Issued: March 31, 2026 Pipeline Investigation Report: PIR-26-02

Enbridge Inc. Natural Gas–Fueled Home Explosion and Fatality

Location	South Jordan, Utah
Date	November 6, 2024
System type	Natural gas distribution
Accident type	Rupture/release
Pipeline operator	Enbridge Gas Utah
Hazardous materials	Natural gas
Fatalities	1
Injuries	0
Property damage	$1,030,443

Summary

On November 6, 2024, about 3:09 p.m., a natural gas–fueled explosion fatally injured one person and destroyed a home in South Jordan, Utah.[1] Several nearby residences were damaged, and families displaced. (See figure 1.) The South Jordan Fire Department responded, arriving on scene about 3:15 p.m. Technicians from Enbridge Inc. (Enbridge) subsidiary Enbridge Gas Utah, the natural gas service provider to the home, responded and arrived on scene about 3:45 p.m.[2] Enbridge isolated the leak about 12:16 p.m. on November 7. At the time of the explosion, conditions were daylight and clear; the temperature was 41°F with no precipitation.

[1] All times in this report are local. (b) Visit ntsb.gov to find additional information in the public docket for this National Transportation Safety Board (NTSB) accident investigation (case number PLD25FR001), including detailed factual reports about the circumstances of the accident.

[2] In June 2024, Enbridge purchased local gas distribution company Questar Gas from Dominion Energy, Inc. and renamed it Enbridge Gas Utah, Enbridge Gas Wyoming, and Enbridge Gas Idaho. Enbridge subsidiary, Enbridge Gas Utah, provided natural gas service to the home. This report uses the current company name, Enbridge, throughout.

Figure 1. The scene on the day of the accident. (Drone photography courtesy of the South Jordan Police Department.)

1.1 Before the Accident

During interviews conducted by the Utah Deputy State Fire Marshal, the residents of the house reported the following observations regarding the days leading up to the explosion:

- Some family members felt dizzy, had flu-like symptoms, and had headaches.
- On November 3, the water heater in the basement was not working correctly.
- On November 5, they attempted to troubleshoot the water heater but were unable to relight the pilot light.
- During the evening on November 5, one of the residents lit a candle, observed an unusually high flame, and quickly extinguished the flame.

The residents told the fire marshal they were aware of what odorized natural gas smelled like and did not smell any gas odor in the home before the explosion. No

outside gas odors in the area were reported to the gas company before the accident.[3] There were no natural gas alarms in the home.

1.2 Accident Response

About 3:09 p.m. on November 6, 2025, the 911 operator received the first of several calls reporting the explosion at 10593 S 3210 W (street). About 6 minutes later, at 3:15 p.m., the fire department arrived at the accident scene. About 3:45 p.m., Enbridge technicians arrived on scene and began work to identify the location of the leak. Their activities included bar hole testing in the ground around the accident scene and pressure testing of the natural gas pipes servicing the home and the neighborhood, which continued for more than 21 hours before the location of the leak was identified.[4] (See figure 2.) Table 1 is a timeline of the accident response.

[3] NTSB investigators reviewed records for 1 year before the accident.

[4] *Bar hole testing* is a gas measurement technique in which a small-diameter hole is made in the ground (a bar hole), a gas measurement probe is inserted into the hole, and a gas concentration measurement in the ground is obtained.

