BCOAPO Final Argument, para. 39.

55 BCSEA Final Argument, para. 39.

56 FEI Final Submissions, para. 152.

57 BCSEA Final Argument, para. 30.

58 FEI Final Submissions, p. 62.

40. FEI's structured two-step alternatives analysis framework considered all three of the major elements of a resilient system, including load management tools. Load management, as envisioned by BCSEA, would involve shutting-off gas supply to significant parts of the Lower Mainland on the first day of a winter outage so as to prevent an uncontrolled system collapse. However, the objective of the TLSE Project is to maintain uninterrupted service, or alternatively limit the number of customers affected. Shutting off service using an automated meter, as envisioned by BCSEA, shortens the service restoration time, but hundreds of thousands of customers would still be without service, and potentially exposed to extreme cold temperatures, for up to two months during winter.[59] The outage is still much too long and widespread to avoid catastrophic consequences. As noted above, more than 100 people died of hypothermia in Texas during a four day outage,[60] and the outage that BCSEA is envisioning is potentially 15+ times longer.[61]

41. The evidence, summarized in FEI's Final Submissions, demonstrates that AMI is much more effective as a resiliency tool when coupled with the TLSE Project.[62]

B. RCIA IS INCORRECT IN SUGGESTING THAT THE RGSD PROJECT WOULD PROVIDE "NEARLY THE SAME" RESILIENCY BENEFITS AS THE TLSE PROJECT

42. RCIA and Sentinel (Sentinel's submissions are addressed later),[63] unlike BCSEA, BCOAPO, CEC and TWN,[64] advocate for FEI to proceed with the RGSD project instead of the TLSE Project. RCIA argues that the RGSD project provides "nearly the same" resiliency benefits,[65] and can be augmented with the existing Tilbury Base Plant. However, the evidence is that the resiliency

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59 FEI Final Submissions, para. 83.

60 Exhibit B-15, BCUC IR1 8.4.

61 FEI Final Submissions, paras. 79-85.

62 FEI Final Submissions, paras. 136 and 152; see also, Exhibit B-1-4, Application, p. 83.

63 RCIA Final Argument, pp. 6-7; Sentinel Final Argument, p. 6.

64 See. e.g., BCSEA accepts that none of the four pipeline options examined would prevent a widespread outage in the Lower Mainland: BCSEA Final Argument, para. 41; The CEC has reviewed the evidence and does not find any substantial evidence to suggest that any other alternative would be considerably less expensive, or more suitable: CEC Final Argument, para. 144.

65 RCIA Final Argument, p. 7.

benefits associated with the RGSD project, while valuable, are qualitatively different.[66] The TLSE Project is the optimal and most cost-effective solution to mitigate the risk of a multi-day winter no-flow event on the T-South system.

(a) RCIA Has Not Filed Evidence to Validate its Unsupported Assumptions

43. As an initial point, RCIA's argument in this regard relies on a number of assumptions that are unsupported by, or contrary to, the evidence on the record (as addressed further below). If RCIA considered a pipeline-based solution such as the RGSD project to be a more effective alternative to the TLSE Project, it ought to have submitted evidence to support its assumptions. As the BCUC explained in its Decision in the CPCN Application for the CTS TIMC project:[67]

> The Panel understands that the difference in the approaches advocated by RCIA and FEI relates, in part, to differences in these two parties' definition and perception of acceptable risk. While the Panel appreciates interveners raising concerns regarding the risk of unjustified or discretionary expenditures, the Panel also agrees with FEI that RCIA's proposed reductions in scope of the Project are not supported by any evidence.
>
> Therefore, the Panel encourages those interveners who wish to propose alternative approaches to projects under review to submit evidence to support their positions, thus allowing other parties to test the soundness of that evidence prior to the argument phase of the proceeding when the evidentiary record has already been closed. As a matter of procedural fairness, it is unfair to the applicant for the BCUC to rely on new, untested evidence put forward as part of an intervener's Final Argument as a basis for its decision. [Emphasis added]

(b) The Resiliency Benefits of the TLSE Project and the RGSD Project Are Complementary, Not Substitutes

44. FEI's Final Submissions reviewed the evidence that, in order for the RGSD project to provide the equivalent protection against a winter T-South outage, FEI would need to hold double the pipeline capacity it requires for ordinary operations throughout the year.[68] In other words, half of the capacity held by FEI would be unused except in an emergency. The annual costs of

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66 FEI Final Submission, paras. 158-161; Exhibit B-15, BCUC IR1 16.3.

67 Decision and Order C-3-22, dated May 18, 2022, p. 61. Online: https://docs.bcuc.com/Documents/Proceedings/2022/DOC_66603_C-3-22-FEI-CTS-TIMC-CPCN-Decision.pdf.

68 FEI Final Submissions, para. 159; see also Exhibit B-1-3, Confidential Application, p. 90 and Exhibit B-39, BCUC Panel IR1 1.2.1.

doing so would be significantly higher, relative to a portfolio approach that includes the TLSE Project and less capacity on the RGSD pipeline.[69] As FEI explained in the Application:[70]

> It is unlikely to be efficient, or in the interest of customers, to try to build resiliency by holding year-round diverse pipeline resources in quantities that would only be required if a "no-flow" event occurred during a short duration peaking period. Conversely, it is unlikely to be feasible or economic to attempt to manage long duration supply events or exposures with on-system LNG storage, since the amount of storage required would be too large.

45. Mr. Hill elaborated at the Workshop:[71]

> Pipeline is place [sic] to serve duration of load, basically because you contract for capacity on the pipeline under a commercial determined tariff for -- paying us for a certain amount of capacity for 365 days a yeah. So you're basically paying for that amount of capacity whether you use it or not. And because of that poor load factor in the region, that has a high cost for customers because that capacity is not necessarily utilized in the summertime. So we want to match our pipeline appropriately best to our load profile in the wintertime.

