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June 2, 2022

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

Attention: Mr. Patrick Wruck, Commission Secretary

Dear Mr. Wruck:

Re: FortisBC Energy Inc. (FEI)

Application for a Certificate of Public Convenience and Necessity (CPCN) for the Tilbury Liquefied Natural Gas (LNG) Storage Expansion Project (Application) ~ Project No. 1599170

FEI Rebuttal Evidence to the Residential Consumer Intervener Association (RCIA) Intervener Evidence

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In accordance with the amended Regulatory Timetable established in British Columbia Utilities Commission Order G-132-22, FEI hereby files its Rebuttal Evidence on the RCIA Intervener Evidence in the above referenced proceeding.

Treatment of Confidential Material

FEI is filing small portions of its Rebuttal Evidence to the RCIA on a confidential basis pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-15-19. FEI considers this information to be security sensitive as it deals with critical system considerations. FEI's treatment of the security-sensitive information is consistent with BCUC Order G-161-21 and the Revised Confidential Application (Exhibit B-1-3). The redacted information will be made available to interveners who have previously signed and provided the BCUC Confidentiality Declaration and Undertaking form (Undertaking) and the revised non-disclosure agreement (NDA).

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

cc (email only): Registered Interveners

Tilbury Liquefied Natural Gas (LNG) Storage Expansion Project Application for a Certificate of Public Convenience and Necessity

Rebuttal Evidence of FortisBC Energy Inc.

to the Intervener Evidence filed by the Residential Consumer Intervener Association (RCIA)

June 2, 2022

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1.0 INTRODUCTION

FEI files this Rebuttal Evidence in response to the submission of Ryall Engineering Limited (REL) on behalf of RCIA (Exhibit C1-10). Although FEI has addressed the main points in REL's report, FEI's silence on a matter should not be taken as agreement. FEI disagrees with much of REL's commentary.

Q1: Can you please identify the names and qualifications of the individuals primarily responsible for the technical aspects of FEI's responses to REL's submission?

A1: The technical information required to prepare FEI's response to REL was provided by a number of highly experienced FEI operations staff, primarily (in alphabetical order):

Mike Forsyth, Operations Manager, Pressure Control-Vancouver Island, Sunshine Coast, Squamish Whistler

Mr. Forsyth has over 29 years of experience at FEI. He started with FEI in 1992 and holds a Class A Gas Fitter designation. He has held positions as a Service Technician and a Pressure Measurement Technician; these positions had him dealing with all matters of utility metering and pressure control, as well everything "downstream" of the meter in all residential and commercial/industrial applications including appliances. During this time Mr. Forsyth was a subject matter lead in pressure regulation and taught FEI's internal pressure factor measurement (PFM) course to ensure compliance with Measurement Canada requirements. Mr. Forsyth has also taught the Utility Ticket which has been offered at Camosun College and BCIT. Currently, Mr. Forsyth is responsible for all Transmission and Distribution Control Stations and Telemetry in the above mentioned areas.

Paul Kitchener, MBA AScT, Project Director, AMI

Mr. Kitchener has over 31 years of experience at FEI. Initially, Mr. Kitchener worked in the field as a technologist responsible for maintaining data communication and control systems. Mr. Kitchener also had management responsibilities for the data communication and controls group, supply chain, and manufacturing. Prior to joining the AMI project in late 2019, Mr. Kitchener held the position of Operations Manager for over 10 years and was responsible for leading employees who respond to gas emergencies, conduct corrective and preventative maintenance on gas meter sets, relight customer appliances, and install and maintain gas mains and services.

Terry Penner, P. Eng., System Capacity Planning Manager.

Mr. Penner has over 29 years of experience at FEI. He started in 1992 as an Operation Manager for Distribution Operations supervising crews installing mains and services, and responding to emergency incidents involving the distribution system. Mr. Penner worked for eight years in Operations managing crews, for another six years managing the

Emergency Operation Center in FEI's Surrey Operations Facility providing support for operation personnel and mangers responding to system damage throughout the province. Since 2006, Mr. Penner has worked in his current role as the System Capacity Planning Manager, and is responsible for FEI's System Capacity Planning department, which produces FEI's system hydraulic models and provides important support in assessing system supply and capacity capability for regular operations and well as assessing isolation activities during emergency response situations.

Darrin Crozier, Director, Operations, Vancouver Island, Sunshine Coast and Metro Vancouver

Mr. Crozier has 29 years of experience with FEI. He started with FEI in 1991 and holds a Utility Management Certificate from Willamette University. He held various positions such as a Distribution Mechanic, Crew Leader, and Trades Trainer in his first 16 years as an employee with the FEI; these positions were mostly centered around operating and maintaining FEI's gas pipe assets. This work included construction of the gas pipe system including purging, gasifying, and performing leak survey activities. During this time, Mr. Crozier was a subject matter lead in polyethylene fusion and was FEI's trades trainer for construction activities. Mr. Crozier has held various management positions over the last 15 years and has been an owner and subject matter lead for many internal construction-related standards and policies. Currently, Mr. Crozier is responsible for operations of the gas distribution systems on Vancouver Island, the Sunshine Coast, and in Metro Vancouver.

Ferenc Pataki, P.Eng. Director, Transmission

Mr. Pataki is a mechanical engineer and has been with FEI for over 30 years. During his career at FEI, Mr. Pataki has held various technical and leadership roles in gas Transmission and Distribution Operations, Gas Control, Asset Management, and Engineering. In his current role as Director, Transmission, he is responsible for FEI's 4,500 km of high pressure gas transmission pipelines, including activities such as Pipeline Engineering, System Integrity, Gas Supply, Transmission Operations, and Rights-of-Way Vegetation Management.

2.0 OVERVIEW OF FEI'S RESPONSE TO REL'S SUBMISSION

Q2: Please provide your overarching comments on the REL submission, with particular focus on the following passage from REL's executive summary:

> **"REL is of the view that the customer outage duration can be limited to the duration of the no-flow event, and therefore the dire consequences identified by FEI of a prolonged shutdown for weeks or months are unlikely to come to pass."[1]**

A2: There is no plausible scenario in which service to all Lower Mainland customers could be restored in a matter of days, as REL appears to suggest. FEI has indicated in its evidence that restoring service to the entire Lower Mainland would take weeks or months, and this would be true even in circumstances that are very favourable to the restoration work. FEI has expanded on the basis for that conclusion in this Rebuttal Evidence, including providing its data inputs and calculations (please refer to Section 4 and Appendix B). FEI's analysis shows that it is reasonable to expect that it would take over 10 weeks to fully restore service in the Lower Mainland without AMI and just under 9 weeks with AMI.

FEI's estimates are based on BC regulatory requirements and well-established operating procedures that are in place to ensure the safety of the public, FEI's customers, and field personnel. FEI is using realistic expectations about the personnel available, including personnel available under mutual aid agreements. All of these considerations are reflected in the System Preservation and Restoration Plan, which FEI has previously filed with the BCUC.

A widespread outage to hundreds of thousands of Lower Mainland gas customers, whether controlled or otherwise, has the potential to cause widespread harm both from the outage itself and from the perspective that safety risks associated with the gas system itself increase the longer the system is depressurized. As such, FEI recognizes the benefits of reducing the length of the outage where possible. At the same time, the process of repressurizing the system, restoring service to premises, and relighting appliances also gives rise to inherent safety risks. In order to mitigate the safety risks associated with restoring service to customers, FEI would take a methodical and professional approach to restoring service that anticipates and addresses potential hazards. FEI's approach reduces the overall restoration time by contemplating, for instance, efficient crew allocation to reduce standby time and unnecessary travel.

FEI considers REL's suggested approach problematic for a number of reasons, which FEI will develop later. The REL submission does not appear to recognize the legislated requirements for gas operators within the province of BC. REL is also, in essence, shifting responsibility for safety from FEI to its customers and the public based on idealized

[1] REL Evidence, p. 4.

assumptions about their behavior and level of knowledge that are at odds with FEI's own experience. REL's recommendations create greater risks for people and property associated with the process of restoring service, and REL has very unrealistic expectations about the extent to which its recommendations would reduce the overall time to restore service to the Lower Mainland. FEI would take all steps it could legally and safely take to accelerate the process of restoring service, but FEI would not—and should not be expected to—base its response to a widespread Lower Mainland outage on REL's recommendations.

Q3: Can you please elaborate on the points you made in the last paragraph in the context of the three major components of service restoration work (shutdown, repressurization and relighting customers)?

A3: Yes. FEI will address these points in more detail later in this Rebuttal Evidence, but notably:

- **Shutdown:** One of the main measures REL is recommending in order to save time in the absence of AMI is to dispense with visiting customer premises to ensure manual meter valves are turned off before repressurizing the adjacent portion of the distribution system.[2] In essence, REL advocates relying on appliance safety mechanisms and customers closing manual appliance valves to prevent the flow of gas into homes and businesses upon system repressurization. REL's desired approach is precluded by section 53(2) of BC's *Gas Safety Regulation* (GSR). There is a compelling safety rationale for the regulatory requirement that makes REL's desired approach unlawful. REL is underestimating the extent of the risk posed to the public by dispensing with the step required by the Regulation, as REL's assumptions about appliances and customer knowledge and behavior do not reflect FEI's operating experience. In any event, REL is significantly overestimating the time savings that would come from implementing its recommendation. (Please refer to Section 5 below).

- **Repressurization:** REL has incorrectly inferred that FEI is contemplating leak surveys and purging activities throughout the entire system before beginning any relighting activities, and states "…FEI does not need to undertake the proposed time-consuming activities such as leak surveys and purging the system of air in order to safely restore service to its customers."[3] FEI is, in fact, anticipating that most areas of the system—where the segment is holding its pressure as gas is reintroduced (which FEI refers to as a pressure check)—a leak survey would occur at the same time FEI is relighting appliances in that area. Leak surveys and purging conducted in the manner FEI is anticipating reduces risk of harm and

[2] REL Evidence, p. 4. "In this evidence, REL explains that FEI does not need to shut off each and every individual service in the event of a no-flow event. This is one of the most significant factors that dictates the timeline for the prolonged outage that FEI states will result from even a short-term no-flow event."

[3] REL Evidence, p. 3.

contribute relatively little to the overall timeline for full resumption of service to the Lower Mainland. FEI also believes REL's suggestion of asking developers and construction companies throughout the Lower Mainland to cease excavation work for the duration of the outage is an unrealistic, and more risky, alternative to purging and leak surveys. (Please refer to Sections 6 and 7 below).

- **Relighting:** Relighting appliances takes, by far, the most time of any of the steps and is the "critical path" for the full resumption of service in the Lower Mainland. REL is suggesting that FEI should encourage customers to relight their own appliances. FEI's time estimates for full resumption of service in the Lower Mainland already account for a significant portion of FEI customers (approximately 25 percent) relighting their own appliances, despite FEI's experience indicating the vast majority of its Lower Mainland customers typically obtain the assistance of a qualified professional. REL is making a number of significant and unrealistic assumptions about the ease with which self-relights can be conducted, and customers' willingness to notify FEI that they have relit their own appliances. Regardless, even if one were to make the highly unrealistic assumption that half of FEI's Lower Mainland customers would be willing and able to perform self-relights successfully and report them to FEI, the process of fully restoring service to Lower Mainland customers would still take a number of weeks. (Please refer to Section 8 below).

Q4: REL bases its recommendations, to a significant extent, on Centra Gas Manitoba's (Centra) approach in the Otterburne outage.[4] Can you please summarize your response in that regard?

A4: The Otterburne rupture event is not a reasonable comparator. A key regulatory difference between Manitoba and BC is that FEI would be precluded by the GSR from leaving customer meter valves open following a system depressurization. Leaving that aside, there is a profound difference in scope or scale of the outages that could result from a T-South no-flow event impacting FEI's Lower Mainland customers. Centra was faced with a localized gas supply interruption affecting approximately 3600 customers in several small communities. A Lower Mainland outage resulting from a no-flow event would involve several hundred thousand FEI customers. This hundredfold difference in scale, combined with factors like temperature and development activity in Lower Mainland climate itself, introduces significantly greater operational and safety challenges that are not appropriately reflected in the REL submission. (Please refer to Section 9 below).

[4] REL Evidence, p. 3. "REL draws upon the experience of a no-flow event that took place in southern Manitoba following a rupture of TransCanada Pipelines' Mainline near Otterburne, Manitoba in 2014."

Q5: Do you have a general response to REL's following characterization of the TLSE Project benefits?

> **"TLSE provides benefits to both customers and FEI by extending the period before a hydraulic collapse occurs for either a controlled or an uncontrolled shutdown, which therefore extends the time until a no-flow event causes customer interruptions. REL sees that the principal benefit of avoiding interruption to customers is to avoid the need to relight customers since, as explained further in this evidence, REL rejects the need for FEI to conduct certain other activities in the restoration process. In REL's view, the value of this benefit to FEI and its customers relative to the $769 million cost of the TLSE project is questionable."[5]**

A5: FEI has three comments regarding REL's characterization of the TLSE Project.

First, the TLSE Project is not just "extending the time until a no-flow event causes customer interruptions." Rather, a key benefit of the TLSE Project is that it will no longer be inevitable that FEI will be unable to support most of the Lower Mainland demand on the first day of a no-flow event occurring during a normal winter, as is currently the case.[6] As proposed, the TLSE Project will avoid altogether any material customer interruptions, so long as the no-flow event is resolved before the new 3 Bcf storage tank is close to being depleted (at which point FEI needs to initiate the process of shutting down portions of the system. FEI will have significantly more time (days versus hours) to take a more thoughtful and informed approach to staging the isolation of segments of the system (if required at all), thereby increasing the likelihood that T-South flows will resume before the entire Lower Mainland system is depressurized. FEI notes REL's later acknowledgement that it "[…] is certainly preferable for FEI to maintain continuity of service. Interruption of customers can potentially be avoided if the TLSE LNG supplies are sufficient to outlast the no-flow event. Avoiding interruption avoids some of the economic and safety consequences of a zero-pressure situation."[7]

Second, REL sees the "principal benefit of avoiding interruption to customers"[8] as being related to avoiding relighting customers, downplaying other restoration steps. The time to relight customers represents the vast majority of the time to fully restore service in the Lower Mainland, such that avoiding the need to relight customers is a very significant benefit even before considering the benefit of avoiding meter shut offs, repressurization, purging and leak surveys.

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5 REL Evidence, p. 18.
6 Response to BCUC Confidential Panel IR1 1.4.
7 REL Evidence, p. 15.
8 REL Evidence, p. 18.

Third, in saying that "the value of this benefit to FEI and its customers relative to the $769 million cost of the TLSE project is questionable", REL is attributing the entire cost of the TLSE Project to increased resiliency. This does not reflect that the Project will provide valuable customer benefits beyond increased resiliency. The Base Plant, which is already over 50 years old, will need to be replaced regardless of whether the TLSE Project proceeds.[9] Moreover, the TLSE Project also provides ancillary benefits, including gas supply benefits worth approximately $30 million per year, that will more than offset the incremental cost of the "third BCF" of the proposed TLSE Project.[10]

[9] As FEI explained in the response to BCUC IR1 16.21, the Base Plant would have to remain in service until at least 94 years old to be financially beneficial versus the alternative of constructing a new 2 Bcf tank and regasification capacity now.

[10] Application, section 4.4; BCUC IR1 46.2.

3.0 CLARIFYING CONTROLLED AND UNCONTROLLED SHUTDOWNS

Q6: Do you agree with how REL has defined hydraulic collapse, controlled shutdown and uncontrolled shutdown?

A6: Yes. While FEI believes it has used appropriate terminology to describe the impacts of a no-flow event, FEI also takes no issue with how REL has defined the terms hydraulic collapse, controlled shutdown, and uncontrolled shutdown in Sections 3.1 to 3.3 of REL's submission.

The shutdown and relight procedures undertaken at an individual customer's premises in any portion of the system that has depressurized do not differ depending on whether the system has lost pressure in a controlled or uncontrolled manner.

