The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

PIPELINE SAFETY DIVISION

INCIDENT REPORT

27 Park Street
Maynard, Massachusetts
September 2, 2021

PIPELINE SAFETY DIVISION

27 Park Street, Maynard, Massachusetts

September 2, 2021

NSTAR Gas Company d/b/a Eversource Energy

Estimated Property Damage (per PHMSA report): $266,601

Injuries: One fatality, three receiving medical treatment

Report Issued: September 1, 2023

Table of Contents

EXHIBIT LIST

Exhibit 1: Telephonic Incident Notification

Exhibit 2: PHMSA Report dated October 1, 2021

Exhibit 3: Massachusetts Fire District Fourteen Fire Origin and Cause Investigation Report

Exhibit 4: Massachusetts Materials Research Inc. Report

Exhibit 5: D.P.U. 22-PL-82, Contractor OQs Notice of Probable Violation and Informal Review Decision

Exhibit 6: D.P.U. 21-PL-74, Maynard Incident Notice of Probable Violation

I. INTRODUCTION

A. Scope of the Investigation

The Massachusetts Department of Public Utilities ("Department"), Pipeline Safety Division ("Division"), pursuant to G.L. c. 164, § 105A and a Federal Certification Agreement as provided for in 49 U.S.C. § 60105, has investigated a natural gas related home explosion resulting in one fatality and three individuals seeking medical treatment ("Incident").

Pursuant to 49 U.S.C. § 60105(c), and as part of the Department's annual certification process by the United States Department of Transportation ("U.S. DOT"), the Department must report to the U.S. DOT:

> each accident or incident . . . involving a fatality, personal injury requiring hospitalization, or property damage or loss of more than an amount the [U.S. DOT] Secretary establishes, any other accident the [Department] considers significant, and a summary of the investigation by the [Department] of the cause and circumstances surrounding the accident or incident.

The Department has established procedures for determining the nature and extent of violations of codes and regulations pertaining to the safety of pipeline facilities and the transportation of gas, including but not limited to, G.L. c. 164, §§ 76, 76C, and 105A and 220 CMR §§ 69.00 and 101.00 through 115.00. The Division, on behalf of the Department, also enforces the U.S. DOT safety standards for gas pipeline systems as set forth in 49 CFR Parts 40, 192, 193, and 199.

B. Overview of Incident

On September 2, 2021, the Division responded to a report of a gas related incident, as defined in 49 CFR Part 191, §191.3, at the NSTAR Gas Company d/b/a Eversource Energy

("Eversource") facilities at 27 Park Street, Maynard. The Division had been notified by Telephonic Incident Notification (Exhibit 1) at approximately 7:38 pm that there was a suspected gas-related house explosion with one fatality. The two neighboring homes at 25 and 26 Park Street were also evacuated.

According to the Massachusetts Fire District Fourteen Fire Origin and Cause Investigation Report ("Report") (Exhibit 3), the Maynard fire department received a report of a strange odor in the house at 27 Park Street at 4:14 pm on the business line, not the emergency line. When the Maynard fire department arrived, they found that the structure was on fire and materials from the home were scattered in the roadway and property. The fire was extinguished and did not spread to any neighboring structures (Exhibit 3, at 2). The resident of 27 Park Street was pronounced deceased at 4:52 pm by fire crews on the scene. The Report determined he died as a result of the explosion/fire and was found against a door separating the finished basement from the dirt basement (Exhibit 3, at 3). The Report also concluded that the origin of the fire was the dirt basement, and the most probable source of ignition was a spark from the light in the dirt basement as the deceased entered to investigate the "strange odor" later determined to be natural gas (Exhibit 3, at 9).

The first Eversource service technician arrived on site at 5:12 pm, and a gas maintenance crew arrived at 6:15 pm (Exhibit 6, at 3). Eversource first responders made contact with the fire chief, cleared the curb valve, and shut off gas service to 27 Park Street. Eversource began a leak investigation with the help of the Maynard fire department and found significant readings inside the main valve, on the Sherman Street side of 27 Park

Street, inside 25 Park Street, and inside 26 Park Street (Exhibit 6, at 3). Eversource established an Incident Command System ("ICS") and began identifying the source of the leak. Eversource also began purging out the ground, which was saturated with gas around 25, 26 and 27 Park Street, and constructed a bypass to be able remove the leaking pipe without interrupting the supply of gas to customers. The crew quickly located the leak around the mechanical coupling on Sherman Street but delayed exposing the coupling to further contain the leak. At 2:50 am on September 3, Eversource activated the bypass and at 3:02 am, Eversource uncovered the leaking [redacted] mechanical coupling. A length of pipe about three feet in either direction of the leaking coupling was cut out and removed from the trench (Exhibit 6, at 4). Eversource continued purging gas around the homes on Park Street until a zero percent gas reading was achieved on September 8, 2021 (Exhibit 6, at 4).

The Division arrived at the scene at 8:25 pm on September 2, 2023. The Division stayed through Eversource removing the leaking coupling as described above. The Division oversaw the delivery of the recovered piece of pipe, the mechanical coupling, and two inches of extracted main to the Massachusetts Materials Research ("MMR") labs on September 3, 2021 (Exhibit 6, at 4).

II. INVESTIGATION

A. Introduction

The Division, on behalf of the Department, conducted an investigation to determine the cause and origin of the explosion. This included incident response, service restoration, pipeline replacement, and materials testing. The investigation also included a review of

applicable Eversource records to ascertain the root cause of the Incident. Beginning on October 25, 2021, the Division issued four sets of information requests, to which Eversource responded. After reviewing the final responses to information requests, a Notice of Probable Violation ("NOPV") was issued on August 9, 2023 (Exhibit, 6). The NOPV alleged violations of state and federal code, including failure to properly qualify leak survey contractors in accordance with their Operator Qualification plan, failure to adequately evaluate cathodically unprotected pipe for active corrosion, failure to adequately count and monitor leaks, and failure to send public officials public awareness notifications. The NOPV assessed a penalty in the amount of $1,500,000 (Exhibit 6, at 17). The results of the Division's investigation are set forth below.

B. Description of the Gas Facilities

The Eversource gas distribution system in this neighborhood is largely [redacted] coated steel intermediate pressure main installed in 1968. A segment near 6 Sherman Street is [redacted] 1938 bare steel, and a 390 foot section on Burnside Street has [redacted] 2018 high density polyethylene plastic main. The section of pipe removed with the leaking mechanical coupling is 1968 coated steel. All of the segments have a Maximum Allowable Operating Pressure ("MAOP") of [redacted] and were operating at [redacted] the night of the Incident.

C. Incident response and field investigation

The night of the Incident, September 2, 2021, and in the following days until gas readings were no longer present surrounding the homes on Park Street, the Division conducted a series of field investigations. The night of the Incident, the Division observed odorant testing, the results of which were normal. Further investigations included a pressure

test of the service line at 27 Park Street and a leak test of customer piping inside 27 Park Street. Both tests maintained pressure without leaking. A subsequent leak test of the appliances conducted by the insurance company, and witnessed by the Division, on October 7, 2021 found a "very small leak" between the water heater and the shut off. These appliances were in the finished part of the basement, removed from the fire's origin.

In total the Division recorded 18 on-site inspection days for the Incident, restoration, and follow up activities. The only substantive findings were the result of the materials testing and the information requests that followed.

D. Massachusetts Materials Research Materials Testing

The pipe and fittings were taken to the MMR facility in West Boylston for analysis. Interested persons were invited to a protocol conference on March 16, 2022, for visual inspection and to establish a protocol for testing. Interested persons were invited to return July 13, 14, and 15, 2022 to witness the testing. On January 12, 2023, MMR issued its final report which concluded the following (Exhibit 4, at 11):

- The mechanical coupling had significant corrosion on the entire outer diameter.
- Two locations had through wall corrosion which provided a leak path for gas to escape the main.
- The gas main pipe segments were in good condition and corrosion damage was isolated to the coupling.

E. Information Requests

The Division issued a series of information requests under docket 21-PL-74. Information requested included incident reports, timelines, qualifications of individuals,

calibration records, leak history, operator procedures, corrosion records, and public awareness materials. On October 25, 2021, the Division issued an initial set of information requests to Eversource, to which they responded on December 1, 2021. The Division issued two subsequent information requests on April 6, 2022 and November 8, 2022. Eversource responded to these information requests on April 27, 2022, and November 22, 2022, respectively. Following the issuing of the Division's Exit Letter outlining preliminary findings, a fourth information request was issued on June 6, 2023 to which Eversource responded on June 23, 2023. In reviewing these procedures and records the Division identified several violations of state and federal pipeline safety codes.

Operator Qualifications: The Division had significant concerns about the qualifications of contractor employees performing leak surveys in the aftermath of the Incident. Several of the individuals performing these tasks were not properly qualified to do so in accordance with Eversource's Operator Qualification ("OQ") Plan, OQ-001. The information request responses for these violations led to a separate enforcement action, 22-PL-82, which found 737 different violations of the OQ Plan based on the response to 21-PL-74 IR 3-7 (Exhibit 5). Eversource did not contest the findings in 22-PL-82 and executed a consent order on March 23, 2023 following an informal conference on March 8, 2023, which assessed a civil penalty of $75,000 (Exhibit 5). Several additional instances of contractor employees performing leak surveys without proper qualifications were omitted from 22-PL-82 and were included in the NOPV for 21-PL-74 (Exhibit 6, at 5).

Unprotected Pipe Evaluations: The Division identified several concerns with the process Eversource utilizes to identify active corrosion on unprotected pipelines. Eversource uses a tool called the Gas Main Replacement Index ("GMRI") to calculate a score of each segment of pipe. The GMRI is an evaluation tool that assesses a risk score based on variables such as soil conditions, utility construction, location type, and leak information (Exhibit 6, at 5). Any pipe segment that scores over 77 is determined to be actively corroding. One concern is that Eversource applied the wrong material score to the main on Sherman Street. The GMRI identified the main as coated steel, however, during the investigation, Eversource acknowledged that it should have used the higher score from the 1938 bare steel pipe located near 6 Sherman Street (Exhibit 6, at 8). The Division's primary concern is that many of the factors that go into the GMRI score are risk based or cost based, and unrelated to factors that would indicate the presence of active corrosion. The tool was designed to rank pipe segments eligible for Gas System Enhancement Plans ("GSEP"), not identify active corrosion. GSEP is a program that allows gas operators to seek cost recovery from ratepayers to accelerate the replacement of leak prone pipelines (Exhibit 6, at 6). The Division does not believe the GMRI process, as written at the time of the Incident, meets the requirements of 192.465(e) (Exhibit 6, at 8). By employing the GMRI, there is no number of leaks and no leak growth rate that could have alerted Eversource to active corrosion on Sherman St. and Park St. Conversely, had the municipality alerted Eversource that Sherman Street was going to be paved following a water or sewer project, the opportunity for joint trenching would have generated a score that would identify this main as actively corroding

(Exhibit 6, at 7). By solely utilizing the GMRI, Eversource did not effectively monitor for areas of active corrosion as required by federal pipeline safety regulations.

Leak Survey and Repair: Eversource provided several records related to the leak history of both Sherman and Park Streets. One pair of leaks on Sherman Street were at times confused with each other, marked in the wrong location, incorrectly located on reinspection, and were undetected by the mobile survey. The leak history of these two leaks were inconsistent, unclear, and the records provided to the Division were at times illegible (Exhibit 6, at 10). This raises serious concerns about Eversource's leak identification and reinspection procedures.

Public Awareness Program: Eversource was utilizing the Police and Fire Chiefs to meet the requirement in API RP 1162, which requires notification of a Public Official identified as "Local, city, county or state officials and/or their staffs having land use and street/road jurisdiction along the pipeline route." Public Safety Chiefs are better suited to meet the API RP 1162 definition of Emergency Officials. Following the Incident, Eversource updated this process to send public awareness information to the Town Administrator (Exhibit 6, at 12).

III. SUMMARY OF FINDINGS

- The cause of the explosion was gas that had accumulated in the dirt basement.
- The source of the gas was corrosion damage to a mechanical coupling on Sherman Street.
- A review of procedures and records received as part of the investigation found inadequate processes to identify active corrosion.

- A review of leak records found unclear and inconsistent practices to identify and monitor leaks.
- At least six individuals performing leak investigations in response to the Incident were not properly qualified to do so.

IV. CONCLUSION

Based on the Division's review of all relevant information, including Eversource's responses to the information requests, the Fire District Fourteen report, and the MMR report, the Division adopts the Fire District Fourteen conclusion that the cause and origin of the Incident at 27 Park Street is natural gas accumulating in the dirt basement, originating from the corroded mechanical coupling on Sherman Street. The Division further concludes Eversource violated federal pipeline safety codes:

- Part 192, § 192.465(e) External corrosion control: Monitoring and remediation;
- Part 192, §192.491(c)(1) Corrosion control records;
- Part 192, § 192.605(a) Procedural manual for operations, maintenance, and emergencies;
- Part 192, § 192.616(c) Public Awareness;
- Part 192, § 192.805(b) Qualification program;
- Part 192, and §192.1007(e)(1)(i) What are the required elements of an integrity management plan?

Additionally, the Division found that these violations could have contributed to the likelihood of a gas incident in the neighborhood of Sherman Street and Park Street, Maynard (Exhibit 6, at 14).

EXHIBIT 1

Telephonic Incident Notification

Massachusetts Department of Public Utilities
Pipeline Safety Division
DPU.PipelineReports@mass.gov

TELEPHONIC INCIDENT NOTIFICATION (TIN) FORM

NOTE: "N/A" = Not Applicable. For unknown or unavailable information, enter "UNK" in the text box.

DPU Use Only					
Date of call:	09.02.2021	Time of call:	1938 hrs.	Report received by:	Angela Motley

SECTION 1 GENERAL INFORMATION			
Operator's Name:	Eversource Energy	Who Notified Operator:	FD
Person Filing Report:	Cherna Baten	Street Address:	27 Park Street
Contact Phone Number:	860-328-0262	City/Town:	Maynard, MA

SECTION 2 INCIDENT INFORMATION

TYPE OF CALL (check all that apply)	
1. Hit Pipeline w/Release of Gas	☐
2. Evacuation	☐
3. Gas Outage	☐
4. 49 CFR 191 Incident	☐
5. Over/Under Pressure	☐
6. Gas Ignition/Explosion	☒
7. LNG Facility	☐
8. LPG Facility	☐
9. Security Breach	☐
10. Media on site	☐

DETAILED DESCRIPTION OF INCIDENT

At 1938 hrs. (07:38 pm) on 09/02/2021, Eversource Gas (EGMA) called Angela Motley (Standby Engineer) to report an incident of a house explosion at the above referenced address, which was gas related. EGMA reported that there was one (1) fatality, and that house numbers 25 and 26 Park Street were also evacuated due to the explosion.

EGMA dispatch also reported that gas readings were obtained outside the foundation wall at 27 Park Street. Media was reported on-site. The incident is under investigation.

SECTION 3 INCIDENT TIMELINE (military time)			
Call received:	1645 hrs	Incident made safe:	UNK
Technician dispatched:	1712 hrs	Service restored (*if applicable*):	UNK
Technician arrived on site:	1807 hrs		

SECTION 4 EVACUATION INFORMATION ☐ N/A			
Evacuated by:	FD	Time evacuated:	Information not yet available
No. of persons evacuated:	UNK	Time allowed to re-enter:	Information not yet available

SECTION 5 LEAK INFORMATION ☐ N/A			
Leak Classification:	Pending	Was gas service interrupted?	☐ Yes ☐ No
Has the leak been secured?	☒ Yes ☐ No	For hit with release of gas, did Excavator call 911?	☐ Yes ☐ No ☐ Unknown

SECTION 6 OUTAGE INFORMATION ☒ N/A			
Estimated duration of outage:		Number of customers affected:	

SECTION 7 DISTRIBUTION SYSTEM INFORMATION					
Pipe Material (select one):	Choose an item.	Operating Pressure (psig):	UNK	Pipe Size (inches):	UNK

SECTION 8 DAMAGE PREVENTION INFORMATION ☒ N/A			
Dig Safe No.		Excavator information:	
Dig Safe Number valid?	☐ Yes ☐ No	Site properly marked?	☐ Yes ☐ No

SECTION 9 NATIONAL RESPONSE CENTER (NRC) INFORMATION ☐ N/A					
Incident reported to NRC?	☒ Yes ☐ No	Date reported:		Time reported (est.):	

SECTION 10 INJURIES/HOSPITALIZATION ☒ N/A			
Number of persons injured:	0	Number of persons hospitalized:	0

Massachusetts Department of Public Utilities
Pipeline Safety Division
DPU.PipelineReports@mass.gov

OPERATOR TELEPHONIC INCIDENT NOTIFICATION FOLLOW-UP REPORT FORM

NOTE: "N/A" = Not Applicable. For unknown or unavailable information, enter "UNK" in the text box.

Date of call to DPU:	9/2/2021	Time of call to DPU:	19:39 Angela Motley	Street Address, City/Town:	27 Park Street, Maynard

SECTION 1 GENERAL INFORMATION

Operator's Name:	Eversource Energy	Who Notified Operator:	FD
Person Filing Report:	Cherna Baten		
Contact Phone Number:	860-328-0262		

SECTION 2 INCIDENT INFORMATION

TYPE OF CALL (check all that apply)	
1. Hit Pipeline w/Release of Gas	☐
2. Evacuation	☒
3. Gas Outage	☐
4. 49 CFR 191 Incident	☒
5. Over/Under Pressure	☐
6. Gas Ignition/Explosion	☒
7. LNG Facility	☐
8. LPG Facility	☐
9. Security Breach	☐
10. Media on site	☒

DETAILED DESCRIPTION OF INCIDENT

Eversource was called by the Fire Dept to a structure fire at 27 Park St in Maynard. Once gas was shut off, the Fire Chief notified the Supervisor in the field that this may potentially be a gas related event and that there was one fatality at the location. Eversource remains onsite investigating and has recorded readings at the foundation of the home. Evacuations were made at 25 and 26 Park St.