46. On-system storage and pipeline capacity serve different, but complementary, roles when it comes to resiliency. On-system storage offers short-term supply at the outset of a supply disruption (e.g., Phase 1 of the 2018 T-South Incident). The RGSD project, if constructed, would provide less support immediately following the no-flow event, but would be optimally sized to manage any long-duration supply disruption (e.g., Phases 2 and 3 of the 2018 T-South Incident) and meet the commercial needs of the region.[72] Put simply, the RGSD project could prolong FEI's ability to withstand a no-flow event beyond three days, but is not a cost-effective solution to provide immediate, dependable supply in the same manner as the TLSE Project due to need to over-contract capacity. It is also an open question as to whether it would even be feasible, let alone economic, to size the RGSD pipeline so that it could serve most of the winter Lower Mainland on its own.[73]

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69 Exhibit B-15, BCUC IR1 16.3; Development has not advanced to a point where the scope of work is sufficiently defined to support a cost estimate: Exhibit B-15, BCUC IR1 16.

70 Exhibit B-15, BCUC IR1 16.3.

71 Workshop Transcript, p. 59, ll. 2-12 (Hill).

72 Exhibit B-15, BCUC IR1 16.3.

73 FEI Final Submissions, para. 160.

47. The need for, sizing, timing and design of the RGSD approach is also contingent on a number of factors that are still being explored.

48. As such, on-system LNG and pipeline expansions should be viewed as providing critical interrelated resiliency benefits that jointly address short- and long-duration supply issues in a cost-effective manner.

(c) RCIA's Argument Is Premised on FEI Having Access to 450 mmcf/d of Resiliency Capacity on RGSD

49. A key assumption underlying RCIA argument is that the RGSD project will provide 450 mmcf/d of resiliency capacity. While RCIA acknowledges that there is no evidence on this record, or the record of the ongoing 2022 LTGRP proceeding, regarding the amount of capacity FEI would contract on a new pipeline, it nonetheless concludes that "it appears" that FEI plans to contract the full 450 mmcf/d.[74]

50. Given the early stage of the RGSD project development, FEI has yet to determine the project's size or the capacity it would retain if developed. However, in the hypothetical examples provided on the record, FEI contemplates splitting the optimal amount of pipeline capacity between the T-South system and a new Southern Crossing Pipeline ("SCP") to Huntington pipeline.[75] Ultimately, however, the size of a pipeline expansion into the region would depend on potential interest from third-party shippers.[76]

(d) RCIA's Proposal Hinges on Continuing to Use the Existing Tilbury Base Plant Tank

51. RCIA suggests that the Base Plant facilities "can and should" supplement the 450 mmcf/d of RGSD project supply that RCIA argues (without sound evidentiary basis) would be available. RCIA contends that FEI has provided no indication that the integrity of the Base Plant tank is a concern.[77] FEI submits that, in fact, RCIA's approach is unworkable and uneconomical.

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74 RCIA Final Argument, pp. 9-11.

75 105 MMcf/day would be diverted to support demand in the Interior region: Exhibit B-1-4, Application, p. 90.

76 Exhibit B-15, BCUC IR1 16.3.

77 RCIA Final Argument, p. 27.

52. First, RCIA, fails to recognize that the Base Plant tank has been in service since 1971, well-beyond the average service life of an asset of this kind.

53. FEI's decision to operate the Base Plant tank at approximately 60 percent of its design capacity, or 0.35 Bcf[78] reflects the age of the facilities, current day seismic design standards[79] and the increased potential for reliability problems. It is an overdue for replacement. FEI has already extended the life of the Base Plant tank by replacing or repairing major components of the tank.[80] Even with significant additional capital investment, the extent of additional operational life that FEI would be able to achieve is unclear.[81]

54. Second, at some point, the Base Plant facilities and the associated gas supply benefits will still require replacement. FEI's evidence is clear that customers are better off replacing the Base Plant now, as proposed.[82] The TLSE Project, with a 3 Bcf tank, is the most-economical means of replacing the current supply benefits – the "third Bcf" avoids approximately $30 million annually in supply costs.[83]

55. Third, RCIA's approach is at odds with the purpose and design of the Base Plant facilities. The facilities are designed to support peak demand for very short durations when demand during cold weather events exceeds contracted supply, not to set aside the volume as a resiliency reserve.[84] The regasification constraint of 150 MMcf/d also limits the Base Plant to supporting, at most, a small fraction of Lower Mainland winter load. RCIA is banking on supplementing this capacity with 450 MMcf/d of capacity on RGSD, which is speculative for the reasons discussed above.[85]

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78 Exhibit B-1-4, Application, p. 62.

79 Exhibit B-22, RCIA IR1 18.3.

80 Exhibit B-15, BCUC IR1 40.1.

81 Exhibit B-22, RCIA IR1 18.1

82 Exhibit B-1-3-1, Application, pp. 99-101;

82 Exhibit B-1-3-1, Application, pp. 99-101; Exhibit B-15, BCUC IR1 16.21 and 16.22; Exhibit B-26, BCUC IR2 79.3.

83 FEI Final Submissions, para. 194-195.

84 Exhibit B-1-4, Application, p. 63; Exhibit B-35, Sentinel IR1 10.

85 Exhibit B-15, BCUC IR1 11.4.

56. Fourth, as described above, if the RGSD project is constructed, FEI will not be holding unused capacity year-round just waiting to be used when an emergency comes.

57. Ultimately, from both a technical and financial perspective, is unreasonable to plan on the basis that (a) the Tilbury Base Plant facilities will operate for at least another 50 years (at which time the Base Plant would be 100 years old), even with significant investment, and (b) RGSD is constructed, with FEI holding double the required year-round capacity so that half of it can be available following a T-South no-flow event. Constructing the TLSE Project is a better approach, both technically and financially.

(e) RCIA Mischaracterizes FEI's On-System Renewable Gas Projections

58. RCIA contends that while FEI's peak demand may grow in the future, so too will its share of on-system RNG and hydrogen supplies that will be unaffected by a T-South outage.[86] RCIA's argument is premised on a misreading of FEI's evidence.

59. In particular, RCIA has misinterpreted FEI's evidence as being that on-system RNG and hydrogen will serve 50 to 55 percent of total annual demand by 2030 and 80 percent by 2042. In fact, these figures represent the percentage of renewable and low carbon gases FEI procures that it anticipates will be produced in FEI's service area, as opposed to off-system. For example, in 2030, FEI anticipates that 24 percent of its projected annual demand will take the form of renewable and low carbon gases, of which approximately 50 to 55 percent will come from on-system resources (i.e., approximately 12 to 13 percent of projected annual demand). Similarly, in 2042, FEI anticipates that 43 percent of its projected annual demand will take the form of renewable and low carbon gases, of which approximately 80 percent will come from on-system resources (i.e., approximately 34 percent of projected annual demand). In particular, with respect to the 2042 planning horizon, FEI stated:[87]

> While the development of on-system resources will have grown in the intervening years, FEI anticipates there will still be reliance on off-system supplies, and

[86] RCIA Final Argument, p. 13.