Q7: REL states:

> **"Depending which parts of the Application are considered, the implication is that by adding TLSE and its resiliency benefits, FEI can perform a controlled shutdown, avoiding an uncontrolled shutdown and a hydraulic collapse along with the associated negative consequences. However, as described by FEI, a controlled shutdown also involves a hydraulic collapse, which is synonymous with a zero-pressure situation – unless it incorporates rapid remote disconnection of individual customer services through advanced metering infrastructure ("AMI").**
>
> **Therefore, REL would like to clarify that both controlled shutdowns and uncontrolled shutdowns result in depressurization of the gas system. That is, both types of shutdown, given continued customer demand on the system, result in hydraulic collapse and zero pressure in the system or at least portions of the system."[11]**

Do you agree?

A7: REL suggests in Section 3.4 of its submission that FEI has incorrectly implied that by taking certain actions (a controlled shutdown) FEI could avoid hydraulic collapse. FEI has, in fact, been clear in responses to IRs about the implications of, and distinction between, a controlled and uncontrolled outage.[12] As FEI stated in the response to BCUC IR2 70.1, "[…] both scenarios are highly disruptive and undesirable for customers […]".

FEI agrees that portions of the system that have been isolated as part of a controlled shutdown will depressurize unless the meter valves at customer premises on that part of

[11] REL Evidence, p. 10.
[12] E.g., BCUC IR2 70.1, 70.2, and BCUC Confidential IR1 1.4.

the system are quickly closed to prevent further consumption. However, there are important differences between controlled and uncontrolled shutdowns:

- There can be a significant difference between a controlled and uncontrolled shutdown in terms of the potential scale of the event—in other words, how much of the distribution system becomes depressurized. An uncontrolled shutdown would impact the entire system downstream of the supply disruption and results in a rapid, system-wide depressurization and loss of service to customers that cannot be mitigated. A controlled shutdown is a strategic step-by-step series of partial (area-by-area) shutdowns intended to preserve pressure in remaining portions of the system for as long as possible, with the objective that the supply imbalance can be corrected before the entire system is lost. In the case of a T-South no-flow event, that would mean gas flows resuming on the T-South system at levels sufficient to meet the demand on the remaining portions of the Lower Mainland system with positive system pressure.

- An uncontrolled outage is chaotic because, as customers continue to consume gas within a wide geographical region, some locations would randomly experience critical low pressures creating dangerous fluctuations in supply during the collapse that cannot be controlled or predicted in advance. These unpredictable fluctuations can result in customers losing, then temporarily regaining, and then losing supply during the collapse, which creates a more dangerous situation than if FEI is able to shut down the system methodically.

The TLSE Project will add resiliency, even in the absence of AMI, because it delays the time before FEI must begin isolating portions of the distribution system in a controlled manner and allowing those portions to depressurize. This means it is far more likely, with the TLSE Project, that other portions of the system will not require isolation and will remain fully pressurized and functional when gas flows on T-South resume, permitting uninterrupted service to the customers in those areas.

Delaying that need to isolate a section of the system, which will be facilitated by the TLSE Project, continues to be important even once residential AMI meters are in place. First, large commercial and industrial customers will not have AMI, such that they will continue to draw down the pressure in the isolated segment until the meter valve can be turned off manually (which may take 3 to 4 days).[13] Second, AMI still results in all residential customers on isolated portions of the system losing service because the meter valve will be closed so as to curtail consumption and retain positive pressure within FEI's distribution system. However, this still results in a loss of gas supply to the premises and consequently all appliances will need to be relit. As discussed in Section 4 below, relighting appliances is the most time consuming aspect of restoring service.

[13] Response to RCIA IR2 36.1.1.

Q8: REL states: "REL is of the view that FEI would be able to conduct a rudimentary controlled shutdown of its system in nearly any circumstance involving a no-flow event on T-South, with or without TLSE. To do this, FEI would close the isolation valves at the inlet to the Coastal Transmission System ("CTS") at Huntingdon station."[14] How would that step effect Lower Mainland customers?

A8: The operational information required to address this question is security sensitive.

[redacted]

[14] REL Evidence, p. 14.
[15] FEI provided additional information on CTS line pack in its response to MS2S IR1 6i.

[redacted]

4.0 CORRECTING REL'S CHARACTERIZATION OF FEI'S PLAN TO RESTORE SERVICE

4.1 The Basis for FEI's Plan to Restore Service

Q9: Does FEI agree with how REL has characterized FEI's evidence on the shutdown and restoration of service?

A9: FEI disagrees with aspects of REL's description of FEI's approach. As described later, the main areas of disagreement are how REL has described the sequencing of the steps, and the circumstances when FEI would perform purging and leak surveys. REL's incorrect inferences contribute significantly to REL overestimating the potential time savings associated with its recommendations.

FEI outlined its shutdown process in the response to BCUC IR1 6.1. Further, in the response to BCUC IR1 6.2, FEI provided information regarding the repressurization and relighting process. In light of REL's incorrect inferences, FEI's Rebuttal Evidence clarifies and expands on its processes, both pre-AMI implementation and post-AMI.

Q10: How did FEI develop its approach to shutdown and restoration of service?

A10: FEI's approach to shutting down and restoring service has been developed and maintained by engineering and operations personnel experienced and knowledgeable in industry best practices to perform emergency service isolation and restoration.

As part of its assessment of its practices, FEI ensures that its approach is compliant with applicable regulations and accounts for industry standards. As discussed later in Section 5 of this Rebuttal Evidence, section 53(2) of the GSR, states that: "[if] a gas supply has been turned off, a person must not turn the gas supply back on until the person […] carefully checks all outlets and pilots to ascertain that they are relighted or turned off."

Additionally, clause 10.5.7.1 of the CSA Z662-19 *Oil and Gas Pipelines* standard requires operators to mitigate hazards associated with gas-air mixtures if such mixtures are within the explosive limits (approximately 5 to 15 percent by volume of gas in air). This requirement, which is mandatory under the GSR, supports FEI's practice of checking the system for leaks and purging mains and or services when explosive gas/air mixtures could be present.

Q11: Have you previously used this approach to shutdown and restoration of service?

A11: Yes. FEI uses this approach routinely in day-to-day operations when system isolations are required to address gas emergencies. Meters valves are always turned off prior to

restoration to comply with section 53(2) of the GSR. The need for, and extent of, purging and leak surveying activities having regard to CSA Z662-19 are considered in light of the circumstances in each case, and in particular an assessment of the risk that there has been air ingress while the system is depressurized. FEI responds to hundreds of gas emergencies each year involving from one to hundreds of customers.

Q12: Can you provide an example of the type of damage or harm that can occur from a gas leak upon repressurization, which FEI's approach is intended to prevent?

A12: The main risk associated with leaking gas upon repressurization is an explosion or fire, causing injury, death, or property damage. FEI's approach is intended to, and does, mitigate that risk.

As an illustration of the potential risks, FEI is aware of reports of two gas explosions occurring in Fort McMurray when ATCO Gas repressurized its system following the 2016 wildfire in that community. The depressurization had affected approximately 20,000 ATCO Gas customers. According to CBC News, "the blasts damaged neighbourhoods that were untouched by May's wildfire."[16] The homes were apparently empty at the time, as the general evacuation order had not yet been lifted. It is reasonable to expect that many premises in the Lower Mainland would similarly be empty during a gas outage for various reasons.

Residents affected by one explosion brought a $20 million class action against ATCO Gas, which was court-certified to proceed in 2019. ATCO Gas has disputed liability and FEI is not aware of any court decision; however, ATCO Gas did not dispute that the explosion was caused by natural gas or that it occurred upon repressurization of the adjacent system. The certification order, Statement of Claim, and Statement of Defense are attached collectively as Appendix A.[17]

The CBC News articles included the following photos of the aftermath of the explosion that was the subject of the class action. Photo 1 shows at least one home destroyed, and others that are significantly damaged. Photo 2 was also published by CBC News in another article.[18]

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[16] https://www.cbc.ca/news/canada/edmonton/class-action-lawsuit-atco-gas-explosion-fort-mcmurray-1.3977644.

[17] The court order certifying the class action against ATCO Gas, which was by consent of all parties, explicitly confirmed the explosion was a gas explosion. The Plaintiffs' allegations with respect to the scope of the physical damage are set out in paragraphs 8 and 9 of the certified Statement of Claim attached to the Order.

[18] https://www.cbc.ca/news/canada/edmonton/atco-gas-explosion-fort-mcmurray-court-1.5147642.

Photo 1: Aerial photo taken by Wood Buffalo Emergency Services after a gas explosion at 118 Clenell Crescent, Fort McMurray, on May 17th. (RMWB)

Photo 2: Several homes destroyed in an explosion which took place during the wildfire evacuation. (Wallis Snowdon/CBC Edmonton)

4.2 FEI's Crews Will be Performing Tasks in Parallel

Q13: You indicated above that REL's incorrect inferences about FEI's process has led it to overestimate the potential time savings associated with their recommendations. In that regard, can you please comment on REL's table on page 17 which it says "summarizes FEI's view of the steps needed in response to a no-flow event"?

A13: REL's table includes a column indicating FEI's "Action or Concern", and what REL says is a summary of FEI's approach with respect to each Action or Concern. FEI notes the following about the table:

- Characterizing the items in the table as "steps" is incorrect to the extent that implies FEI would conduct them strictly sequentially. This is not reflective of what FEI expects would actually transpire. Some items REL has included in the column "Action or Concern" would be addressed through a single step. Other actions happen in tandem.

- REL's descriptions of FEI's approach to purging and leak surveys oversimplifies the process. As discussed in Section 6 below, FEI expects that leak surveys would be prioritized to certain areas of the system that have an elevated risk of third-party damage or have been depressurized for an extended period. Purging and leak surveys can be conducted as part of repressurizing a collapsed system and do not significantly delay relighting customer appliances.

- REL states that FEI's position in the absence of AMI is that the "Distribution will depressurize to zero", but that with AMI "Some or all sections of distribution system can remain pressurized." This is accurate in the absence of the TLSE Project; however, the TLSE Project will delay the need to shut down portions of the system, making it far more likely that some or all of the distribution system will remain fully functioning until the no-flow event is resolved. In any circumstance, once meter valves are closed, appliances will still need to be relit once gas supply is re-established.

- REL says that FEI sees potential to conduct relights "remotely with customer telephone" once AMI is in place. The potential to reopen the automated gas valve remotely still requires someone to relight all downstream appliances in the premises. As discussed in Section 8 below, based on historical experience, FEI expects that a majority of Lower Mainland customers will still need on-site assistance from a professional. As REL later notes, even with AMI "…the relight process may still be as onerous."[19]

[19] REL Evidence, p. 17.

4.3 The Expected Timeline is Longest Before AMI is Implemented

Q14: For clarity, please outline FEI's intended process assuming the absence of AMI's automated meter valve shutoff.

A14: FEI's process assuming the absence of AMI's automated meter valve shut off consists of three overlapping phases:

- **Shutdown (Residential, Commercial and Industrial)**: In the absence of AMI automated meter shutoff, FEI must manually verify that the meter valves at customer premises are closed before repressurizing that segment of the system. Field technicians would attend every meter and use a hand wrench to turn off the meter valve to stop any flow of gas into the premises. The time required to complete this phase is a function of the number of meters, the number of available field technicians, customer geographic density, weather conditions and traffic conditions. Although REL has suggested that these site visits are unnecessary,[20] verification step is a requirement under the GSR.

- **Repressurization:** FEI expects that repressurization would begin approximately three days after gas flow resumes on the T-South system (which is reflected in Figure 1 below). Before repressurization could start, FEI would have started to segment its system into manageable sizes (typically a few thousand customers per segment) and would have turned off the customers in the isolated segments. Repressurization is necessary because, in the absence of AMI, isolated portions of the system will naturally depressurize as customers continue to consume gas. Repressurizing the system would involve:

    - Developing a detailed restoration plan for the sequencing of restoring supply (planning would commence early and concurrently with the shutdown activities). While much of this work has been done during the development of FEI's Preservation and Restoration Plan, there would still be a need to tailor the plans for the specific circumstances of the event.

    - Reintroducing gas sequentially, working from the supply points (gate stations) into sections of the distribution system that are otherwise isolated from the rest of the system by closing existing valves or creating new isolation points. Specific plans would include the sequencing for which isolation valves would be closed and then opened and any need for new isolation points installed (e.g., temporary or permanent physical sectioning of distribution mains). This detailed planning is necessary to ensure that the gasification of the isolated section will not affect the hydraulic integrity of the larger FEI system.

[20] REL Evidence, pp. 30 and 42.

- Checking the system integrity by slowly introducing gas into an isolated segment and monitoring the pressure increase. The larger the isolated segment and the longer that it has been isolated, the greater the probability that its integrity may have been compromised due to third-party damage.

- Purging segments in areas where leaks have been identified or where air in the system is otherwise suspected.

- Conducting leak surveys if the newly pressurized segment does not hold pressure as expected, if there is elevated risk of third-party damage, or if the area has been without pressure for a prolonged period.

These steps occur during the early portion of the restoration timeline and concurrently with the relighting activities that begin following the resolution of the no-flow event and then the successful repressurization of the first segments. The repressurization work is performed segment-by-segment and FEI expects that in many cases repressurizing a segment and purging and leak surveying the same segment are all conducted on the same day.

- **Relights:** As soon as a segment is repressurized, field employees would typically (i.e., unless a significant leak or other operational issue was identified) begin the process of relighting appliances in that segment. FEI would prioritize reconnections to vital community service providers, and then perform the necessary work at other premises in the newly repressurized segment.

Q15: For clarity, please provide a figure showing FEI's expected timeline for the full resumption of service in the Lower Mainland, assuming the absence of AMI's automated meter valve shutoff.

A15: The presence or absence of automated meter shutoffs (associated with AMI) significantly affects the timelines for full restoration of service. Figure 1 below illustrates FEI's expected timeline for the full resumption of service in the Lower Mainland without AMI. This timeline is based on the full staffing availability contemplated in FEI's System Preservation and Restoration Plan, which includes FEI employees and contractors, augmented by local private contractors and significant mutual aid personnel from other utilities.[21] Customer relight productivity rates are at their highest during the first few weeks in Figure 1 as FEI crews address the most readily accessible premises.[22] It assumes (for reasons discussed

[21] FEI's Preservation and Restoration Plan estimates, reflected in the figures above, assume access to resources working 6 days a week and 12 hour days (operations would continue seven days a week, but for safety reasons employees would work six days and then have one day off to recover). Refer to Appendix B for additional details.

[22] As time progresses, FEI's relight productivity rates will decrease. The reason for this decrease is some field resources will have to start driving back to neighbourhoods to complete customer relights that were not completed during FEI's first sweep because some customers were not home.

later) that 25 percent of customers will perform their own relights. It also assumes that FEI is able to proceed with its work without any unforeseen major disruption. .

Key dates in the expected timeline of Figure 1 include:

- Day 1 of the timeline in Figure 1 represents the point when a pressure collapse occurs in the Lower Mainland system. FEI would respond as quickly as possible to try and preserve pressure within the Transmission and Intermediate pressure systems by using valves at gate stations throughout the system.

- Starting on Day 2 (and continuing to Day 3), FEI is planning its resources and creating shutdown work orders.

- Starting on Day 2 (and continuing to Day 7), FEI is confirming the Lower Mainland Transmission Pressure and Intermediate Pressure systems are isolated from the distribution system and retained pressure or are prepared to be re-pressurized. This work ensures that, when gas supply has been restored, the distribution system can be repressurized in sections. Sectionalizing FEI's Lower Mainland distribution system consists of closing main valves and in some cases crimping mains within the distribution system.

- On Day 4, FEI starts to perform customer shutdowns (turning off manual meter set valves).

- On Day 5, it is assumed that gas supply to the Lower Mainland on the T-South system has been restored. Note that FEI would not be ready to begin repressurization work until Day 8 in any event. Also, since the remainder of the work depends on gas supply being available, any delay in the resumption of T-South supply beyond Day 8 would also delay FEI's timeline for restoring service.

- By Day 8, FEI has finished sufficiently sectionalizing the system and completing customer shutdowns at the meterset that some areas of the Lower Mainland system can now start to be repressurized. The repressurization work is performed segment-by-segment and in Figure 1 below, regassifying a segment and purging and leak surveying the same segment are all conducted on the same day.

- By Day 10, FEI has repressurized enough of the Lower Mainland gas system and begins relighting customer appliances in large groups. Relights would continue until Day 72.