SECTION 3 INCIDENT TIMELINE (military time)

Call received:	1639	Incident made safe:	2:52 9/3
Technician dispatched:	1645	Service restored (*if applicable*):	
Technician arrived on site:	1712		

SECTION 4 EVACUATION INFORMATION ☐ N/A

Evacuated by:	FD	Time evacuated:	Evacuated prior to Operator Personnel arrival
No. of persons evacuated:	4	Time allowed to re-enter:	22:00

SECTION 5 LEAK INFORMATION ☐ N/A

Leak Classification:	Grade 1	Was gas service interrupted?	☒ Yes ☐ No
Has the leak been secured?	☒ Yes ☐ No	For hit with release of gas, did Excavator call 911?	☐ Yes ☐ No ☐ Unknown

SECTION 6 OUTAGE INFORMATION ☒ N/A

Estimated duration of outage:		Number of customers affected:	

SECTION 7 DISTRIBUTION SYSTEM INFORMATION

Pipe Material (select one):	**Steel**	Operating Pressure (psig):	[redacted]	Pipe Size (inches):	[redacted]

SECTION 8 DAMAGE PREVENTION INFORMATION ☒ N/A

Dig Safe No.		Excavator information:	
Dig Safe Number valid?	☐ Yes ☐ No	Site properly marked?	☐ Yes ☐ No

SECTION 9 INJURIES/HOSPITALIZATION ☐ N/A

Number of persons injured:	4	Number of persons hospitalized:	3

EXHIBIT 2

PHMSA Report dated October 1, 2021

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty as provided in 49 USC 60122.		OMB NO: 2137-0635 EXPIRATION DATE: 5/31/2024
U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	10/01/2021
	No.	20210084- 35921
		---------- (DOT Use Only)

INCIDENT REPORT - GAS DISTRIBUTION SYSTEM

INSTRUCTIONS

Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at* http://www.phmsa.dot.gov/pipeline/library/forms.

PART A - KEY REPORT INFORMATION

Report Type: *(select all that apply)*	**Original:**	**Supplemental:**	**Final:**
		Yes	

Last Revision Date	10/27/2021
1. Operator's OPS-issued Operator Identification Number (OPID):	2652
2. Name of Operator	NSTAR GAS COMPANY
3. Address of Operator:	
3a. Street Address	157 CORDAVILLE ROAD
3b. City	SOUTHBOROUGH
3c. State	Massachusetts
3d. Zip Code	01772
4. Earliest local time (24-hr clock) and date an incident reporting criteria was met:	09/02/2021 18:35
4a. Time Zone for local time (select only one)	Eastern
4b. Daylight Saving in effect?	No
5. Location of Incident:	
5a. Street Address or location description	27 Park St
5b. City	Maynard
5c. County or Parish	Middlesex
5d. State:	Massachusetts
5e. Zip Code:	01754
5f. Latitude / Longitude	42.42682, -71.45641
6. Gas released:	Natural Gas
- Other Gas Released Name:	
7. Estimated volume of gas released unintentionally: - thousand standard cubic feet (mcf)	1.00
8. Estimated volume of intentional and controlled release/blowdown: - thousand standard cubic feet (mcf)	
9. Were there fatalities?	Yes
- If Yes, specify the number in each category:	
9a. Operator employees	0
9b. Contractor employees working for the Operator	0
9c. Non-Operator emergency responders	0
9d. Workers working on the right-of-way, but NOT associated with this Operator	0
9e. General public	1
9f. Total fatalities (sum of above)	1
10. Were there injuries requiring inpatient hospitalization?	No
- If Yes, specify the number in each category:	
10a. Operator employees	
10b. Contractor employees working for the Operator	
10c. Non-Operator emergency responders	
10d. Workers working on the right-of-way, but NOT associated with this Operator	
10e. General public	
10f. Total injuries (sum of above)	

11. What was the Operator's initial indication of the Failure? *(select only one)*	Other
- If Other, Specify:	Leak Investigation
11a. If "Controller", "Local Operating Personnel, including contractors", "Air Patrol", or "Ground Patrol by Operator or its contractor" is selected in Question 11, specify.	
12. Local time operator identified failure	09/02/2021 18:35
If 11 = Notification from Emergency Responder, skip questions 13 through 15.	
13. Did the operator communicate with Local, State, or Federal Emergency Responders about the incident?	Yes
- If No, skip A14 and A15	
14. Which party initiated communication about the incident?	Local/State/Federal Emergency Responder
15. Local time of initial Operator and Local/State/Federal Emergency Responder communication	09/02/2021 16:33
16. Local time operator resources arrived on site:	09/02/2021 17:12
17. reserved for local time of confirmed discovery – proposed in "Pipeline Safety: Operator Qualification, Cost Recovery, Accident and Incident Notification, and Other Changes" rulemaking	
18. Local time (24-hr clock) and date of initial operator report to the National Response Center:	09/02/2021 19:45
19. Initial Operator National Response Center Report Number:	1315634
19a. Additional NRC Report numbers submitted by the operator:	1315635, 1315730
20. Method of Flow Control (select all that apply)	
"Key/Critical" Valve – inspected in accordance with Part 192.747	
Main Valve other than "Key/Critical"	
Service (curb) Valve	Yes
Meter/Regulator shut-off Valve	
Excess flow valve	
Squeeze-Off	
Stopple fitting	
Other	Yes
- If Other, Specify:	TD Williamson Three Way Stoppers
21. Did the gas ignite?	Yes
If A21 = Yes, answer A21a through A21d.	
21a. Local time of ignition	09/02/2021 16:15
21b. How was the fire extinguished?	Local/State/Federal Emergency Responder
- If Other, Specify:	
21c. Estimated volume of gas consumed by fire (MCF): (must be less than or equal to A7.)	1.00
21d. Did the gas explode?	Yes
22. Number of general public evacuated:	4

PART B - ADDITIONAL LOCATION INFORMATION

1. Was the Incident on Federal land?	No
2. Location of Incident	Public property
3. Area of Incident:	Underground
Specify:	Under pavement
If Other, Describe:	
3a. Depth of Cover:	4
3b. Were other underground facilities found within 12 inches of the failure location?	No
4. Did Incident occur in a crossing?	No
- If Yes, specify type below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased	
Uncased	
Bored/drilled	
- If Road crossing –	
Cased	
Uncased	
Bored/drilled	
- If Water crossing –	
Cased	
Uncased	
Bored/drilled	

Name of body of water (If commonly known):	
Approx. water depth at time and location of Incident (ft):	
(select only one):	

PART C - ADDITIONAL FACILITY INFORMATION

1. Indicate the type of pipeline system:	Privately Owned
- If Other, specify:	
2. Part of system involved in Incident:	Main
- If Other, specify:	
2a. Year item involved in the incident was installed:	1968
2b. Year item involved in the incident was manufactured:	Unknown
When 2.is any value other than "Main", "Main Valve", "District Regulator/Metering Station", or "Other":	
2c. Indicate the customer type: (select only one)	
2d. Was an EFV installed on the service line before the time of the incident?	
If 2d = Yes, then 2e. Did the EFV activate?	
2f. Was a curb valve installed on the service line before the time of the incident?	
3. When 2. is "Main" or "Service" answer 3a through c and 4:	
3a. Nominal Pipe Size:	[redacted]
3b. Pipe specification (e.g., API 5L, ASTM D2513):	API5L
3c. Pipe manufacturer:	Unknown
4. Material involved in Incident:	Steel
- If Other, specify:	
4a. If Steel, Specify seam type:	Other
- If Other, specify:	unknown at this time
4b. If Steel, Specify wall thickness *(inches)*:	[redacted]
4c. If Plastic, Specify type:	
- If Other, describe:	
4d. If Plastic, Specify Standard Dimension Ratio (SDR):	
Or wall thickness:	
Unknown	
4e. If Polyethylene (PE) is selected as the type of plastic in Part C, Question 4.c:	
- Specify PE Pipe Material Designation Code (i.e. 2406, 3408, etc.)	
Unknown?	
5. Type of release involved :	Other
- If Mechanical Puncture - Specify Approx size:	
Approx. size: in. (axial):	
in. (circumferential):	
- If Leak - Select Type:	
- If Other, Describe:	
- If Rupture - Select Orientation:	
- If Other, Describe:	
Approx. size: (widest opening):	
(length circumferentially or axially):	
- If Other - Descr be:	Unknown till completion of incident analysis

PART D - ADDITIONAL CONSEQUENCE INFORMATION

1. Class Location of Incident :	Class 3 Location
2. Estimated Property Damage :	
2a. Estimated cost of public and non-Operator private property damage paid/reimbursed by the Operator	$ 212,051
2b. Estimated cost of Operator's property damage & repairs	$ 15,874
2c. Estimated cost of emergency response	$ 38,676
2d. Estimated other costs	$ 0
- Describe:	
2e. Property damage subtotal (sum of above)	$ 266,601
Cost of Gas Released	
Cost of Gas in $ per thousand standard cubic feet (mcf):	$ .00
2f. Estimated cost of gas released unintentionally	$ 0
2g. Estimated cost of gas released intentionally during controlled release/blowdown	$ 0
2h. Total estimated cost of gas released (sum of 2f and g)	$ 0
2i. Estimated Total Cost (sum of 2e and 2h)	$ 266,601
3. Estimated number of customers out of service:	

3a. Commercial entities	0
3b. Industrial entities	0
3c. Residences	1
Injured Persons not included in A10 The number of persons injured, admitted to a hospital, and remaining in the hospital for at least one overnight are reported in A10. If a person is included in A10, do not include them in D4.	
4. Estimated number of persons with injuries requiring treatment in a medical facility but not requiring overnight in-patient hospitalization:	3
If a person is included in 4, do not include them in 5.	
5. Estimated number of persons with injuries requiring treatment by EMTs at the site of incident:	0
Buildings Affected	
6. Number of residential buildings affected (evacuated or required repair or had gas service interrupted):	3
7. Number of business buildings affected (evacuated or required repair or had gas service interrupted):	0
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Incident (psig):	[redacted]
2. Normal operating pressure at the point and time of the Incident (psig):	[redacted]
3. Maximum Allowable Operating Pressure (MAOP) at the point and time of the Incident (psig):	[redacted]
3a. MAOP established by 49 CFR section:	192.619(c)
3b. Date MAOP established:	07/01/1970
4. Describe the pressure on the system relating to the Incident:	Pressure did not exceed MAOP
5. Type of odorization system for gas at the point of failure:	drip
- If Other, Specify:	
6. Odorant level near the point of failure measured after the failure:	0.1
Not Measured	
7. Was a Supervisory Control and Data Acquisition (SCADA) based system in place on the pipeline or facility involved in the Incident?	No
- If Yes:	
7a. Was it operating at the time of the Incident?	
7b. Was it fully functional at the time of the Incident?	
7c. Did SCADA-based information (such as alarm(s), alert(s), event (s), and/or volume or pack calculations) assist with the initial indication of the Incident?	
7d. Did SCADA-based information (such as alarm(s), alert(s), event (s), and/or volume calculations) assist with the confirmed discovery of the Incident?	
8. Was an investigation initiated into whether or not the controller(s) or control room issues were the cause of or a contr buting factor to the Incident? *(select all that apply)*:	No, the Operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to: (provide an explanation for why the Operator did not investigate)
- If "No, the operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to:" (*provide an explanation for why the operator did not investigate*)	The system never exceeded MAOP thus no investigation was required
- If Yes, Specify investigation result(s) *(select all that apply)*:	
- Investigation reviewed work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
- Investigation did NOT review work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
- Provide an explanation for why not:	
- Investigation identified no control room issues	
- Investigation identified no controller issues	
- Investigation identified incorrect controller action or controller error	
- Investigation identified that fatigue may have affected the controller(s) involved or impacted the involved controller(s) response	
- Investigation identified incorrect procedures	
- Investigation identified incorrect control room equipment operation	
- Investigation identified maintenance activities that affected control room operations, procedures, and/or controller response	

- Investigation identified areas other than those above	
Describe:	
PART F - DRUG & ALCOHOL TESTING INFORMATION	
1. As a result of this Incident, were any Operator employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
1a. How many were tested:	
1b. How many failed:	
2. As a result of this Incident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
2a. How many were tested:	
2b. How many failed:	
PART G - CAUSE INFORMATION	
Select only one box from PART G in shaded column on left representing the Apparent Cause of the Incident, and answer the questions on the right. Enter secondary, contributing, or root causes of the Incident in Part J – Contributing Factors.	
Apparent Cause:	G8 - Other Incident Cause
G1 - Corrosion Failure – only one **sub-cause** can be picked from shaded left-hand column	
Corrosion Failure Sub-Cause:	
- If External Corrosion:	
1. Results of visual examination:	
- If Other, Specify:	
2. Type of corrosion:	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other	
- If Other, Describe:	
2a. If 2. is Stray Current, specify	
2b. Describe the stray current source:	
3. The type(s) of corrosion selected in Question 2 is based on the following:	
- Field examination	
- Determined by metallurgical analysis	
- Other	
- If Other, Describe:	
4. Was the failed item buried or submerged?	
- If Yes:	
4a. Was failed item considered to be under cathodic protection at the time of the incident?	
- If Yes, Year protection started:	
4b. Was shielding, tenting, or disbonding of coating evident at the point of the incident?	
4c. Has one or more Cathodic Protection Survey been conducted at the point of the incident? (select all that apply)	
If "Yes, CP Annual Survey" – Most recent year conducted:	
If "Yes, Close Interval Survey" – Most recent year conducted:	
If "Yes, Other CP Survey" – Most recent year conducted:	
Descr be Other CP Survey:	
- If No:	
4d. Was the failed item externally coated or painted?	
5. Was there observable damage to the coating or paint in the vicinity of the corrosion?	
6. Pipeline coating type, if steel pipe is involved:	
- If Other, Describe:	
6a. Field Applied?	
- If Internal Corrosion:	

7. Results of visual examination:	
- If Other, Describe:	
8. Cause of corrosion *(select all that apply)*:	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	
- Other	
- If Other, Specify:	
9. The cause(s) of corrosion selected in Question 8 is based on the following: *(select all that apply)*:	
- Field examination	
- Determined by metallurgical analysis	
- Other	
- If Other, Describe:	
10. Location of corrosion *(select all that apply)*:	
- Low point in pipe	
- Elbow	
- Drop-out	
- Other	
- If Other, Describe:	
11. Was the gas/fluid treated with corrosion inh bitor or biocides?	
12. Were any liquids found in the distribution system where the Incident occurred?	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Part of system involved in incident" (from PART C, Question 2) is Main, Service, or Service Riser.	
13. Date of the most recent Leak Survey conducted	
14. Has one or more pressure test been conducted since original construction at the point of the Incident?	
- If Yes:	
Most recent year tested:	
Test pressure:	
G2 – Natural Force Damage – only one **sub-cause** can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Specify:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Specify:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Specify:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Incident generated in conjunction with an extreme weather event?	
6.a If Yes, specify *(select all that apply)*:	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Specify:	
G3 – Excavation Damage – only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Previous Damage due to Excavation Activity: Complete the following ONLY IF the "Part of system involved in Incident" (from Part C, Question 2) is Main, Service, or Service Riser.	
1. Date of the most recent Leak Survey conducted	

2. Has one or more pressure test been conducted since original construction at the point of the Incident?	
- If Yes:	
Most recent year tested:	
Test pressure:	
Complete the following if Excavation Damage by Third Party is selected.	
3. Did the operator get prior notification of the excavation activity?	
3a. If Yes, Notification received from: *(select all that apply)*:	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
3b. Per the primary Incident Investigator report, did State law exempt the excavator from notifying the one-call center?	
If yes, answer 3c through 3e.	
3c. (select only one)	
- If Other, Specify:	
3d. Exempting Authority:	
3e. Exempting Criteria:	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
4. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
5. Right-of-Way where event occurred *(select all that apply)*:	
- Public	
- If Public, Specify:	
- Private	
- If Private, Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
6. Type of excavator :	
7. Type of excavation equipment :	
8. Type of work performed :	
9. Was the One-Call Center notified?	
If No, skip to question 13	
9a. If Yes, specify ticket number:	
9b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
10. Type of Locator:	
11. Were facility locate marks vis ble in the area of excavation?	
12. Were facilities marked correctly?	
13. Did the damage cause an interruption in service?	
13a. If Yes, specify duration of the interruption:	
14. Description of the CGA-DIRT Root Cause *(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well)*:	
- Root Cause Description:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - only one **sub-cause** can be selected from the shaded left-hand column	
Other Outside Force Damage – Sub-Cause:	
- If Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation:	
1. Vehicle/Equipment operated by:	
If this sub-cause is picked, complete questions 7-13 below.	
- If Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels Set Adrift or Which Have Otherwise Lost Their Mooring:	

2. Select one or more of the following IF an extreme weather event was a factor:	
- Hurricane	
- Tropical Storm	
- Tornado	
- Heavy Rains/Flood	
- Other	
- If Other, Specify:	
- If Previous Mechanical Damage NOT Related to Excavation: *Complete the following ONLY IF the "Part of system involved in Incident" (from Part C, Question 2) is Main, Service, or Service Riser.*	
3. Date of the most recent Leak Survey conducted:	
4. Has one or more pressure test been conducted since original construction at the point of the Incident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
- If Intentional Damage:	
5. Specify:	
- If Other, Specify:	
- If Other Outside Force Damage:	
6. Describe:	
Complete the following if Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation sub-cause is selected.	
7. Was the driver of the vehicle or equipment issued one or more citations related to the incident?	
If 7. is Yes, what was the nature of the citations (select all that apply)	
7a. Excessive Speed	
7b. Reckless Driving	
7c. Driving Under the Influence	
7d. Other:	
- If Other, Specify:	
8. Was the driver under control of the vehicle at the time of the collision?	
9. Estimated speed of the vehicle at the time of impact (miles per hour)?	
Unknown	
10. Type of vehicle?	
11. Where did the vehicle travel from to hit the pipeline facility?	
12. Shortest distance from answer in 11. to the damaged pipeline facility (in feet):	
13. At the time of the incident, were protections installed to protect the damaged pipeline facility from vehicular damage?	
If 13. is Yes, specify type of protection (select all that apply):	
13a. Bollards/Guard Posts	
13b. Barricades, including "jersey" barriers and fences	
13c. Guard Rails	
13d. Meter Box	
13e. Ingress or Regress at a Residence	
13f. Other	
- If Other, Specify:	
G5 - Pipe, Weld, or Joint Failure - only one **sub-cause** can be selected from the shaded left-hand column	
Pipe, Weld or Joint Failure – Sub-Cause:	
- If Body of Pipe:	
1. Specify:	
- If Other, Describe:	
- If Butt Weld:	
2. Specify:	
- If Other, Describe:	
- If Fillet Weld:	
3. Specify:	
- If Other, Describe:	
- If Pipe Seam:	
4. Specify:	
- If Other, Describe:	
- If Mechanical Joint Failure	