[87] Exhibit B-39, BCUC Panel IR1 1.2.

therefore, the need to flow physical molecules of RNG and natural gas to a majority of FEI's customers.

60. Although FEI is planning on the basis that renewable and low carbon gas will comprise an increasing share of its total supply over the next 20 years and beyond, the amount of each resource to be acquired and delivered to customers throughout the planning period will ultimately be predicated on a number of a variables. These variables include: (1) the quantity and timing of resource availability; (2) how renewable and low carbon gases are developed and delivered; and importantly, (3) the geographic location where renewable and low carbon supply production is physically delivered.[88] For example, FEI does not yet know whether, and if so, in what proportion, on-system RNG will be transported to FEI's gas delivery system through the T-South system, thus being affected if a no-flow event were to occur. The BCUC can be confident that, regardless of the development of renewable and low carbon gases, the TLSE Project will still have a role.

C. SENTINEL'S ATTEMPT TO REPLICATE THE RESILIENCY BENEFITS OF THE TLSE PROJECT ARE HYPOTHETICAL AND CONTRADICTORY

61. Sentinel contends that the proposed TLSE Project is the "wrong investment" to address FEI's resiliency requirements, and instead, proposes that FEI rely on "a variety of existing or more economically constructed facilities".[89] In particular, Sentinel advocates for FEI to rely on the combination of:

- Transitioning high peak low load factor firm loads off FEI's system; **and**
- Developing a new pipeline to the Sumas hub; **and**
- Recognizing the investments made into the T-South pipeline following the T-South Incident in 2018; **and**
- Leveraging existing assets at the Tilbury site with added vaporization; **and**

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88 Exhibit B-39, BCUC Panel IR1 1.2.

89 Sentinel Final Argument, p. 11.

- Adjusting FEI's planning assumptions to be less pessimistic, including assuming access to linepack following a no-flow event; **and**

- Using smaller, geographically disparate, lower capital cost initiatives to achieve a reasonable level of resiliency.

62. There are a variety of problems with Sentinel's argument, as discussed below.

(a) Sentinel's Proposal Is Not Based on Evidence

63. First, like RCIA, Sentinel's proposal is not supported by – and, indeed, is contradicted by – the evidence. Sentinel had an opportunity to submit intervener evidence supporting its proposed alternative approach, which would have provided FEI with an opportunity to test its evidence, and did not. The BCUC's comments in the CTS TIMC Project decision, discussed above in response to RCIA, are also applicable to Sentinel's position.

(b) Sentinel's Position Is Internally Inconsistent

64. There are two notable internal inconsistencies with Sentinel's position. First, despite advocating for a transition away from the province's continued reliance on natural gas, several components of its proposal would require significant investment in the delivery system. Second, Sentinel describes the TLSE Project as a "billion dollar" insurance policy, while simultaneously encouraging other more costly investments that would provide less resiliency.[90]

(c) Sentinel's Proposal Depends on Resources that Are Unavailable, Undesirable, Uneconomic or Impractical

65. FEI addresses each component of Sentinel's proposal below. Sentinel's proposal depends on resources that are unavailable, undesirable, uneconomic or impractical.

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[90] Sentinel Final Argument, p. 6.

Transitioning High Peak Low Load Factor Firm Loads Off FEI's System Would Increase Energy Costs for British Columbians

66. Sentinel's proposal includes FEI beginning to transition high peak / low load factor firm loads off its system.[91] Sentinel is effectively suggesting that FEI cease serving residential and commercial heating load in the Lower Mainland. This approach would not address FEI's reliance on the T-South system and would lead to a number of negative knock-on effects.

67. First, Sentinel's approach would increase delivery rates for remaining customers, as the costs of FEI's delivery system would need to be recovered over fewer GJs.[92] While new loads with a low load factor can drive capital costs, reducing the peak load by ceasing to serve residential and commercial heating load would not avoid reinvestment in on-system storage to replace the Tilbury Base Plant as it reaches the end of its life.[93]

68. Second, transitioning these types of loads away from the gas system to the electricity system would worsen the resiliency of the overall provincial energy system at a significant cost for British Columbians. As explained in the Pathways to 2050 report,[94] BC's electricity system is currently not sized to support a meaningful migration of gas heating load to electric heat pumps.[95] Therefore, transitioning load would require significant incremental infrastructure investments, and ultimately, would be a less efficient use of capital. As FEI explained:[96]

> In the most extreme scenario where all gas load was electrified with heat pumps and where a significant peak cold weather event hit the region in line with what was experienced in 1996 in terms of temperature and duration and when provincial variable renewable capacity was not generating, then the peak resources required would be 7,000 MW of battery or some other type of electricity storage to withstand a 5-day cold period. This reserve of storage would be required to generally equate the resiliency of an electrified heating system with

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91 Sentinel Final Argument, p. 6.

92 Exhibit B-24, Sentinel IR1 97.

93 Exhibit B-24, Sentinel IR1 97.

94 Exhibit B-15, Attachment 63.1.

95 Analysis conducted in the Pathways to 2050 report demonstrates that if gas customers migrated *en masse* to the electric system using efficient air source electric pumps between now and 2050, an additional 3,000 MW of clean firm generating capacity would be needed to power these heat pumps during peak heating periods: Exhibit B-24, Sentinel IR1 97.

96 Exhibit B-24, Sentinel IR1 97.

> the gas system of today. However, the costs to install the storage required for resiliency would exceed $7 billion per year to 2050.

The scale and associated cost of generation required to meaningfully displace the energy provided by the gas system is a key restriction of electrified heating. It would create a single system solution that is fundamentally less resilient.[97]

69. Decarbonizing BC's energy system should not come at the cost of the system's resiliency and its ability to meet BC's energy requirements, particularly during cold weather conditions.98

New Pipeline Infrastructure Would Provide Valuable, But Distinct Resiliency Benefits

70. Sentinel identifies a number of benefits of a new pipeline that directly connects to the Sumas hub as a means of mitigating the risk posed by FEI's reliance on the T-South system.[99] The RGSD project, if developed, will add resiliency. It is also understandable that Sentinel, as an energy broker, is particularly attracted by the market benefits associated with the RGSD project. However, as explained above in response to RCIA, the on-system storage provided by the TLSE Project provides unique resiliency benefits and is the most effective solution to withstand a multi-day winter no-flow event in winter.