Figure 1: Restoration timeline for the Lower Mainland following a T-South no-flow event (prior to the implementation of AMI)

Even in a best case scenario, during the first four weeks, FEI would be closing meter valves (to comply with the GSR requirements), repressurizing segments of the collapsed system, and relighting customers. Prior to the end of Week 5, FEI would expect to have repressurized the entire Lower Mainland system. Relighting the last of FEI's customers would conclude in Week 11. There is a high probably during the repressurization effort, that FEI will have to repair damage to its system so the actual repressurization timeline may exceed the illustrated three and half weeks. Should the effort to repressurize FEI's system take significantly longer for any reason, completion of customer relights may also be delayed.

A Microsoft Excel working model used to derive Figure 1 is provided in Appendix B, and all of the assumptions and inputs are stated. FEI recognizes that an actual event would vary somewhat from the assumptions used; however, the potential for time variances is asymmetrical. That is, although unforeseen events (e.g., identification of major leaks, bad weather, competing demands limiting mutual aid assistance) could cause significant delays in the restoration work, it is much less likely that opportunities for time savings would meaningfully shorten the time required. FEI has performed its own sensitivity testing of the working model (refer to the response to Q36) to test the assumptions and does not foresee any realistic scenario where there could be time savings of the magnitude hypothesized by REL.

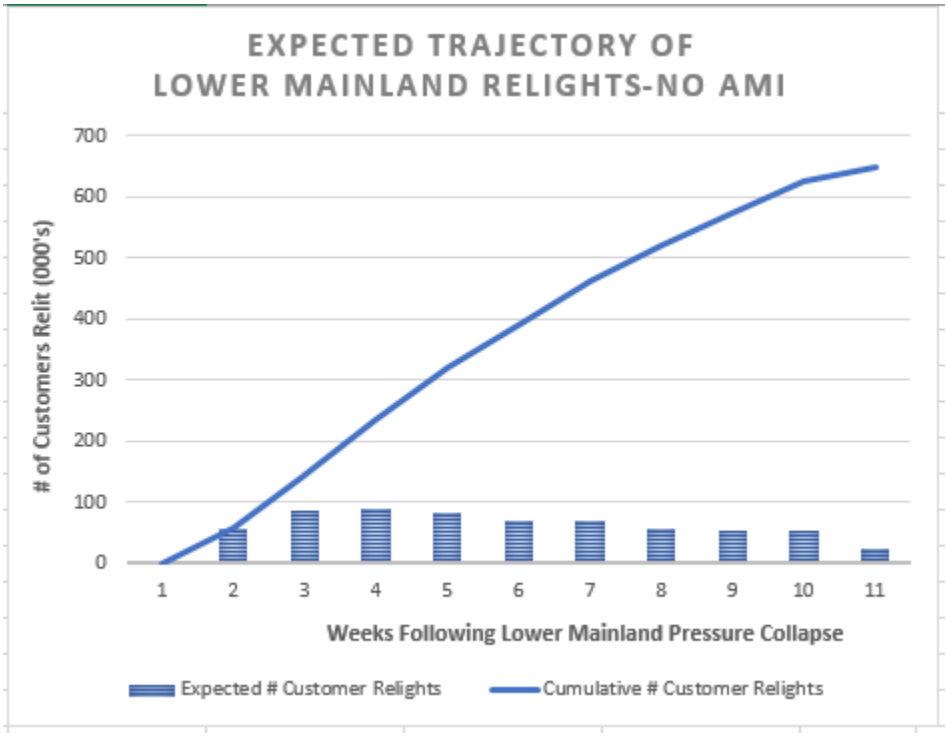
Q16: How does FEI's approach translate in terms of the expected pace or trajectory of relights in the Lower Mainland, assuming the absence of AMI?

A16: The anticipated process discussed above results in a steady increase of reconnections starting soon after partial gas flows resume on T-South system. The expected trajectory of cumulative reconnections in the absence of AMI, based on the same inputs as used in Figure 1 above, is shown in Figure 2 below.

FEI would expect to start to perform relights during Week 2 but expects that it would be resource limited because a percentage of the field resources who are qualified to relight appliances would still be closing meter valves. Once the Lower Mainland system is repressurized (Weeks 2 to 5), the projected 25 percent of customers who may relight their

own appliances are also included in the projected weekly total of customer relights. By Week 5, FEI would have closed all meter valves in the affected areas and the resources that were performing this critical task could now instead join the existing crews conducting appliance relights.

Figure 2: Timeline of cumulative number of customers restored (prior to the implementation of AMI)



4.4 AMI Shortens the Timeline But Full Restoration Will Still Take More Than Two Months

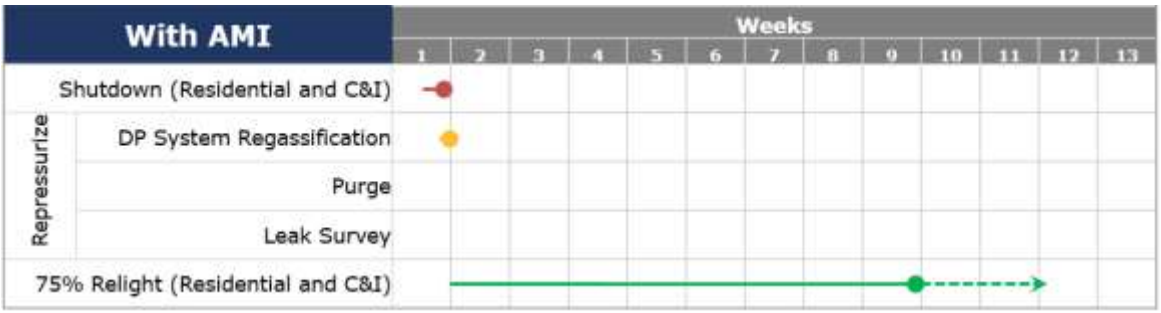
Q17: FEI has sought approval to implement AMI in a separate BCUC process. Please also provide a timeline showing how the introduction of AMI will affect FEI's time estimates.

A17: The implementation of AMI for residential and small commercial customers will reduce aspects of the timeline, as shown in Figure 3 below. During the first week of activities, this timeline uses the same assumptions outlined in the response to Q16; however, AMI in most scenarios will prevent a system pressure collapse such that when gas supply is restored on Day 5, FEI would able to bring the system back into operation during Days 6 to 7. Other resourcing and the percentage of customers that perform self-relights are the same as what is assumed in the response to Q16. Even with AMI, it would still take more than eight weeks from the time FEI starts closing meter valves before restoring service to

all Lower Mainland customers. The timeline would be extended to the extent that there was a delay in resumption of flows on the T-South system.

A Microsoft Excel working model used to derive Figure 3 is provided in Appendix B. Appendix B also contains the assumptions used to determine resource availability and production rates.

Figure 3: Restoration timeline for the Lower Mainland following a T-South no-flow event (after the implementation of AMI)



The main benefits that AMI has on the timeline relate to shutdown and repressurization:[23]

- **Shutdown**: With AMI in place, FEI does not need to physically visit all Lower Mainland premises to confirm the meter valves are closed before turning on the gas supply to an area. FEI would still need to visit "radio off" residential customers and commercial and industrial customer premises to manually close these meter valves, which would take 3 to 4 days to complete.

- **Repressurization**: In most cases, AMI will allow the Lower Mainland system to retain pressure, since closing the meter valves prevent residential customers from continuing to consume gas. "Radio off", commercial and industrial customers would continue to use gas until manually isolated in the shutdown process unless they manually turn off appliances in response to appeals to reduce consumption. Because, in most cases, AMI averts a pressure collapse, the system will retain some pressure; consequently, once gas supply to the Lower Mainland is available again, the repressurization effort will only require a day or two to complete. Repressurization now consists of bringing the system back up to operating pressure and does not include purging or leak surveying.

- **Relighting**: AMI would not materially change the total time for FEI to perform relights, as the closure of the meter valve results in depressurization of the pipes within the customer premises and the pilots in all appliances extinguish.[24] The slight decrease in time required to complete relights in the AMI scenario is a result of being able dedicate all of the qualified field resources to customer relights instead of having to dedicate

[23] Workshop Transcript pp. 158-159.
[24] There would likely be slight efficiencies for those customers that do elect to perform their own relight, because FEI can do a remote dial test for them.

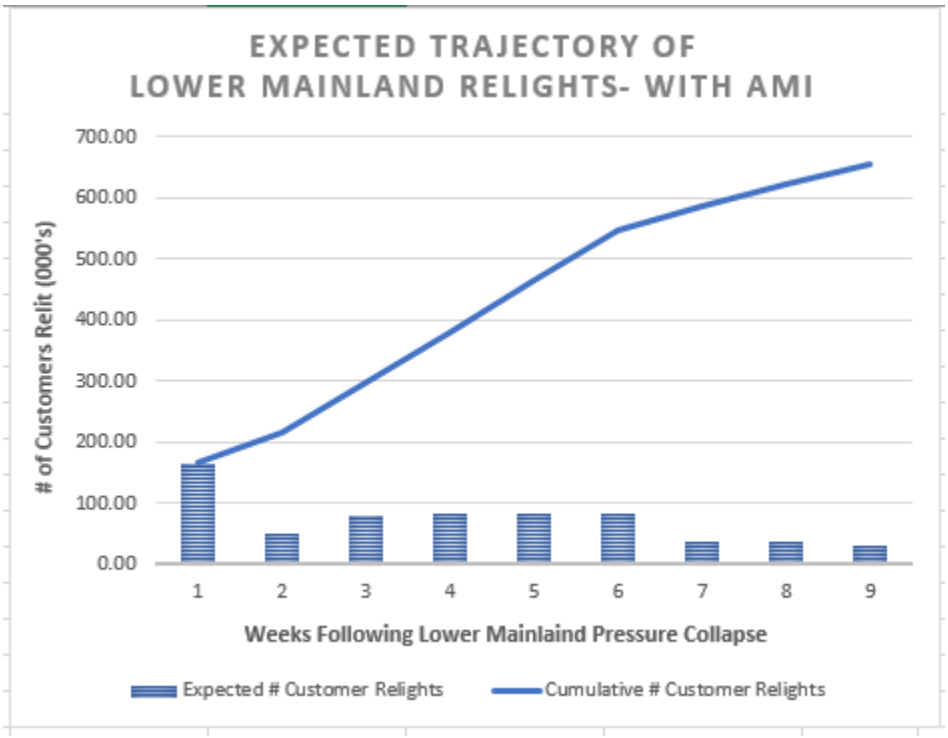
most of these resources to closing meter valves in the early weeks of the "No AMI" scenario (as shown in Figure 1 above).

FEI has performed its own sensitivity testing of the working model (refer to the response to Q36) to test the post-AMI assumptions and does not foresee any realistic scenario where there could be time savings of the magnitude hypothesized by REL.

Q18: How does that process translate in terms of the expected pace or trajectory of reconnections in the Lower Mainland, assuming AMI is in place?

A18: Figure 4 below aligns with the inputs in Figure 3. It illustrates how, with AMI in place, relighting of customer appliances would start in Week 1. A much larger number of customer relights would be completed in that first week because the projected 25 percent of customers who may relight their appliances would likely do so shortly after gas supply to the Lower Mainland is restored. The figure also shows that three weeks after starting customer relights, over 270,000 customers would still be without service. Five weeks after starting relights, over 100,000 customers would still be without service. At best, full restoration of service would only occur eight weeks after FEI starts relighting customer appliances.

Figure 4: Timeline of cumulative number of customers restored (after to the implementation of AMI)



5.0 FEI MUST FOLLOW THE *GAS SAFETY REGULATION* REGARDING METER VALVE SHUTOFF

Q19: With respect FEI's approach of ensuring meter valves are shut off before the section of the system is repressurized, REL states:

> **"The requirement to shut off individual services and then turn them back on appears to REL to be the primary reason why FEI views a 3-day no-flow event as an unacceptable outcome as it would mean a prolonged outage for hundreds of thousands of customers.**
>
> **However, as demonstrated by Centra, a no-flow event can be withstood without turning off every individual service. Avoiding turning off each service also avoids the need to turn each service back on. There is still the issue of completing the relighting process, which is addressed in Section 6.8."[25]**

REL elaborates:

> **"It is not necessary for FEI to shut off individual services in a zero-pressure situation as the individual gas appliance safety features will prevent gas from entering the customer's premises. For manually controlled appliances, customers can be expected to turn off appliances such as cooktops if they stop working while in use. It is not reasonable for FEI to continue a lengthy process to turn off individual customer services once the no-flow event on T-South is over and FEI can repressurize its system."[26]**

Would REL's recommended approach be lawful in British Columbia?

A19: No, REL's recommended approach is prohibited by the BC GSR.

The GSR provides:

> *Division 2 — Installation and Repair Procedures for Appliances and Gas Systems*

[25] REL Evidence, p. 4: "In this evidence, REL explains that FEI does not need to shut off each and every individual service in the event of a no-flow event. This is one of the most significant factors that dictates the timeline for the prolonged outage that FEI states will result from even a short-term no-flow event."

[26] REL Evidence, p. 46.

Turning gas supply on and off

53 (1) A person must not turn off a gas supply unless there is an imminent safety hazard and the person notifies all affected consumers.

(2) If a gas supply has been turned off, a person must not turn the supply on again until the person

(a) notifies all affected consumers, and

(b) carefully checks all outlets and pilots to ascertain that they are relighted or turned off. [Underlining added.]

Section 2(b) of the GSR has implications for both the shutdown, regasification, and relighting processes.

As per the GSR, if the gas supply has been turned off, then FEI must notify the customer before turning the gas supply back on (s. 53(2)(b)) and ensure that no gas flows through to appliances or outlets in premises unless they are checked to ascertain that they are relighted or turned off. In practice this means:

- first isolating customers from a collapsed portion of FEI's system by closing the premises' meter valve;
- regassifying the system and informing the customer that their gas supply will be turned back on (GSR 53.2.a); and
- when the meter valve is opened, the technician (or owner/occupant, if that person opens the valve to perform a self-relight) ensures the premises' gas outlets are turned off or appliances are relit.

As such, in the absence of AMI, any reasonable time estimate for restoration of service in the Lower Mainland must account for site visits to all Lower Mainland customers. Figure 1 above includes time for this step.

Once AMI is in place for residential customers, FEI will be able to use the automated meters to perform this "careful check" remotely. FEI will still need to visit the premises of the approximately 50,000 customers in the Lower Mainland that will not be capable of remote disconnection. As shown in Figure 3 above, FEI has estimated that visiting these customers would take approximately 3 to 4 days as stated in RCIA IR2 36.1.1.

As REL acknowledges in the passage quoted in the question, once the meter valves have been closed—whether remotely or manually—appliances will have to be relit. The relighting process is the most time consuming aspect of service restoration.

Q20: Apart from the requirements under the GSR, what is the rationale for closing meter valves before repressurizing the adjacent system?

A20: Closing meter valves is a critical step to ensure customer and public safety, as described in FEI's responses to the RCIA IR1 8 series of questions. While it is a moot point given that the law requires FEI to act in the way it is planning to act, FEI wishes to elaborate on the safety considerations given how dismissive REL appears to be of FEI's concerns.

If the meter valve remains open, repressurizing FEI's system would result in gas immediately flowing into customer houselines and to individual appliances. There are safety risks associated primarily with faulty automatic shutoffs in appliances, or people leaving appliances with manual shutoff valves in the "on" position when gas ceases to flow.

REL expresses confidence in automatic shutoffs on modern appliances[27] and states that the risk of failure is no different than in the ordinary course.[28] This does not reflect FEI's operating experience. In the ordinary course, FEI encounters many defective appliances (e.g., commercial grills, stoves, hot water heaters, furnaces, and fireplaces) that represent safety hazards. Defects include safety valve failures, such as failure of springs to work under zero gas pressure.[29] There has also been a safety recall on common electromagnetic appliance gas valves that customers either may not be aware of, or may not have addressed.[30]

These types of issues are evident in FEI's historical tracking data for trouble calls involving customer appliances. An FEI technician or gas fitter issues a "Red Tag" when a defective appliance is encountered during a service call or outage; in this case, the owner is prohibited from relighting the appliance until it is repaired or replaced. A "Pink Tag" is issued by a technician as a caution if a defect is found that requires the attention of a licensed gas fitter but does not prohibit the owner from operating the appliance. Figure 5 below shows the Red Tags and Pink Tags registered by FEI technicians for the one year period from October 19, 2020 to October 19, 2021. During this time there were 999 Red Tags and 1557 Pink Tags issued. Over 517 of the defects associated with Red Tags issued by FEI in that one year period (the rows shown in boldface in Figure 5) were related to leaks in customer appliances (320 occurrences), defective control valves (68 occurrences), or pilot safety controls (29 occurrences).