5a. Specify the Mechanical Fitting Involved (select only one)	
Other Compression Type Fitting (specify):	
5b. Specify the Type of Mechanical Fitting (select only one)	
Other (specify):	
5c. Fitting Manufacturer:	
Unknown	
5d. Part or Model Number:	
Unknown	
5e. Fitting Material (select only one)	
Other (specify):	
5f. How did the joint failure occur? (select only one)	
Other *(specify):*	
- If Fusion Joint:	
6. Specify:	
- If Other, Specify:	
7. Year installed:	
8. Other attr butes:	
9. Specify the two materials being joined:	
9a. First material being joined:	
- If Other, Specify:	
9b. Second material being joined:	
- If Other, Specify:	
- If Other Pipe, Weld, or Joint Failure:	
10. Describe:	
Complete the following if any Pipe, Weld, or Joint Failure sub-cause is selected.	
11. Additional Factors (*select all that apply*):	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other	
- If Other, Specify:	
12. Was the Incident a result of:	
- Construction defect	
Specify:	
- Material defect	
Specify:	
- If Other, Specify:	
- Design defect	
- Previous damage	
13. Has one or more pressure test been conducted since original construction at the point of the Incident?	
- If Yes:	
Most recent year tested:	
Test pressure:	
G6 - Equipment Failure - only one **sub-cause** can be selected from the shaded left-hand column	
Equipment Failure – **Sub-Cause:**	
- If Malfunction of Control/Relief Equipment:	
1. Specify:	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	

- Power Failure	
- Stopple/Control Fitting	
- Pressure Regulator	
- Other	
- If Other, Specify:	
- If Threaded Connection Failure:	
2. Specify:	
- If Other, Specify:	
- If Non-threaded Connection Failure:	
3. Specify:	
- If Other, Specify:	
- If Valve:	
4. Specify:	
- If Other, Specify:	
4a. Valve type:	
4b. Manufactured by:	
4c. Year manufactured:	
4d. Valve Material:	
- If Other, Specify:	
- If Other Equipment Failure:	
5. Describe:	
G7 - Incorrect Operation - only one **sub-cause** can be selected from the shaded left-hand column	
Incorrect Operation Sub-Cause:	
- If Other Incorrect Operation:	
1. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	
2. Was this Incident related to: (select all that apply)	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other	
- If Other, Describe:	
3. What category type was the activity that caused the Incident:	
4. Was the task(s) that led to the Incident identified as a covered task in your Operator Qualification Program?	
4a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	
G8 - Other Incident Cause - only one **sub-cause** can be selected from the shaded left-hand column	
Other Incident Cause – Sub-Cause:	Unknown
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	Still under investigation, cause of Incident to be determined* (*Supplemental Report required)
Mandatory comment field:	
PART J - CONTRIBUTING FACTORS	
The Apparent Cause of the accident is contained in Part G. Do not report the Apparent Cause again in this Part J. If Contributing Factors were identified, select all that apply below and explain each in the Narrative:	
External Corrosion	
External Corrosion, Galvanic	
External Corrosion, Atmospheric	
External Corrosion, Stray Current Induced	
External Corrosion, Microbiologically Induced	
External Corrosion, Selective Seam	
Internal Corrosion	
Internal Corrosion, Corrosive Commodity	
Internal Corrosion, Water drop-out/Acid	
Internal Corrosion, Microbiological	
Internal Corrosion, Erosion	

Natural Forces	
Earth Movement, NOT due to Heavy Rains/Floods	
Heavy Rains/Floods	
Lightning	
Temperature	
High Winds	
Snow/Ice	
Tree/Vegetation Root	
Excavation Damage	
Excavation Damage by Operator (First Party)	
Excavation Damage by Operator's Contractor (Second Party)	
Excavation Damage by Third Party	
Previous Damage due to Excavation Activity	
Other Outside Force	
Nearby Industrial, Man-made, or Other Fire/Explosion	
Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation	
Damage by Boats, Barges, Drilling Rigs, or Other Adrift Maritime Equipment	
Routine or Normal Fishing or Other Maritime Activity NOT Engaged in Excavation	
Electrical Arcing from Other Equipment or Facility	
Previous Mechanical Damage NOT Related to Excavation	
Intentional Damage	
Other underground facilities buried within 12 inches of the failure location	
Pipe/Weld Failure	
Design-related	
Construction-related	
Installation-related	
Fabrication-related	
Original Manufacturing-related	
Equipment Failure	
Malfunction of Control/Relief Equipment	
Threaded Connection/Coupling Failure	
Non-threaded Connection Failure	
Valve Failure	
Incorrect Operation	
Damage by Operator or Operator's Contractor NOT Excavation and NOT Vehicle/Equipment Damage	
Valve Left or Placed in Wrong Position, but NOT Resulting in Overpressure	
Pipeline or Equipment Overpressured	
Equipment Not Installed Properly	
Wrong Equipment Specified or Installed	
Inadequate Procedure	
No procedure established	
Failure to follow procedures	

PART H - NARRATIVE DESCRIPTION OF THE INCIDENT

Report filed on by half of NSTAR GAS COMPANY d/b/a EVERSOURCE ENERGY. Based upon the initial narrative provided by the Maynard Fire Department to Eversource, on September 2, 2021 at 16:14, the Maynard Fire Department dispatch resources to 27 Park St Maynard, MA due to an odor call. The Maynard Fire Department arrived on site at 16:17 to a structure fire. Eversource received a call from the Maynard Fire Department at 16:33 notifying Eversource of the subject structure fire. Eversource coordinated with the Maynard Fire Department, Massachusetts State Fire Marshall, and state regulatory agency on site. The situation was made safe through a mainline repair on September 3, 2021. A section of the main with a coupling was secured and delivered to the Massachusetts Material Research facility for 3rd party analysis. Neither the Maynard Fire Department nor the State Fire Marshall reports have been released at this time. Please note the following as it relates to this report:

Part A.4, A.12 This was the time the Company commenced a leak investigation during which gas readings were detected. The final failure and cause of the Incident is still pending the investigation.
Part A.21 The Company responded yes based upon the initial narrative provided by the Maynard Fire Department and gas readings found in near proximity to the structure fire. Neither the Fire Department nor the State Fire Marshal have issued their findings as to whether released gas caught fire.
Part A.21.a The time the Maynard Fire Department arrived on site to a structure fire.
Part A.21.d Per "Section III. Conclusion" of the Massachusetts Fire District Fourteen's Regional Fire Investigation Team Fire

Origin and Cause Investigation Report, issued to Eversource on October 13, 2021, "The most plausible hypothesis is that of fuel gas explosion. It is believed to be an accidental low order fuel gas explosion caused [the] fire."
Part A.7,A.21.c, D2.f Values defaulted to 1 and 0. The amount of gas release is unknown at this time.
Part D.2.a The public and non-operator private property damage is currently based on a property assessment provided by the fire department as well as costs associated with landscaping, paving and concrete.
Part D.2.b The repair cost includes the repair costs as well as the follow up leak survey costs
Part E.2 An average operating pressure was obtained prior to the incident.
Part E.3.b The main was installed in 1968 pre-code. The date for MAOP was defaulted to 7/1/1970 as that was when 192.619(c) was established.
Part E.5 The drip referenced is a drip odorizer - Z9000 Part E.6 The Company took multiple readings none of which reached or exceeded 0.15%. The reading provided was the first readily detectable level recorded at 0.07. This report functionality rounded the number up to 0.1.

PART I - PREPARER AND AUTHORIZED PERSON

Preparer's Name	Meggan Pena
Preparer's Title	Manager Operations Gas Compliance
Preparer's Telephone Number	5084689956
Preparer's E-mail Address	meggan.pena@eversource.com
Preparer's Facsimile Number	
Local Contact Name:	Meggan Pena
Local Contact Email:	meggan.pena@eversource.com
Local Contact Phone:	5084689956
Authorize Signature's Name	Meggan Pena
Authorized Signature's Title	Manager Operations Gas Compliance
Authorized Signature's Email Address	meggan.pena@eversource.com

EXHIBIT 3

The Massachusetts Fire District Fourteen Fire Origin and Cause Investigation Report

Massachusetts Fire District Fourteen
P.O. Box 472
Hudson, MA 01749
508-928-2295

REGIONAL FIRE INVESTIGATION TEAM

FIRE ORIGIN AND CAUSE INVESTIGATION REPORT

Date of Report: September 22, 2021

NFIRS Incident Type: 111
Incident Street Address/Location: 27 Park St., Maynard, MA 01754
Incident Date/Time (first reported): September 2,2021 @ 16:14
Fire Department Incident #: 211140

***PRELIMINARY / FINAL* REPORT**

PARTICIPATING FIRE INVESTIGATORS:

The below listed personnel jointly participated in the fire investigation on Thursday September 2, 2021

Mark S. Tomyl IAAI-FIT	Lead	Maynard Fire Department / Mass District 14 FIU	978-897-1014
Gregg Silverio CFEI	O&C	Stow Fire Department / Mass District 14 FIU	978-897-4537
David Nichols IAAI-CFI	O&C	Concord Fire Department / Mass District 14 FIU	978-318-3489
Roland Cormier	O&C	State Fire Marshal's Office	978-567-3310
Justin Peledge	O&C	State Fire Marshal's Office	978-567-3310
Colleen Tanguay	Photos	MSP Crime Scene Unit	978-567-3310

The below listed personnel rendered special assistance to the participating fire investigators on Thursday September 2, 2021

Ed Mullen	Building Commissioner	Town of Littleton, MA	978-540-2420

I. SYNOPSIS

1. On Thursday September 2, 2021, at 16:14, the Maynard fire department received a report of odor investigation of strange smell in house at 27 Park St. The report was received by business line phone call. Upon arrival a box alarm was struck and the following units Engine 2 and Ladder 1 under the command of Captain King arrived on scene. The weather at the time of alarm was temp: 74 visibility; 10 surface: Dry wind: VAR 5 mph.

2. The site of the alarm was a residential, 2 story wood frame single family, which faced North onto Park St. Arriving units discovered orange material in road, a possible electrical wire sheath and large window in roadway. Upon closer approach light brown smoke emanating from A and D windows on division 1. Suppression operations were immediately begun. The fire was not quickly extinguished. The fire did require additional alarms. A second alarm was struck which brought a Concord Engine and Ladder, Stow Engine, Acton Engine and Ladder, Boxboro Engine, Hudson engine, Sudbury Engine to the scene and Wayland and Carlisle covered the town. C1 Chief Stowers took command at 16:31. There was 1 death caused by the fire. There were 3 persons injured as a result of the fire. 1 person was left homeless. The fire did not extend to adjoining properties. The fire caused an $255,000 in damage.

3. On Thursday September 2, 2021, at 1701, the Massachusetts State Police Fire & Explosion Section, assigned to the Office of the State Fire Marshal, received notification of this fire from Maynard Dispatch Center. Trooper Roland Cormier was assisted in this investigation by Sgt Justin Peledge and Lt. Colleen Tanguay of the Crime Scene Unit. As a result of this investigation, the cause of the fire was ruled accidental, the case remains open at this time. The Massachusetts State Police Fire & Explosion Section has referred the follow up investigation, awaiting DPU report.

II. FINDINGS

A. BUILDING/STRUCTURE INFORMATION

1. The site of the fire was a two-story type V wood frame single family residence, of 1488 finished area square footage. Interior walls were wood lath and plaster. The exterior was covered in vinyl siding. Roof covering was asphalt shingles. Foundation was stone masoned on the two-story section of the home un-masoned in single story portion. Basement flooring was poured concrete in the two-story portion and dirt in the single-story portion. A stairwell to basement was located on the B-wall from kitchen area, a staircase to second floor was located on B-wall mid- structure from hall. Four entrances to the property were a door on the A-side front door into living room, B-side door into kitchen area, door into basement on B-side, a sliding door located on the C-side. The building faced North onto Park Street.

2. For the purpose of orientation, the following designations will be utilized henceforth in this report: Each side of the structure will be assigned an alphabetical designation, “A”, “B”, “C”, and “D”. These designations remain constant for the interior and the exterior of the structure. The designations will begin with what is considered the front side of the structure and proceed clockwise with each side designated as follows: The “A” side of the structure will be the front of the structure facing the street. Side “B” will be the left side of the structure as you face the front entrance. Side “C” will be the rear of the structure. Side “D” will be the right side as you face the front entrance.

3. The location, including building side designation, of the utilities are as follows: Gas service entered on B-side with a interior meter placement. Water, electrical, telephone and cable entered on the D-side. Oil tank fill and vent located on B-side.

4. The owner of the property was identified as [redacted], 27 Park St., Maynard, MA DOB [redacted] SS# [redacted],phone# (H) [redacted] © [redacted]. She was interviewed by Investigator Tomyl on September 15, 2021 @ 10:56 at the Club Car Café in West Concord, MA., with son's [redacted] present. Ownership of the site was executed on [redacted]. The property was under the mortgage with North Main St., Bank with monthly payments of [redacted]. The property was insured. It was insured by Travelers Insurance for [redacted] for dwelling, [redacted] other structures, [redacted] personal property, [redacted] personal liability, [redacted] medical payments, [redacted] loss of use.

5. There had not been recent renovations to the property.

B. VICTIM LIST

1.	[redacted]	[redacted]	[redacted] 27 Park ST., Maynard, MA

C. VICTIM INFORMATION

1. [redacted] died as a result of this explosion / fire. He was found against a door separating the finished and dirt basement by FF. Jason Chasse His condition at the time of discovery was deceased due to untenable conditions. The victim was removed from the scene by Concord fire personal and taken to the garage to await pick up by Medical Examiner's Office personal.

2. The victim did not receive medical treatment.

3. [redacted] was pronounced dead at 27 Park St., Maynard, MA. on *September 2, 2021* at *1652* by *crews on scene*. The attending Medical Examiner was *name*. An autopsy was performed on *date, time* at *location* by State Pathologist *name*. The cause of death was determined to be the result of (*explain cause of death*). At the time of this report no information was available, once received it will be included.

D. WITNESS LIST

1.	[redacted]	[redacted]	[redacted]
2.	[redacted]	[redacted]	[redacted]
3.	[redacted]	[redacted]	[redacted]
4.	Capt John King	Maynard Fire Department	978-897-1014
5.	FF. Josh Schrader	Maynard Fire Department	978-897-1014
6.	[redacted]	[redacted]	
7.	[redacted]	[redacted]	[redacted]

8.	[redacted]	[redacted]	[redacted]
9.	[redacted]	[redacted]	[redacted]
10.	Capt. Angela Lawless	Maynard Fire Department	978-897-1014
11.	[redacted]	[redacted]	[redacted]
12.	Ofc. Eric Davoll	Maynard Police Department	978-897-1011 [redacted]

E. WITNESS STATEMENTS

1. The investigation conducted several interviews with the following witnesses.

[redacted] stated the following: He was outside in his driveway at [redacted]. when he heard a "boom", followed by the sound of "raining glass". He then walked down the street towards the sound and saw fire coming out of the front windows at 27 Park St. He stated he smelled gas outside of this address. He described the fire as bright yellow with dark smoke. He stated that he knows the residents at 27 Park St., [redacted] (approx. 65 years old) and [redacted]. He stated that he is not aware of any work being done to the house recently. He last saw [redacted] out this morning walking his dog. They did not speak other than to wave "Hi".

[redacted] stated the following: He was in his garage at [redacted] when he heard an "explosion" and saw smoke coming from the house across from his. He then saw the police officer, Eric, from next door go by, heading towards the front door of the house (27 Park St.). He followed Eric towards the front door of the house and saw Eric go inside briefly. [redacted] did not go inside. Eric got the resident's dog out of the house. He stated that he knows the residents at 27 Park St. He last saw the resident [redacted] at approximately 11:30 AM this morning leaving his house, driving his car. [redacted] also stated that he thought he smelled gas in the basement of his house at approximately 6:30 AM this morning. He stated he does not have gas service to his house; his home is heated by oil.

[redacted] stated the following: She was on the phone in the kitchen of her home at [redacted]. when she heard a "boom". She went to her front door, looked out, and saw the windows of the house directly across the street (27 Park St.) were blown out and lying in the street along with some insulation. At this time, she stated that there was no smoke or fire coming from the house, but approximately 30-60 seconds later she started seeing smoke coming out of the front windows. She went outside but stayed on her side of the street. She stated she knows the residents of 27 Park St., [redacted]. She was not aware of any work being done to their house. She stated that [redacted] works in Hudson at Hudson Art & Framing, and that [redacted] is an electrician. She saw that both of their cars were in the driveway and thought that they might be home. She yelled across the street, "Are you guys OK?". She used her phone to call 911. She saw that Eric the police officer and [redacted] her neighbor went to the front door of the house. She stated that [redacted] usually keep the front door locked and generally use the side door coming and going. She took several pictures with her phone of the house on fire from outside of her house, through the front window on the first floor, and then from the 2nd floor. She later took [redacted] dog from the police officer (Eric) and brought him into her house.

Captain King narrative: E-2 dispatched to address for the report of "a funny smell" in the home. Dispatch stated the caller stated he could not tell if it was CO or gas. As engine 2 was approaching the scene from Sudbury Road access E-2 crew saw what appeared to be an orange material in the middle of the road. Capt. King's first reaction was that it was an electrical wire sheath used by Eversource to protect workers from contacting the wires...and that we had wires down. As we got closer crew realized it was orange foam insulation and a large window was lying on the opposite side of the road from the incident building. On arrival light brown smoke was emanating from A and D side windows that were blown out. It became apparent that there was some sort of explosion. E-2 on arrival was on opposite side of Park Street off the A/D corner of building. Captain King established command and requested Box Alarm be struck for the working fire. E-2 crew began to establish water supply. Reports on scene reported that 2 residents were still in the building. During this short time of less than 2 minutes, the fire intensity dramatically increased with heavy fire coming out of A and D side windows. FF. Schrader ordered to try and make entry for a primary search. Captain King directed 1 3/4 handline into front windows to knock down bulk of fire to facilitate rescue operation. The hose line was then moved to B side entry and FF Schrader took line and made entry in second rescue attempt. On arrival of Maynard L-1, crew was directed to make

entry on the handline and join rescue effort with FF. Schrader. Fire was attacked from inside. Due to intensity of the fire crew was backed out of the building. Command requested a 2nd alarm assignment. Handlines were redirected into the window from exterior.

FF Chasse directed to do a primary search of basement. As fire was brought under control access into basement was made again and a small entry door into a crawl space was found. Door would not open and was forcibly removed. At this time the crew found the victim behind and against the door. The victim was deceased as the conditions in the space prior to making access were untenable. As fire brought under control mutual aid companies were directed in for 2nd search for victims. Command was notified that the reported 2nd victim was accounted for. Crews were sent in for overhaul and found that that the first floor was unsafe. All crews were backed out of the building and a PAR was taken. Operation switched from interior to exterior operations. During firefighting operations Eversource Electric and Gas divisions were requested to secure utilities. Mutual aid companies worked with Eversource Gas to evaluate and meter neighboring homes as it became apparent that there was a gas leak in the area.

Firefighter Schrader stated the following: Upon arrival he observed light smoke showing from the 1st floor A side windows, and that the window frames from those windows were already in the street. He entered the building via the C side entry to conduct a primary search but there was very low visibility, with dark smoke down to 1-2 feet from the floor. He attempted to search the second floor but was unable to ascend the stairs due to high heat. After backing out of the building, he and the first due crew stretched a handline into the first floor through the B side entry. He observed the heaviest fire in the front (A side) room of the first floor, toward the A/B corner.