No Basis to Assume T-South Pipeline is Less Susceptible to Outages than Other Systems

71. Sentinel is of the view that FEI should recognize Westcoast's investments to upgrade the T-South system. In particular, Sentinel asks FEI to take for granted that the likelihood of a failure must now be lower as Westcoast "catches up" on its pipeline integrity efforts.[100] While FEI recognizes these investments,[101] JANA's report is based on Pipeline and Hazardous Materials Safety Administration ("PHMSA") and Transportation Safety Board of Canada ("TSB") rupture rate data for pipelines that are subject to similar regulation and standards as Westcoast.[102]

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97 Exhibit B-24, Sentinel IR1 97 and 98.

98 See Exhibit B-15, BCUC IR1 63.1.

99 Sentinel Final Argument, p. 6.

100 Sentinel Final Argument, p. 6.

101 Workshop Transcript, p. 50, ll. 8-21 (Hill).

102 FEI Final Submissions, para. 38.

Moreover, Sentinel does not address other potential causes of disruption, which are not contingent on pipeline integrity investments (e.g., a cyber-attack).[103]

72. FEI submits that there is no basis to consider the T-South system to be any safer than the large group of North American pipelines considered by JANA. No amount of integrity management work can eliminate the risk of an integrity-related rupture,[104] let alone a non-integrity-related event.

FEI Has Identified the Limitations of Leveraging Existing Assets at the Tilbury Site

73. Sentinel contends that FEI should rely on the existing Tilbury T1A facilities for a "good portion" of the system resiliency to be gained through the TLSE Project while also evaluating the incremental costs to bring the Tilbury Base Plant tank to full capacity.[105] Sentinel's assumptions with respect to the existing asset at Tilbury are contradicted by the evidence.

74. The Tilbury T1A tank was constructed for LNG sales, as affirmed by Direction No. 5 to the BCUC, and the volumes are not being set aside to ensure they are available during a no-flow event.[106]

75. Moreover, Sentinel is overlooking the regasification constraint at Tilbury, which affects both the Base Plant and Tilbury T1A. New regasification capacity would still be required to support peak Lower Mainland demand during the winter, otherwise FEI would be unable to regasify the LNG stored at Tilbury fast enough to support the Lower Mainland system load on day one of a winter no-flow event. The majority of Lower Mainland customers would lose service on the first day following a no-flow event during a cold winter.[107] FEI explained the technical impediments to adding regasification to the existing Base Plant.[108]

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[103] Please refer to FEI Final Submissions, para. 40.

[104] FEI Final Submissions, para. 35.

[105] Sentinel Final Argument, p. 7.

[106] FEI Final Submissions, para. 216.

[107] Exhibit B-15, BCUC IR1 11.2; FEI Final Submissions, paras. 67-68.

[108] FEI Final Submissions, paras. 163-168.

76. Finally, Sentinel's proposal to gradually restore the Tilbury Base Plant tank fails to recognize that the tank is well-beyond its expected service life and that there are financial and technical benefits to replacing the tank now. In light of the required refurbishment and maintenance costs,[109] the Tilbury Base Plant tank, which is now over 50 years old, would have to remain in service until it at least 94 years old to be financially beneficial (versus the alternative of constructing a new 2 Bcf tank and associated regasification capacity now).[110] That is highly unrealistic and fails to recognize the economies of scale in building a larger tank now.[111] The TLSE tank will also be based on modern design standards which minimize the potential for venting of methane to the atmosphere, thus decreasing the potential release of greenhouse gases.[112]

FEI's Planning Assumptions Are Appropriate

77. Sentinel considers FEI's planning assumptions underlying the selection of the TLSE Project to be overly pessimistic.[113] FEI submits that its planning assumptions are realistic. The risk of a supply disruption on the T-South system still exists on a "very cold day", and there will be significant loss of load from a no-flow event occurring at any point during a design winter or normal winter. Further, FEI cannot plan based on a failure only occurring north of Kingsvale on the T-South system as, without further investigation of the pipeline itself, it must be assumed to have an equal risk of rupture. Cyber attacks would intuitively target the greatest vulnerability. Finally, the evidence on the record supports FEI's view that linepack cannot be relied upon when planning for a supply emergency; it is not dependable and will limited regardless of where the rupture occurs.[114]

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[109] For context, the 2020 operating and maintenance costs for the Base Plant facilities (including the tank) were approximately $2.2 million: FEI Final Submissions, para. 211.

[110] Exhibit B-15, BCUC IR1 16.21.

[111] Exhibit B-15, BCUC IR1 40.8.

[112] Exhibit B-15, BCUC IR1 21.4.

[113] Sentinel Final Argument, p. 7-8.

[114] FEI Final Submissions, paras. 62-64.

Variety of Incremental Investments and Initiatives Are Not Practical or Effective

78. Finally, Sentinel proposes a number of discrete capital investments which it contends that, in conjunction with load shedding, achieve a "reasonable level of resiliency". Sentinel argues that these investments are smaller, less costly and geographically disparate, are thus preferable to the TLSE Project.[115] FEI submits that there is no evidentiary basis for Sentinel's argument, specifically:

- **Improved Backfeed from the Mt. Hayes LNG Facility:** Sentinel proposes that FEI use the Mt. Hayes LNG facility, which supports Vancouver Island load, to "aid" in meeting the resiliency requirements of the Lower Mainland.[116] This proposal should be rejected.

  FEI's evidence is that the Mt Hayes facility can only provide 60 MMcfd/d to the Lower Mainland under favourable conditions. Although, Sentinel advocates for additional capital investments in the Mt. Hayes facility to reverse the flow of gas when required for resiliency purposes, it acknowledges that there is no evidence to support what the output would be during winter conditions. In fact, FEI's evidence is that the existing compressors on the Vancouver Island transmission system are not configured or located for effective flow from west to east and, therefore, new (and costly) compressors would be needed.[117]

  FEI observes that a T-South no-flow event also deprives Vancouver Island of supply, and FEI must rely on Mt. Hayes to support the Vancouver Island system; Sentinel's approach is to reduce resiliency on Vancouver Island in order to increase it in the Lower Mainland. FEI submits that making significant capital investments to accomplish that result would reflect poor system planning.