It is important to recognize that many of these appliances are, from any superficial examination, ostensibly functioning properly until the gas is turned off; typically the technical issue is only revealed when FEI's technician attempts to relight the appliance. In other words, the latent failure of an automatic safety device will not be evident during

[27] REL Evidence, p. 33.
[28] BCUC IR1 3.2 on REL's evidence.
[29] In BCUC IR1 3.2 on REL's evidence, REL cites the presence of such springs as a reason for confidence.
[30] Robertshaw Recall of Series 7000 Gas Valves due to valve sticking open after loss of pilot light. https://www.csagroup.org/recall/gas-control-valves-robertshaw-controls-13-04/

normal system operation and appliance usage. It is only once gas supply is restored after having been turned off that the failure of the safety device (automatic shutoff) makes itself known.

Figure 5: Customer appliance Red tags and Pink tags issued by FEI from October 19, 2020 to October 19, 2021

	Tags	Red Tags	Pink tags	Total
Defect	**Total:**	**999**	**1557**	**2556**
	Code Violation	31	27	58
	House Piping	56	182	238
	Venting	76	52	128
	Not specified	0	1311	1311
	Excessive CO in flue	235	0	235
	Improper venting	53	0	53
	Unvented	8	0	8
	Obstructed flue/vent	35	0	35
	Down draft	18	0	18
	Venting deteriorated	17	0	17
	No draft diverter	0	0	0
	Lack of combustion air	28	0	28
	No relief valve	1	0	1
	Defective control valve	**68**	**0**	**68**
	Gas leak in piping	**84**	**0**	**84**
	Leak-appliance connector	**45**	**0**	**45**
	Gas leak at appliance	**291**	**0**	**291**
	No pilot safety/control	**29**	**0**	**29**
	Defective Heat Exchanger	152	0	152
	Plugged heat exchanger	134	0	134
	No limit control	4	0	4
	Defective Limit control	17	0	17
	Condition Other	181	0	181

Note: Due to some tags recording multiple defects found, the sum of the defects found exceeds the number of tags issued.

REL states that "The risk of an appliance valve failing to close is more dependent on whether the customer is home and can detect the leaking gas odour and less on whether the gas system is repressurizing from zero pressure or in normal operation."[31] Further, REL suggests that people can call FEI or 911 and "remain out of their homes for a period

[31] BCUC IR1 3.2 on REL's evidence.

of time until the meter shutoff valve can be turned off".[32] It is true that residents are likely to call FEI or 911 if they smell a gas leak; however, this is dependent on people being present and detecting the gas odours. As one example, following a wide-scale outage, thousands of restaurants in the Lower Mainland would be closed (due to a lack of gas to operate their appliances) such that no one would be present to detect leaking gas. Further, there are many vacant or unoccupied homes in the Lower Mainland in the ordinary course. It is reasonable to expect that the number of vacant homes would be higher in circumstances where occupants have no heat, since in cold weather they can be expected to move to another shelter where heat is available. In much of the Lower Mainland, people live in high-rise condominiums and apartment blocks where the failure of one customer to turn off a cooktop could have significant impacts on the entire building.[33] FEI intends to mitigate these risks by following the process mandated by the GSR, and ensuring that meter valves are off before repressurizing the adjacent portion of FEI's system.

REL states that it is unaware of the prevalence of old appliances with no shutoff valves in BC, and says "[if] FEI is aware of the existence of appliance valves in its service territory that do not automatically close the gas supply when the pilot goes out, then FEI should have a plan to address these valves." FEI does not have that data either, nor is there any reasonable means for it to collect this data from its over one million customers—and to ensure that it is up to date and accurate at all times (customers routinely replace their appliances). Under the BC regulatory framework, FEI advises the customer and BC Safety Authority if FEI technicians identify such appliances during service calls, but the BC Safety Authority oversees customer appliances more generally.

A non-exhaustive list of appliances that typically have manual shutoffs include many commercial grills, residential stoves and barbeques, Bunsen burners and gas valves in educational and research labs, welding torches, and small process kilns. REL downplays the risk that occupants will leave manual valves on when gas ceases to flow to the premises during the shutdown, stating that "[a] customer acting reasonably would not leave the cooktop in the "on" position if the flame was extinguished."[34] REL also cites the potential to provide safety messaging, including warnings to be vigilant for the smell of gas and the need to shut individual appliances such as cooktops and barbeques off." Certainly, in the event of a supply emergency, FEI will be ready with the type of safety messaging that REL contemplates. However, FEI does not regard messaging as an equal substitute for shutting off the meter valves as contemplated in the GSR:

- First, FEI believes it is unreasonable to expect that FEI's hundreds of thousands of affected customers will unfailingly act in the manner that REL characterizes as being rational. FEI and contractors performing service calls do, from time to time,

[32] Ibid.
[33] During one inside leak investigation, the responding FEI technician noted gas readings at an electrical outlet. Punching holes in the drywall to trace gas readings eventually revealed the source to be a neighbour that had left a cooktop on (and not lit) creating a gas odour. This investigation spanned a 12 hour period.
[34] REL Evidence, p. 28.

find appliances being left in the open position when gas service to a premises has been disrupted. As an additional illustration of the potential for human error or even irrational behavior when it comes to safety: the US National Fire Protection Association (NFPA) reports[35] that leaving cooking equipment unattended is a factor in one-third of cooking fires, despite the self-evident risks of doing so.

- Second, messaging directed at customers to enable them to safety manage their appliance relighting assumes a basic level of understanding on the part of customers as to the location and nature of their appliances. It is not uncommon for customers (particularly elderly customers or more vulnerable populations) to be unable to identify gas appliances in their own premises when FEI personnel perform service calls; it follows that these customers may be unable to ascertain that all outlets and pilots are relighted or turned off. FEI also contends with language barriers, since there are a large number of languages spoken in the Lower Mainland.

- Third, people must also be present in their premises to respond to the message, leaving travelers or otherwise absent occupants vulnerable.

For all of the above reasons, in the context of an outage that could impact hundreds of thousands of Lower Mainland customers with hundreds of thousands of appliances, FEI would not indiscriminately restore gas service to customers based solely on REL's assumptions about automatic valves and customer behavior. FEI's policy (which is compliant with the GSR) is for meter valves to remain closed until someone (an FEI technician, gas fitter, or the customer/occupant) is present in the customer premises and ready and able to relight appliances or identify problems. FEI intends to comply with the GSR at all times.

[35] https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Fire-causes/oscooking.pdf.

6.0 ADDITIONAL RESPONSE TO REL REGARDING LEAK SURVEYS

Q21: REL states with regard to leak surveys:

> **"In REL's view, it is unreasonable for FEI to hold off re-establishing service to its customers once it has restored pressure to the distribution system. It would certainly be difficult to explain to customers that they must wait additional days, weeks, or months for FEI to complete leak surveys before allowing them to restore gas service. In fact, FEI may run into a situation where customers fail to wait and reactivate their own services while FEI continues its leak surveys."[36]**

Is this a realistic scenario?

A21: No, REL's comments are based on a misunderstanding of FEI's process. There is no circumstance in which FEI would first repressurize the entire system and make customers "wait additional…weeks, or months for FEI to complete leak surveys before allowing them to restore gas service."

Under FEI's System Preservation and Restoration Plan, repressurization, leak surveys and relights would occur in parallel, on an area-by-area basis. As FEI stated in response to RCIA IR1 8.12, "While FEI crews continued to safely repressurize remaining sections of the collapsed system, FEI would have other dedicated groups of employees working in parallel, relighting customers connected to sections of the system that are safe to resume operation." As a result, in many circumstances (particularly in the initial weeks of the restoration process), there would be little time between a specific area being repressurized and FEI visiting customer premises in that area to perform relights.

Q22: To what extent is FEI's approach to leak surveying extending the duration of fully restoring service to Lower Mainland customers?

A22: Leak survey work would occur in parallel with customer relights and can be completed much faster than the relighting of customer appliances. As such, theoretically dispensing with leak surveys altogether would only affect the overall time to fully restore service in the Lower Mainland to the extent that personnel responsible for leak surveys and purging could be reallocated to relight activities. However, even before AMI, this represents only a very small percentage of the personnel (likely less than 5 percent). Once AMI is in place, the percentage of personnel performing leak surveying would be even smaller, as FEI will have been able to maintain pressure on much of the system. In other words, REL's

[36] REL Evidence, p. 39.

recommendation to do away with leak surveys would not reduce the time estimate for full restoration of service to mere days as REL seems to anticipate.

Q23: REL states: "There is no need to conduct leak surveys to prove the integrity of the system, and in fact such leak surveys can only meaningfully take place once the distribution system has been repressurized."[37] Can you comment?

A23: FEI is already contemplating that the integrity of the system is verified, in the first instance, by determining whether an isolated area of the system is holding pressure as expected as gas is being reintroduced. The pressure check would reveal large leaks, such that in the event that the system is holding pressure as expected FEI may be able to begin relighting almost immediately while another crew conducted a leak survey in parallel. A failed pressure check may delay relight activity in a specific area until the cause is identified and isolated. Evidence of active high risk construction activity may delay relights in an area briefly, but relight crews are unlikely to remain idle. In addition, as FEI proceeds through the Lower Mainland area-by-area, the later areas will have been depressurized for some time. In such cases, FEI could end up surveying most or all of the system within these areas, although if the pressure check has passed these surveys would not hold up relighting activities.

To the extent that REL is suggesting dispensing with leak surveys altogether regardless of the outcome of the pressure check and level of construction activity, FEI would strongly oppose this in the interest of public safety.

Q24: REL provides the following recommendations in lieu of FEI performing leak surveys:

> **"To minimize the risk of this [i.e., third-party damage to depressurized lines], there are steps that FEI can take. The most meaningful way to minimize this risk is to minimize the time that the system is unpressurized. FEI appears to agree with this based on its decisions to not leak survey its systems in prior zero-pressure events. Secondly, FEI can proactively contact excavators and especially directional drilling contractors and warn them of the risk of contacting its pipelines, and recommend that they cease excavation operations until the system is restored. To limit the number of contractors FEI must contact, an option is for FEI to work with the B.C. One Call centre to identify those contractors with open or recent tickets and to**

[37] REL Evidence, p. 46.

contact them. FEI can develop processes ahead of time to facilitate such mass communications."[38]

What is your response?

A24: As described in Section 4 above, FEI's approach would be to repressurize successive areas of the system as quickly as safety permits and FEI's available resources allow. The timelines in Figures 1 and 3 above, which reflect the staffing and approach reflected in the System Preservation and Restoration Plan, already reflect the self-evident need to restore service as quickly as possible.

FEI recognizes the benefit of public messaging and outreach to reduce the risk of third-party damage. FEI already invests in advertising campaigns regarding "call before you dig", and outreach would increase during a supply emergency. However, FEI regards it as impractical to expect all developers, owners and construction companies in the Lower Mainland to cease excavation altogether. As noted previously, there will be large portions of the Lower Mainland that will wait weeks before being fully repressurized.

With respect to targeting directional drilling contractors specifically, there are many other ways to unknowingly damage a depressurized gas system. FEI's system can be damaged through activities such as curbing and forming for concrete (where the contractor inadvertently hammers in rebar or stakes into the gas line), or digging fence posts and sign posts (see Photo 3 below for stake damage). FEI's steel service lines in the Lower Mainland include a compression coupling that can be pulled apart unknowingly by excavator activity. These are just some examples that would not be captured by REL's suggestions. In fact, most of the damage to FEI's system is related to the use of backhoes, excavators and hand tools, not directional drilling.

Photo 3: Service Line Puncture from Stake

[38] REL Evidence, p. 39.

While a mass communication plan could be developed by FEI and communicated to drilling contractors, excavation contractors, etc. by collaborating with BC 1 Call, there is a considerable issue with people who already fail to adhere to proper protocols and construction techniques.

FEI experiences, on average, approximately three reported damage incidents each day system-wide. FEI's damage statistics also show that, on an annual basis, approximately two-thirds of the damages to FEI's system are committed by third-parties who have not obtained a BC 1 Call ticket and locate information, despite a legal requirement to do so. As such, REL's suggestion for FEI "to work with the BC 1 Call centre to identify those contractors with open or recent tickets and to contact them" would have little effect on reducing system damages caused by the vast majority of people who damage FEI's system.

Further, in FEI's experience, even with a live and pressurized gas system, damages occur that are not reported with the incident location left in an unsafe condition. An instance where a contractor tried to hide line damage is shown in Photos 4 to 7 below. Photos 8 and 9 below also illustrate actual discoveries by FEI of attempted makeshift repairs during previous damages to its system. FEI expects that with an unpressurized system the likelihood of unreported incidents would only increase.

Photos 4 to 7: Attempts by Contractor to Conceal Damage to Gas Line[39]

[39] The first photo shows gas line damage in Chilliwack, BC in May 2022. The contractor backfilled after damaging the pipe and left the site. Gas travelled underground with 100 percent volume detected in BC Hydro ducts and 28 percent volume in storm drains causing multiple home evacuations. Thus, the BC Hydro ducts (containing live electrical cables) in the vicinity were fully charged with escaping natural gas, which is an obvious safety hazard in the presence of live electrical equipment.

Photos 8 and 9: Makeshift Repair Attempts by Contractors In An Effort to Conceal Damage to Gas Lines

7.0 ADDITIONAL RESPONSE TO REL REGARDING PURGING OF THE SYSTEM

Q25: REL states in the Executive Summary that, by closing the isolation valves at the inlet to the Coastal Transmission System at Huntingdon station, FEI can "…isolate its system from the upstream T-South system and avoid the possibility of air entrainment from the T-South rupture."[40] Can you please comment?

A25: As discussed in the response to Q8 above, FEI's planned restoration response, including purging, is driven by concern about air entrainment from sources on FEI's own system, not concern about air entrainment from an upstream T-South rupture entering FEI system.

FEI would close the isolation valves at Huntingdon station before pressure on T-South was reduced to zero, and Westcoast would do the same on their system, which would prevent air entrainment from the rupture itself; [redacted]

Q26: REL states in its Executive Summary: "Since the no-flow event is expected to be over in a matter of one to three days, the risk of air entrainment in FEI's own [system] is negligible."[41] What is your response?

A26: FEI agrees in principle that, where there is only a short period of depressurization (for example, a single day), the risk of air entrainment in to FEI's system is reduced. The two prior outages on FEI's system discussed in the response to RCIA IR2 32.1 are examples of short-duration (one day) outages where that risk of third-party damage was minimal, thus avoiding the need to perform any purging. As explained previously, it is not credible to suggest that a T-South no-flow event during the winter would result in a one to three day disruption to Lower Mainland customers.

As explained in the response to Q15, it would take weeks to manually close meter valves in a larger or system-wide outage before the implementation of AMI. Because AMI will greatly shorten the duration to close all meter set valves, this will effectively eliminate the potential for air to enter FEI's system from residential premises. Nevertheless, even after AMI is implemented, (as shown in Figure 3) it will take three to four days to turn off commercial customer meter valves. Portions of the system with more commercial customers will continue to have some risk of air entrainment because of potential above ground leaks.

[40] REL Evidence, p. 4.
[41] REL Evidence, p. 4.

Q27: REL states: "There is no need to purge the entire distribution system; local purging of pipelines is only required where there is an obvious breach of the pipeline."[42] Can you please comment?

A27: FEI does not expect that it will be necessary to purge its system entirely, but would do so in locations where there appears to be an elevated risk of air entrainment in the system.

In the response to Q24 above, FEI discussed situations where breaches of the pipeline will not be "obvious" while the system is depressurized (including willful or inadvertent reburial). FEI thus believes that purging is appropriate where there is an elevated potential for third-party damage based on the type of construction or work activities being undertaken in the vicinity.

