

Incident Summary #II-1230899-2021 (#22950) (FINAL)

SUPPORTING INFORMATION	Incident Date		July 29, 2021
	Location		Surrey B.C.
	Regulated industry sector		Gas - Natural gas system
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
		Damage description	A 3" (88MM) polypropylene gas line @ 60 PSI was punctured causing a major uncontrolled gas release and fire which resulted in the total loss of an excavator that was consumed by the flames. A second excavator received minor damaged due to the flames.
		Damage rating	Major
	Incident rating		Major
Incident overview		During excavation for the installation of a new sanitary service on a public road in a commercial area, an underground gas service line was punctured. The uncontrolled release of gas ignited resulting in a large fire. Due to difficulty of isolating the main gas line that was pressurized from both directions by the utility company, 6 hours was taken to isolate the release. Two homes were isolated from natural gas during the incident. One excavator owned by the excavating contractor was a total loss and a second excavator was damaged from the fire.	
INVESTIGATION CONCLUSIONS	Site, system and components	Natural gas is distributed by a gas utility company through a network of underground distribution piping and service piping connecting each property to the distribution system. Piping can be steel or polyethylene plastic.	
		When excavating around gas lines, clear conformation of the location of gas lines is required before digging. Further determination of gas lines can be done by using tracing tools to trace the metal gas line or a tracer wire ran adjacent to the plastic gas piping. This also helps determine the exact depth and location. Having markings on the road in clear view along with procedures with hand digging within 1 meter of the gas line is required.	
		Tracer wire is used to assist in locating plastic gas pipes after they have been buried in the ground. Once a pipe is laid down, a tracer wire is placed along its length and buried with the pipe. Tracing tools can attach to the wire and assist in locating the gas lines and depths after they have been buried.	
		A survey information company like BC 1 Call facilitates the release of the required information on underground utility lines. Before a contractor begins excavation of an area, they are required to call and request information for underground utility lines in that area before digging.	
		The <i>Safety Standards Act</i> is an act set out by the government for contractors to follow for regulated work. <i>The Safety Standards Act</i> and the Gas Safety Regulation outlines requirements for digging around gas lines. The <i>Safety Standards Act</i> and associated safety regulation in BC are laws written by the provincial government detailing legal requirements regarding regulated work. The Gas Safety Regulation	

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	<p>specifically details requirements for excavating around underground gas installations. Requesting information pertaining to the location of the underground gas installation is a requirement outlined in the Gas Safety Regulation.</p> <p>Requesting information regarding the location of underground gas lines before digging is required. If there are discrepancies with the location of the gas lines as per the information received, it is required for the excavating company to request the utility company to come and determine the exact location of the utility gas lines.</p> <p>The method of “potholing” is used by excavation companies where they dig and expose certain sections of an underground gas line. This method is used to determine depths, material, and location of the gas line. It is assumed by these samples that the rest of the gas line is ran at the same depth.</p>
Failure scenario(s)	<ul style="list-style-type: none"> - The excavating contractor was installing sanitary lines. - The gas lines services for properties along the main road would have to be exposed for running the new sanitary service. - The excavating contractor requested documents from BC 1 Call and obtained a service list showing GPS locations of the gas lines (no depths or as-built drawings). - The foreman of the excavating contractor used a GPS locator to paint out the assumed location of the gas lines. - The foreman for the excavating contractor tried to trace out a service line from a meter set with a tracing tool to determine depth of the gas line. He could not locate the line via this manner and assumed it was due to depth of the line (assumed at 6-7 feet). - No secondary call was made to the utility company to assist in locating depths of the gas line. - As-built drawings for the neighbouring property of the line that was punctured were available but not obtained by the excavating contractor. The depth on the as-built drawing for the line is indicated at 3 ½' (42") deep. - The foreman of the excavating company assumed the depth of the 3" 88MM punctured gas line service by methods of “potholing” the 4" main on the north side of the road, depth assumed at 6-7 feet deep. This method is described as exposing the 4" main and determining depth physically of the main and assuming the service continues in the same depth. - During excavation around the gas line, the line was punctured resulting in a release of gas and an eventual fire.
Facts and evidence	<p>Interview Statements</p> <p>Site Foreman - Excavation company</p> <ul style="list-style-type: none"> - During excavation around the 3" 88MM service, the excavation foreman explained the crew was hand digging around the service. The excavator bucket was located 6-7 feet away and 10 feet deep and only being used to remove loose dirt from the hole. During this procedure, the dirt around the gas line collapsed and assumed by the excavation foreman due to a release of high pressure and volume of natural gas. The workers moved and shut off

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	<p>the machines and evacuated the area. The excavation foreman explained that it was assumed due to the heavy bucket and the weight of the machine pushing on the earth and ground below, pieces of concrete left in the hole from the crews in the past must have shifted and struck the gas line causing the puncture (Image 6).</p> <ul style="list-style-type: none"> - 5-10 minutes after the gas leak started, the gas ignited, and a fire was created. - Service drawings were only obtained showing GPS locations of gas lines without depths. - Issues with determining depths with the tracing tool took place while tracing lines on adjacent properties. - Depth was determined by "potholing" the 4" (100MM) main across the road. - Depth of the punctured line was assumed at 6-7 feet deep. - The site foreman was not aware of the <i>Safety Standards Act</i> and requirements for excavating around gas lines in the act. - The site foreman did not attempt to trace out the punctured line from the meter set due to a gate around the meter set. <p>Investigator - Gas utility company</p> <ul style="list-style-type: none"> - No secondary call was made to the gas utility company for verification of the gas lines and depths or to request assistance in accessing the locked meter set that the punctured line serviced. - The tracing wire that was attempted to be traced out by the excavating company was broken and untraceable. - As built drawings for the neighbour property showing depths at 42" deep were available. - The actual gas line location from the top of the asphalt was 56" deep (Images 3 & 4). - Investigator with the gas utility assumed the cause of ignition was static electricity caused by high-pressure and volume gas rushing through the plastic line. <p>Emails</p> <ul style="list-style-type: none"> - The excavating company obtained service lists from the survey company of the gas lines. - No secondary call was made to the utility company for verification of location of the gas lines.
<p>Causes and contributing factors</p>	<p>It is very likely that the excavating contractor not contacting the utility company to assist in locating the gas line, led to the puncture of the gas line and eventual fire.</p> <p>Contacting the utility company is required by the Gas Safety Regulations if the excavator is not satisfied with the location information provided by the gas company and they must verify that information prior to excavating.</p>



Image 1 - Photo supplied by the utility company showing the first excavator damage caused by the fire resulting in a total loss.



Image 2 - Photo supplied by the utility company showing the second excavator damage caused by the fire resulting in minor damage.



Image 3 – Photo supplied by the utility company showing the actual depth of the gas line at 54”.



Image 4 - Photo supplied by the utility company showing the actual depth of the gas line at 54".



Image 5 - Photo supplied by the utility company showing the punctured gas line after the fire and the removal of the downstream section of piping. Photo shows the burnt end of the piping because of the fire.



Image 6 – On site photo taken by the safety officer showing some concrete debris in the trench.