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115 Sentinel Final Argument, pp. 9-11.

116 Sentinel Final Argument, pp. 9-10.

117 : Exhibit B-15, BCUC IR1 11.7.

- **Incremental Supply from the Williams Northwest Pipeline:** Sentinel suggests that FEI investigate what infrastructure costs would be required to deliver increments of 50 MMcfd/d north using the Williams Northwest pipeline ("Williams").[118] System hydraulics preclude physical flows northwards across the border in winter when it would be required.[119] William's incremental tolling methodology would result in FEI paying for the cost of what are inevitably going to be significant upgrades.[120] More fundamentally, Sentinel is identifying a pipeline-based solution, which (as described in the context of the RGSD project above) are sub-optimal as a means of addressing a short-term no-flow event.

- **Strategic Isolation of the Coastal Transmission System:** Rather than investing in a resiliency solution, Sentinel advocates for "strategic isolation" of portions of the CTS.[121] The evidence shows that significant portions of the system would have to be shut-down, and they would remain without service for a lengthy period. These areas would experience the same serious consequences that the TLSE Project is intended to avoid. FEI submits that adding supply is far superior to shutting in large sections of the Lower Mainland.

- **Communication with Emergency Management BC and the Public:** Sentinel also call for a methodology to inform customers in the event of a supply disruption and educational investments that enable customers to undertake their own relights.[122] FEI submits that these measures are not project alternatives, but rather, are means of mitigating the consequence of hydraulic collapse on FEI's system. FEI's BCUC-approved System Preservation and Restoration Plan includes a communications plan for a supply emergency.[123] Sentinel's relight education

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[118] Sentinel Final Argument, p. 10.

[119] FEI Final Submissions, para. 24.

[120] Exhibit B-24, Sentinel IR1 1.

[121] Sentinel Final Argument, p. 10.

[122] Sentinel Final Argument, pp. 10-11.

[123] The Plan is filed confidentially in Exhibit B-48-1. In Letter L-32-18, the BCUC found that the Plan was in the public interest and not unduly discriminatory as it is in accordance with FEI's approved tariff:

campaign is impractical; effective education would require ongoing communications in perpetuity with questionable results given the variety and complexity of appliances available.[124]

D. FEI HAS APPROPRIATELY SIZED THE TLSE PROJECT

79. Interveners generally recognize that FEI has appropriately sized the TLSE Project as part of Step 2 of the structured alternatives analysis framework. In the subsections below, FEI addresses specific concerns raised by CEC, BCSEA and BCOAPO.

(a) FEI Has Justified the Cost-Effectiveness of a 3 Bcf Tank

80. Only CEC argues that it would not be appropriate for ratepayers to pay to construct a 3 Bcf storage tank, comprising a 2 Bcf resiliency reserve (based on current load) and 1 Bcf (i.e., the "third Bcf") providing a resiliency margin and other gas supply and operational benefits currently provided by the Tilbury Base Plant.[125] In particular, CEC states that cost difference between a 2 Bcf and 3 Bcf tank should be justified on a cost-effectiveness basis and should only be undertaken if it definitively benefits customers financially.[126] FEI submits that the evidence on the record overwhelmingly favours a 3 Bcf storage tank and, in particular:

- **Financial Value of a 3 BCF Tanks Exceeds its Incremental Cost:** As FEI explained in its Final Submissions, it would be significantly more costly for customers to contract for a peaking resource than using the storage available from the proposed 3 Bcf storage tank.[127] In particular, the existing Tilbury Base Plant, which provides a number of gas supply benefits, is reaching its end of life. The gas supply benefits it provides would conservatively cost approximately $30 million per year to replace through the market, and can be replaced by using the "third Bcf".

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https://www.ordersdecisions.bcuc.com/bcuc/orders/en/item/351450/index.do?q=L-32-18.

[124] Exhibit B-52, BCUC IR3 112.1.

[125] CEC Final Argument, paras. 164 and 268.

[126] CEC Final Argument, paras. 164, 169, 179 and 268.

[127] FEI Final Submissions, pp. 193-197.

As part of this proceeding, FEI has committed to maintaining 2 Bcf in the TLSE tank as a minimum resiliency reserve (based on current load), which will only be used during a supply disruption event.[128] Without building a larger 3 Bcf storage tank, these benefits would need to be drawn from the available 2 Bcf, thus reducing the resiliency reserve and compromising FEI's ability to withstand and recover from a 3-day no-flow event on the T-South system. CEC is effectively seeking FEI to reduce the resiliency reserve, unless it is willing lose these supply benefits, which FEI submits should be rejected.[129]

- **Operational Benefits Enhance System Reliability:** A 3 Bcf tank also provides operational benefits such as enhanced load balancing and increased operational flexibility during periods of system strain that are ultimately to the benefit of customers.[130]

- **Potential to Avoid New Investments to Serve Localized Load Growth:** FEI could use the incremental 1 Bcf of LNG storage and increased regasification capacity to meet future load growth in specific areas, thus avoiding future system upgrades.[131]

- **Third-Party Storage:** A "third Bcf" presents the conceptual potential to offer storage to a third-party, thereby generating revenue to offset the cost of service of the TLSE Project for the benefit of customers.[132]

81. CEC suggests that other parties should not only incur the additional cost of service for the 1 Bcf of storage, but also contribute to a portion of the 2 Bcf cost. Alternatively, CEC argues that the storage should be contracted out at a market premium for the benefit of ratepayers. FEI submits that imposing this type of condition would be inappropriate. As recognized by both

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128 Exhibit B-18, BCSEA IR1 4.2.

129 CEC Final Argument, para. 73.

130 FEI Final Submissions, para. 201.

131 FEI Final Submissions, paras. 198-200.

132 FEI Final Submissions, paras. 204-205.

BCSEA and BCOAPO,[133] a 3 Bcf tank is economically the most optimal option to meet the Project objective. FEI was also clear that the potential for a third-party to use storage capacity is only conceptual. Further, with respect to requiring a "market premium", in FEI's submission, it is premature to make a determination in this regard and should only be addressed in the context of any future proposal by FEI to approve tolling.

