

Missouri Public Service Commission

Staff's Incident Report

APPENDIX A

FACTS REVIEWED BY UTILITIES

Spire Missouri Inc.
(Formerly known as “Laclede Gas Company”)
and
Gateway Infrastructure, LLC

*Industry Analysis Division
Safety Engineering Department
Jefferson City, Missouri*

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I. Facts Reviewed by Spire

A. Incident Description and Emergency Response

On March 1, 2022, JDK Cable General Contractors (“The Excavator”) was boring on the North side of Millers Ct. from a bore rig located in front of 7 Millers Ct. The work was being performed on behalf of Gateway Infrastructure, LLC (“Gateway”).

The intended path of the bore head was east to west, parallel to a 2-inch diameter plastic natural gas distribution main, and crossing three natural gas service lines. The Excavator had verified the locations of the service lines by “potholing¹” prior to boring. The bore head had advanced from the bore rig approximately 200 feet west to a location in front of 3 Millers Ct. when it struck the natural gas main. The Excavator had not verified the location of the natural gas main at this location by potholing. Figures 1 and 2 in Appendix B show the incident location.

The damage was to a 2-inch diameter polyethylene (PE) natural gas main, operating at 39.77 psig at the point and time of the damage. Figure 3 in Appendix B shows the location of damage to the pipeline. An employee working for the Excavator called a supervisor to report the gas leak. The Excavator then called 911.

At 10:37am the Excavator reported the damage to Spire. At 10:38 am, the Excavator called Missouri One Call to report the damage (Ticket No. 220601729).

At 10:42 am, Spire Missouri Inc., d/b/a Spire Missouri East (“Spire”) dispatched a first crew, which arrived on the scene at 10:59 am to coordinate with the O’Fallon Fire Protection District (FPD), and to check for gas migration.

Spire dispatched its second crew, a Leak Truck Foreman and a Leak Truck Worker to 3 Millers Ct. at 11:01am. Spire then dispatched a Supervisor of Maintenance at 11:08 am. The

¹ Section 319.037 RSMo uses the term “potholing” to refer to the practice of exposing an underground facility to determine its specific location, but does not define the term. The Common Ground Alliance (CGA) Best Practices Guide refers to a “pothole” as a “test hole” and provides the following definition:

Test Hole: Exposure of a facility by safe excavation practices used to ascertain the precise horizontal and vertical position of underground lines or facilities.

Spire Leak Truck Foreman and Leak Truck Worker arrived on-site at 11:18 am. Meanwhile, the General Fitting Service technician established a restricted zone. The Leak Truck Foreman began assessing shut down options and the Leak Truck Worker began air jacking² the affected area.

At 11:23 am Spire called in an emergency locate request (Ticket No. 220602061) and began digging to expose the main in front of 4 Millers Ct. At 11:25 am Spire obtained a reading of 1% gas-in-air³ inside the 3 Millers Ct. residence. Spire personnel turned off the gas to 3 Millers Ct. and obtained a 0% gas-in-air reading in the sanitary sewer at 5 Millers Ct. No one was home at 5 Millers Ct.; the occupant at 3 Millers Ct. was evacuated.

At 11:30am Spire obtained a reading of 2% gas-in-air in the 1516 Parsons Bend Ct. residence to the west of 3 Millers Ct. (See Appendix B, Figure 2), and expanded the restricted zone. Spire personnel turned off the gas to 1516 Parsons Bend Ct. and found no one home at 1508 Parsons Bend Ct. Spire personnel performed another check of the sanitary sewer at 5 Millers Ct. and confirmed the previous 0% gas-in-air reading.

At 11:35am, Spire personnel began work to stop the flow of gas to the main. The main was exposed at approximately 11:37am.

At 11:54 am, the residence at 3 Millers Ct. exploded and subsequently caught fire. Spire completed a squeeze off⁴ of the main at 11:55 am. Spire obtained a reading of 0% gas-in-air inside the residence at 1528 Parsons Bend Ct., and subsequently began turning off gas to nearby homes on Millers Ct., and checking for gas migration in additional homes on Millers Ct. and Parsons Bend Ct. At 12:00 pm, the residence at 5 Millers Ct. caught fire.

² “Air-jacking” is a term Spire uses to describe the procedure of forced ventilation of the subsurface atmosphere. The purpose of the “air-jack” is to eject a volume of air out of a subsurface area that is to be ventilated. To draw natural gas from a subsurface area, a pipe connected to an air compressor is inserted into a subsurface opening (e.g., bar-hole, excavation, man-hole, confined space) and the air flow creates a venturi-effect in the pipe that results in a vacuum in the soil or space to be ventilated. This accelerates the removal of natural gas from the soil or space to be ventilated.