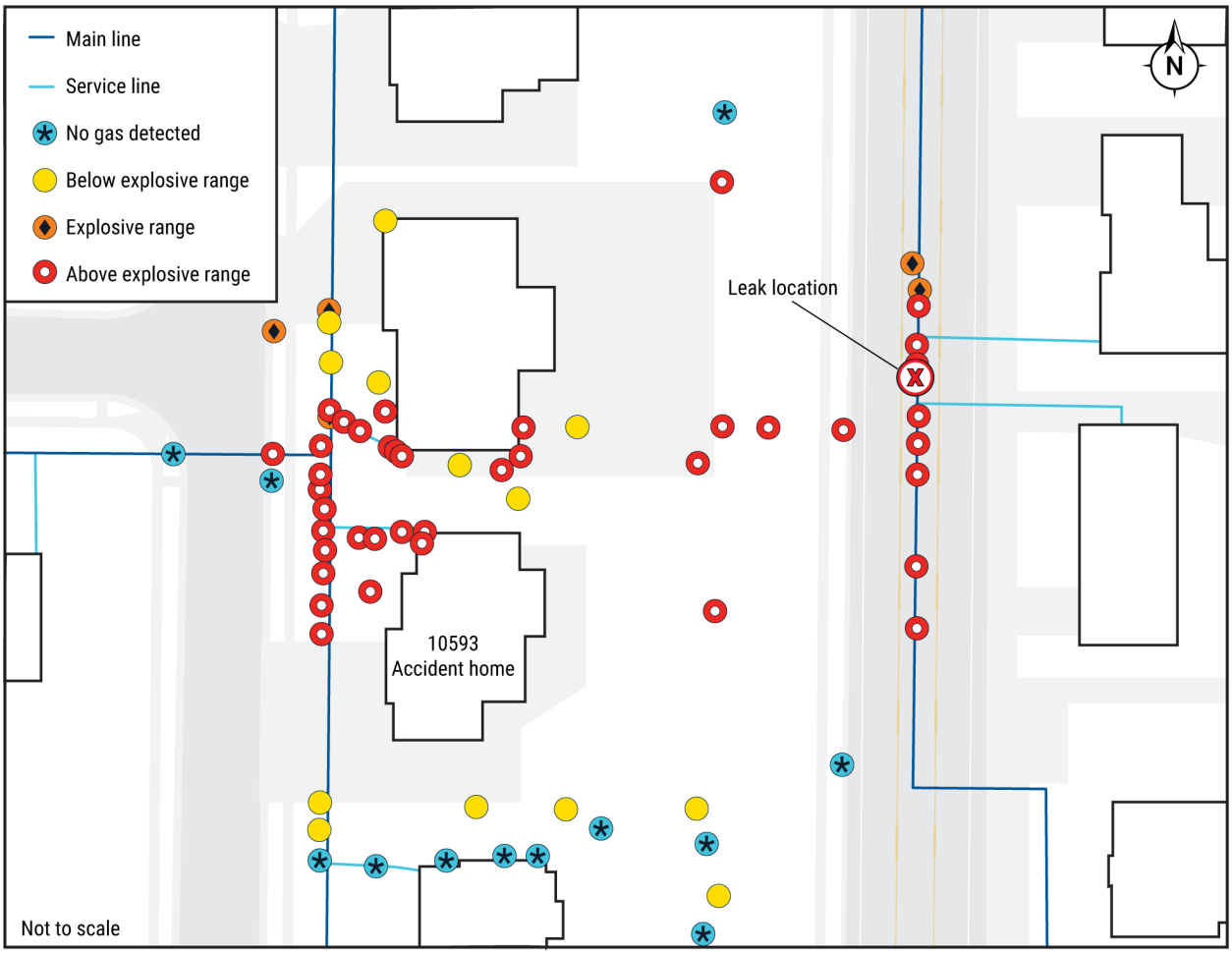

Figure 2. Peak subsurface gas readings before isolation of the gas leak.

About 12:16 p.m. on November 7, Enbridge technicians found a leak about 150 feet northeast of the home on a 4-inch-diameter Aldyl A natural gas main, which Enbridge also owned and operated.[5] The Aldyl A gas main was manufactured and installed in 1976 and operated at a pressure of about 45 psig, below the maximum allowable operating pressure of 60 psig.[6] The technicians removed and then replaced the damaged section of the pipe.

[5] *Aldyl A* is the trademarked name of a polyethylene plastic gas pipeline product that was manufactured by the DuPont chemical company using a proprietary polymer resin. It is no longer manufactured or used in new pipelines.