(b) FEI Has Optimally Sized the Regasification Capacity at 800 MMCcf/d to Take Advantage of Incremental Benefits

82. While BCSEA acknowledges that a 3 Bcf tank may be justified, it favours reducing the number of regasification units from four to three.[134] FEI agrees that three regasification units (600 MMcf/d) would significantly limit or avoid a disruption on Day 1 of a winter no-flow event; however, BCSEA does not address the incremental benefits associated with the additional 200 MMcf/d of regasification capacity. In particular, for a modest cost relative to the total Project cost (between $14.5 to $23.5 million), this additional unit would allow FEI to serve additional load on very cold days, support future load growth and provide redundancy when one of the other three regasification units encounters a problem or is taken out of service for maintenance or other purposes.[135]

E. ADDRESSING THE AGE OF THE TILBURY BASE PLANT FACILITIES ALONE WOULD NOT ADDRESS THE PROJECT OBJECTIVE

83. While BCOAPO accepts that a portion of the cost of the TLSE Project would be incurred because the Tilbury Base Plant facilities have reached their end of their useful life, it notes that FEI did not provide a cost estimate for merely replacing the Tilbury Base Plant facility like-for-like. FEI submits that replacing the Tilbury Base Plant like-for-like is not an alternative, as it would not achieve the Project objective. Put simply, replacing the Base Plant tank alone would be a fundamentally different project. FEI did consider an alternative involving replacing the Base Plant tank at a later date while augmenting the Base Plant with a 1.4 Bcf tank in the meantime. FEI

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133 BCSEA Final Argument, para. 45; BCOAPO Final Argument, para. 22.

134 BCSEA Final Argument, para. 43.

135 FEI Final Submissions, paras. 180-181.

determined that this approach would result in higher costs for customers than the TLSE Project and would have feasibility challenges.[136]

[136] FEI Final Submissions, paras. 206-214.

PART FOUR: PROJECT COSTS AND RATE IMPACTS

A. THE PROJECT COST ESTIMATE MEETS BCUC REQUIREMENTS AND IS WELL-SUPPORTED

84. BCOAPO recognizes the "care and wisdom" underpinning the capital cost estimate for the TLSE Project, including validation by experts and its consistency with other CPCN applications. Yet, BCOAPO expresses "a certain level of pragmatic discomfort" with FEI's Class 3 AACE cost estimate.[137] BCAOPO cites three specific concerns, each of which is answered below.[138]

85. First, BCOAPO expresses concern about the uncertainty inherent in a P50 AACE Class 3 Cost Estimate. This is the standard required by the BCUC CPCN Guidelines.[139] FEI explained in its Final Submissions why the estimate it provided in the Application remains an appropriate basis for determining this CPCN Application.[140] FEI also expects to update the cost estimate once the EPC contractor has been selected and work has been completed to optimize the TLSE Project for cost and schedule efficiencies, which will occur after a CPCN is granted. In any event, FEI has committed to report on any material changes in cost (i.e., those exceeding 5 percent) as soon as practicable.[141]

86. BCOAPO's second concern is the risk of "significant cost overruns", citing the experience of transmission, hydro-electric and pipeline projects constructed by other companies. The projects cited by BCOAPO differ from the TLSE Project in a number of key respects:

- The TLSE Project will be constructed entirely within an existing brownfield site,[142] which represents a much lower risk profile compared to a new dam or linear infrastructure project spanning long distances.

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137 BCOAPO Final Argument, paras. 28-29.

138 BCOAPO Final Argument, para. 28.

139 BCOAPO Final Argument, para. 24

140 FEI Final Submissions, paras. 233-235.

141 FEI Final Submissions, para. 225.

142 FEI Final Submissions, para. 260.

- FEI is using an industry-standard tank design that has been used for at least 50 other projects worldwide.[143]

- The regasification units are designed by, and purchased from, a third-party supplier.

- FEI also has relatively recent experience constructing Tilbury 1A, which has provided FEI with valuable information about the site itself (including geotechnical and archaeological data) and insight in to developing projects of this nature.[144]

87. BCOAPO has also cited concern about inflationary pressures. FEI acknowledges that project costs can be affected by inflation; however, at this stage the utility cannot predict how any such pressures will affect the Project closer to, and throughout, its construction (construction is not expected to commence for some time still). As noted above, FEI has committed to ongoing cost-related reporting.

B. FEI HAS USED AN APPROPRIATE RATE IMPACT ANALYSIS PERIOD

88. CEC advocates for the financial analysis to assume seven years of construction plus 20 years of useful life to 2050, rather than FEI's proposed 67-year analysis period. While CEC does not expressly articulate its rationale for this shorter analysis period, FEI has assumed that this recommendation relates to the CEC's argument regarding long-term demand.[145] FEI has explained why a 67-year analysis period is appropriate in paragraphs 241 to 243 of its Final Submissions, and addressed CEC's energy transition argument in Part Two above.

89. FEI has nonetheless demonstrated that, even if one assumes a levelized delivery rate impact reflecting a useful life to 2050, the impact remains reasonable while providing significant benefits to customers over that period.[146] There is no option that is without cost to customers.

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143 FEI Final Submissions, para. 224.

144 Exhibit B-32, BCOAPO IR2 6.1.

145 CEC Final Argument, paras. 198-199.

146 Exhibit B-39, BCUC Panel IR1 7.1.

The Tilbury Base Plant tank is also over 50 years old and would need to be replaced before 2050, thus impacting FEI's delivery rates.

C. FEI HAS PROPERLY CONSIDERED THE PROJECT'S IMPACT TO DELIVERY RATES

90. BCOAPO makes arguments in relation to the delivery rate impacts associated with the TLSE Project, the mitigation of rate increases generally and FEI's approach to the "affordability" of rates for customers. FEI addresses each of these submissions below; however, as explained in Part Two of these Reply Submissions, the consequence of a multi-day no-flow event on the T-South system is an unacceptable that can only be effectively addressed by the TLSE Project. There is no cost-free approach.