³ Natural gas is composed mostly of methane. The lower explosive limit (LEL) for methane is 5% gas-in-air by volume, therefore a 1% gas in air reading indicates that the amount of gas in air is at approximately 20% of the LEL. ** [REDACTED]

⁴ A squeeze-off of pipe utilizes a clamping tool to constrict the pipe so that natural gas can no longer freely flow past the tool.

Spire reported the incident to the National Response Center (Report No. 1329957) at 12:33 pm, and MO PSC Staff at 12:47 pm. Figures 4 and 5 in Appendix B show the property damage at 3 Millers Ct. following the incident. Figures 6 and 7 in Appendix B shows the property damages to adjacent homes following the incident.

At 11:55 am Spire made the scene gas safe by squeezing the main. At 4:45pm the damaged 2-inch plastic main was replaced, and gas was reintroduced.

At 8:32 pm Spire had restored gas service to 18 homes, 2 homes were condemned and the gas to 1 home was left off.

Table 1 presents a summary of the timeline of events.

TABLE 1: SUMMARY OF EVENTS	
Time	Activity
10:37 AM	Spire notified of excavation damage
10:38 AM	O'Fallon FPD dispatched units for report of gas leak outside of residence
10:38 AM	Excavator Notified MO One-Call (Ticket No. 220601729)
10:42 AM	Spire dispatches first crew
10:45 AM	O'Fallon FPD arrives on scene
10:59 AM	Spire's first crew arrives on scene, begins to check for gas migration
11:01 AM	Spire leak crew is dispatched
11:18 AM	Restricted Zone established, Spire leak crew arrives on scene
11:23 AM	Emergency locates called in
11:25 AM	Evacuations begin
11:30 AM	Restricted Zone expanded
11:37 AM	Spire begins the squeeze off process
11:54 AM	Explosion and fire at residence at 3 Miller's Ct
11:55 AM	Main squeezed off
12:00 PM	Residence at 5 Miller's Ct caught fire

TABLE 1: SUMMARY OF EVENTS	
Time	Activity
4:45 PM	Services lines to 3 and 5 Millers Ct. abandoned, main repaired and gas reintroduced to main.
7:45 PM	Fire rekindled at 3 Millers Ct., O'Fallon FPD arrives to extinguish
8:32 PM	Spire completes 18 relights, 2 homes condemned.

No deaths or injuries were reported as a result of this incident. Property damages included three residences, the damaged homes were 3 and 5 Millers Ct. and 1528 Parsons Bend Court. Spire estimated that the property damage from the incident is \$663,761 property and contents, not including the estimated cost of natural gas loss.

The natural gas escaping from the damaged 2-inch diameter PE gas main exited at a pressure of approximately 40 psig. Since natural gas is lighter than air⁵, it will tend to migrate along paths of least resistance through the soil and upward into the atmosphere. Because the excavator had not exposed the main at this location, the natural gas migrated through the soil and into the basement of the residence located at 3 Millers Ct. The exact route the gas followed is unknown. Natural gas migrating to and along the foundation could have entered the structure through any cracks or utility entrance holes.

Natural gas entering the structure accumulated to an explosive mixture, and was ignited. The ignition source is unknown.

1. **Spire's Emergency Response**

Spire provided a copy of its applicable emergency procedure, *Emergency Plan Standard Operating Procedure (SOP) 220.D.4* to Staff on March 24, 2022.

Spire's actions to comply with the Commission's requirements in 20 CSR 4240-40.030(12)(J) were as follows:

⁵ Natural gas has a specific gravity of approximately 0.6 while air has a specific gravity of 1.0.

- A. Within minutes of receiving notification of the damage, Spire dispatched its first crew to assess the scene, coordinate with emergency responders, and begin checking for gas migration;
- B. The written accounts from Spire, the O’Fallon FPD and the O’Fallon police indicate that throughout the events leading up to and following this incident Spire maintained adequate communications with appropriate responders and public officials;
- C. In coordination with the emergency responders, Spire took appropriate actions to monitor for gas migration inside of nearby buildings and to evacuate residents;
- D. Spire made appropriate personnel, equipment and tools available to respond to the emergency;
- E. In coordination with the emergency responders, Spire took appropriate actions to protect people first, then property;
- F. By taking actions to squeeze off the main, Spire took actions to minimize hazards and restore safety; and
- G. Following the incident, Spire took actions to restore the service outage.