[redacted] stated the following: She was not home at the time of the fire/explosion, but the day prior to the fire, she was home all day cooking and her aunt told her that she smelled gas, but [redacted] dismissed it at the time due to the use of the stove much of the day. She did not notice the smell of gas the day of the incident.

[redacted] stated the following: She was home watching TV at approximately 4:15pm when she heard an explosion and crashing sounds. She went outside, looked down Park St. and saw smoke coming out of the front of the house at 27 Park St. and windows/glass still falling in the street. She did not smell gas or anything unusual at the time of the incident, nor recently prior to the incident. She stated that she knew the residents of 27 Park St. well and was not aware of any issues with their house or recent work done.

[redacted] stated the following: [redacted], the resident of 27 Park St., called him at approximately 11:30am on the day of the incident and told him that he smelled a strange smell in his house. He thought it was coming from under the 1st floor front room of his house and stated that it smelled like an animal had died under there. He asked [redacted] if he knew of any companies that would remediate something like that since [redacted] is a real estate agent, but [redacted] told him he was not aware of any companies who could provide that service. [redacted] also stated that he was not aware of any other issues with the [redacted] house, or any recent work performed, and that he was not home at the time of the fire/explosion.

[redacted] stated the following: She was inside of her house at the time of the incident. She heard an explosion and went outside to investigate. She did not observe anything unusual on [redacted] but then looked down Park St. and saw glass and windows down in the street, then soon saw smoke/flames coming from the front of 27 Park St. She did not smell gas or anything unusual at the time of the incident, nor recently prior to the incident. She does have a surveillance camera on the front of her house, but it did not capture any video of the incident, as it is pointed down toward the sidewalk in front of her house.

Captain Lawless stated the following: Assigned to Engine 1 fire watch duty beginning approximately 2230 on September 2, 2021, til approximately 0730 September 3, 2021. Watch was assigned post residential structure fire located at 27 Park Street with workmen on scene from Eversource. Upon arrival, Eversource crews on scene working on possible natural gas leak in the street. Holes were dug at the intersection of Sherman and Park and a second smaller hole was dug on Park Street in line with first hole. Crew work concentrated on the Sherman Street hole throughout the noted time period. Captain Lawless witnessed Eversource crew taking two sections of pipe out of the hole and placing on the pavement next to the hole, a backhoe picked up the pipe and removed from the area.

Ofc. Eric Davoll stated the following: He was on duty that day and performing traffic speed enforcement at Crowe Park 0.2 miles away. He heard the call for an odor investigation go out over the radio. A few moments later his girlfriend called him and “said to get over here (meaning home) something exploded”. He responded down Sherman St. and was directed by a neighbor toward 27 Park St. Upon arrive he reports smoke coming from the front of the house “not bad”, and the front windows had been blown out and he did hear alarms sounding. He attempted to make entry through the “a” side door but was unable the door seemed jammed.

He then went to “B” side door was able to gain entry and was able to find and remove the family dog under heavy smoke conditions. He then made entry via the “C” side door on his hands and knees, this area is the dinning area, he went to his right until coming the kitchen island. At this point he reports the smoke and heat banked down too extreme he had to turn out and exit. He did not notice upon arrival or while on scene prior to transport to hospital any odor of gas. As a resident of the neighborhood, he lives [redacted]. As a resident he states occasional there is an odor of gas “occasional burp of the system”. He informed the investigator it was three (3) or four (4) years ago that Eversource replaced the gas line on Burnside St. and “a couple of months ago installed gas service to number [redacted].. Ofc. Davoll also supplied the investigation with video footage from his home camera from the time of the explosion at 16:15:45

[redacted] provided a timeline of the prior 24 hours.
Wednesday, September 1, Evening
Rain was heavy with lots of water coming in on the Sherman St. side of the house – [redacted] was out emptying accumulated water. Noticed a musty, unusual smell; assumed it was from rain coming into dirt cellar.
Thursday, September 2, Mourning
9 a.m. – Smell was more noticeable; still thought it smelled like water/rain. Aired out rooms and opened windows.
I drove to dentist and did a couple of errands.
Noon - [redacted] drove me to work; I was leaving late so he was going to pick me up and join me for dinner out later. He had a doctor’s appointment at 1 p.m. and planned to go to work after; said he could call the fire department if the smell was still there.
Around 4:30 p.m. - [redacted] called me at work saying a neighbor had called him and told him of an explosion at the house. He asked if I knew where [redacted] was – I assumed he was at work. My neighbor [redacted] also called me and said he had the dog; offered to pick me up.I contacted my boss who was not in the shop that day; she drove me to Maynard.
I called his workplace, [redacted], to see if [redacted] was there, and no one had seen him since early afternoon. Also called Maynard Police and was told to go to the station, [redacted] was waiting for me.

2. The fire was discovered by *Name, DOB* at *Time* on *Date*. *He/She* was *what was person doing, where was he and why was he there* at the time of discovery. *Witness name* provided the investigation with the following account of his/her observations and descriptions at that time: *Describe full statement pertaining to original views of the fire*. [*Repeat same format with each witness*].

3. The first responding Police Officer (s) to arrive on the scene of the fire was *Officers name and department*. *He/She* became aware of the fire as the result of *routine patrol, citizen advised, radio transmission, other*. *Officers name* provided the investigation with the following account of *his/her* observations and descriptions of the fire *Describe full statement pertaining to the original views of the fire*. [*Repeat the same format for each additional witness*].

4. The first responding fire unit to arrive at the scene was Engine 2 commanded by Capt. King. On the crew were Firefighters Schrader, back step and FF. Boudreau, pump operator. Capt. King reported that his first observations of the fire condition at the site were made upon arrival light brown smoke emanating from “A / D “corner. He described the condition of the site as follows: Reports on scene reported that 2 residents were still in the building. During this short time of less than 2 minutes, the fire intensity dramatically increased with heavy fire coming out of “A and D” side windows. Captain King ordered his crew to take the following action: FF. Schrader ordered to try and make entry for a primary search. Captain King directed a 1 ¾ handline into front windows to knock down bulk of fire to facilitate rescue operation. The hose line was then moved to “B” side entry and FF Schrader took line and made entry in second rescue attempt.

5. Firefighter Schrader was the first firefighter to enter the fire scene. He had been ordered into the scene by Captain King. Firefighter Schrader provided the following remarks concerning the pre-entry condition of the scene: Smoke was light brown quickly changing to black. On approach he noted the front A side windows had been blown out. Entry was made on C side through an unlocked door to attempt a primary search with reports of occupant inside. He believed the seat of the fire to be in the A side living room area or crawl space below. After rapid primary search FF Schrader exited to re-enter on B side with a hose line in a second rescue attempt and fire suppression.

6. Chief Stowers took overall command of the fire suppression operations at 16:31 on Thursday September 2, 2021. He relieved Captain King. Upon taking command of the scene, he described the fire situation as follows: Chief Stowers, Car 1, assumed command at approximately 1631 hours. At that time, we had two lines working inside the building, with one or two occupants believed missing. Interior crews reported the floor was compromised, and we pulled all interior companies out of the building. When we thought it was safe enough, a crew was sent to division two to complete a primary search, nothing was found. A crew was sent to Division one to complete a search where they could reach safely, nothing was found. A crew was sent to the basement division, where a male victim was found deceased behind a door in the basement. It took extensive operations to remove the victim. The victim was placed in the garage awaiting the arrival of the medical examiner, who had been contacted by Maynard Police. Fire suppression efforts continued from the outside. Eversource electric arrived on-scene and removed the meter disconnecting electricity to the building. Eversource gas arrived and shut off the gas service to the house from the driveway. During the event, (2) Police Officers involved with the initial response were transported to Emerson for evaluation after suffering inhalation injuries. One firefighter was transported to Emerson Hospital for evaluation suffering from exertion. The fire was called under control at 1741 hours, holding all companies for extensive overhaul. Overhaul operations were difficult because they were performed from outside of the building.

F. FIRE SCENE EXAMINATION

1. On Thursday September 2, 2021, at 17:55 an examination of the fire scene was conducted by Massachusetts Fire District 14 FIU and State Police investigators assigned to the Fire Marshalls Office with assistance from Crime Scene Photographer. Building Commissioner Ed Mullen and Inspector of Wiring Peter Morrison assisted with safety evaluation of structure. Entry onto the premises was made immediately following fire suppression. The scene examination concluded on Thursday September 2, 2021, at 22:48.

2. The fire scene examination methodology consisted of documentation of the exterior then the interior of the structure. A systematic approach was utilized examining areas observed as least damage to areas of heaviest damage.

3. Exterior examination of the fire site revealed area of greatest, outside observable fire damage, was on the A side first level and A/D corner, extending upward and along roof line. The lowest point of external burn was midway down the A side windows and door.

4. Interior examination of the fire site revealed that the lowest and most substantial areas of fire damage were located on first floor living room area and in the dirt basement area below the living room area in a general nondescript pattern, and was floor to ceiling indicating full room involvement. Heavy charring was noted on the floor joists in the dirt basement area. Other areas of the first floor showed no fire damage however large areas of plaster broken off of the walls as a result of an explosion damage. Firefighters did no interior overhaul of fire scene to create this damage.

5. The low burn area(s) *was or were* examined in closer detail. This examination revealed: Consistent, even burn patterns in both involved areas.

6. The investigation revealed that the low burn area was frequented by [redacted] and [redacted]. The area was used for Storage. The last person at that location before the fire was [redacted] He was there on September 2, 2021 at 16:14 and was investigating an odor in the dirt basement.

7. The property was heated by a Beckett system 2000. The heating unit was located finished side of basement. The unit was fueled by oil, which was located in the finished side of basement. The system was off the season and was having no issues with system.

8. The property was serviced by a 100 AMP electrical service. The main panel box was located on the D wall in finished basement. The panel controlling circuits in the low burn area was located in the main panel. There was one (1) light in the dirt basement operated by a pull string.

E. SAMPLES AND ANALYSIS

1. Lt. Collen Tanguay captured 171 digital photographic images in the course of the fire scene analysis. Investigator Tomyl captured video footage of house gas service line and meter leak test. No other evidence was collected during this investigation.

2. Investigator Tomyl made a rough sketch not to scale of basement level using Assessors image and hand drawn not to scale of exterior.

F. SECURITY

1. Four entrances onto the property were identified. The entrances are listed as follows: #1 Front door A side, #2 side door B side, #3 B side basement entrance, #4 C side sliding glass door. The property was protected by key management. Describe the general system and its operation, indicate where the control panels were and what condition they were found. Windows were not secured, upon arrival of fire companies several windows had been blown out.

2. The investigation revealed that there was no evidence of forced entry.

3. The investigation revealed that the locked condition of the entry points at the time of the fire was: 3 of the 4 were unsecured, The conditions of these points are listed as follows: A side front door broken by blast, B side kitchen entrance was unlock, C side sliding door was unlocked, B side basement entrance was secured.

G. FIRE PROTECTION

1. The property was protected by a fire protection system which featured: hardwired combination detectors

2. The system did operate properly at the time of the fire. Upon arrival of Maynard Police Department there was report of alarms sounding.

H. FIRE PROGRESSION TO OTHER STRUCTURES

1. The fire at this location did not progress to other structures.

I. ESTIMATED PROPERTY LOSS

1. Estimated Building/Structure Loss: $291,000

2. Estimated Contents Loss: $60,000

3. Estimated Property Loss: $351,000

J. WEATHER

1. Weather data was collected from Weatherchannel-wunderground, for September 2, 2021, @15:54
temp: 74; visibility: 10; surface: Dry; wind: VAR 5 mph.

III. CONCLUSIONS

1. Based upon the information compiled during the course of the investigation, and derived from scientific methodology, it is this investigator's opinion, that the origin of this fire was in the dirt basement and living room area and that the cause was an accidental low order explosion caused fire. The most plausible hypothesis is that of the "strange odor" reported by the resident prior to the explosion was natural gas migrating underground from the leaks found out in the street. Due to the heavy rains during this summer and very recent to the date of explosion it may be plausible that the gas underwent "odor fade" (NFPA 10.9.9.2). The ignition source was must likely a spark/Arc from the light in the dirt basement that [redacted] may have turned on upon entering the dirt basement area. That switch will need to be forensically examined. The fire may have spread quickly due to the saturation of building materials and household items being exposed to the gas for a period of roughly twenty-four (24) hours. Incendiary was ruled out because there were no signs of it being intentionally set, Natural was ruled out because there were no signs of natural events on the date of the fire. It is further concluded that the building not secured at the time of the fire it was occupied by the homeowner.

IV. RECOMMENDATIONS

1. This investigator respectfully recommends that this case:

Remain open pending further investigation by private investigators and forensic testing and analysis.

V. ATTACHMENTS

1. Firefighter Statements: Schrader, Chasse, Aubert, Boudreau, Capt. King, Capt. Lawless
2. Police Officer Statements: Ofc. Brennan, Ofc Davoll
3. Witness Interviews: [redacted], Capt. King, FF. Schrader, [redacted]
4. Time Line by [redacted]
5. Photo Logs
6. Exterior measurement sketch not to scale
7. Email for contact information
8. Assessors image not to scale used for basement level landmarks
9. Assessors Street plot map used to mark trench cut with leaking gas line located
10. Records request to Office of the Medical Examiner
11. Evidence Return Receipt from Crime Lab for scene digital images
12. Video Footage of line/ meter testing (contains incorrect date stamp)
13. Photos taken by Crime Scene Unit
14. Neighbor photos
15. Recording of phone call
16. Recording of Fire and Police Radio Communications
17. Silverio Photos
18. Scene Examination Notice
19. Travelers Scene Examination Co-vid protocols

VI. REFERENCE MATERIAL

1. Unofficial Property Record Card
2. Weather Report for September 2, 2021
3. Building Permits X 8
4. Maynard Fire Department NFIRS report
5. Insurance Documents for 27 Park St. Maynard, MA. 01754
6. NFPA 921 Chapter 10 Building Fuel Systems
7. NFPA 921 Chapter 22 Explosions

Respectfully Submitted

Mark S. Tomyl IAAI-FIT
Fire Investigator
Maynard Fire Department
Massachusetts Fire District 14 Regional Fire Investigation Team

The preceding report is representative of the prominent known facts relative to this case and is not intended to represent all actions carried out during the course of the investigation of this incident.

PEER REVIEW BY:

[*Signature*]

Name:

Title:

Department:

Date:

ADMINISTRATIVE REVIEW BY:

[*Signature*]

Name:

Title:

Department:

Date:

REVISION HISTORY:

Revised: (*date*)

[*Document each revision date*]

Acton • Ashland • Boxborough • Carlisle • Concord • Framingham • Holliston • Hopedale • Hopkinton • Hudson • Lincoln • Marlborough • Maynard • Milford • Natick • Northborough • Sherborn • Shrewsbury • Southborough • Stow • Sudbury • Wayland • Westborough

EXHIBIT 4

Massachusetts Materials Research Inc Report

REPORT TO:

Eversource Energy
Westwood, MA

Attn: Marissa Goldberg

Purchase Order No. 13045332

Analysis of a Leaking Gas Main From 27 Park Street, Maynard, MA

MMR Project No. 142001

January 12, 2023

From:
Massachusetts Materials Research

Fahmida Hossain, Ph.D.
Director of Materials Engineering

TABLE OF CONTENTS

1. BACKGROUND AND INVESTIGATION

Massachusetts Materials Research (MMR) received a 7' section of a gas main on September 3, 2021. The section contained a valve and a coupling. The information provided on the segment is shown below:

> *Items from an incident were dropped off on September 3, 2021.*
>
> *Report filed on behalf of NSTAR GAS COMPANY d/b/a EVERSOURCE ENERGY. Based upon the initial narrative provided by the Maynard Fire Department to Eversource, on September 2, 2021 at 16:14, the Maynard Fire Department dispatch resources to 27 Park St., Maynard, MA due to an odor call. The Maynard Fire Department arrived on site at 16:17 to a structure fire. Eversource received a call from the Maynard Fire Department at 16:33 notifying Eversource of the subject structure fire. Eversource coordinated with the Maynard Fire Department, Massachusetts State Fire Marshall, and state regulatory agency on site. The situation was made safe through a mainline repair on September 3, 2021. A section of the main with a coupling was secured and delivered to the Massachusetts Material Research facility for 3rd party analysis. Neither the Maynard Fire Department nor the State Fire Marshall reports have been released at this time. Please note the following as it relates to this report: Part A.4, A.12 This was the time the Company commenced a leak investigation during which gas readings were detected. The final failure and cause of the Incident is still pending the investigation. Part A.21 The Company responded yes based upon the initial narrative provided by the Maynard Fire Department and gas readings found in near proximity to the structure fire. Neither the Fire Department nor the State Fire Marshall have issued their findings as to whether released gas caught fire.*

Information on the subject incident on one of the published news is shown below:

> *A gas leak caused a deadly house explosion in Maynard, Mass. last Thursday. Fire crews responded to the scene at 27 Park Street after receiving reports of a gas-like small coming from the house. Firefighters arrived to find a quickly growing fire with smoke coming out of the windows of the house. The flames were so intense that neighbors reported feeling the heat inside their homes. Sadly, a man in his 60s was found dead in the basement. It is unknown if anyone else was home at the time of the blast, but neighbors told NBC10 Boston that "a lovely couple has lived there for over 40 years."*

MMR was requested to perform an investigation on the subject gas main with a coupling and a valve and determine the root cause of the failure/leaking of the segment. The coupling was mentioned to be a Dresser coupling for gas mains which are routinely used to join pipe segments. *The pipe was installed in 1968. This was noted by Eversource GIS system the night of the incident and is documented in their response to 21-PL-74 IR 1-9.*

1.1 Testing Protocol

The examination of the pipe segment was generally governed by the following test and evaluation protocol:

A Subsidiary of THE MMR GROUP, INC.
Massachusetts Materials Research, Inc.
P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Test and Evaluation Protocol
Analysis of a Leaking Gas Main Segment (~6' long) with a Valve and a Coupling
27 Park Street, Maynard MA
MMR Project No. 142001, Proposed Date of Investigation 7/13/22 – 7/14/22

Item No.	Description	Purpose
1	Service arrangement layout and as-received visual examination and photography. Light cleaning of name plates, if necessary, to reveal part information/manufacturers.	Document as-received condition of service components and any manufacturer information surviving any damage.
2	Verify bolt positions of the coupling including outside of coupling nuts. Index mark bolt/nut positions as-found and the valve stem position as-found. Measure the distance from the bolt head to the nut for all bolts.	Try to establish proper/improper engagement of bolting.
3	Verify valve position and any disturbance.	To establish proper assembly
4	Eversource Energy will provide an exemplar with end-caps to practice the leak testing.	
5	First, perform borescope examination of the pipe.	The borescope inspection will provide information on the internal condition of the pipe. Evidence of any leaks.
6	Next perform, the leak/flow rate testing of the pipe segment with air and soap water spray on the outer diameter. Perform leak testing as follows: Supply air pressure (regulated) starting at 2 psi and then increasing pressure to 5 psi, 10 psi, 20 psi, 30 psi, 40 psi, 50 psi, 55 psi, and 60 PSI. Manual ramping of the supply pressure is fine. Pressure not to exceed 60 psig. Flow rates to be measured in the supply piping and at a test item internal pressure of 60 psig. Test item internal pressure measurement to be taken downstream of any flow rate device or high-friction-loss test stand component. Minimize test stand piping/tubing between test item pressure gauge and test item. After leak testing is completed, sample materials of soil, sand, potential corrosion product, or other substances on the evidence item, as requested by attendees, and preserve the same. This step may be repeated in additional areas if leak locations are identified through future steps.	Document any leaks and leak flow in service components.