Another potential source of air entrainment in depressurized portions of FEI's system is faulty customer appliances or appliances left on. FortisBC residential regulators fail open during a depressurized event; therefore, there is a path for air entrainment/displacement from the customer's gas service. The risk this represents in the absence of purging will depend on how long the system is depressurized before the meter valve is closed. It is unlikely to be an issue where only residential AMI meters are present, but it may be an issue where there are manual meter valves present that took several days to close.

As previously cited in the response to RCIA IR1 9.1, the Winter 2016 edition of *The PEG*, published by the Association of Engineers and Geoscientists of Alberta (APEGA) included an article on the aftermath of the Fort McMurray fires in 2016 and ATCO's restoration of service.[43] With respect to purging, the article stated:

> Before service could be restored, gas lines needed to be purged to ensure there was no air in the system. To purge a system, gas is flowed through the pipelines to push out the air. This is done at various end points in the system, usually at homes or gate stations. Service valves had to be shut off at all homes and businesses.
>
> ATCO suspected there would be mostly gas in the pipes with only a small amount of air. "What we found was a lot of air and a little bit of gas. Which meant the entire system had to be purged," says Mr. Carter.

As such, when faced with an extended outage, FEI would prepare to purge extensively until such time as the evidence specific to the incident supports that the purging of the system could be reduced.

Q28: REL downplays the risk of third-party damage, stating: "Again, in the context of air entrainment when the system is at zero pressure, REL is of the view that it would

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[42] REL Evidence, p. 46.
[43] https://online.flippingbook.com/view/874501/52/.

require a large, hazardous leak to be in existence prior to or at the time of reaching zero pressure. Such a leak would be highly noticeable in the urban and developed areas of the Lower Mainland when the system is under pressure."[44] Do you agree?

A28: No. This statement overlooks the potential for third-party damage to occur after the system is at zero pressure.

When the gas system is at zero psig and is damaged by a third party, they may or may not realize that they hit a gas line. They may briefly detect a small amount of odourant from the residual gas, but with no gas blowing (because there is no pressure in the system) there is also no clear indication that system damage has occurred. Thus, without realizing that they hit the gas system, a damager may cover the system in its damaged state, allowing water, air, etc. to enter the system and form an explosive air/gas mixture or non-combustible slug of air within the gas system.

REL acknowledges the potential for an unnoticed horizontal directional drilling (HDD) strike to go unnoticed;[45] however, as discussed in the response to Q24 above, HDD is only one type of ground disturbance activity. Other causes of the hundreds of system damages FEI experiences every year include:

- Stakes and/or rebar used for concrete curbing and forming;
- Residents and contractors installing fence posts;
- Excavators operating heavy machinery;
- Homeowners and landscapers clearing and planting gardens;
- Surveyors driving in stakes or iron pins; and
- Realtors driving signposts into the ground.

Once a gas line is damaged, it is impossible to tell how far the air has infiltrated. It is unsafe to have an explosive air/gas mixture or slugs of non-combustible gas (air) in the system, and to have it flow to customers' premises. Hence, when FEI is aware of high risk activity in the vicinity, FEI will typically purge the nearby mains, service lines, and customer houselines.

REL has not acknowledged the potential for multiple third-party damages to be detected and reported all at once following the repressurization of the system. FEI technicians and emergency responders across the Lower Mainland would have to respond to multiple near-simultaneously reported gas leaks. This would further impair FEI's restoration capabilities which may already be resource constrained.

[44] CEC IR1 1.2 on REL's evidence.
[45] CEC IR1 2.1 on REL's evidence.

Q29: Regarding the potential sources of air entrainment from a customer premises, REL states:

> **"A furnace with electronic ignition can open its valve to the burners during a start attempt, which effectively opens the system and allows gas to escape. If several start attempts are made, the gas in the house line can dissipate. Or, a homeowner may try to light their pilot, not realizing that the service to the house is shut off. There may also be a mix of appliances within the home that have pilots and electronic ignition which have tried to light when the meter valve was shut off."[46]**

Can you please comment?

A29: FEI agrees that air in the customer's houseline is a result of an appliance attempting to relight while the gas pressure in the houseline has collapsed. When a system is collapsed, and the meter valve is open, the houseline pressure will also be collapsed. As REL states, during this situation, when an appliance attempts to relight, air will instead enter the houseline and possibly migrate into FEI's system. This possibility will continue until the meter valve is closed or an appliance locks out and the gas safety valve does not allow air to enter the houseline.

Q30: In response to the potential for air entrainment from manual valves on customer appliances being left on, REL states:

> **"While it is plausible, for air to enter the system this way gas must still leak out. The gas will be odourized and provide an indication to the customer to take action: i.e. to turn off the burner. FEI can also undertake public messaging – which will be essential for several reasons during such an emergency as a no-flow event – to remind customers to turn off gas appliances such as stoves and barbeques."[47]**

Can you please comment?

A30: REL appears to be relying heavily on the assumption that every person within the Lower Mainland would take heed of public messaging and would be present within their premises to monitor and attend to gas odour issues diligently. FEI agrees that the significant majority of customers and member of the public could be expected act responsibly, and many would be present to detect and report leakage. However, REL does not appear to

[46] REL Evidence, p. 36.
[47] REL Evidence, p. 37.

recognize that, given the vast number of premises involved in Lower Mainland outage scenario, that even a small percentage of customers diverging from normal expectations could create a concerning number of potential safety incidents. Further, REL does not appear to fully acknowledge that the risks associated with a wide-scale event are significantly different from the smaller examples provided in their submission. For example, a significant number of customers in such an extended event would likely not be occupying their premise for the duration of the event and may not be present to detect gas odours that indicate a hazardous gas concentrations may be accumulating or already exist.

Q31: REL also states:

> **"Furthermore, air in house lines is not the significant safety issue that FEI claims. When relighting such appliances, these lines are effectively purged back into service through the pilot flow or through electronic ignition start cycles. Practically, the person performing the relight must hold the pilot actuator for a longer period of time until gas reaches the ignitor, or an appliance like a furnace with electronic ignition must cycle multiple times before it starts."[48]**

What is your response?

A31: REL's characterization of the risk is consistent with a normal localized shutdown but is under representing the additional possibility of larger amounts of air entering FEI system as a result of the extended nature of the much larger outages considered here. FEI is concerned that air in FEI's system could move into premises previously successfully relit snuffing the appliance pilot and leaving the customer premise reliant on proper functioning of the safety. This creates a similar situation to re-pressurizing against an open meter valve (which FEI would not do) although it would affect a smaller population of premises.

Q32: In any event, to what extent is purging portions of FEI's distribution system contributing to the total expected time to fully restore service in the Lower Mainland?

A32: The time that FEI estimates would be required to perform targeted purging is already reflected in the timelines in Figures 1 and 3, and purging activity does not contribute materially to the overall time to restore service to the Lower Mainland irrespective of whether AMI is in place. Purging work is occurring in parallel and can be completed much faster than the relighting of customer appliances. As such, theoretically dispensing with purging altogether would only affect the overall time to fully restore service in the Lower

[48] REL Evidence, p. 37.

Mainland to the extent that personnel responsible for purging could be reallocated to relight activities. As discussed in response to Q22 above, reallocating the small number of personnel responsible for purging would not reduce the time estimate for full restoration of service to mere days as REL seems to anticipate.

Q33: Is FEI anticipating also purging the customer's in-premises pipes (downstream of the meter valve) when it conducts relights?

A33: Yes, the discussion above relates to purging of FEI's own system. Purging the customer's houselines of air once the customer's meter valve is opened is a normal process that a technician undertakes when relighting the premises' appliances, and is factored into the relighting time in FEI's System Preservation and Restoration Plan and in Figures 1 and 3. After a prolonged system outage, there likely will be air in the premises' houselines so the technician would first relight the gas cooktop if available.[49] If entrained air causes a flameout the technician will identify this, relight the cooktop and restart the purging process until the appliance remains lit. If a cooktop is not available, the technician would relight the premises' hot water tank and ensure all the air in the houselines is purged before continuing to relight the remaining appliances.

If this houseline purging process is not completed properly, air will remain in the houseline and could cause an appliance to flameout. If the appliance's gas safety valve fails and allows unignited gas to flow out of the appliance a safety issue will occur and could result in a fire or explosion.

[49] A cooktop is an ideal choice to purge a customer's houseline of air because a cooktop can be manually left in the 'on' position.

8.0 MANY CUSTOMERS WOULD OR COULD NOT RELIGHT THEIR OWN APPLIANCES

Q34: REL agrees "that relighting tens or hundreds of thousands of customers is a monumental task."[50] One of REL's main recommendations to shorten the time required to restore service across the Lower Mainland is to educate customers about relighting their own appliances, although REL acknowledges that, regardless: "REL expects that FEI will still need to employ an "all-hands-on-deck" approach to completing relights as many customers will not be comfortable performing them."[51] What is your response?

A34: FEI agrees with REL that some customers would be willing to perform relights on their own, but that many customers would not be comfortable or able to do so. FEI's time estimates in Figures 1 and 3 above already assume that 25 percent of Lower Mainland customers will perform their own relights.

Q35: Why does FEI assume in its analysis that 75 percent of customers will require assistance with relighting appliances?

A35: FEI's experience and data supports that the vast majority of customers require assistance relighting appliances when FEI restores service to a premises after outages due to a local gas emergency, lock-off, or routine meter exchange. FEI has assumed a lower percentage of only 75 percent of customers requiring assistance in Figures 1 and 3 based on the expectation that some customers might be more inclined during a wide-scale outage to overcome personal hesitancy if they have been without gas service for some time already.

FEI considers this assumption to be reasonable, and there are two reasons why FEI is cautious about making more aggressive assumptions regarding the number of customer who would relight their own appliances. First, as REL recognizes, a certain portion of the customer base would be unable to perform the work (e.g., elderly or disabled individuals), and many people would be very hesitant about reigniting gas appliances on their own. Second, since the system will be repressurized on an area-by-area basis concurrent with FEI's crews visiting individual premises, customers in the earlier areas being regasified would save little time by performing their own relights rather than waiting for a crew in the neighbourhood to reach them. FEI believes it would be highly unrealistic to expect that the majority of the hundreds of thousands of Lower Mainland customers would undertake that work themselves even with published instructions.

[50] REL Evidence, p. 42.
[51] REL Evidence, p. 45.

Q36: Please provide a sensitivity analysis showing how FEI's estimated time to relight appliances in the Lower Mainland would be affected by some customers (with or without AMI) being willing and able to perform their own relights.

A36: Figure 6 below provides the requested sensitivity analyses, with and without AMI. AMI accelerates the timeline because, with AMI, some FEI field employees that would have normally been devoted to meter shut offs can instead be allocated to relights. The calculations are performed on the basis as Figures 1 and 3 above.

As indicated previously, FEI considers it to be highly unrealistic to plan on the basis that a majority of customers will perform relights on their own. Regardless, the sensitivity analysis shows that it would still take weeks or months to restore service to all Lower Mainland customers. Even the highly improbable assumption of 75 percent of customers relighting their own appliances would leave FEI with over 160,000 customers requiring assistance to relight their appliances. This unrealistic scenario is still over 40 times larger than the Otterburne outage cited by REL.

Figure 6: Sensitivity Analysis of Full Restoration of Service Times Assuming No AMI, With AMI and a Portion of Self-Relights

Assumed % of Lower Mainland Customers Performing Self-Relights	Remaining Number of LML Customers Requiring FEI Relight Assistance	No AMI- Estimated Duration to Fully Restore Service to LML Customers	With AMI- Estimated Duration to Fully Restore Service to LML Customers
25% (base case)	489,000	72 days	61 days
50% (aggressive)	326,000	55 days	44 days
75% (unrealistic)	163,000	37 days	27 days

Q37: REL notes that some newer appliances have the ability to automatically relight once gas flow resumes in the premises.[52] Can you comment on how that affects your estimated time line?

A37: There are many appliances in use in the Lower Mainland that predate 2010 when electronic ignition was mandated for new high-efficiency furnaces. The existence of these older furnaces has been observed by FEI technicians during the normal course of business when appliances require relighting following routine meter exchanges. It is possible that the relatively mild climate of the Lower Mainland region allows older low- to mid-efficiency appliances to continue to provide reasonable levels of heat without being excessively costly to operate. As such, customers in this region may not have the same incentives to upgrade to more modern high-efficiency equipment than customers in the colder Interior and Northern regions of BC (or the Otterburne region of Manitoba, for that matter). In the absence of data that confirms otherwise, FEI assumes that there are likely

[52] REL Evidence, p. 46.

thousands, or tens of thousands, of furnaces which have standing pilots, and hence would require relighting following a gas outage.

Regardless, FEI has confirmed both through discussions with equipment manufacturers, and through its own testing of typical equipment, that electronic ignition appliances will likely not perform as described by REL in its submission. This is because in most cases, appliances with electronic ignition will automatically "lock out" for safety reasons when they attempt (and fail) to automatically light during the period while gas supply to the customer is disrupted.[53] This lock-out condition will persist indefinitely, even after gas supply is restored to the appliance. This expected behaviour requires action on the part of the customer or occupant to reset the appliance. In some cases, this reset can be accomplished by cycling the power to the furnace; some vendors have indicated that the lock-out can only be reset through the appliance control panel. Given this behaviour, FEI expects that many customers will either be incapable or uncomfortable with resetting appliances on their own to clear the lock-out, and hence these customers will still require a technician to visit their premises for assistance.

Q38: REL provides a number of other recommendations on pages 42 and 43 for work that FEI can potentially do in advance to expedite the relight process. Can you comment?

A38: FEI provides the following responses to these other recommendations.

- **"A web portal where customers can enter their relight status."**

While it is conceivable to develop a web portal, develop an app, and operate a phone line (REL proposed the latter two channels in a subsequent IR response)[54] that could allow customers to provide FEI with the relight status of their appliances, FEI does not believe these would be utilized by customers to make an impact on the amount of time it would take to restore service to FEI's Lower Mainland customers.

First, as described previously in Section 4.4, in the absence of AMI there may be little time between when pressure is restored to an area and when FEI's crews visit the premises. FEI field technicians will still end up going to customer's premises only to learn at that time the appliances have been relit.

Second, as described previously in the response to Q35, FEI's experience with its customers suggests that few of the projected 25 percent that will relight their own

[53] During an extended gas outage in cold weather the temperature inside buildings would begin to drop. Once the temperature in the building drops below the thermostat setpoint, the thermostat would automatically signal the furnace to start up. Since there is no gas supply to the premises, the furnace will fail to ignite and the automatic control will go to lock-out.

[54] BCUC IR1 4.4.1 on REL's evidence.

appliances. It is even less likely they would consistently update FEI as to their relight status. It is typical for customers who relight their appliances after a meter exchange (change and leave off) or an emergency outage not to advise FEI.

Third, managing appliance relights in the manner REL suggests in the context of a Lower Mainland-wide outage would be extremely challenging. During a gas emergency of this magnitude, FEI's finite resources will be fully consumed issuing field work orders and providing support to field employees. Continually revising job packages to be issued to the field on a daily basis would be impractical.

In summary, these offerings would consume significant resources to develop and maintain, the offerings would likely not be utilized, nor does FEI expect to achieve the time savings REL is hypothesizing.

- "**Establishment of priority relights, such as hospitals, care homes, communal living facilities, etc.**"

FEI already has a process for identifying critical customers of this nature for priority restoration of service following outages.

- **"Establishment of priority geographic areas for relights based on the likelihood that these areas have older furnaces without electronic ignition or where it may be less likely that customers are willing or able to conduct their own relights."**

- **"Identification of customers who have furnaces and other appliances with electronic ignition so that these customers can be prioritized lower for relighting."**

FEI does not maintain a database on the age or type of its customer appliances. FEI would be limited to considering the age of the service that provides gas from FEI's gas main to the customer's premises; however, this would not give a true indication of the age or type of appliances in each premises as these can be replaced at any time subsequent to the installation of the service line.

Managing the effort to relight FEI's customers in the manner REL suggests would be extremely challenging. During a gas emergency of the scope and scale contemplated to occur in the Lower Mainland, FEI will be resource constrained just to issue work orders out to field crews and provide them with proper support. Expecting FEI's technicians to traverse the Lower Mainland so the next prioritized area or customer is relit will result in a very inefficient effort, in terms of overall restoration time for the Lower Mainland. Instead, the methodical, sequential approach as stated in FEI's System Preservation and Restoration Plan is the best and most efficient approach to relighting the highest number

of customers in the shortest amount of time. The System Preservation and Restoration Plan also prioritizes customer relights by customer classification (critical or non-critical customer) and by how long a segment's gas pressure has collapsed.