[6] *Psig* is the abbreviation for pounds per square inch, gauge, which is the pressure measurement obtained by using a conventional pressure gauge.

Table 1. Timeline of the accident response.

Time	Activity
November 6	**November 6**
3:09 p.m.	The first 911 call reported an explosion at 10593 S 3210 W.
3:15 p.m.	Fire Department Engine 62 arrived on site.
3:45 p.m.	Enbridge technicians arrived on scene and began leak investigation activities.
5:00 p.m.	Enbridge began bar hole testing.
5:45 p.m. to 12:34 a.m. (November 7)	Enbridge began pressure testing gas assets west (in front) of accident home.
November 7	**November 7**
12:17 a.m. to 4:30 a.m.	Enbridge resumed bar hole testing west of accident home.
4:55 a.m. to 6:33 a.m.	Enbridge expands bar hole testing east of (behind) accident home.
12:16 p.m.	Enbridge found and stopped the leak.

After the explosion, Enbridge technicians found gas in the ground in front of the house and again between the accident home and the adjacent home immediately to the north. Further investigation found gas in the ground extending from the rear of the house to the location of the leak in the street to the east, behind the accident home. The subsurface gas extended from the leak location below the street behind the home, through the backyard, and to the front yard of both homes (the accident home and the adjacent home), reaching about 250 feet from the leak. Technicians also detected gas in the atmosphere of the adjacent home after the accident.

1.3 Gas Main Examination

Examination of the damaged pipe by the National Transportation Safety Board (NTSB) Materials Laboratory found crack growth that started at the inner wall of the pipe. The crack growth features were traced back to a single point origin on the inner surface, which aligned longitudinally with an outer surface impingement point. (See figure 3.) The crack growth region extended as much as 3.5 inches along the length of the pipe. Further, flow testing of the damaged pipe in the lab measured a leak rate for natural gas

equivalent of 48.7 scfm at a pressure of 43 psig (about the operating pressure at the time of the accident).[7]

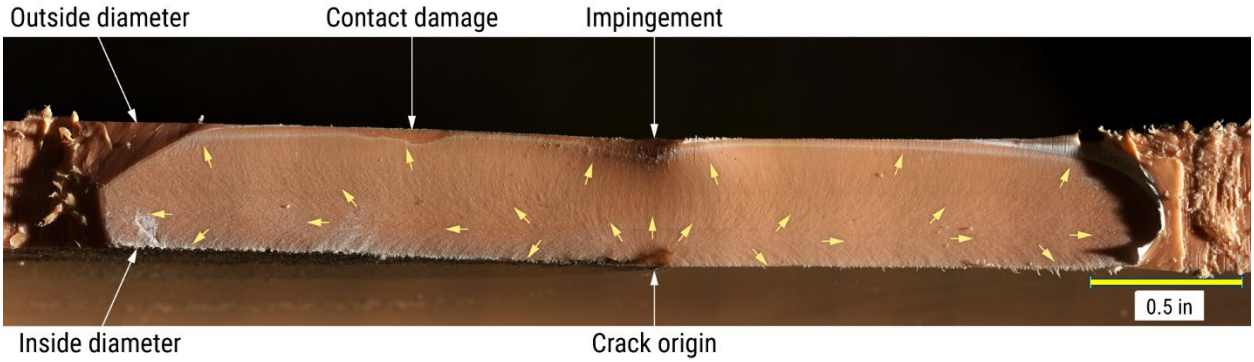

Figure 3. Crack origin area on inner wall of pipe.

Aldyl A piping manufactured before 1983 is prone to slow crack growth, which may be initiated by rock impingement or impingements from other causes.[8] The NTSB investigated a 2006 accident where an impingement caused a leak on a 2-inch Aldyl A gas main manufactured in 1976.[9]

2 Analysis

On November 6, 2024, a natural gas–fueled home explosion fatally injured one resident and damaged nearby homes. A crack in the 4-inch-diameter Aldyl A gas main near the home allowed natural gas to leak and fuel the home explosion.