Test and Evaluation Protocol (continued)

7	Portable Digital X-ray/radiography of components, valve, coupling with pipe. A reference scale (penetrometer) should be included in the X-ray imagery to allow for accurate photogrammetry, if necessary.	Document internal condition of parts and allow modification of testing protocol, if necessary.
8	Borescope examination of the Gas main, if necessary, after radiography. Comment- Borescope examination should first be performed before the leak/flow rate testing (#5). It can be repeated again afterwards if requested.	Document as-received condition of pipe valve and coupling internals.
9	Sectioning of the pipe in segments as necessary. A four-wheel pipe cutter will be used to minimize any disturbance and vibration on the pipe and fittings. Eversource Energy will bring the pipe cutter. An OQ Eversource employee will operate the pipe cutter and perform the cutting.	To facilitate further inspection.
10	Re-borescope the interior of the segmented pipe.	
11	In the event multiple leak locations, the item's piping will be cut into segments to isolate individual leak locations/components. Re-leak-test individual segments at the earlier described increments to 60 psig to identify leak rate of individual leak locations/components.	
12	If agreed upon by all the parties, unwrap black tape from pipe sections on either side of valve. Examine area.	
13	In-detail visual and stereomicroscope examinations of the coupling.	Verify overall condition.
14	If necessary, and if agreed upon by all parties, disassemble bolting of the coupling to release the pipe segments. Count the number of turns-to-free for each bolt. Please note that Travelers may object to this step or request additional steps first if a leak is identified at the bolt-force generated seal during leak testing.	Allow inspection of the pipe segments.
15	In-detail visual stereomicroscope examinations of the valve.	Low power magnification to provide details on referenced items.
16	In-detail visual stereomicroscope examinations of the pipe on selected representative areas. If the leaking is on the pipe, that area will be excised for examination.	Low power magnification to provide details on referenced items.
17	Identify failed/leaking areas for further analysis. If possible: a) excise coupons of the evidence item which include the entirety of each leak location for more detailed inspection, analysis and testing; b) excise coupons from like-areas complementing the leak locations, which do not contain leaks; c) obtain thickness measurement of pipe/coupling/valve wall in area of leak(s) and complementary areas.	To isolate the failed areas for further examination.

Test and Evaluation Protocol (continued)

18	Stereomicroscope/3D Digital microscopy of revealed cracks/fractures/blow holes in various assemblies.	Low power magnification to provide details on referenced items.
19	Cleaning and/or coating of any fractures, blow hole areas if necessary.	Allow scanning electron microscopy of metallic and/or polymeric fractures.
20	Scanning electron microscopy of any fractures or blow holes to include energy dispersive x-ray spectroscopy analysis, if necessary.	Detail microscopy to reveal fracture mode, elemental analysis of any anomalies (i.e. corrosion byproduct, filler clusters at origin, etc.) noted on failed areas.
21	Metallurgical/cross-sectional examination of fractures or pin-hole/blow hole areas, if necessary.	Examine material structure at and near any revealed fractures.
22	Examination of the gaskets, if any, from the assembled fittings. Obtain sample of pipe exterior coating material and or coating on the coupling & valve if applicable. Perform FTIR and spectroscopy/EDS as necessary to identify constituent material.	Document materials of construction.
23	Fourier Transform Infrared (FTIR) spectroscopy/EDS of gaskets or other polymeric components, if necessary.	Measure any degradation of the components.
0	Other testing as necessary.	Adjust to findings during investigation.

Note: Investigation is expected to be two (2) days. However, depending on the findings, it may run into a third day.
*Photography is assumed to be part of all protocol steps involving fractography or metallurgical examination.

A Protocol conference was held on March 16, 2022. The root cause failure investigation was performed at MMR on July 13, 14, 15, 2022. The sign in sheets for the attendees at the investigation are provided in the appendix section at the end of the report.

On Day 1 of the investigation, overall examination without any disturbance of the components were performed with photographic documentation. Digital Radiography was performed on the entire pipe length including the components. A pressure test was performed on an exemplar similar pipe segment (without any attachments), submitted by Eversource. The air pressure gauge available at MMR was not significantly sensitive to determine accurately lower pressures and the flow rates. At that point it was decided that the next day (Day 2) Eversource and GAI Industries would bring their own more accurate and sensitive pressure gauges and air pressure equipment to pressurize an exemplar and the subject gas line to determine the leaking/failure location of the segment at the pressure at which the leaking occurs. The flow rates at different pressures would be measured also. At the end of the testings, segments were excised to smaller pieces to facilitate further in-detail examination. On Day 3 of the investigation, further sectioning of the failed areas and metallurgical examination, including stereomicroscope and electron scanning microscope, were performed.

On the failed locations, Energy Dispersive X-ray Spectroscopy (EDS) was performed to determine the elements present in the debris around the failure. EDS is a semi-quantitative microchemical analysis technique performed using equipment attached to the scanning electron microscope (SEM). This is an elemental analysis technique. The graphs obtained from the EDS analysis are called “spectrograms.” The peak heights of each element on the graph indicate the relative amounts of the elements present in the particular area analyzed. The elements are reported qualitatively as major, minor and trace amounts. This analysis would identify any aggressive species in the corrosion debris which could have contributed to the failure.

Smaller cross-sections at the failure location were encased in plastic, ground and polished, to facilitate optical microscope examination. The encased pieces were prepared using standard metallographic techniques resulting in “metallurgical mounts". The mounts were examined both in the unetched and etched conditions. Note that in the unetched condition any surface corrosion attack, depth of attack, inclusions, pores/voids in the material are identified. In the etched condition the structure of the material is developed and analyzed for any anomalies. A 2% nital etchant was used.

2. RESULTS

2.1 As-received Visual Examination

An overall view of the subject gas main segment with the valve and coupling is shown in Figure 1. Close-up views starting from right-hand side traveling towards the left are in Figures 2-10. The coupling appeared to be in a severely corroded condition. The valve was covered with dirt and rust and the actual condition could not be determined from the overall views. There was black tape noted on the pipe outer diameter (OD) in the areas adjacent to the valve and this is a standard practice. The overall OD of the pipe segments displayed a greenish colored

paint/coating. There was presence of soil on the pipe OD surface in some areas, however, no significant rusting or any other anomalies were observed. Some markings were noted on the pipe pieces which are displayed in Figures 11-15. In some locations the OD coating appeared to be disturbed, Figure 11, which was likely during the handling of the segment. No identification markings were identifiable on the coupling or on the valve.

The OD of both pipe segments were measured to be about [redacted] The inner diameter (ID) was measured at [redacted] No movement was noted on the coupling or the valve from its original assembled position. Areas of possible wall thinning/leaking were noted adjacent to one edge of the coupling (nut ends of the bolts).

For reference purposes, the upright position of the valve was identified to be at 12 o'clock location and the bottom of the valve would be at 6 o'clock.

2.2 Borescope Examination

Limited Borescope examination was performed on the pipe segment without any positive identification of a leaking spot.

2.3 Digital Radiography

Distances were measured starting at zero on the right hand side in Figure 1. The 12 o'clock position (top of the valve in assembly) was identified as 90°and 3 o'clock position at 0°. Radiographs were taken both at 0° and 90° orientations as needed. The gas main did not show any wall thinning or any other discontinuities/anomalies along the entire length. The valve and valve/pipe joint areas did not show any anomalies also. The coupling tube and bolts displayed significant wall thinning due to corrosion. The wall thinning for the coupling tube was from OD surface. Wall thinning was present at ~58" marking slightly inboard of the coupling edge on the bolt/nut side. The wall thinning area appeared to be isolated to this location and was in-line with the ~7 o'clock position. Representative views from the DR are presented in Figures 16a-16i. Figure 16d shows the gap between the two coupled pipes.

2.4 Pressure Testing

On Day 2 of the investigation, with the available sources, pressure testing was initially performed on an exemplar pipe segment and with the available source the pressure was held stable at [redacted] with [redacted]. Next, the subject pipe segment was tested.

An overall view of the subject pipe segment for the pressure test setup is in Figure 16. An epoxy glass cover was placed around the coupling to stop any sudden fly-out of any particles during the testing (Figure 17). The valve is shown in Figure 18. Note that the segment was laid down with the 12 o'clock (upright position in assembly) sidewise. The segment was placed in this position for easiest way of laying out the components.

For the leaking pipe segment, at the initial stage a gauge from [redacted] was used. The pressure was increased gradually, holding for some time, typically at an interval of [redacted]; this would increase the flow rate also. Both the flow rate and pressure were measured. For the initial portion, [redacted] was measured at a pressure of [redacted]. Next, the gauge was changed to read between [redacted] of the flow rate. The pressure was increased gradually. A slow leaking was noted at a pressure of [redacted]. The pipe segment could be pressurized up to a pressure of [redacted]. At the next increase, the flowrate was at [redacted] and the pressure at [redacted] where a significant leaking was noted on the coupling at a location closer to one of the edges of the coupling and on the side further away from the valve. At this location wall thinning was identified visually and in DR. Most leaking was noted at around 7 o'clock position and views of leaking with air bubbles from soap spray are presented in Figures 19-21. Another small leak was observed at around 4 o'clock. The chart below displays the flow rate/pressure values.

Chart: Pressure Testing Results of the Failed Gas Main

Flow rate (cfh)	Pressure (psi) @source/@inlet	Comments
[redacted]	[redacted]	[redacted]

Views of the coupling after the pressure testing are in Figures 22-26. The arrows point to two through hole leaks identified at around 7 o'clock. Note that these through wall leaks were covered with rust or oxidation debris before the pressure testing and were not obvious. During the pressure testing, the oxidation/corrosion debris was forced out and the through wall holes were clearly visible. The long bolts of the coupling were identified as 1, 2 and 3 arbitrarily and the overall views are in Figures 25, 27 and 28. Note that the leaking position at around 4 o'clock was not obvious at this point. Next the long bolts were sectioned off using a bandsaw. The views after removing the bolts are in Figures 29-31. The green lines in Figures 30 and 31 show the cut lines and the witness lines. The segment between the two circumferential parallel green lines would contain the leaking positions. A band saw was used to make the cuts, Figure 32. Views of the segments after the circumferential cuts are in Figures 33-39. From the overall views the gas main pipe inside the coupling appeared to be in good condition without any evidence of

corrosion or wall thinning. The OD wall of the coupling appeared to be significantly corroded; the ID wall appeared to be in good condition. There was a polymer liner on the ID of the coupling and around the OD of the gas main. The three removed bolt sections are in Figure 36. Figure 40 shows a schematic of the cuts on the excised segment with the leaks. The smaller segment containing the leaks were identified with clock positions, Figures 37-39. This shows a lengthwise cut to be made along 3 and 9 o'clock line and followed with the cut in the lengthwise direction at 6 o'clock. This would separate the 7 o'clock and 4 o'clock leaking locations. The gas main segment at the leaking location inside the coupling is in Figure 41. The polymeric liner at the ID of the coupling is in Figure 42. All of them appeared to be in good condition. There was some evidence of rust colored deposit on the polymer lining. The half diameter section containing the 12 o'clock position is displayed in Figures 43-47. The views clearly show significant corrosion of the OD of the coupling, no significant oxidation/corrosion on the ID of the coupling or on the ID/OD of the gas main. The polymer liner appeared to be in good condition. The ID of the coupling displayed a reddish colored paint/coating. The OD of the gas main displayed a greenish colored paint/coating.

Views of the segment containing the leak are in Figures 48-57. This segment contained the welded seam on the polymeric coupling, Figures 48 and 49. The weld seam location was at around 5-6 o'clock location in assembly. These views show a deep corrosion pit at around 4 o'clock location which revealed slight leaking during the pressure testing. OD views of 4 o'clock and 7 o'clock locations are in Figures 51 and 52, respectively. The ID view of these two locations are in Figure 53. Through wall holes are observed at 7 o'clock. The 4 o'clock location displayed a large rust type debris on the ID. Overall view of the segment containing the leaks are in Figure 54 showing the ID of the coupling, polymeric liner and the gas main. The OD view of these segments are in Figure 55.

Next, additional cuts were made closer to the leaking areas for mounting purposes. Arrows in Figures 57 and 58 show the mounted plane for 4 o'clock and 7 o'clock leaking locations.

Overall view of the mount at 4 o'clock is in Figure 59 and that at 7 o'clock is in Figure 60. Two through wall holes are obvious in the 7 o'clock location. The mount at 4 o'clock shows presence of oxide scale at the through hole location with small areas of leaking passage. The views clearly showed that there was significant corrosion from the OD surface of the coupling and the wall thickness was reduced to knife edges at the leaking locations. Other areas of the coupling also displayed significant corrosion.

2.5 Stereomicroscope Examination

Stereomicroscope examination was performed on the excised smaller segments with leaking areas. For the leaking location at 4 o'clock, visually a through wall penetration was not obvious. However, stereomicroscope examination showed that there were small areas of through wall leak path among the tightly packed corrosion debris. An overall view of this location is displayed in Figure 61 with a higher magnification in Figure 62. The OD surface adjacent to this location displayed some parallel markings only present adjacent to this location. An overall view of this area in Figure 56 shows these markings; the markings are almost at a 45° angle to the lengthwise direction of the coupling. Overall views of these markings are obvious in Figures 63 and 64.

Note that this area on the OD of the coupling has been significantly corroded reducing the overall wall thickness. Presence of these markings may indicate that the surface was in contact with a surface from which impression was created on this location. Even with wall thickness loss, the impression was still there indicating that the surface was in close contact with this mating external surface. The views from the ID surface at this location are in Figures 65 and 66; the views clearly show the tightly packed corrosion debris in the area. Figure 67 shows the cut line and the mounted plane through this location.

For 7 o'clock location the wall was significantly thinned due to corrosion. Note that there were two through holes at this location; the mount was prepared through the longer hole and the mounted plane is shown in Figure 68.

2.6 SEM/EDS Analysis

For the SEM views the sample identification/location, magnification and other pertinent information are provided on the lower left-hand side corner of each micrograph. For the EDS spectrograms, the sample analysis location is shown on top of each graph. At the bottom of each graph the semiquantitative analysis results are displayed which are normalized to 100 wt.%.

The analysis was performed only on the OD surface as the corrosion and wall thickness occurred from this surface and the ID surface was relatively smooth without any significant anomalies.

4 o'clock Pit: An overall view of this pitted area is in Figure 69. The areas identified in rectangular boxes were analyzed by EDS and the spectrograms are in Figures 70 and 71 from the areas. One location away from the corrosion pit was also analyzed, Area 3 (not in the view), and the spectrogram is in Figure 72. Note that the samples were not cleaned before the EDS analysis. In all the areas similar elements were identified which are: major amounts of oxygen (O, ~30 wt.%) and iron (Fe, ~50 wt.%); minor amounts of carbon (C, ~10% wt.%) and chlorine (CL, ~8 wt.%); trace amounts of silicon (Si), sulfur (S), aluminum (Al) and chromium (Cr). The levels of trace elements are <1wt.%. The elevated level of oxygen indicates that there is iron oxide on the surface and inside the pit created during oxidation/corrosion of the iron base material. The level of chlorine is higher (~10 wt.%) inside the pit compared to the away location (~5 wt.%). This would indicate that chlorine is the aggressive element on the OD surface which is causing the corrosion of the steel coupling material. The source of carbon is likely an organic coating which was present (probably) on the OD surface of the coupling tube. Note that on the ID surface there is a reddish coating/paint present on the coupling. However, on the OD surface there is no evidence of any paint as the original surface is corroded away. If there was no coating present on the original coupling tube surface, then carbon is indicative of the soil/dirt present as organic contamination. Elements sulfur, silicon and chromium can be present in trace amounts in the material itself; the elevated levels of these elements can also come from the soil surrounding the coupling tube.

An overall view of the corroded area on the ID is displayed in Figure 73. The areas identified were analyzed by EDS and the spectrograms are presented in Figures 74-76. The areas again displayed elevated level of oxygen indicative of iron oxides. The level of carbon is elevated on the ID surface compared to the OD. This likely confirms that the carbon is from the coating which was found to be present on the ID in most of the locations. In some areas levels of aluminum and silicon are elevated which may be from the coating or from the soil/dirt on the OD surface. There was consistent presence of elemental chlorine on all the areas identified. Note that the chlorine is from the OD surface environment which penetrated through the through wall hole locations to the inside surface of the tube.

Figures 77 and 78 show two areas on the ID away from the corrosion pit. In these areas the reddish type paint was intact. The level of carbon is at ~50 wt.% with oxygen at ~20 wt.% in these areas. There are minor amounts of iron (~9 wt.%) and zinc (~11 wt.%) together with trace amounts of aluminum (Al, ~3 wt.%); silicon (Si, ~3 wt.%); phosphorous (~0.50 wt.%) and sulfur (S, ~0.70 wt.%). These elements indicate that they are indicative of the coating on the ID surface of the coupling. A small amount of elemental chlorine was noted which could be from the outside environment which penetrated through the perforated locations.

7 o'clock Anomaly: Note that this area displayed through holes and the OD surface adjacent to the through hole pits were analyzed. The different views are in Figures 79-83 and the areas analyzed are shown in these views. The representative spectrograms from the areas are in Figures 84-87. All the areas analyzed typically show elevated levels of oxygen and iron indicating iron oxide. There was always presence of minor amounts of carbon which may either be from the coating present or from the organic environment the surface is in contact with in service. The results showed consistent presence of elemental chlorine, the source of which is also from the service environment on the OD surface. Only one location, Area 4, in Figure 87 did not show any chlorine and displayed only a predominant amount of iron with a minor amount of oxygen. This shows oxidation of the steel tube material.