9.0 CENTRA'S EXPERIENCE IS INAPPLICABLE IN THIS CONTEXT

Q39: REL says in Section 5.5:

> **"Absent from Centra's service response to the no-flow incident were the following steps or activities which FEI states it must complete when shutting down and restoring its system:**
>
> - **Shutting off each residential customer's meter shutoff valve**
> - **Verification that each residential customer's meter shutoff valve is closed**
> - **Leak surveys**
> - **Purging the distribution system with nitrogen and natural gas to remove air**
> - **Purging each customer's piping to remove air"**

What is your response?

A39: FEI is unable to comment on the regulatory framework in Manitoba and has not verified REL's description of Centra's process. However, leaving meter valves open before repressurizing would be prohibited in BC by the GSR.

According to REL in its response to BCUC IR1 2.2 on its evidence, Centra did close some restaurant meter valves. The reason REL provides is that "REL understands that not all commercial appliances have automatic shutoff valves, such as commercial cooking appliances. Hence, it was important that commercial services to restaurants were shut off." In fact, there are a number of types of commercial appliances that have no automatic shutoff valves. Residential stoves and gas barbeques do not have automatic shutoffs either. REL did not specify how prevalent these appliances are in the area of the Otterburne outage, but FEI is confident there would be thousands to tens of thousands more of them in the Lower Mainland. FEI would not know which premises have these appliances, and which do not, at any given time.

REL states, citing Centra's approach to the Otterburne rupture: "In REL's view, a no-flow event on the order of several days need not cause a long-term outage because FEI does not need to undertake the proposed time-consuming activities such as leak surveys and purging the system of air in order to safely restore service to its customers."[55] Based on how REL has described the Otterburne event, the Otterburne situation differed significantly from the type of outage FEI could expect in the Lower Mainland. FEI

[55] REL Evidence, pp. 3-4.

understands why Centra might not have performed a leak survey in their specific circumstances. Indeed, FEI likely would have made the same determination in Centra Gas' circumstances with respect to purging and surveys for the following reasons:

- The outage was contained to a small geographic area, with limited gas distribution infrastructure;
- The area was predominantly rural, with limited development activity;
- The outage was fully resolved, with service fully restored, within 63 to 73 hours; and
- It occurred mid-winter during extreme sub-zero temperatures (CBC reported at the time that it was minus 20°C, or minus 34°C with wind chill),[56] which is not conducive to outdoor activities such as ground excavation.

FEI repressurized a small part of its own system in 2018 following the T-South Incident without performing a leak survey. This is because it was a small area, largely rural, without active construction activities and following a relatively short outage.[57] The same is true for the other short duration limited-scope outage referenced in RCIA IR2 32.1.

In contrast, an outage in the Lower Mainland following a no-flow event on T-South would have the following characteristics:

- The outage would affect a very large geographic area with thousands of kilometers of gas lines;
- The area is predominantly urban, and portions are experiencing significant construction projects and development;
- The construction season is year-round; and
- The length of the outage is also necessarily going to be significantly longer than the Otterburne event because of the number of customers requiring restoration.

The relative levels of construction activity in the Eastman area (the approximate geographic region in Manitoba impacted by the Otterburne outage) versus the Lower Mainland region are illustrated by the number of locate requests received (Figure 7 below) and system damages (Figure 8 below) for the respective areas.[58] Of particular note is that there is a significant drop (an approximate 75 to 80 percent difference from high and low)

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[56] https://www.cbc.ca/news/canada/manitoba/natural-gas-pipeline-explodes-near-otterburne-man-1.2510873#:~:text=A%20fire%20is%20out%20after%20burning%20for%20more,where%20temperatures%20dipped%20to%20near%20-20%20C%20overnight.

[57] Salmon Valley is a small system in the Prince George area fed from the Westcoast system. It was isolated after the rupture. It has one small station, about 100 customers, about 8.9 km of 60mm and 42mm distribution pressure mains.

[58] FEI obtained the relevant data from Manitoba Hydro.

in locate requests during the winter months in the Eastman area of Manitoba. In contrast, excavation work continues at significant levels throughout the year in the Lower Mainland (the number of locate requests illustrates a much smaller 30 to 40 percent difference from high to low throughout the year). Further, the number of system damages is also significantly lower during the winter months in the Eastman area, whereas the number of damages to FEI's Lower Mainland system remains relatively steady throughout the year.

Figure 7: Underground Locate Requests for the Centra Eastman Area versus FEI Lower Mainland Region

	Centra Eastman area (2020)	Centra Eastman area (2021)	FEI Lower Mainland (2020)	FEI Lower Mainland (2021)
January	471	438	6,635	7,358
February	380	318	6,552	6,726
March	352	556	7,151	9,869
April	534	1,057	7,361	8,574
May	1,396	1,177	7,412	9,005
June	1,296	1,497	7,520	7,884
July	1,051	1,063	6,919	7,318
August	1,051	1,181	6,766	7,035
September	1,093	1,053	7,198	7,447
October	1,081	956	7,706	7,411
November	776	901	7,731	7,119
December	428	593	5,494	5,903
Total	**9,909**	**10,790**	**84,445**	**91,649**

Notes:

- *Centra locations: Eastman area (New Bothwell, Niverville, Otterburne, Kleefeld, St-Pierre-Jolys, Grunthal, St. Malo and Dufrost)*
- *FEI locations: All Lower Mainland systems*

Figure 8: Number of system damages for the Centra Eastman area versus FEI Lower Mainland region

	Centra Eastman area (2020)	Centra Eastman area (2021)	FEI Lower Mainland (2020)	FEI Lower Mainland (2021)
January	1	1	19	34
February	0	1	35	26
March	0	0	42	30
April	1	2	38	46
May	4	8	42	44
June	4	1	42	43

	Centra Eastman area (2020)	Centra Eastman area (2021)	FEI Lower Mainland (2020)	FEI Lower Mainland (2021)
July	2	1	51	39
August	4	4	59	57
September	2	3	51	56
October	0	5	36	38
November	1	1	29	46
December	1	1	26	23
Total	**20**	**28**	**470**	**482**

Notes:

- *Centra locations: Eastman area (New Bothwell, Niverville, Otterburne, Kleefeld, St-Pierre-Jolys, Grunthal, St. Malo and Dufrost)*
- *FEI locations: All Lower Mainland systems*

With AMI, most of the Lower Mainland will retain pressure, thus eliminating most leak surveying. Pre-AMI, some parts of the depressurized system that are the first to be repressurized may only be depressurized for several days. In these areas, leak surveys may be unnecessary or the surveys could be very limited. However, absent AMI, large parts of the Lower Mainland system will be without pressure for weeks, which increases the risk of third party damage. FEI would likely perform additional surveys in those areas to confirm the integrity of the system, particularly where there are indications of significant underground excavation activity taking place.

Q40: How does FEI's process compare to that of ATCO Gas following the May 2016 Fort McMurray outage?

A40: FEI's process generally aligns with the approach taken by ATCO Gas as described in *The PEG* magazine cited in the response to Q27 above. Specifically, ATCO Gas:

a. visited every home and business location to shut off the service valve;

b. confirmed the safety and availability of supply from the upstream gas provider prior to beginning customer restoration;

c. conducted inspections and any necessary system repairs prior to beginning customer restoration.

The article stated, for instance:

THE PURGE

ATCO typically brings about 20,000 new gas customers online every year. In Fort McMurray, 20,000 homes and businesses needed to be brought back online ASAP.

Before service could be restored, gas lines needed to be purged to ensure there was no air in the system. To purge a system, gas is flowed through the pipelines to push out the air. This is done at various end points in the system, usually at homes or gate stations. Service valves had to be shut off at all homes and businesses.

ATCO suspected there would be mostly gas in the pipes with only a small amount of air. "What we found was a lot of air and a little bit of gas. Which meant the entire system had to be purged," says Mr. Carter.

But crews couldn't just start opening valves. A team of Professional Engineers from within the company was called upon to create a set of procedures to guide the project in a safe and coordinated manner.

They were tasked with finding the most effective purge points and determining how long each purge should last. After crunching the numbers, they identified upwards of 1,500 purge points across the city.

[…]

But there were more hurdles. When people began returning, ATCO Gas employees had to visit homes and stores to turn gas valves back on, complete safety inspections, and relight appliances.

Q41: Do other operators' experience corroborate FEI's time estimates to fully restore service in the Lower Mainland?

A41: Yes. FEI checked the reasonableness of its estimates against the experience of ATCO Gas following the Fort McMurray wildfires and the Black Hills Company service disruption that occurred in Aspen, Colorado in December, 2020. Recognizing that not all the details of each incident are available to make a direct comparison, FEI's estimates for addressing outages generally correspond. If anything, the experience of ATCO Gas and Black Hills Company suggests longer, not shorter, times that those yielded by FEI's System Preservation and Restoration Plan modelling.

ATCO has stated it took 10 days to safely regassify the system that serves 20,000 customers using 150 personnel. FEI's model in Appendix B shows it would take approximately two days to isolate the equivalent 20,000 customers and approximately one day to repressurize, requiring approximately three days to safely regassify the same sized

system. Accounting that the requirements for purging the Fort McMurray system, in the aftermath of a wildfire was found to be extensively required, FEI's three day estimate of repressurizing and being ready to commence relighting the equivalent 20,000 customers rather than the 10 days it took ATCO seems reasonably comparable.

Public reports from Black Hills Energy indicate that it took 170 technicians, 36 hours to complete 3,500 relights. Effectively on average, it took a technician in excess of 1.5 hours per relight. FEI's Preservation and Restoration Plan model shows that it would take 170 technicians working in the Lower Mainland only 18 hours (approximately half the time that it took Black Hills Energy) to relight the same number of customers. On average, this is 0.8 hours per relight. This efficiency rate reflects the work described elsewhere in this Rebuttal Evidence, and also contains the expectation that a number of customers will not be home when the technician arrives so subsequent follow-up visits would be required until all 3500 customers have their appliances relit.

Q42: REL has identified what it refers to as "lessons learned" from Centra's experience with the Otterburne rupture. One "lesson learned" addressed by REL relates to AMI:

> **"Advanced metering infrastructure that had remote shut off capability could have aided the response had it been in place. Centra would have used it to turn off additional commercial services, primarily to preserve the line pack in the transmission and distribution systems so it could be consumed by residential customers. Additional telemetry from advanced metering infrastructure would also have provided Centra with additional situational information on pressures and locations."[59]**

Does FEI agree that AMI is beneficial from a resiliency standpoint?

A42. Yes. AMI will provide the benefits of remote shutoff capability for residential customers and greatly improve FEI's situational awareness during both normal and abnormal system operations. FEI has described how AMI complements the TLSE Project as a resiliency tool in Section 4.2.2 of the Application and FEI's responses to BCUC IR1 16.2 and 16.2.

Q43: REL indicates in its response to BCUC IR1 2.1.1 on its evidence that "REL expects that conservation of gas was not a priority as the minimal line pack – as evidenced by the time that the systems reached zero pressure (between 10 and 17 hours) – meant that there was insufficient time to convey a gas conservation message to the

[59] REL Evidence, p. 24.

public and expect a meaningful response." How would this compare to the Lower Mainland system without the TLSE Project?

A43: The result would be similar in the case of the Lower Mainland system in the absence of the TLSE Project. In a normal winter there is no prospect that conservation messaging would be able to prevent hydraulic collapse in the Lower Mainland, even with all available tools being used. As discussed in the response to BCUC Panel IR1 5.1.2, with the existing Tilbury facilities as the only supply resource in the event of a no-flow event on T-South the regasification capacity could only serve a fraction of the Lower Mainland load.

Q44: REL also identifies the potential to use of trucked Compressed Natural Gas (CNG) as a lesson learned from Otterburne outage.[60] Can you please comment on that in the context of the Lower Mainland?

A44: FEI's Application and the Guidehouse report both articulate that each utility must look at its unique needs when developing tools to improve resiliency. FEI sees the step that Centra took in building a loading dock to facilitate the temporary use of CNG as being directly analogous to what FEI is proposing with the TLSE Project—in other words, developing the ability to provide stored supply to maintain service to customers during a pipeline disruption.

The scale of the TLSE Project storage is obviously much larger than the Centra solution, but it is commensurate with the much larger size of the Lower Mainland load. As discussed in the Application and the responses to CEC IR1 8.1 and MS2S IR2 1.3, stored and/or trucked CNG is not a realistic option for maintaining service in the Lower Mainland. Even if the infrastructure existed for truck filling, in the context of a T-South no-flow event there is no practical way to move the volumes of gas required to sustain even a limited portion of the Lower Mainland load, nor is there a CNG source within hundreds of kilometres of the Lower Mainland that could meet the volumes needed even if it were practical to move.[61]

Q45: REL states "Because of the cold temperatures, Centra coordinated with Manitoba Hydro's electric operations to shift electric load settings on the feeders in the area to maximize the capacity of the electric system to support temporary electric heating for affected customers." Further, REL recommends that "FEI should continue to work with BC Hydro in order to improve this aspect of the response to future no-flow events". How would the Otterburne response translate to a Lower Mainland outage?

A45: FEI has every expectation that BC Hydro would do what it could to support people in the Lower Mainland during a gas system outage. However, in contrast to the Otterburne

[60] REL Evidence, p. 24.
[61] FEI could not obtain CNG from the US (I-5 corridor) because it is also dependent on T-South supply as well.

outage (which impacted 3600 gas customers), a T-South no-flow event could result in outages to several hundred thousand FEI customers throughout the Lower Mainland region. As illustrated in Figure 4-6 of the Application, FEI's cumulative three-day demand for all winter months exceeds 1 Bcf for all winter months. This volume of gas is equivalent to approximately 366 TJ per day of energy.[62] When converted directly into electricity units this is approximately 102 GWh per day.[63] In other words, throughout the winter period, FEI's system delivers approximately 4240 MW of electric energy equivalent in each hour to the Lower Mainland, on average.[64] Even when accounting for efficiency differences and the potential temporary nature of the heating load, it is highly unlikely that BC Hydro would be able to absorb the sudden imposition of this amount of incremental electric load onto their system.[65]

As such, FEI is unclear on specifically what BC Hydro could "improve" in their system to support the sudden imposition of hundreds of megawatts of unexpected load in the Lower Mainland region at a time when BC Hydro may already be experiencing peak demand conditions.

Q46: Does FEI have any other observations about the Otterburne rupture?

A46: Yes. FEI notes that in REL's description of the event, following the rupture of one of three pipelines in the corridor, TCPL shut down the two adjacent undamaged TCPL lines (one of which also served Otterburne). The no-flow event ended after between 63 and 70 hours (approximately 3 days), when flows in the undamaged line resumed.[66] This is analogous to the Westcoast T-South Incident and further demonstrates how adjacent pipelines in the same right of way can be affected by a rupture, and how this can impact the time it takes to verify the undamaged pipes are fit for service.

[62] 1 Bcf of natural gas contains approximately 1,100 TJ of energy.
[63] 1 TJ is equivalent to 0.2778 GWh.
[64] 102 GWh divided by 24 hours = 4240 MW for each hour of the day.
[65] BC Hydro reports that it set a new winter peak demand of 10,787 megawatts for the entire province on December 27, 2021.
[66] REL states on page 22: "Following its assessments of the integrity of Lines 400-2 and 400-3, TCPL returned these lines to service in the early morning of January 28. Gas service to the affected communities resumed later in the morning, approximately three days after they lost service. The zero-pressure event on Centra's system lasted approximately 63 to 70 hours, depending on the community."

10.0 CUSTOMER SURVEY EVIDENCE SUPPORTS FEI'S ATTENTION TO SAFETY

Q47: FEI has emphasized the importance of customer and public safety during the restoration process. Do you have any indication of what importance FEI customers place on customer and public safety?