The NTSB found that the crack originated on the inner surface of the pipe and aligned directly with an oblong impression on the outer surface. Investigators determined that a rock impingement likely caused the oblong impression on the outer surface of the pipe and the resulting crack. They also found that the crack growth features indicated that the crack breached the outer surface in a single abrupt event. As a result, the pipe rapidly transitioned from releasing no gas to releasing up to 48.7 scfm,

[7] *Scfm* is the abbreviation for standard cubic feet per minute, a measurement of gas flow corrected for standard temperature of 60°F and absolute atmospheric pressure of 14.696 pounds per square inch.

[8] Haine, Steven. 2014. *Hazard Analysis and Mitigation Report on Aldyl A Polyethylene Gas Pipelines in California*. San Francisco, CA: California Public Utilities Commission.

[9] NTSB. 2010. *Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, California, December 24, 2008*. PAB-10/01. Washington, DC: NTSB.

as measured in the lab.[10] Post-explosion, subsurface gas readings showed that the natural gas migrated about 150 feet from the leak location to the home. Although the exact timing of the leak could not be determined, the residents' observations of physical symptoms, inability to relight the basement water heater, and an unusually high candle flame before the accident suggest that natural gas may have been present in the home for at least 3 days before the explosion. On November 6, the flammable natural gas–air mixture ignited in the southwest quadrant of the basement. The Utah Deputy State Fire Marshal identified two possible sources of the ignition: a water heater and a furnace. The water heater was turned off at the control point, so the only credible ignition source was the furnace.[11]

Before the accident, Enbridge had implemented safeguards to mitigate the consequences of leaks, including periodic leak surveys, timely response to odor complaints, and targeted replacement projects. However, none of these strategies proved effective for this scenario, because of the following issues related to the strategies:

- **Periodic leak surveys.** Regulators require distribution leak surveys to be conducted every 5 years. Enbridge conducted its most recent leak survey on April 29, 2022—two years before the accident. However, in this accident, through-wall crack propagation occurred too rapidly, causing the leak to go undetected before the explosion.
- **Timely response to odor complaints.** Regulators require odorization of natural gas in distribution systems to help alert the public to natural gas leaks. During interviews conducted by investigators, the NTSB determined that the local residents had not smelled natural gas odorant near the accident home, even though gas was determined to have permeated the ground in the area during postaccident surveys, indicating that the odorant had been stripped from the leaked natural gas that ultimately entered the home.[12] Although odorant can act as an early warning of a gas release to prevent an explosion and fire, it has been known to become depleted when traveling through soil, as it did in this accident. Previous NTSB investigations have identified occurrences of odorant depletion that

[10] The actual leak rate may have been lower, given that the pipeline was buried in soil, which would constrain the pipe and provide back-pressure resistance to gas as it leaked from the pipe.

[11] The furnace control valve was found postaccident to have significant thermal damage, consistent with it being the ignition source.

[12] Field testing of the gas in the distribution system after the explosion found acceptable odorant concentrations.

allowed natural gas leaks to go undetected, resulting in explosions in Dallas, Texas, in 2018 and in Silver Spring, Maryland, in 2016.[13,14]

- **Targeted replacement projects.** A 2014 California Public Utilities Commission study showed that the vintage of Aldyl A present in this accident, with stress concentrations from rock impingement, squeeze-off, bending, or deflection, were statistically predicted to fail between 22 and 235 years after installation.[15] Because the estimated failure time is imprecise (a range of more than 200 years), and because some environmental conditions—such as the locations of rocks in the backfill material—are unknown, the Enbridge evaluation of the cracking threat to the 1976 vintage Aldyl A did not accurately characterize the risk of rock impingements and prevented Enbridge from identifying effective mitigative actions and targeted replacement projects.[16]

Even though Enbridge worked continuously to search for the leak after the explosion, it took them more than 21 hours to find and isolate the natural gas leak. During this time, the pipeline continued to leak natural gas into the ground, increasing the risk to nearby residents, first responders, and others operating in the area.