The cut surface of the segment, Figure 88, was analyzed and the spectrogram is in Figure 89 which displayed predominantly iron (~99 wt.%) with trace levels of silicon, chromium and manganese. This reflects the composition of the tube material which is a carbon steel. No quantitative chemical analysis was deemed necessary to confirm the material type.

2.7 Microstructural Examination

The mounts prepared through the leaking locations were examined and the results are presented in this section. An overall view of the 4 o'clock mounted location is in Figure 90. This overall view clearly shows wall thinning from the OD surface of the coupling tube and compacted corrosion debris at the minimum wall location. A higher magnification view of the corrosion pit is in Figure 91 which shows the layered corrosion debris. At relatively high pressure the gas odor leaked to the OD surface from the ID through these cracked corrosion layers. The overall OD surface displayed general corrosion attack, Figure 92. Note a thin reddish layer on the ID which is the paint/coating present on the tube. An overall view of the 7 o'clock mounted location is in Figure 93 with higher magnification views in Figures 94 and 95. This area shows through wall corrosion and thinning of the wall to knife edge at the corrosion pit. This area was also packed

with corrosion debris which likely was removed during the pressure testing. From the views the general corrosion on the OD is obvious with knife edge appearance of the wall at through hole locations. Figure 96 shows the reddish colored paint/coating on the ID surface. The ID did not show any corrosion.

Next, a metallograph was used to examine the microstructure of the pipe material and the corrosion features.

4 o'clock Mount: Figures 97 and 98 show the two edges of the corrosion pit. The light yellowish colored area is the pipe material left over. Note significant corrosion and wall thinning from the OD surface. Some corrosion was noted on the ID surface at the pit, away no corrosion was observed. A higher magnification view of one of the edges of the corrosion pit is in Figure 99. This view shows wall loss from the OD and some corrosion on the ID. A representative view of the microstructure of the tube coupling is in Figure 100. The microstructure consisted of predominantly ferrite grains with some fine pearlite grains. This can be a typical microstructure for a pipe material for a steel component. A representative view from the ID of the tube is in Figure 101 which did not show any corrosion.

7 o'clock Mount: Figure 102 shows one of the edges of the corrosion pit; the view clearly shows wall loss due to corrosion from the OD surface to a knife edge causing the through hole pit. No significant corrosion was noted on the ID. Higher magnification views in Figures 103 and 104 show general corrosion attack and oxidation on the OD surface. Higher magnification view of the ID, Figure 105, did not show any significant corrosion attack.

Hardness: Hardness measurements were performed on a segment of the coupling tube and hardness was measured at 76 Rockwell B which is in agreement with the microstructure of the coupling tube material.

3. CONCLUSIONS

The investigation performed on the gas main segment revealed significant corrosion on the entire outer diameter surface of the coupling tube from the soil/dirt service environment. Significant wall thinning was present at isolated locations which were identified to be at around 4 and 7 o'clock when the valve top is placed at 12 o'clock in the assembly. Small through wall corrosion pits were identified at these two locations which created the leak path for the gas from the inside of the gas main to escape.

The coupling was placed properly on the tube gas main segments to be coupled, there was a polymeric insert and coating/painting present on the ID of the coupling tube and OD of the gas main. The ID surface of the coupling tube appeared to be in good condition with no significant breaching of the coating. The gas main appeared to be in significantly good condition without any anomalies through the entire length of the pipe segment. There was a small gap present between the coupled pipe ends inside the coupling and this condition is typical at coupling joints. The polymeric liner in between the coupling ID and gas main OD appeared to be in good condition. This polymeric liner possessed a weld seam which is expected and the location of the

seam was at around 5 o'clock adjacent to the leaking locations. The significant corrosion of the OD surface of the coupling caused significant wall thinning and at isolated spots the pits breached through the wall thickness. The presence of these through wall small corrosion pits caused transmitted gas to be leaking out to the outside environment.

No material anomalies were noted on the coupling tube material; it is likely a carbon steel material which is typically used in these couplings. The hardness and the microstructure values are in agreement with these types of couplings. The gas main pipe segments were in good condition and no analysis was performed on them.

Semiquantitative chemical compositional analysis on the OD surface and near the corrosion pits revealed elevated level of elemental chlorine in the deposit. Note that the element chlorine is aggressive to a steel pipe in moist environments. In some areas of the buried gas mains, water can be collected (water pools) and cause corrosion of the steel couplings. It could not be unequivocally determined whether there was a paint/coating present on the OD surface of the coupling initially due to extensive corrosion and removal of the original wall condition. Even in the presence of a thin paint or coating, with significant length of service time, some breaching of the coating can be typically expected which would initiate the corrosion process.

Figure 1:

Figure 2:

Figure 3:

Figure 4:

Figure 5:

Figure 6:

Figure 7:

Figure 8:

Figure 9:

Figure 10:

Figure 11:

Figure 12:

Figure 13:

Figure 14:

Figure 15:

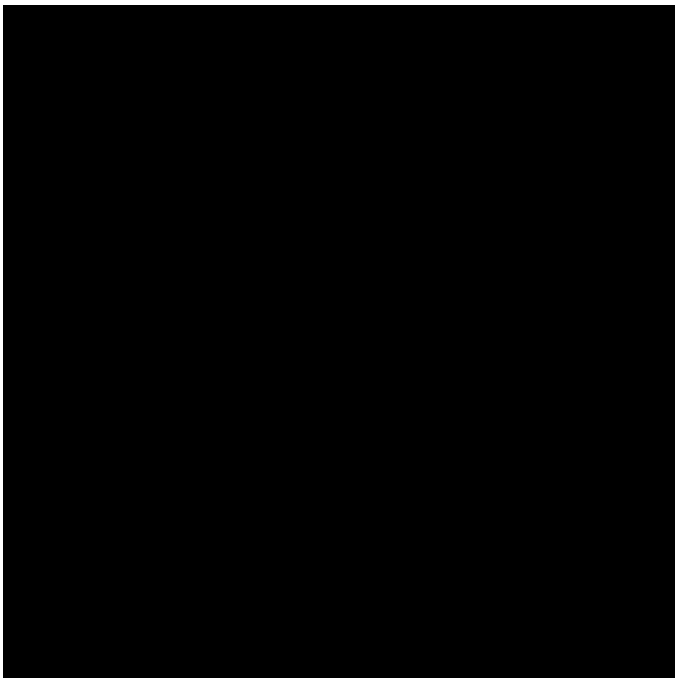


Figure 16a:

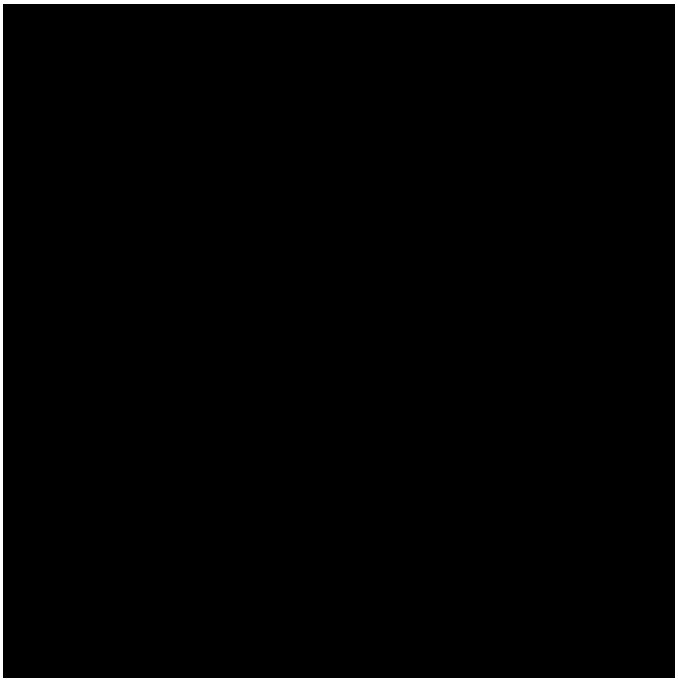


Figure 16b:

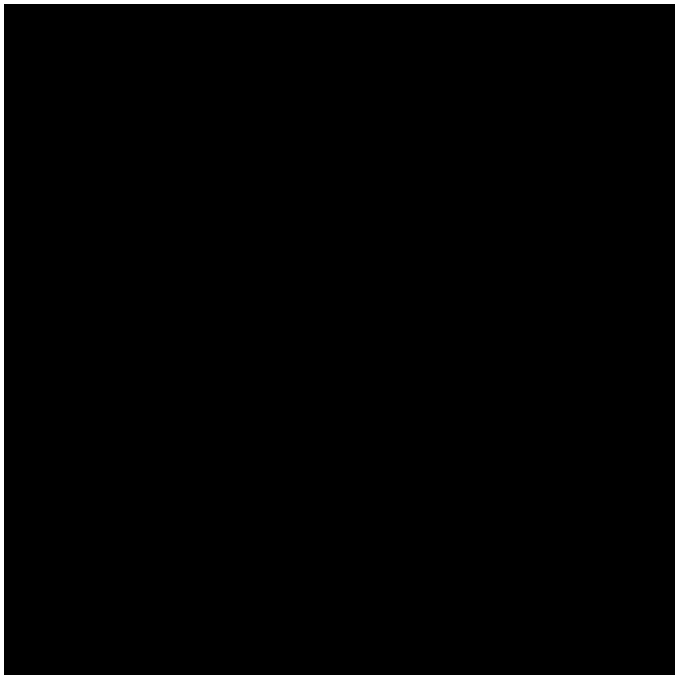


Figure 16c:

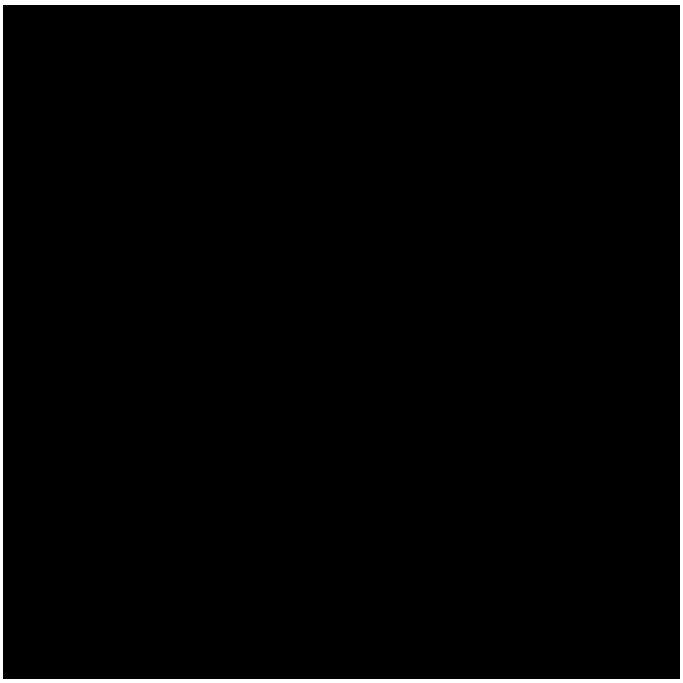


Figure 16d:

Figure 16e:

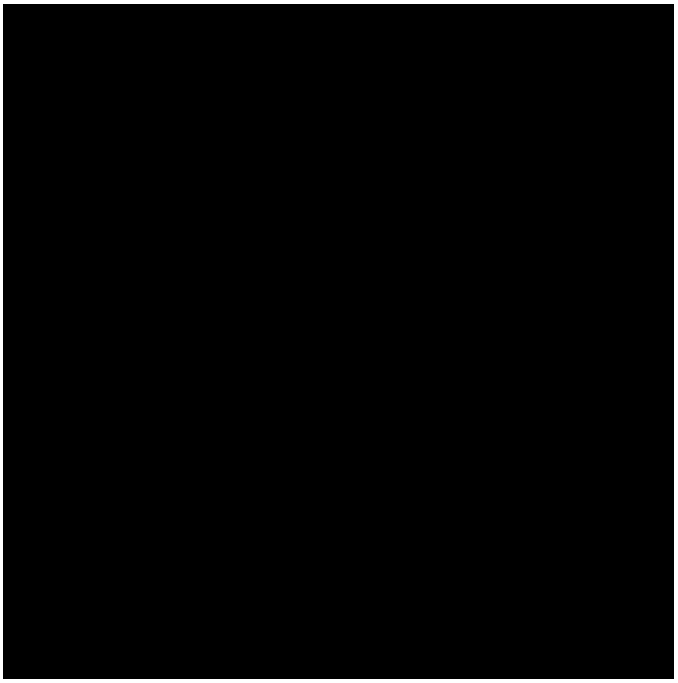


Figure 16f:

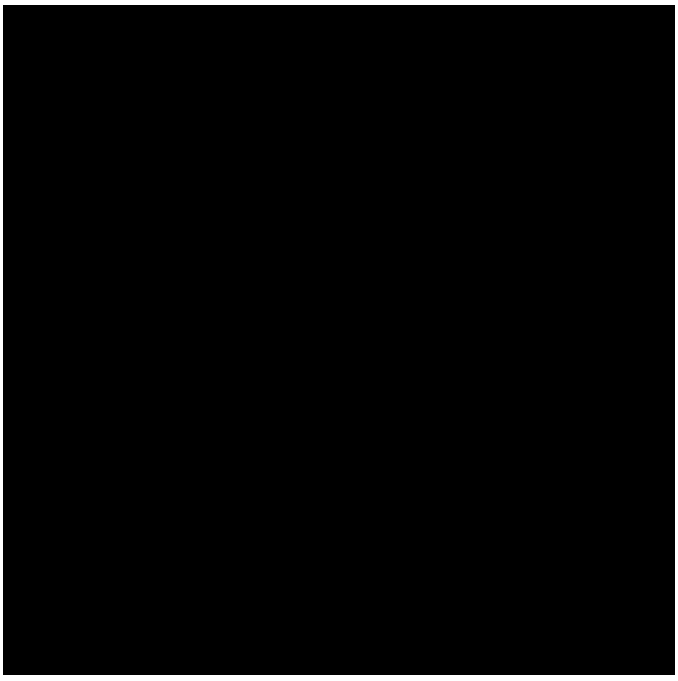


Figure 16g:

Figure 16h:

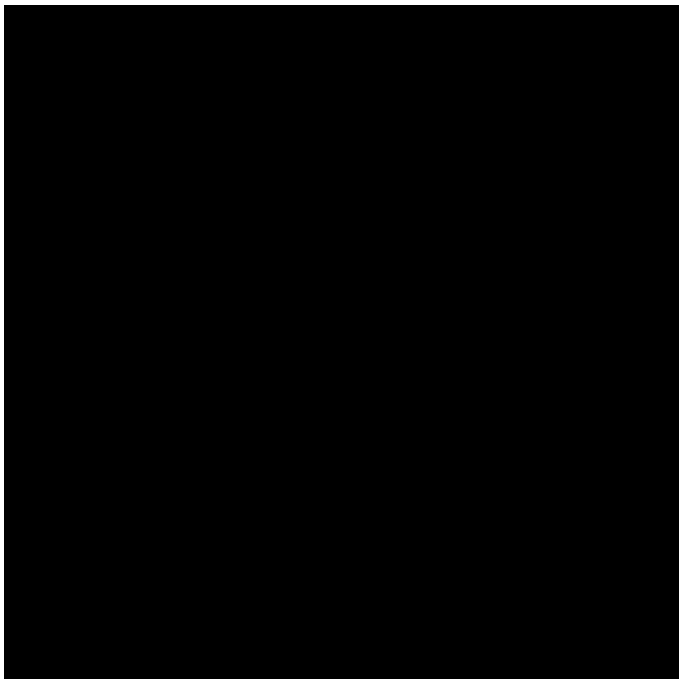


Figure 16i:

Figure 17a:

Figure 17b:

Figure 18:

Figure 19: Arrow points to a leaking location @ ~7 o'clock on the coupling.

Figure 20: Another view of the leaking location, arrow.

Figure 21: Another view of the leaking areas.

Figure 22:

Figure 23: Arrow points to the 7 o'clock leak. Yellow lengthwise lines are witness lines. The cross-lines are cut lines.

Figure 24:

Figure 25:

Figure 26:

Figure 27:

Figure 28:

Figure 29:

Figure 30:

Figure 31:

Figure 32:

Figure 33:

Figure 34:

Figure 35:

Figure 36: Excised bolts from the coupling.