2. Reporting

a. Excavator

The Missouri One Call System’s Ticket Status system⁶ shows that on March 1, 2022 at 10:38 am, Mario Franco of JDK Cable General Contractors working on behalf of Gateway called to report a dig-up of a gas line, and that gas was blowing at 3 Millers Ct. in O’Fallon, Missouri.⁷ The Excavator also notified 911 and Spire of the damage.

Spire provided a Confidential document, identifying the excavator as **

b. Spire

⁶ Ticket Search & Status is available publically at [iSite \(occinc.com\)](https://www.occinc.com)

⁷ Missouri One Call Ticket No 220601729.

Spire provided notifications required by 20 CSR 4240-40.020 as follows:

- Spire’s first notification to the NRC was on March 1, 2022 at 12:33 pm CST⁸
- Spire first notified Commission Staff telephonically of the incident at approximately 12:47 pm on March 1, 2022, stating that the incident occurred at around noon.
- Spire’s second notification to the NRC was on March 3, 2022 at 1:38 pm CST.⁹
- Spire’s incident report was submitted to PHMSA on March 31, 2022.¹⁰

3. Spire’s Damage Prevention Program

Spire provided a copy of its Damage Prevention Program Standard Operating Procedure (SOP), Document number 220.C.3.

A notification of intent to excavate on Millers Ct. was received from Missouri One Call System. Spire’s locate contractor provided locate markings on the ground surface above the Spire facilities along Millers Ct. on February 23, 2022. The locate markings on the ground surface above the natural gas main at the damage location were within the “approximate location” as required by Section 319.030, RSMo.

Spire identified “high-profile areas” (HPAs)¹¹ on its pipeline system and used a ticket management system to screen locate requests and determine when a locate request conflicts with an HPA. Conflicts are e-mailed to Spire’s civic improvement inspectors to evaluate the need for and extent of excavation inspection. The excavation along Millers Ct. did not conflict with an HPA and Spire did not conduct an excavation inspection prior to the incident.

⁸ NRC Incident Report No. 1329957, taken by NRC on 01-MAR-22 at 13:33 ET.

⁹ NRC Incident Report No. 1330159, taken by NRC on 03-MAR-22 at 14:38 ET.

¹⁰ PHMSA No 20220025-36533

¹¹ Staff asked what was Spire's definition of a high-profile area (HPA) on March 1, 2022, and Spire’s response stated: The Company’s definition of a high-profile area (HPA) is the area 25-feet in each direction of mains of cast or bare steel material, transmission lines, mains 6-inches or larger in diameter, and mains with an MAOP greater than 60 psig.

B. Terms of Commission Order from Case No. GS-2007-0130

Staff submitted written questions to Spire to explain how the Company has complied with ordered paragraph 2 of the Commission Order issued on July 31, 2007 in Case No. GS-2007-0130, including how projects were identified and visited. The Spire response to each question stated:

“It is the Company’s recollection that subsequent to the Stipulation and Agreement for GS-2007-0130, the Company discussed the implementation of the recommendation with Staff and that the two came to an understanding that the recommendation was impractical as written. This was due to the difficulty of determining the method of installation, duration of the project, and the actual start date of the work as this often does not align with the date on the ticket. Specifically, the Company found that boring was marked on a majority of tickets even though it was not always the installation technique. Thereafter, the Company discussed with Staff its continued focus on education with excavators especially those that create concern for the Company. In keeping with the intent of the recommendation, the civic improvement inspectors continue to focus efforts on those excavators that create concern for the Company despite being unable to identify the specific subset of excavations identified in the Stipulation and Agreement. Since the time of the Stipulation and Agreement with the State, the Company has implemented more modern methods of identifying work completed near critical facilities through its ticket management system.”

Staff found no Stipulation and Agreement for Case No. GS-2007-0130 as stated above, and Spire later responded that they meant to reference the Commission Order issued on July 31, 2007. Spire also confirmed the understanding by Staff that this Commission Order has not been amended. Staff has not found in its records documentation of the discussions Spire

referred to in this response. Staff requested documentation of these discussions from Spire; however, Spire stated that it did not have documentation of discussions.