When an underground natural gas pipeline leak occurs rapidly, it can be difficult to safeguard against. Natural gas alarms can provide an early warning of natural gas leaks inside nearby structures and can alert the building occupants to take immediate safety actions. Had in-home natural gas alarms been installed in the homes involved in this accident, they would have alerted the residents to a potential problem and prompted them to evacuate and call 911, reducing or eliminating the fatal consequences of the explosion. The NTSB has previously recommended requiring the installation of natural gas alarms in businesses, residences, and other buildings (Safety Recommendation P-25-05).

Probable Cause

[13] NTSB. 2021. *Atmos Energy Corporation Natural Gas–Fueled Explosion, Dallas, Texas, February 23, 2018*. PAR-21/01. Washington, DC: NTSB.

[14] NTSB. 2019. *Building Explosion and Fire, Silver Spring, Maryland, August 10, 2016.* PAR-19/01. Washington, DC: NTSB.

[15] California Public Utilities Commission 2014 Hazard Analysis and Mitigation Report On Aldyl A Polyethylene Gas Pipelines in California. Haine 2014.

The National Transportation Safety Board determines the probable cause of the explosion was a through-wall crack that formed in the 1976 vintage 4-inch-diameter Aldyl A polyethylene gas distribution main from a rock impingement, allowing natural gas to leak, migrate about 150 feet, and accumulate in a home, where it was ignited by the home's furnace. Contributing to the severity were insufficient safeguards to mitigate hazards presented by the leak.

Lessons Learned

The events leading up to the home explosion in South Jordan illustrate how natural gas alarms could mitigate the consequences of gas leaks. Aldyl A piping manufactured before 1983 is prone to cracking and needs to be carefully assessed to protect public health and safety. Aldyl A pipeline failures are difficult to predict, and natural gas alarms can help safeguard members of the public who reside in areas with natural gas distribution systems. Natural gas alarms have been available for several years and can alert homes and businesses of gas leaks even when natural gas odorant is depleted in the natural gas. Natural gas alarms provide an early warning to building occupants before the gas concentrations reach an explosive level and alert occupants to evacuate the building. For more, see NTSB Safety Alert SA-098, Natural Gas Alarms Save Lives.

To address the threats identified during the investigation, Enbridge initiated several changes to their procedures and evaluation of Aldyl A pipe. Enbridge Gas Utah updated their risk assessment protocols for Aldyl A piping and completed leak surveys using an advance mobile leak detection system of 100% of the Aldyl A gas piping with the threat of cracking. All immediate leaks were evaluated and repaired. Enbridge has committed to an increase in its capital budget for risk-informed targeted replacement of high-risk Aldyl A piping. Their leak history, leak survey results, and repair data will be used to refine ongoing leak survey frequency and better inform asset replacement decisions.

To decrease the risk to the first responders and nearby residents and address the extended response time to locate the gas leak in South Jordan, Enbridge revised two standard practices specific to Enbridge Gas Utah operations for the investigation of leaks. One change refocused response resources on all gas assets in the area to improve the efficiency of the response and to isolate leaks as quickly as possible, and the other change requires bar hole testing of the perimeter of the structure and over all the gas assets in the area. To promote the installation of natural gas alarms, Enbridge has partnered with the American Red Cross in the Salt Lake City area and has made natural gas alarms/carbon monoxide detectors available at a recent event. In partnership with the city of South Jordan, Enbridge is also making additional

natural gas alarms/carbon monoxide detectors available to residents at an upcoming event in May.

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For more detailed background information on this report, visit the NTSB Case Analysis and Reporting Online (CAROL) website and search for NTSB accident ID PLD25FR001. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

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