Figure 37:

Figure 38:

Figure 39:

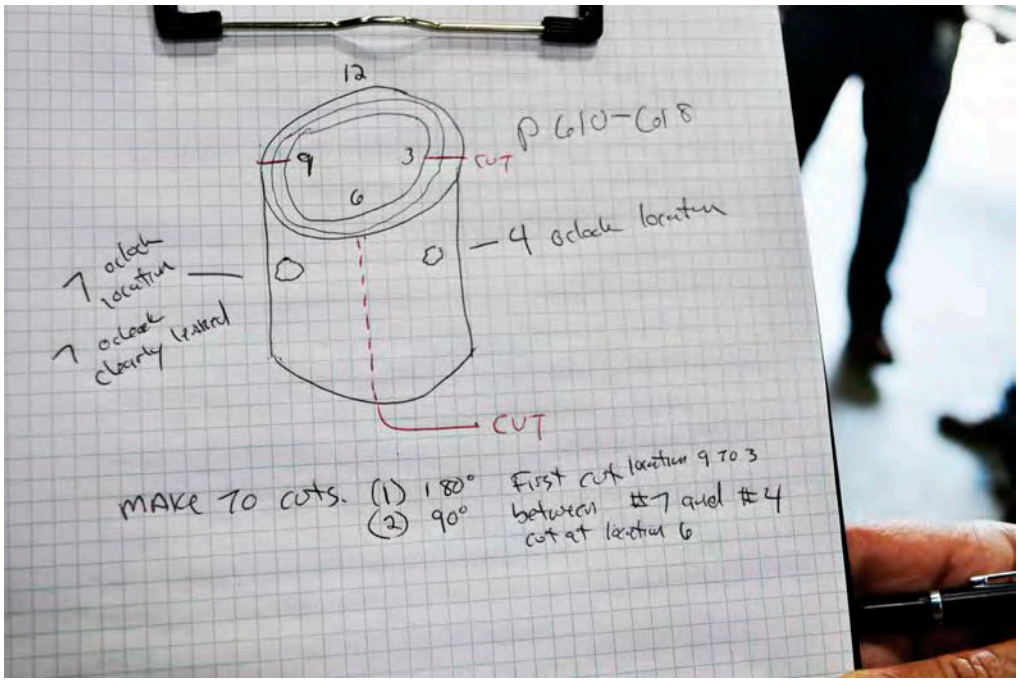


Figure 40:

Figure 41:

Figure 42:

Figure 43:

Figure 44:

Figure 45:

Figure 46:

Figure 47:

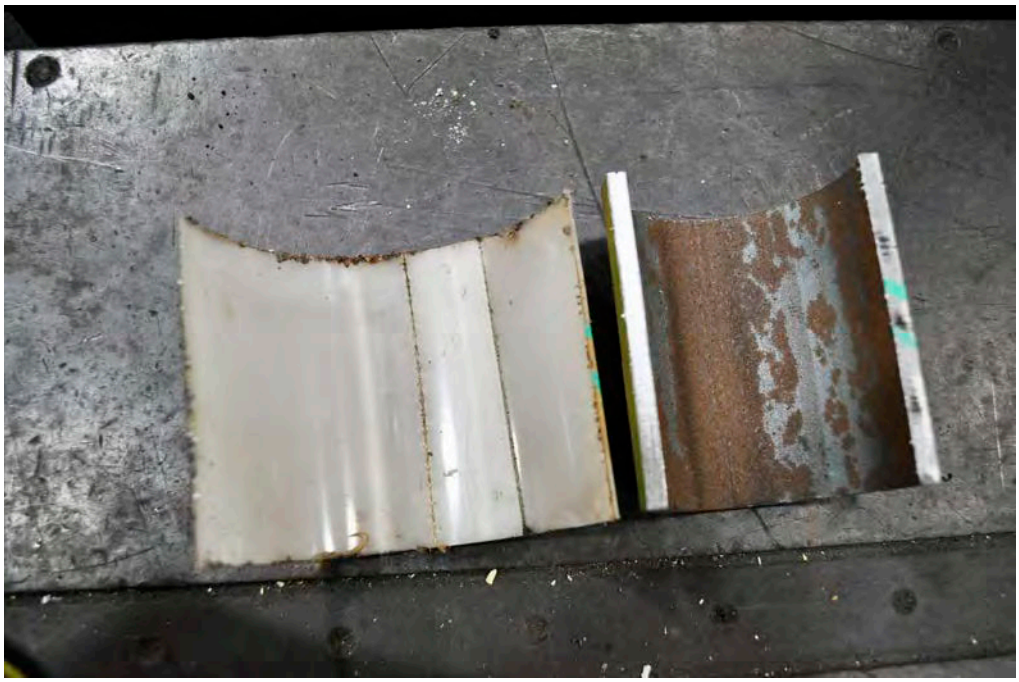


Figure 48:

Figure 49:

Figure 50: Arrows point to 7 o'clock leak (top) and a possible leak @ 4 o'clock (bottom).

Figure 51:

Figure 52:

Figure 53: ID view: 7 o'clock through hole pits (top) and 4 o'clock possible leak (bottom)

Figure 54: ID view of the components in the leaking segment.

Figure 55: OD view.

Figure 56:

Figure 57:

Figure 58:

Figure 59: Mounted cross-section at 4 o’clock.

Figure 60: Mounted cross-section @ 7 o’clock.

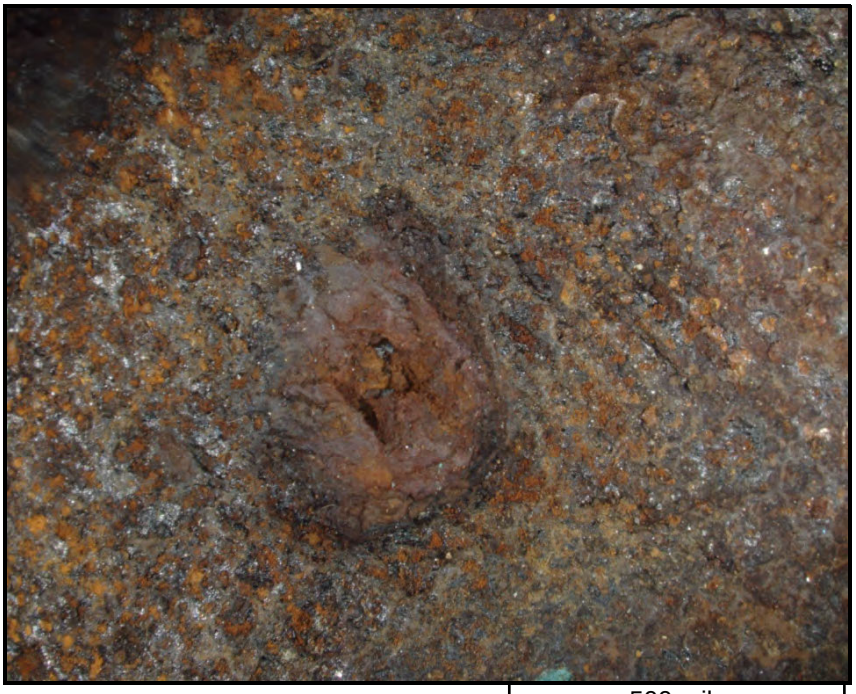


Figure 61: Failed location at 4 o'clock: An overall view of the corroded spot on OD.

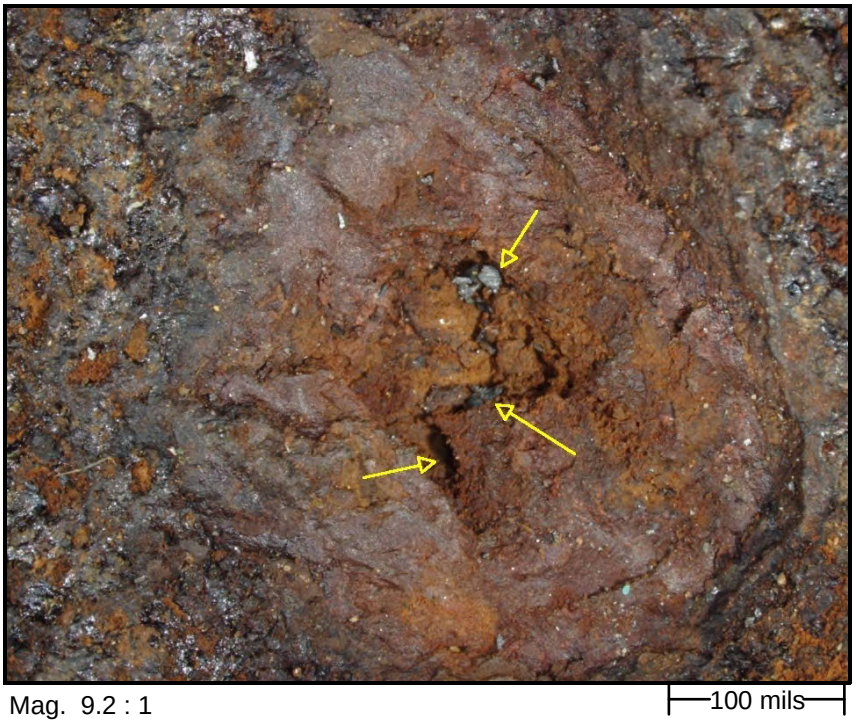


Figure 62: Failed location at 4 o'clock: An overall view of the corroded spot on OD. A higher magnification view of the previous image. Arrows point to possible through wall corrosion.

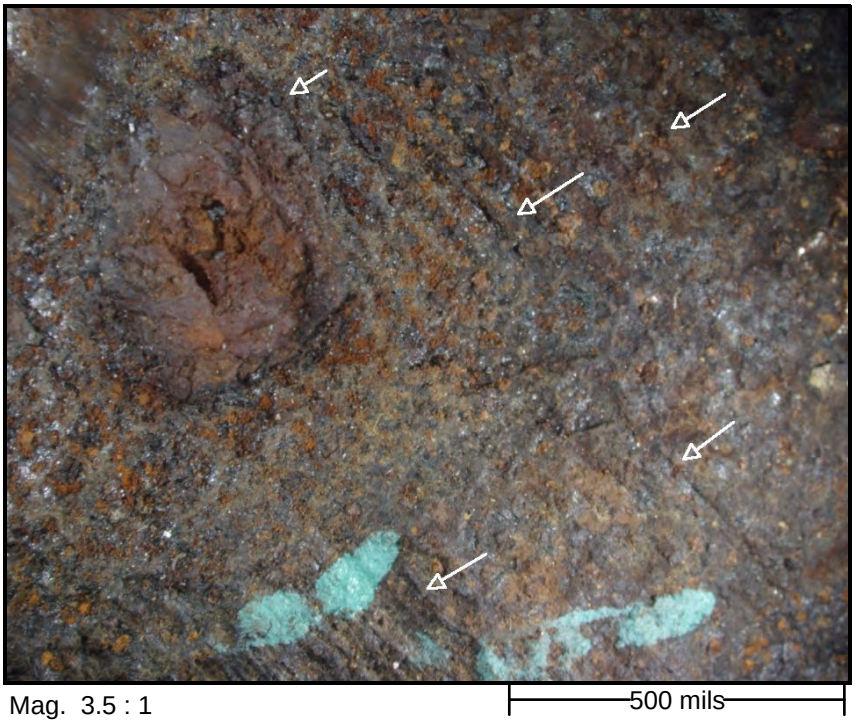


Figure 63: Failed location at 4 o'clock: An overall view of the corroded spot on OD. Arrows point to parallel line type surface impression around the corroded spot.

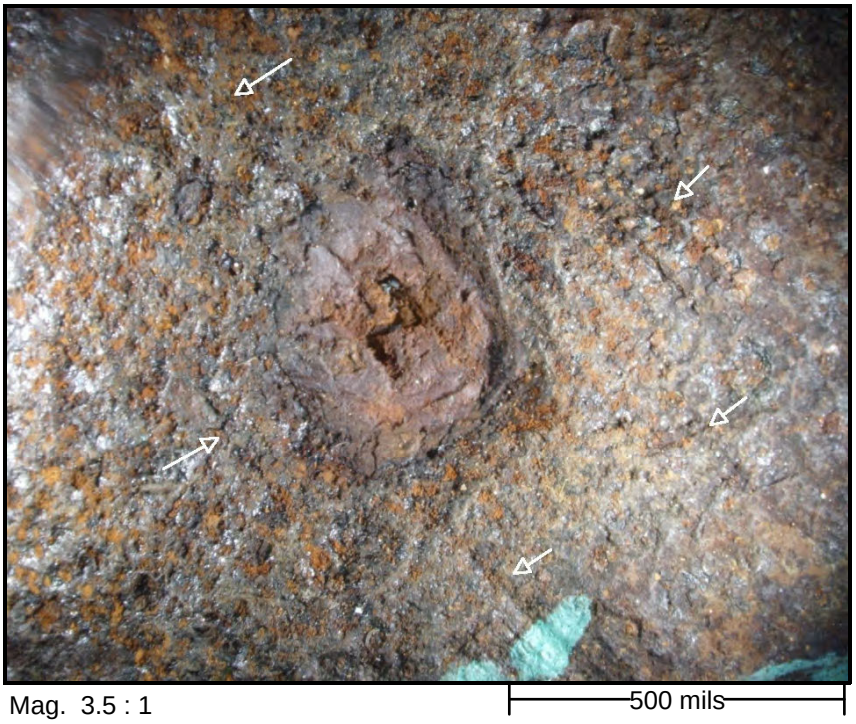


Figure 64: Failed location at 4 o'clock: An overall view of the corroded spot on OD. Arrows point to parallel line type surface impression around the corroded spot. Another view.

Figure 65: Failed location at 4 o'clock: An overall view of the corroded spot on ID. Note the packed corrosion debris.

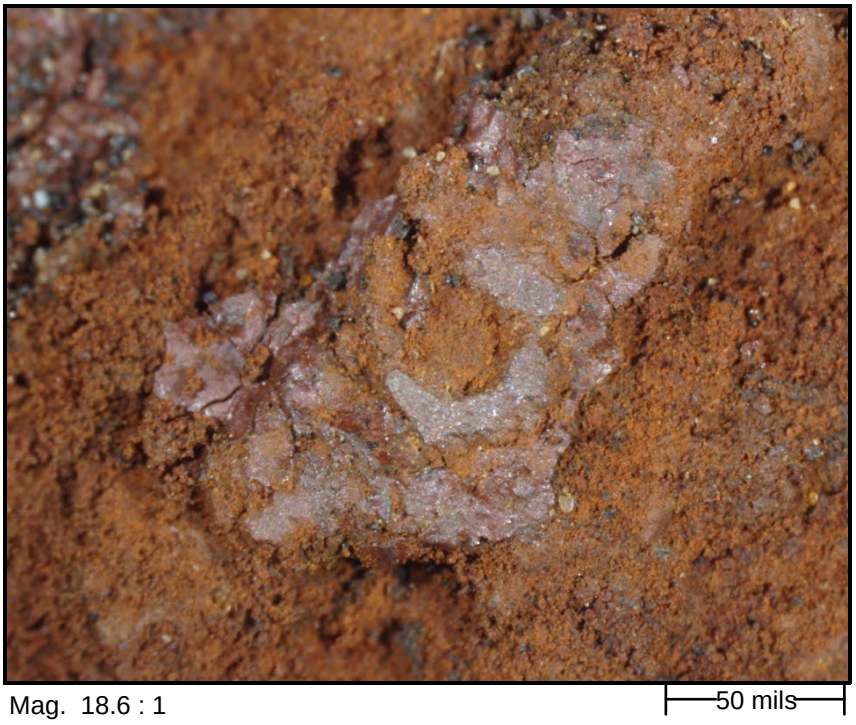


Figure 66: Failed location at 4 o'clock: An overall view of the corroded spot on ID. Note the packed corrosion debris. A higher magnification view of the previous image.

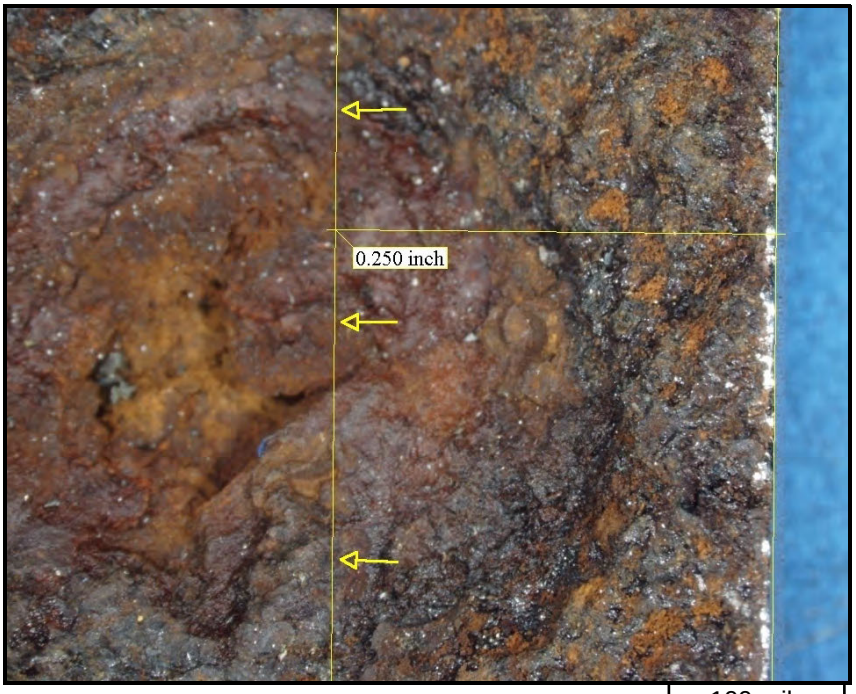


Figure 67: 4 o'clock anomaly: Arrows point to the mounted plane.

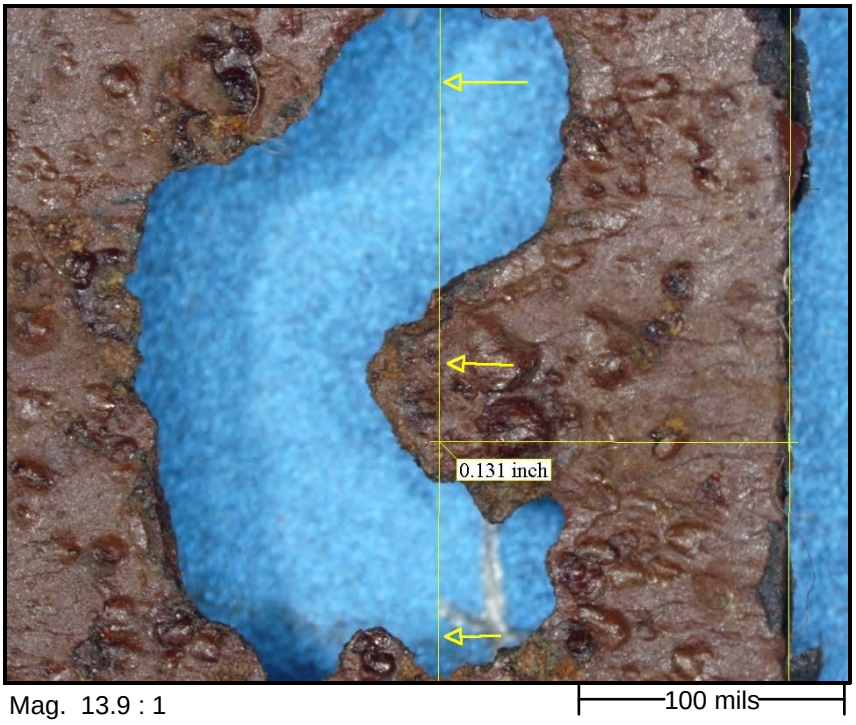


Figure 68: 7 o'clock anomaly: Arrows point to the mounted plane.