According to information provided by Spire, while Spire has been making inspection visits to most¹² excavations near high-profile areas, Spire has not specifically attempted to perform a site visit after each instance when locating personnel respond to an excavation notification and identify that an excavator with damage history is involved in a long duration boring project. However, the notification of intent to excavate on Millers Court that Spire received from Missouri One Call System was only for Millers Court and did not state that it was part of a larger boring project. Spire's locate contractor provided locate markings on the ground surface above the Spire facilities along Millers Court on February 23, 2022, which represents the full extent of the recorded actions by the locate contractor.

II. Facts Reviewed by Gateway

A. Incident Description and Emergency Response

At 10:37am the Excavator reported the damage to Spire. At 10:38 am, the Excavator called Missouri One Call to report the damage (Ticket No. 220601729).

Table 1 presents a summary of the timeline of events.

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1. Reporting

¹² Staff asked Spire: For the 2022 excavations that have occurred in HPA areas in Spire Missouri East, please provide the approximate percentage where 1 or more inspections of the excavation have been conducted. Spire's response stated: The Company has conducted excavation inspections on 80% of excavations that conflicted with HPA polygons.

c. Excavator

The Missouri One Call System's Ticket Status system¹³ shows that on March 1, 2022 at 10:38 am, Mario Franco of JDK Cable General Contractors working on behalf of Gateway Fiber called to report a dig-up of a gas line, and that gas was blowing at 3 Miller's Ct. in O'Fallon, Missouri.¹⁴ The Excavator also notified 911 and Spire of the damage.

B. Gateway's Damage Prevention Program and Installation Practices

Gateway Infrastructure, LLC¹⁵ is a telecommunications corporation in Missouri that is regulated by the Missouri Public Service Commission and must follow the Commission rules that apply such as 20 CSR 4240-18.010. Gateway Infrastructure, LLC (Gateway) uses contractors to install fiber optic cable systems in Missouri that are used by Missouri customers for internet and phone service, including the cable that was being installed on Miller's Ct.. Gateway contracted with ** [REDACTED]

[REDACTED] ** to install the fiber optic cable on Miller's Ct.. On February 15, 2022, JDK General Cable Contractors notified Missouri One Call of the intent to excavate along Miller's Ct. as recorded on Missouri One Call ticket 220463870.

Staff submitted written questions to Gateway about its telecommunication cable installation process, interactions with contractors, damage prevention program, and how these applied to the installation on Miller's Ct. in O'Fallon. The letter with Gateway's responses stated the responses should be considered a "closed record" pursuant to Missouri Revised Statue Section 610.021(1) and (14), so the responses are currently be treated as confidential. Gateway had a design-build type of contract with the general contractor. Staff asked if Gateway requires underground fiber optic cable installations by contractors/subcontractors to comply with the safety standards in 20 CSR 4240-18.010 and Gateway's response stated:

** [REDACTED]

¹³ Ticket Search & Status is available publically at [iSite \(occinc.com\)](https://occinc.com)

¹⁴ Missouri One Call Ticket No 220601729.

¹⁵ Gateway Infrastructure, LLC is the company name registered with Missouri Public Service Commission to provide VoIP phone service, but they do business in Missouri as Gateway Fiber.

[REDACTED]
[REDACTED]
[REDACTED] **

Staff asked if the fiber optic line being installed along the block of Miller's Ct. at 3 Miller's Ct. on March 1, 2022 was being installed in an underground conduit system (Part 3, Section 32 of the NESC), in an underground duct that is not part of a conduit system (Part 3, Section 35 of the NESC), or as a direct-buried cable (Part 3, Section 35 of the NESC).

Gateway's response stated:

** [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] **

Staff asked if Gateway requires underground fiber optic cable installations by contractors/subcontractors to comply with the National Electric Code (NESC) and specifically if Gateway requires contractors/subcontractors to maintain at least 12 inches of separation between the conduit and existing gas lines as required by Rule 320B5 for conduit systems.

Gateway's response stated to both questions stated:

** [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] **

Staff asked how many times were natural gas facilities damaged by either Gateway or a contractor or subcontractor between 1/1/2021 and 3/1/2022 and Gateway responded:

** [REDACTED]
[REDACTED]
[REDACTED] **

Staff asked Gateway if they employ inspectors to monitor work performed by contractors/subcontractors performing excavations and if so, to describe how such monitoring

is performed. The Gateway responses stated:

** [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
**

Staff asked Gateway to describe any changes and enhancements made to its damage prevention program following the incident at 3 Miller's Ct. and Gateway responded:

** [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] **