(a) FEI Has Provided Considerable Contextual Evidence to Support the Merits of the TLSE Project and its Cost

91. BCOAPO maintains that, given the incremental delivery rate impact of the TLSE Project, the merits of the project should be considered on their own and "within the larger context of the utility's operations."[147] However, the BCUC's CPCN Guidelines articulate the requirements of a CPCN application. Those requirements include a discussion of need and alternatives and consideration of the most recently filed resource plan, not a general requirement to discuss the project in the larger context of the utility's operations. FEI has discussed need and alternatives in its evidence, demonstrating why other projects do not address the same need.[148] FEI has also explained how the Project is aligned with its latest LGTRP. In short, the BCUC has the necessary evidence to consider the TLSE Project within the relevant context of the utility's operations and, in particular, as part of a larger portfolio of resiliency investments.

(b) FEI is Mindful of the Impact of Capital Investments on Customer Rates

92. BCOAPO submits that it is "utterly inconceivable" that rate impacts can be discussed in the absence of discussion about affordability, is critical of FEI's response to affordability

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147 BCOAPO Final Argument, para. 32.

148 In addition to the alternatives analysis in the Application, FEI was asked specifically about how (if at all) projects such as the Okanagan Capacity Upgrades (OCU) project and AMI affected, or were affected by, the TLSE Project. See Exhibit B-15, BCUC IR1 14.1.

challenges, and asks the BCUC to direct FEI to begin immediately developing a definition of affordability.[149] As explained below, while FEI's recognizes that large capital investments can have an impact on customer rates, it disagrees with BCOAPO's commentary and requested direction.

BCOAPO's Submissions Are Misaligned with the UCA

93. BCOAPO's emphasis on affordability is misaligned with the UCA. The BCUC must set rates in accordance with the requirements of section 59. As the BCUC explained in its Decision in BC Hydro's F2020 to F2021 Revenue Requirements Application:[150]

> Affordability may also be a matter of public policy in which the government of BC may choose to take an interest and pass legislation or take other measures. However, the BCUC has no legislative mandate to make rates affordable, either for all customers or for specific groups of customers. The BCUC made this clear in its decision on BC Hydro's 2015 Rate Design Application when it rejected a request for a low-income rate which was unsupported by an economic or cost of service justification….
>
> For rates to be just and reasonable, we must be satisfied that the utility is able to recover only sufficient funds to enable it to continue to provide safe and reliable service, and to provide an appropriate return on the utility's invested capital. [Emphasis added]

94. FEI will nonetheless continue to be mindful of the impact of its rates on customers. Competitive delivery rates are in the interest of both customers and the utility.

FEI Must Balance Lower Rates With Appropriate Reinvestment in the System

95. FEI must balance the goal of lower rates against the need to make necessary safety, reliability, integrity and resiliency investments in its system.[151] FEI brought this Application forward after considerable assessment of the need, alternatives and capital costs.

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149 BCOAPO Final Argument, paras. 60-61.

150 Decision and Order G-246-20, p. 194. Online: https://docs.bcuc.com/Documents/Proceedings/2020/DOC_59355_2020-10-02-BCH-F2020-F2021-RRA-Decision.pdf.

151 Exhibit B-32, BCOAPO IR1 5.9.

96. The present economic conditions and their impact on customers, including the potential recession cited by BCOAPO,[152] do not change the underlying need for the Project. BCOAPO's suggestion that the BCUC consider whether customers can afford to address the need underlying the TLSE Project - or, put another way, whether customers can accept the risk in such circumstances given the associated Project cost and current economic context[153] - is at odds with BCOAPO's acknowledgement that:

- the consequences of a no-flow event on T-South occurring in winter would be very significant;
- "hoping" a multi-day no-flow event doesn't occur is not a plan;
- FEI's customers have been "lucky" to avoid such a event for decades; and
- some investment is inevitable.[154]

97. It bears noting that BCOAPO's constituents are among the people who would be most severely impacted by being left without heat and hot water for a lengthy period of time in winter. FEI has demonstrated that the TLSE Project is the only effective solution.

98. Ultimately, a definition of affordability would not change the need to make a significant investment for the benefit of customers.

Rate Mitigation Strategies Are Best Addressed When Determining Revenue Requirements

99. BCOAPO recommends that the BCUC proactively review potential rate mitigation strategies as part of the 2022 LTGRP proceeding.[155] As explained above, FEI is mindful of the impacts of delivery rates on customers and will continue to seek opportunities to address future

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[152] BCOAPO Final Argument, para. 17.

[153] BCOAPO Final Argument, paras. 17.

[154] BCOAPO Final Argument, paras. 15-16.

[155] BCOAPO Final Argument, paras. 55 and 59.

rate increases. However, strategies to mitigate rate impacts are best addressed as part of an annual review or revenue requirement application. As FEI explained:[156]

> These processes are the appropriate place to consider rate mitigation strategies because the rate impacts of major projects can be viewed holistically with all of the costs and revenues forecast for a given year or years. Through the revenue requirements or annual review proceedings, FEI (and the BCUC and interveners) can consider not only the costs of the projects at the time they enter rate base, but also any increased demand or cost reductions that can help offset those costs, and the timing of those costs/revenues, thus providing a full picture of all the factors impacting rates in a given year.

100. FEI submits that a proactive review as part of the 2022 LTGRP, as proposed by BCOAPO, would be premature and lead to the development of mitigation strategies based on incomplete information. The 2022 LTGRP proceeding remains the appropriate venue for considering infrastructure needs, environmental and climate change targets/policies, and changes in customer consumption levels, rather than rate mitigation strategies.[157]

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[156] Exhibit B-32, BCOAPO IR1 5.6.

[157] Exhibit B-17, BCOAPO IR1 7.2.

PART FIVE: INDIGENOUS AND STAKEHOLDER ENGAGEMENT

101. Interveners do not take issue with FEI's engagement activities, or the adequacy of the duty to consult, with respect to the TLSE Project. In particular, TWN indicates that it does not oppose the TLSE Project and is not seeking any additional Crown consultation in relation to this Application.[158] The Musqueam Indian Band ("Musqueam") also provided its support for the TLSE Project.[159]

102. TWN provides additional submissions that are intended for the benefit of the BCUC in future proceedings.[160] FEI respectfully takes no position regarding these submissions in this proceeding, except that they do not relate to the Application. As TWN has noted, they raise considerations that are properly addressed outside this proceeding.

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158 TWN Final Argument, p. 1.