A47: Yes, FEI has survey evidence that indicates its customers place a high priority on public safety. Each quarter from 2013 through part of 2017, FEI evaluated customer perceptions about the importance of several service factors, including "showing concern for public safety." Over that period, customers evaluated this attribute as 9.7 on a scale where 1 is "not at all important" and 10 is "extremely important." This score was comparable to the results associated with perceptions about the importance of natural gas service reliability.

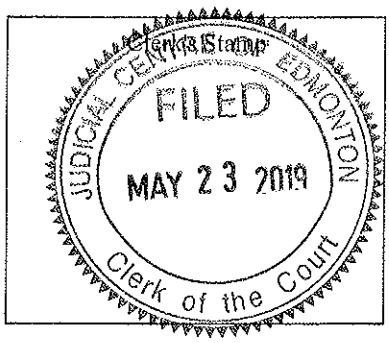
Q48: Does that complete FEI's Rebuttal Evidence in respect of REL?

A48: Yes, it does.

Appendix A

CERTIFICATION ORDER, STATEMENT OF CLAIM AND STATEMENT OF DEFENSE

COURT FILE NUMBER	1703-02448
COURT	COURT OF QUEEN'S BENCH OF ALBERTA
JUDICIAL CENTRE	EDMONTON
PLAINTIFF(S)	JOSHUA SOMERS and MICHAEL WHALEN as REPRESENTATIVE PLAINTIFFS
DEFENDANT(S)	ATCO LTD., ATCO GAS AND PIPELINES LTD. and NORTHWESTERN UTILITIES LIMITED
DOCUMENT	**CONSENT ORDER**
ADDRESS FOR SERVICE AND CONTACT INFORMATION OF PARTY FILING THIS DOCUMENT	James H. Brown & Associates 2800, 10123 – 99 Street Edmonton, AB T5J 3H1 Attention: Richard J. Mallett Telephone: 780-428-0088 Facsimile: 780-428-7788 File No. 50238-7/RJM



I hereby certify this to be a true copy of the original.

for Clerk of the Court

DATE ON WHICH ORDER WAS PRONOUNCED: May 23, 2019

NAME OF JUDGE WHO MADE THIS ORDER: P. B. Michalyshyn

LOCATION WHERE ORDER WAS PRONOUNCED: Edmonton

UPON THE APPLICATION OF THE PLAINTIFFS; AND UPON HEARING SUBMISSIONS FROM COUNSEL FOR THE PARTIES; AND UPON NOTING THE CONSENT OF THE PARTIES HEREIN:

IT IS HEREBY ORDERED THAT:

1. The Plaintiffs' application to have this case certified as a class action is granted.

2. The "Class" is hereby defined as follows:

    i. All resident homeowners,

    ii. All non-resident homeowners,

iii. All resident and non-resident family members of homeowners,

iv. All building owners,

v. All tenants, sub-tenants, occupiers, and,

vi. All property insurers,

of each residence and building, as applicable, within a ½ kilometer radius of the residence located at 118 Clenell Crescent, Fort McMurray, Alberta (the "Origin Residence"), as of the date of an explosion (the "Explosion") and resulting fire on or about May 17, 2016 (the "Affected Area").

3. Joshua Somers and Michael Whalen are hereby appointed as the Representative Plaintiffs.

4. ATCO Ltd. and Northwestern Utilities Limited are removed from the lawsuit and the Statement of Claim of the Plaintiffs is amended as set out in the fifth Amended Statement of Claim, attached hereto as Schedule "A".

5. Higgerty Law and James H. Brown & Associates are appointed as Class Counsel.

6. The nature of the claims advanced on behalf of the Class are:

(a) That the Defendant ATCO Gas and Pipeline Ltd. ("ATCO"), provided natural gas services to businesses and residences in and around Fort McMurray, Alberta, and was responsible for the restoration of service following the wildfires in and around the Affected Area on or about May 17, 2016;

(b) That ATCO did not meet the proper standards of care expected;

(c) That ATCO failed to develop and implement adequate control methods for dealing with situations of potential danger or damage, so as to ensure danger or damage was minimized or prevented;

(d) That ATCO failed to employ and properly train competent staff and have in place and follow proper, safe and/or adequate natural gas restoration techniques;

(e) That ATCO failed to use appropriate, safe, and sufficient piping and other materials to avoid natural gas leaks;

(f) That ATCO failed to monitor adequately, or at all, whether it was safe to restore the natural gas, before, during and after doing so;

(g) That ATCO was negligent or liable in private nuisance.

7. The common issues for the Class are as follows:

(a) Is the Defendant ATCO liable to the Class in negligence?

(b) Did ATCO owe a duty of care to the Class including to:

i. ensure that it was safe to restore the natural gas to both the Origin Residence and the Affected Area, and that restoring the gas would not result in danger, damage or harm?

ii. conduct adequate and regular testing of the natural gas underground pipelines, risers, shut off valves, meters and regulators both before, during, and after the restoration of natural gas to the Origin Residence and Affected Area?

iii. develop, implement and maintain adequate control methods and procedures for dealing with situations of potential danger or damage, so as to ensure that said danger or damage was minimized or prevented?

iv. ensure that duly authorized and properly, professionally trained personnel were on duty at all possible and material times?

v. use appropriate, safe, and sufficient piping and other materials to avoid natural gas leaks? And if gas leaks occurred, use proper and efficient materials to repair said leaks?

vi. warn the Class and take immediate and comprehensive steps to assess any and all damage, and take other appropriate remedial action?

(c) Did ATCO breach the duty of care and standard of care expected?

(d) If so, did the breach of the duty of care cause the Explosion and the Class members' loss?

(e) Are the Defendants liable in private nuisance?

i. Did the acts or omissions of the Defendants cause the natural gas leak and Explosion?

ii. Did the natural gas leak and Explosion cause a substantial or unreasonable interference with the use of land by the Class?

(f) If ATCO is liable to the Class,

i. what type of damages are available to the Class?

ii. are the damages attributable to ATCO?

(g) Can damages to the Class be determined in whole or in part on an aggregate basis? If so, what are the aggregate damages?

8. The relief sought by the Class is:

(a) Judgment for non-pecuniary including, without limitation, for mental distress and pecuniary damages;

(b) Judgment for aggravated damages;

(c) Judgment for interest pursuant to the *Judgment Interest Act,* RS.A. 2000, c. J 1 as may be allowed;

(d) Judgment for G.S.T. where applicable;

(e) An Order for distribution amongst the Representative Plaintiffs and the Class Members of the aggregate assessment of monetary relief as this Honourable Court deems appropriate;

(f) Costs of this action on such basis as this Honourable Court may see fit; and

(g) Such further and other relief as this Honourable Court may allow.

9. Notice of this Order is to be provided to all Class members as follows:

(a) For those whom mailing addresses are available by mail, within 30 days of the date that the Order is filed;

(b) By posting of this Order on the firm websites maintained by Class Counsel;

(c) By publishing of a Short Form Notice, to be agreed upon by counsel or as directed by the Court, within 30 days of the date of this Order in the following newspapers:

i. Fort McMurray Today

ii. Edmonton Sun

iii. Edmonton Journal

iv. Calgary Sun

v. Calgary Herald

10. Any person who meets the criteria of a Class member in this class proceeding but does not wish to be a Class member, may opt out of the class by providing notice in writing to Higgerty Law by email to info@higgertylaw.ca or by mail to 101, 440 – 2nd Avenue SW, Calgary, Alberta, T2P 5E9 within 60 days of the date that the Order is filed and served.

11. Costs of this Application have been agreed between the parties to be in the cause, except no costs shall be awarded for or against the defendants which have be removed from this action by this Order.

12. This Order may be consented to in counterpart, electronically or by facsimile copier.

"P.B. Michalyshyn"

J.C.Q.B.A.

Consented To:

Bennett Jones LLP

Ken Lenz, Q.C, counsel for the Defendants

Higgerty Law

Patrick B. Higgerty, Q.C, co-counsel for the Plaintiffs

James H. Brown & Associates

Rick Mallet, co-counsel for the Plaintiffs

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_____
J.C.Q.B.A.

Consented To:

Bennett Jones LLP

_____
Ken Lenz, Q.C, counsel for the Defendants

Higgerty Law

_____
Patrick B. Higgerty, Q.C, co-counsel for the Plaintiffs

James H. Brown & Associates

_____
Rick Mallet, co-counsel for the Plaintiffs

SCHEDULE "A"

FORM 10
[RULE 3.25]

CLERK'S STAMP

COURT FILE NUMBER	1703 02448
COURT	COURT OF QUEEN'S BENCH OF ALBERTA
JUDICIAL CENTRE	EDMONTON
PLAINTIFF(S)	JOSHUA SOMERS and MICHAEL WHALEN as REPRESENTATIVE PLAINTIFFS
DEFENDANT(S)	^ ATCO GAS AND PIPELINES LTD. ^
DOCUMENT	**AMENDED AMENDED AMENDED AMENDED AMENDED STATEMENT OF CLAIM**
ADDRESS FOR SERVICE AND CONTACT INFORMATION OF PARTY FILING THIS DOCUMENT	Higgerty Law Attention: Clint Docken, QC and Patrick B. Higgerty, QC Main Floor, Millennium Tower 101, 440 - 2 Ave SW Calgary, AB T2P 5E9 Ph: 403-503-8888 Fax: (587) 316-2260 Richard J. Mallett James H. Brown & Associates 2400, 10123 - 99 Street Edmonton, AB T5J 3H1 Telephone: (780) 428-0088 Facsimile: (780) 428-7788

A Class Proceeding pursuant to the Class Proceedings Act, S.A. 2003, C-16.5

NOTICE TO DEFENDANT(S)

You are being sued. You are a defendant.

Go to the end of this document to see what you can do and when you must do it.

Note: State below only facts and not evidence (Rule 13.6)

Statement of facts relied on:

A. **LITIGANTS**

1. The proposed Representative Plaintiffs, Joshua Somers ("Somers") and Michael Whalen ("Whalen") are residents of the City of Fort McMurray, in the Province of Alberta, and are employed as a journeyman heavy equipment technician and a red seal journeyman parts technician, respectively.

2. ^

2.1 The ^ Defendant ATCO GAS AND PIPELINES LTD. ^ operates under the trade name "ATCO GAS", ^ and is an Alberta-based regulated natural gas distribution companies and distributors, ^ incorporated pursuant to the laws of Alberta.

2.2 ^

2.2.1 ^

2.3 The Class herein is defined as all:

i. resident homeowners,

ii. non-resident homeowners,

iii. resident and non-resident family members of homeowners,

iv. building owners,

v. tenants, sub-tenants, occupiers, and,

vi. property insurers

of each residence and building, as applicable, within a 1 kilometer radius of the residence located at 118 Clenell Crescent, Fort McMurray, Alberta (the "Origin Residence"), which were damaged or destroyed by the explosion described in paragraph 8 below (the "Affected Area"), and were in such position at the time of that explosion.

The Class herein as so defined is hereinafter referred to as the "Class", and any individual members of the Class are hereinafter referred to as a "Class Member" and collectively as "Class Members".

B. CLAIM

3. From May 3, 2016 to July 5, 2016, a series of wildfires ("the Wildfires") burned through Fort McMurray, Alberta and surrounding areas, covering 590,000 hectares, and destroying approximately 2,400 homes and buildings.

4. The Wildfires were active in Fort McMurray between May 3, 2016 and May 7, 2016.

5. At all material times, ATCO provided natural gas services to businesses and residences in and around Fort McMurray.

6. During the Wildfires, in an effort to prevent further damage or destruction, ATCO cut off the supply of natural gas in significant parts of Fort McMurray.

7. On or around May 17, 2016, ATCO began restoring natural gas service to areas of Fort McMurray that were deemed safe and free of ongoing wildfire risk, and had completed the restoration of natural gas service to approximately 60% of Fort McMurray.

8. On or around May 17, 2016, while ATCO was restoring natural gas service to residences in the Fort McMurray neighborhood of Dickinsfield, the Origin Residence was destroyed by an explosion related to the restoration of the natural gas. The explosion and resulting fire (the "Explosion") caused damage to numerous residences, other buildings and property. <>In the Explosion, a number of residences in the immediate vicinity of the Origin Residence were destroyed, and numerous residences in the Affected Area were damaged.

9. At all material times, Joshua Somers and Michael Whalen, were the owners and occupants of private residences located respectively at 134 Clenell Bay, Fort McMurray, Alberta and 117 McConachie Crescent, Fort McMurray, AB, in the affected area and <>nearby the Origin Residence. The Origin

Residence was the source or origin of the Explosion, and both residences were significantly damaged by the Explosion.

10. <>

11. <>

C. VICARIOUS LIABILITY

12. The Plaintiff pleads that the ^ Defendant can only act through ^ its employees, directors, officers and agents and is vicariously liable for their acts and omissions as hereinafter pleaded. The acts and omissions particularized and alleged in this claim to have been done by the ^ Defendant were authorized, ordered or done by the ^ Defendant's employees, directors, officers and agents while engaging in the management, direction, control and transaction of the ^ Defendant's business and are therefore acts and omissions for which the ^ Defendant is vicariously liable.

D. NEGLIGENCE

13. The ^ Defendant is liable to the Representative Plaintiff and the Class Members in ^ negligence.

14. At all material times, the ^ Defendant owed a duty of care to the Representative Plaintiffs and other Class Members to ensure that ^ it exercised due care and caution when restoring the natural gas to the neighborhood of Dickinsfield, and that said restoration would not result in harm or damage to the properties in the Affected Area.

15. The Representative Plaintiffs and the other Class Members plead that the ^ Defendant breached^ its duty and the standard of conduct expected of ^ it in the circumstances.

16. The ^ Defendant owed to the Representative Plaintiffs and Class Members <> the following duties of care and other duties, among others:

    a. To ensure that it was safe to restore the natural gas to the neighborhood of Dickinsfield prior to proceeding to do so, and that

said restoration would not result in harm or danger to the Affected Area;

b. To ensure that it was safe to restore the natural gas to the Origin Residence prior to proceeding to do so, and that said restoration would not result in harm or danger to the Origin Residence and Affected Area;

c. To ensure that proper hazard assessments and safety procedures were adhered to during the natural gas restoration;

d. To ensure that adequately trained personnel were present at the site of the natural gas restoration and properly carried out the restoration of the natural gas;

e. To conduct adequate testing in the neighborhood of Dickinsfield prior to initiating the natural gas restoration;

f. To conduct adequate testing on the Origin Residence prior to initiating the natural gas restoration;

g. To develop and implement adequate control methods for dealing with situations of potential danger or damage, so as to ensure that said danger or damage was minimized or prevented;

h. To ensure that duly authorized and properly, professionally trained personnel were on duty at all possible and material times;

i. To monitor adequately or at all, whether it was safe to restore the natural gas, before, during, and after doing so;

j. To use appropriate, safe, and sufficient piping and other materials to avoid natural gas leaks.

E. PARTICULARS OF NEGLIGENCE

17. The Representative Plaintiff and the Class Members state that the Explosion and consequent damages were caused by the negligence of the ^ Defendant,

jointly and severally, including but not limited to any one or more of the following:

a. Failing to adhere to the proper Detailed Work Instructions, policies, and procedures applicable for undertaking a natural gas service shut down and restoration;

b. Failing to undertake the proper risk management practices, including conducting surveys and inspections of the residences and surrounding areas in the Affected Area, prior to shutting down or reactivating the natural gas flow to the Dickinsfield neighborhood;

c. Failing to ensure that proper testing in the Affected Area was conducted prior to attempting to restore the natural gas service to same;

d. Failing to conduct proper testing on Origin Residence by clocking or testing the property's natural gas meters to ensure that no leak existed, prior to attempting to restore the natural gas service to same;

e. Failing to inspect all natural gas flow risers to the residences in the Affected Area, particularly to the Origin Residence, prior to turning such risers back on, or restoring the natural gas service to the Affected Area;

f. Failing to ensure that all natural gas flow risers (connections) to the residences in the Dickinsfield neighborhood, particularly to the Origin Residence, were properly shut off at the time natural gas service to the Affected Area was shut off, and prior to restoring the natural gas service;

g. Failing to inspect the interior of residences and buildings within the Dickinsfield neighborhood, particularly at the Origin Residence to ensure that no natural gas leaks existed;

h. Failing to implement, adhere to, and execute appropriate hazard and safety protocols;

i. <>

j. Failing to ensure that the restoration of natural gas service was properly supervised, conducted, and authorized by appropriately qualified and certified personnel;

k. Failing to employ and properly train competent staff on proper, safe or adequate natural gas restoration techniques;

l. Failing to devote sufficient financial resources to staffing personnel with expertise in appropriate safety and hazard procedures;

m. Failing to develop and implement adequate control methods for dealing with situations of potential danger or damage, so as to ensure that such danger or damage was minimized or prevented;

n. Failing to adequately train employees regarding product and goods safety and failing to implement adequate safety measures;

o. Failing to have duly authorized and properly, professionally trained personnel on site at all possible and material times;

p. Failing to use appropriate, safe, and, sufficient piping and other materials to avoid natural gas leaks;

q. Such other particulars as maybe proven at trial.

17.1 ^

F. **NUISANCE** ^

18. The ^ Defendant is liable ^ to the Representative Plaintiffs and the Class Members inter alia ^ in Private Nuisance ^

19. The Private Nuisance resulted from the substantial and unreasonable interference with the use and enjoyment of the land in the Affected Area by the

Representative Plaintiffs and the Class Members who were occupiers thereof, resulting from the natural gas leak and Explosion, which caused the damages described in this pleading.

20. ^

21. The Private ^ Nuisances resulted in substantial interference with the occupation and enjoyment by the Representative Plaintiffs and Class Members, of the property of the residences they respectively owned and/or occupied in the Affected area through physical damage to such property, and with their health, comfort and convenience.

22. The ^ Defendant made a non-natural use of the land within the affected Area by allowing the natural gas leak causing or contributing to the Explosion from the ^ Defendant's property, namely its right of way for the natural gas pipeline concerned, and that pipeline and related material.

23. The ^ Defendant brought onto the Affected Area, something which was likely to do mischief if it escaped, namely a natural gas pipe and the natural gas which flowed through it.

24. The ^ Defendant is liable for said Private Nuisance ^ by allowing natural gas to escape onto the Affected Area during the Explosion.

25. As a result of the escape of the natural gas and the Explosion, damage was caused to property in the Affected Area.

26. ^

G. DAMAGES

27. <>As a result of the actionable acts and omissions of the ^ Defendant, the Representative Plaintiffs and Class Members sustained and suffered property damage to their respective residences, outbuildings, personal property, as applicable. Further, the Representative Plaintiffs and Class Members who are homeowners have and will sustain and suffer structural and foundational

seismic damage to their respective residences and outbuildings, due to seismic damage from the Explosion.

28. <>As a further result of the actionable acts and omissions of the ^ Defendant, the Representative Plaintiffs and Class Members have sustained and suffered general damages, particularly loss of enjoyment of life and life amenity in relation to the property damage from the Explosion.

28.1 <>As a further result of the actionable acts and omissions of the ^ Defendant, the Plaintiffs and Class Members also suffered and will continue to suffer psychological injuries and emotional upset as a consequence of the loss or damage of, and loss of amenity of, their property from the Explosion. Further, without limitation, such psychological injuries include mental stress and anxiety relating to the temporary or long-term loss of their respective property and residences, and to their ability or inability to secure alternate housing.

29. As a further result of the <> actionable acts and omissions of the ^ Defendant, the Plaintiffs and Class Members have suffered and incurred and will continue to suffer and incur pecuniary damages, including special damages, some of the particulars of which include but are not limited to:

i. The cost of additional living expenses due to the temporary or long-term loss of their housing and residence;

ii. The cost of repairing or replacing their damaged or lost property;

iii. Out-of-pocket expenses for the purchase of various goods and amenities due to the lack of access to their property or belongings;

iv. The cost of purchasing food, products or goods for usage or consumption;

v. Costs of counselling services for their psychological injuries and emotional upset flowing from the loss or damage to their property;

vi. Lost income;

vii. Accommodation costs, transportation costs, out-of pocket expense;

viii. Legislation relied on in *Judgment Interest Act* R.S.A 2000, c.J 1;

ix. For each Class Member which is an insurer, all amounts it incurred or may incur, and/or for which it is liable or potentially liable, on account of indemnity and costs and expenses (including without limitation for related assessment and administration), including without limitation such amounts by claim payments, settlements and/or advances, under each of its issued property insurance policies as a result of the Explosion, whether constituting under each such policy subrogated claims, non-subrogated claims, pure economic loss or any combination of such claims.

29.1 If the subrogate claims of the Class Members which are insurers as outlined in paragraph 29.ix above may not be made by them directly then such claims are hereby made through their respective insureds who are Class Members.

30. The trial of this action will not likely take more than twenty-five days to complete.

31. The Representative Plaintiffs and the other Class Members propose that this action be tried in the City of Edmonton in the Province of Alberta.

H. REMEDY SOUGHT

32. As against ^ the Defendant the Representative Plaintiffs and the Class Members claim the following:

i. An order certifying the action as a class proceeding;

<>

i.1. An interim and permanent preservation order for the protection of any and all evidence, including but without limitation piping, relating to the Explosion;

ii. An order appointing Joshua Somers and Michael Whalen as the Representative Plaintiffs for the Class Members;

iii. A declaration that the ^ Defendant is liable to the Representative Plaintiffs and the Class Members for damages resulting from the restoration of natural gas services to the neighborhood of Dickinsfield, which caused the Explosion and ensuing damages claimed;

<>

iv. Judgment for non-pecuniary damages and pecuniary damages as claimed herein, including general and special damages in an estimated total amount of $20,000,000;

<>

v. Judgment for aggravated damages, including without limitation, for mental distress in an amount to be proven at trial and to be apportioned by the Court;

vi. Judgment for interest pursuant to the *Judgment Interest Act*, R.S.A. 2000, c. J 1 as may be allowed;

vii. Judgment for G.S.T. where applicable;

viii. An Order for distribution amongst the Representative Plaintiffs and the Class Members of the aggregate assessment of monetary relief as this Honourable Court deems appropriate;

ix. Costs of this action on a solicitor/client basis or on such other basis as this Honourable Court may see fit; and,

x. Such further and other relief as this Honourable Court may allow or counsel may advise.

NOTICE TO THE DEFENDANT(S)

You only have a short time to do something to defend yourself against this claim:

20 days if you are served in Alberta

1 month if you are served outside Alberta but in Canada

2 months if you are served outside Canada.

You can respond by filing a statement of defence or a demand for notice in the office of the clerk of the Court of Queen's Bench at Edmonton, Alberta, AND serving your statement of defence or a demand for notice on the plaintiff's(s') address for service.

WARNING

If you do not file and serve a statement of defence or a demand for notice within your time period, you risk losing the law suit automatically. If you do not file, or do not serve, or are late in doing either of these things, a court may give a judgment to the plaintiff(s) against you.

FORM 11
[RULE 3.31]

CLERK'S STAMP

JUDICIAL CENTRE OF EDMONTON
FILED
OCT 01 2019
Clerk of the Court

ENTERED by L.U.

COURT FILE NUMBER	1703-02448
COURT	COURT OF QUEEN'S BENCH OF ALBERTA
JUDICIAL CENTRE	EDMONTON
PLAINTIFFS	JOSHUA SOMERS and MICHAEL WHALEN as REPRESENTATIVE PLAINTIFFS
DEFENDANTS	ATCO GAS AND PIPELINES LTD.
DOCUMENT	**STATEMENT OF DEFENCE**
ADDRESS FOR SERVICE AND CONTACT INFORMATION OF PARTY FILING THIS DOCUMENT	**BENNETT JONES LLP** Barristers and Solicitors 4500 Bankers Hall East Tower 855 – 2nd Street SW Calgary, Alberta T2P 4K7 Attention: Ken Lenz Q.C./Leanne Desbarats Telephone No.: 403-298-3317/3424 Fax No.: 403-265-7219 Client File No.: 12073-659

Note: State below only facts and not evidence (Rule 13.6)

Statement of facts relied on:

1. Capitalized terms used herein have the same meaning as in the Amended Amended Amended Amended Statement of Claim (the "**Statement of Claim**"), unless otherwise defined herein.

2. Except as hereinafter expressly admitted ATCO Gas and Pipelines Ltd. ("**ATCO**"), denies each and every allegation in the Statement of Claim as if set out separately herein and denied, and put the Plaintiffs to the strict proof thereof.

The Parties

3. ATCO admits paragraph 2.1 of the Statement of Claim. ATCO further admits that, at all material times, ATCO operated under the tradename ATCO GAS and was the Alberta-based regulated natural gas distribution company incorporated pursuant to the laws of Alberta that operated the natural gas distribution system within Fort McMurray, Alberta (the "**Distribution System**") that delivered natural gas to Dickinsfield community.

4. The members of the class that was certified on May 23, 2019 are resident and non-resident home or building owners, tenants, sub-tenants, occupiers and property insurers of residences and buildings within a ½ kilometer radius of the residence located at 118 Clenell Crescent, Fort McMurray, Alberta (the "**Origin Residence**") as of May 17, 2016 (the "**Class Members**").

5. The Class Members are represented by Joshua Somers and Michael Whalen (the "**Representative Plaintiffs**").

The Wildfire

6. On or around May 1, 2016, a wildfire broke out near Fort McMurray and continued to burn uncontrolled until approximately July 5, 2016 (the "**Wildfire**"). On or around May 3, 2016, the Wildfire threatened Fort McMurray and the Provincial Government issued an evacuation Order directing all of the residents of Fort McMurray to leave the city (the "**Evacuation Order**"). The Evacuation Order was lifted in stages beginning on or around May 25, 2016.

7. For the safety of the residents of Fort McMurray and their property, ATCO shutoff the flow of natural gas to the Distribution System and natural gas service to Fort McMurray, including the community of Dickinsfield. On or about May 8, 2016, prior to the Evacuation Order being lifted, ATCO commenced the process of assessing the integrity of the Distribution System and safely restoring natural gas service to homes and businesses in Fort McMurray.

8. On May 17, 2016, an explosion (the "**Explosion**") occurred at or near the Origin Residence. The Explosion damaged homes in the Dickinsfield community including the residence of the Representative Plaintiffs and the Class Members.

Any matters that defeat the claim of the Plaintiffs:

9. In specific response to paragraphs 14 and 16 of the Statement of Claim, ATCO denies that it owed the Representative Plaintiffs or Class Members the duties of care as described in the Statement of Claim. The Representative Plaintiffs and the Class Members were not customers of the Defendants, but received natural gas from the Distribution System. The relationship between ATCO and all parties receiving natural gas from the Distribution System was governed by the Terms and Conditions for Distribution Service Connections approved by the Alberta Utilities Commission in force at the time (the "**Terms**"). ATCO fulfilled all of its responsibilities under the Terms.

10. In response to the entire Statement of Claim, ATCO denies that it was negligent, and states that all work performed by the ATCO was properly performed in a good and workmanlike manner and in accordance with industry standards.

11. In specific response to paragraph 17 of the Statement of Claim, ATCO specifically denies that it:

    (a) Failed to adhere to the proper Detailed Work Instructions, policies, and procedures applicable for undertaking a natural gas service shut down and restoration;

    (b) Failed to undertake the proper risk management practices, including conducting surveys and inspections of the residences and surrounding areas in the Affected Area, prior to shutting down or reactivating the natural gas flow to the Dickinsfield neighborhood;

    (c) Failed to ensure that proper testing in the Affected Area was conducted prior to attempting to restore the natural gas service to same;

    (d) Failed to conduct proper testing on Origin Residence by clocking or testing the property's natural gas meters to ensure that no leak existed, prior to attempting to restore the natural gas service to same;

(e) Failed to inspect all natural gas flow risers to the residences in the Affected Area, particularly to the Origin Residence prior to turning such risers back on or restoring the natural gas service to the Affected Area;

(f) Failed to ensure that all natural gas flow risers (connections) to the residences in the Dickinsfield neighborhood, particularly to the Origin Residence, were properly shut off at the time natural gas service to the Affected Area was shut off, and prior to restoring the natural gas service;

(g) Failed to inspect the interior of residences and buildings within the Dickinsfield neighborhood, particularly, at the Origin Residence to ensure that no natural gas leak existed;

(h) Failed to implement, adhere to, and execute appropriate hazard and safety protocols;

(i) Failed to ensure that the restoration of natural gas service was properly supervised, conducted. and authorized by appropriately qualified and certified personnel;

(j) Failed to employ and properly train competent staff on proper, safe or adequate natural gas restoration techniques;

(k) Failed to devote sufficient financial resources to staffing personnel with expertise in appropriate safety and hazard procedures;

(l) Failed to develop and implement adequate control methods for dealing with situations of potential danger or damage, so as to ensure that such danger or damage was minimized or prevented;

(m) Failed to adequately train employees regarding product and goods safety and failing to implement adequate safety measures;

(n) Failed to have duly authorized and properly, professionally trained personnel on site at all possible and material times; and/or

(o) Failed to use appropriate, safe, and, sufficient piping and other materials to avoid natural gas leaks.

12. In the alternative, if ATCO did fail to discharge its contractual duties or satisfy its duty of care, then such failures did not cause the buildup of natural gas in the Origin Residence or the Explosion. The buildup of natural gas in the Origin Residence and the Explosion were caused solely by the negligence or intentional acts of the tenants of the Origin Residence, the owners of the Origin Residence, or parties for whom ATCO is not responsible at law and whose identities are not yet known to ATCO. The particulars of such negligence or intentional acts include, but are not limited to:

(a) improper operation and maintenance of natural gas appliances in the Origin Residence;

(b) improper operation and maintenance of natural gas piping in the Origin Residence;

(c) tampering with natural gas piping and fittings within the Origin Residence;

(d) tampering with the meter and regulator in the Origin Residence;

(e) undertaking ground disturbing work in contravention of *Occupational Health and Safety Act*, RSA 2000, c O-2 the regulations thereunder, and the *Occupational Health and Safety Code 2009;*

(f) striking and damaging the distribution service line connecting to the meter of the Origin Residence; and/or

(g) such further and other particulars to be proved at trial.

13. In the further alternative, if the buildup of natural gas in the Origin Residence and Explosion were in any manner caused by the shut down and resumption of natural gas service, then ATCO is not liable as they were acting under directions issued as a result of a declared state of emergency. ATCO pleads and relies upon the *Emergency Management Act*, RSA 2000, c E-6.8.

14. ATCO pleads and relies on the provisions of the *Contributory Negligence Act*, RSA 2000, c C-27 and the *Tortfeasors Act*, RSA 2000, c T-5.

15. In the further alternative, the buildup of natural gas in the Origin Residence and the Explosion were a result of an inevitable accident, *force majeure*, or act of god for which ATCO is not responsible.

16. In specific response to paragraph 18 of the Statement of Claim, ATCO denies that the buildup of natural gas or the Explosion amounted to a nuisance for which the ATCO is liable because:

    (a) the buildup of natural gas and the Explosion originated from and on the Origin Residence, not from or on ATCO's property;

    (b) the buildup of natural gas and the Explosion were caused by the negligence or intentional acts of the tenants of the Origin Residence, the owners of the Origin Residence, or parties for whom ATCO is not responsible at law and whose identities are not yet know to ATCO as described in paragraph 14 above; and

    (c) ATCO was unaware of the buildup of natural gas and the actions of the third parties that caused it, despite undertaking reasonable steps to prevent and detect leaks within the Distribution System.

17. ATCO pleads and relies on the provisions of the *Limitations Act*, RSA 2000, c L-12.

Damages

18. ATCO denies that the Class Members and the Representative Plaintiffs suffered damages as alleged or at all, and puts the Class Members and the Representative Plaintiffs to the strict proof thereof.

19. In the alternative, if the Class Members and the Representative Plaintiffs have suffered any damages, which is expressly denied, then ATCO states that those damages are excessive, too remote to be recoverable at law, not reasonably foreseeable and/or are in an amount lesser than that claimed.

20. In the alternative, if the Class Members and the Representative Plaintiffs have suffered any damages, which is denied, the Class Members and the Representative Plaintiffs had a duty to take reasonable steps to mitigate their damages and have failed to do so.

Remedy sought:

21. The claim of the Class Members and the Representative Plaintiffs be dismissed, with costs to be awarded to ATCO on a party and party basis or such other basis as the Court may deem just.

Appendix B

FIGURE 3 WORKING MODEL

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)