159 Exhibit B-54-1, BCUC IR4 114.1.

160 TWN Final Argument, pp. 1-8.

PART SIX: BC ENERGY OBJECTIVES

103. BCSEA is the only intervener who addressed British Columbia's energy objectives. Although BCSEA acknowledges that not all energy objectives are applicable to every project,[161] BCSEA disputes the TLSE Project's furtherance of the objective to "encourage economic development and the creation and retention of jobs".[162] It suggests that, unlike the Pattullo Gas Line Replacement ("PGR") project, the TLSE Project is responding to a "potential" future winter no-flow event.[163]

104. FEI agrees that the PGR project was developed to replace the capacity provided by the Pattullo Gas Line and was driven by the scheduled demolition of the Pattullo Bridge; however, the two projects are similar insofar as they "encourage economic development and the creation and retention of jobs" despite not being intended to promote load growth.[164] In this regard:

- BCSEA does not challenge that the development of the TLSE Project will create additional employment, lead to the procurement of local goods and use of local services;

- BCSEA does not challenge that the agreement reached with the Musqueam, which includes the TLSE Project, promotes positive socio-economic opportunities for Indigenous communities; and

- BCSEA similarly accepts that disruptions to FEI's customers would have social and economic impacts.[165] Put simply, the resiliency benefits provided by the TLSE Project have an economic value.[166] BCSEA fails to recognize the economic benefits that flow from a stable energy system in the face of the impacts of climate change.

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161 BCSEA Final Argument, para. 58.

162 *Clean Energy Act*, s. 2(k).

163 BCSEA Final Argument, para. 59.

164 FEI Final Submissions, para. 335.

165 BCSEA Final Argument, para. 37.

166 FEI Final Submissions, para. 335.

105. BCSEA also notes that the TLSE Project does not further the energy objective of reducing GHG emissions in British Columbia. However, as FEI explained in its Final Submissions, while the TLSE Project dovetails with FEI's planned transition to a low-carbon energy system, it is a resiliency project that also has a "fundamental role" to play in the future of the province's energy system.[167] As noted above, FEI is planning to set aside 2 Bcf (based on current demand) exclusively for use in emergencies. Therefore, the TLSE Project need not directly reduce GHG emissions in the province as this is not the Project's objective.

[167] FEI Final Submissions, para. 337.

PART SEVEN: OTHER ISSUES RAISED BY INTERVENERS

A. THE BCUC HAS ALREADY RECOGNIZED THE IMPORTANCE OF RESILIENCY

106. BCOAPO recommends that the BCUC clarify that an approval of the TLSE Project is not an approval of resiliency in principle or as a general objective by the BCUC.[168] FEI's requested approvals are specified in the draft Order Sought, and do not include a general request for endorsement of resiliency beyond consideration of TLSE Project need.[169] Regardless, the BCUC has already recognized the importance of gas supply resiliency. FEI developed its Resiliency Plan, which is an appendix to the 2022 LTGRP, in response to a BCUC direction coming out of the 2017 LTGRP proceeding. Interveners in the 2017 LTGRP proceeding (specifically, CEC and BCSEA) had also raised concerns about the 2018 T-South Incident.[170]

B. CUSTOMERS VALUE RESILIENCY AND RECOGNIZE THE ADVERSE IMPACTS OF CATASTROPHIC EVENTS

107. CEC recommends that the BCUC acknowledge customer dependence on gas but give little to no weight to customer views of the value of resiliency unless coupled with an indication of customers' willingness to pay.[171] FEI has already acknowledged that customers' views on specific reliability and resiliency measures will be influenced by costs.[172] The 2021 survey of 2,125 FortisBC MyVoice community panel members does, however, confirm that FEI customers understand the importance of resiliency and, in particular, recognize the potential for catastrophic impacts to result from disruptions in gas supply. FEI submits that the importance customers place on resiliency reflects their dependence on gas for a number of essential purposes, as acknowledged by CEC,[173] especially during the winter.

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168 BCOAPO Final Argument, para. 9.

169 Exhibit B-1-4, Application, Appendix T2.

170 Decision and Order G-39-19, dated February 25, 2019. Online: https://www.ordersdecisions.bcuc.com/bcuc/decisions/en/363860/1/document.do.

171 CEC Final Argument, para. 112.

172 FEI Final Submissions, para. 41.

173 CEC Final Argument, paras. 72 and 109.

C. THERE IS OVERSIGHT OF ARCHAEOLOGICAL IMPACTS

108. CEC recommends that the BCUC provide significant oversight of archaeological impacts as part of Project reporting. The evidence demonstrates that there is already significant regulatory oversight of archaeological work, including through the Environmental Assessment process.[174] For example, FEI has developed a site-specific chance find management procedure with Indigenous groups and has committed to hiring Indigenous archaeology monitors, consistent with any recommendations of the AIA.[175] Further, as noted above, the TLSE Project will be located on a brownfield site.

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[174] FEI Final Submissions, para. 271-274; see, e.g., Exhibit B-1-4, Application, Section 7.3; Exhibit B-15, BCUC IR1 51.1, 52.2; Exhibit B-25, TWN IR1 5.1, 6.2, 7.1, 7.2; Exhibit B-44, Rebuttal Evidence to TWN, p. 28.

[175] Exhibit B-25, TWN IR1 7.2 and Exhibit B-36, TWN IR2 8.1.

PART EIGHT: CONCLUSION

109. The evidence in this proceeding, discussed in the Final Submissions and augmented here, makes a compelling case for BCUC approval of the TLSE Project and related orders on the terms sought. The cumulative probability of another multi-day no-flow event occurring is high, irrespective of whether one considers those probabilities over the expected service life of TLSE Project, or some shorter period defined by speculation regarding provincial policy. The consequences of a winter no-flow event will, without question, be catastrophic without further investment. The serious implications of a lengthy and widespread outage are underscored by the deaths of more than 100 people following a recent, and much shorter, winter power outage in Texas. We can hope that FEI never needs to call upon the TLSE Project, but (as BCOAPO observed), hope is not a plan. The TLSE Project is the best way to mitigate this risk to acceptable levels and, unlike hope, is a defensible approach in the aftermath of a no-flow event.

ALL OF WHICH IS RESPECTFULLY SUBMITTED

Dated: December 12, 2022 ***[original signed by Matthew Ghikas]***

Matthew Ghikas

Counsel for FortisBC Energy Inc.

Dated: December 12, 2022 ***[original signed by Niall Rand]***

Niall Rand

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