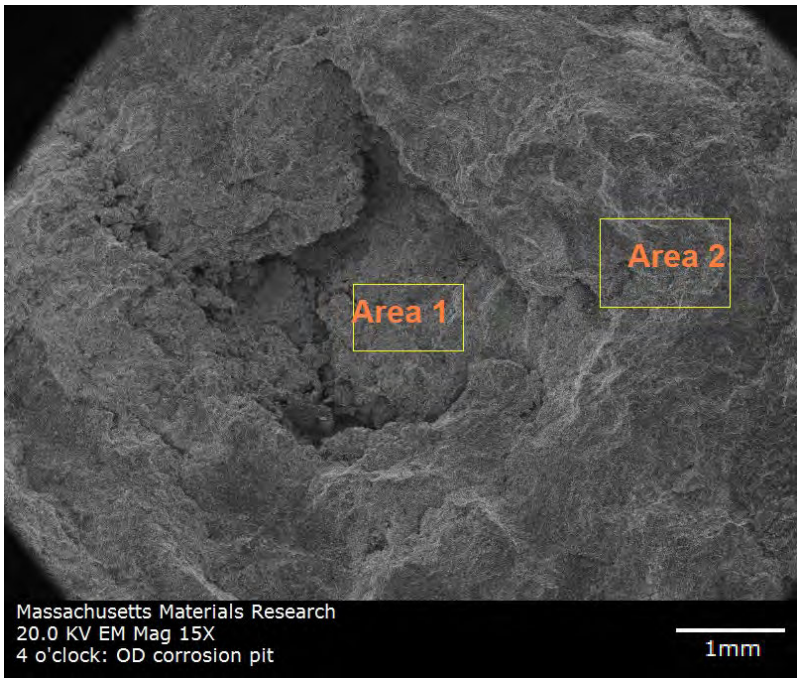


Figure 69:

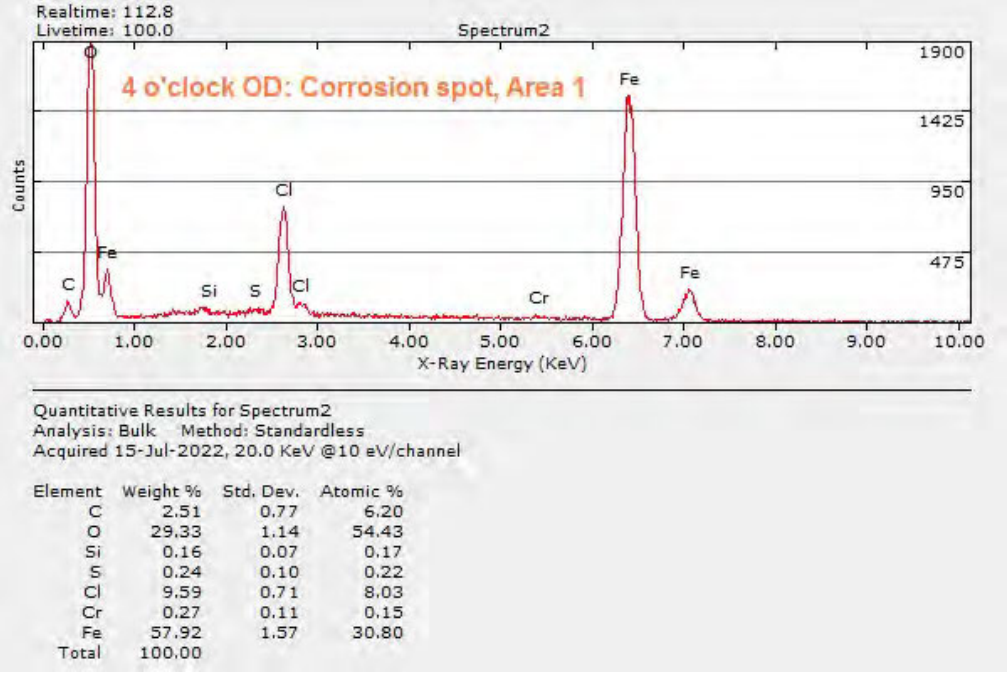
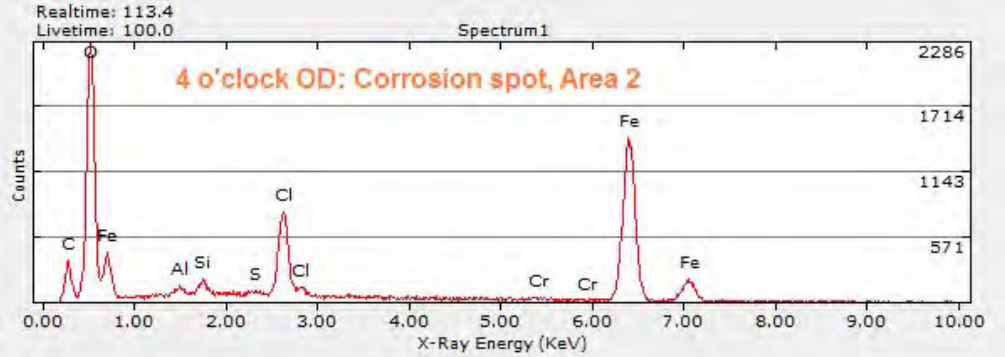


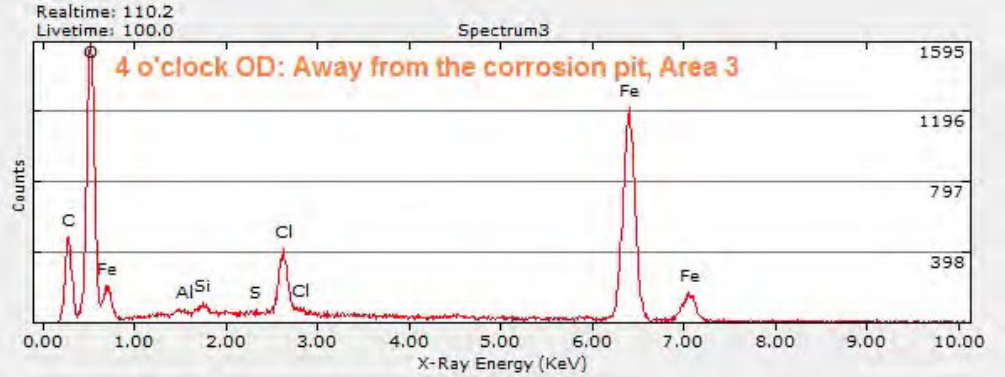
Figure 70:



Quantitative Results for Spectrum1
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	9.28	0.85	18.57
Oxygen	36.86	1.12	55.40
Aluminum	0.77	0.29	0.69
Silicon	0.95	0.34	0.81
Sulfur	0.28	0.11	0.21
Chlorine	8.03	0.97	5.45
Chromium	0.15	0.07	0.07
Iron	43.68	1.20	18.80
Total	100.00		

Figure 71:



Quantitative Results for Spectrum3
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	13.84	0.87	28.01
Oxygen	30.43	1.18	46.23
Aluminum	0.15	0.07	0.14
Silicon	0.41	0.17	0.35
Sulfur	0.01	0.01	0.01
Chlorine	4.99	1.09	3.42
Iron	50.16	1.42	21.83
Total	100.00		

Figure 72:

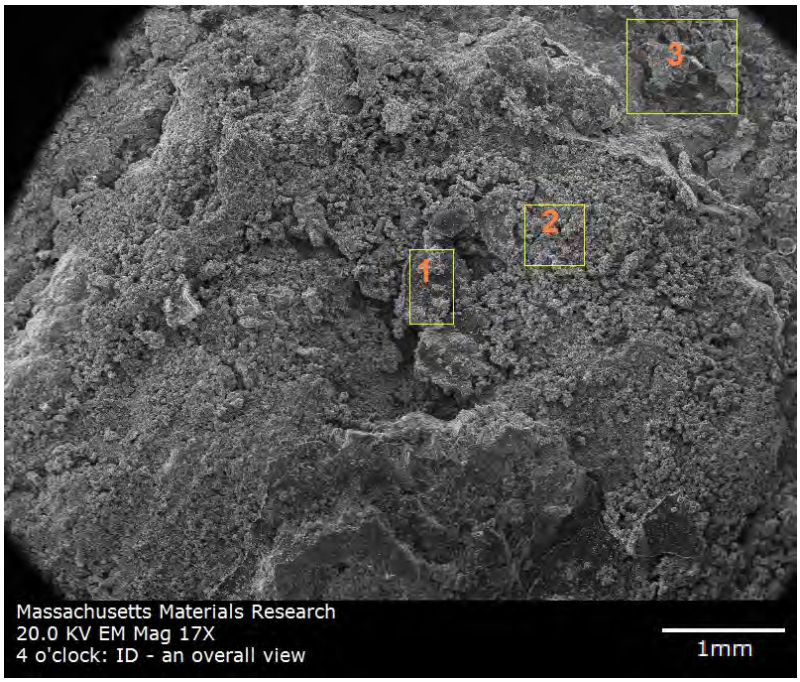
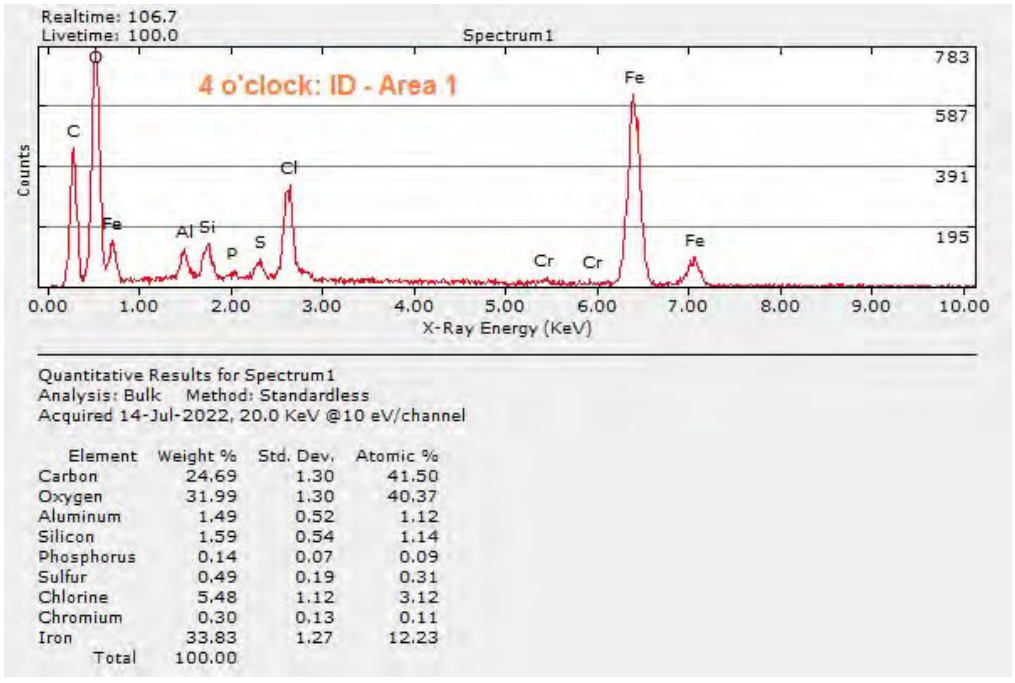
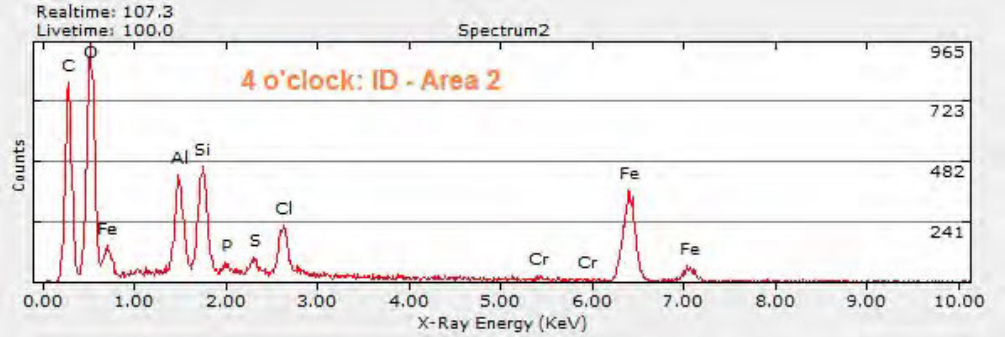


Figure 73:



Element	Weight %	Std. Dev.	Atomic %
Carbon	24.69	1.30	41.50
Oxygen	31.99	1.30	40.37
Aluminum	1.49	0.52	1.12
Silicon	1.59	0.54	1.14
Phosphorus	0.14	0.07	0.09
Sulfur	0.49	0.19	0.31
Chlorine	5.48	1.12	3.12
Chromium	0.30	0.13	0.11
Iron	33.83	1.27	12.23
Total	100.00		

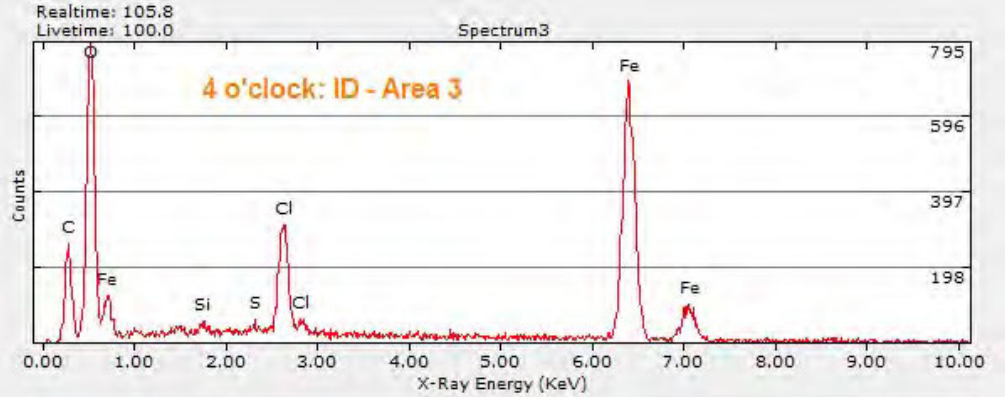
Figure 74:



Quantitative Results for Spectrum2
Analysis: Bulk Method: Standardless
Acquired 14-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	38.91	1.34	53.14
Oxygen	34.68	1.27	35.55
Aluminum	4.86	1.08	2.96
Silicon	4.79	1.07	2.80
Phosphorus	0.35	0.14	0.19
Sulfur	0.60	0.23	0.31
Chlorine	2.46	0.74	1.14
Chromium	0.04	0.02	0.01
Iron	13.29	0.82	3.90
Total	100.00		

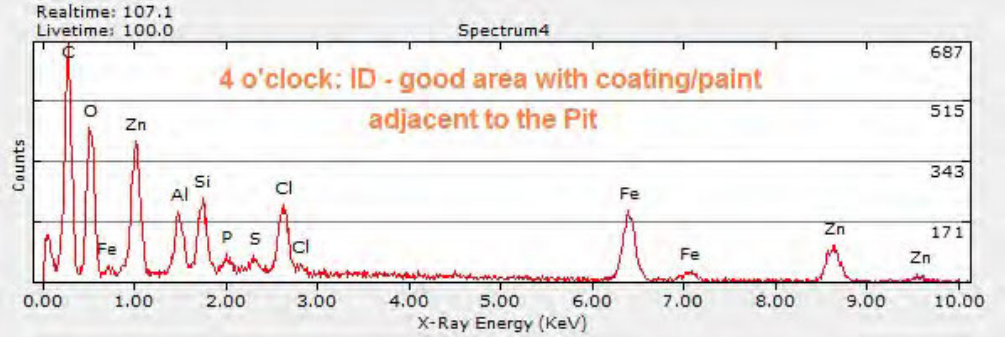
Figure 75:



Quantitative Results for Spectrum3
Analysis: Bulk Method: Standardless
Acquired 14-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
C	12.20	0.87	25.69
O	28.73	1.27	45.42
Si	0.15	0.08	0.14
S	0.27	0.12	0.21
Cl	7.62	1.07	5.44
Fe	51.02	1.58	23.10
Total	100.00		

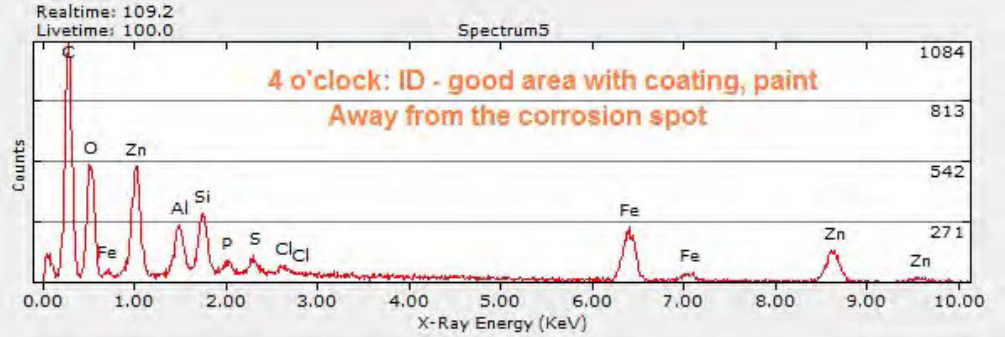
Figure 76:



Quantitative Results for Spectrum4
Analysis: Bulk Method: Standardless
Acquired 14-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
C	45.32	1.54	64.32
O	21.57	1.20	22.99
Al	3.40	0.93	2.15
Si	3.40	0.93	2.06
P	0.60	0.23	0.33
S	0.64	0.24	0.34
Cl	3.73	0.97	1.79
Fe	10.26	0.72	3.13
Zn	11.08	0.86	2.89
Total	100.00		

Figure 77:



Quantitative Results for Spectrum5
Analysis: Bulk Method: Standardless
Acquired 14-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
C	52.85	1.63	70.83
O	19.24	1.08	19.35
Al	3.20	0.89	1.91
Si	3.16	0.87	1.81
P	0.47	0.18	0.24
S	0.77	0.28	0.39
Cl	0.53	0.20	0.24
Fe	8.57	0.95	2.47
Zn	11.21	0.82	2.76
Total	100.00		

Figure 78:

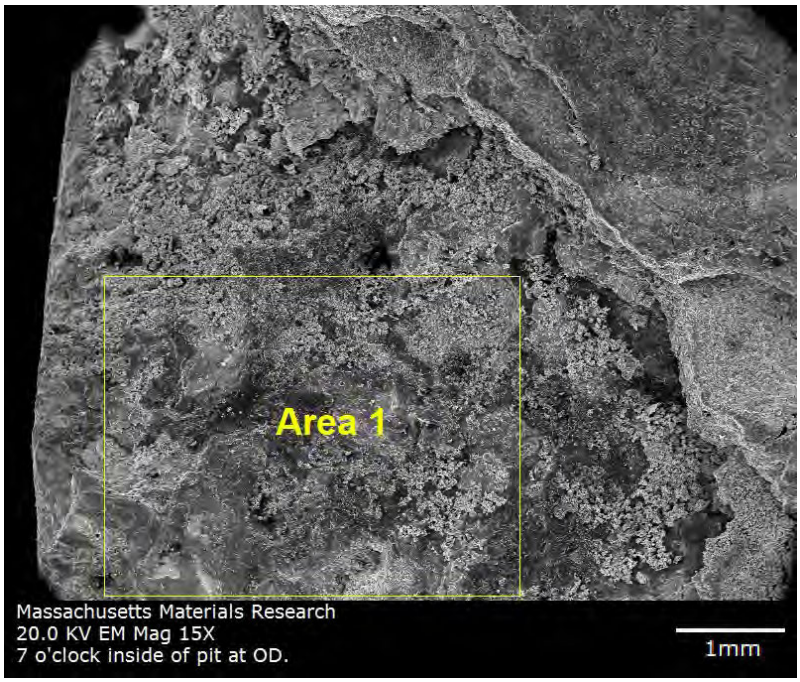


Figure 79:

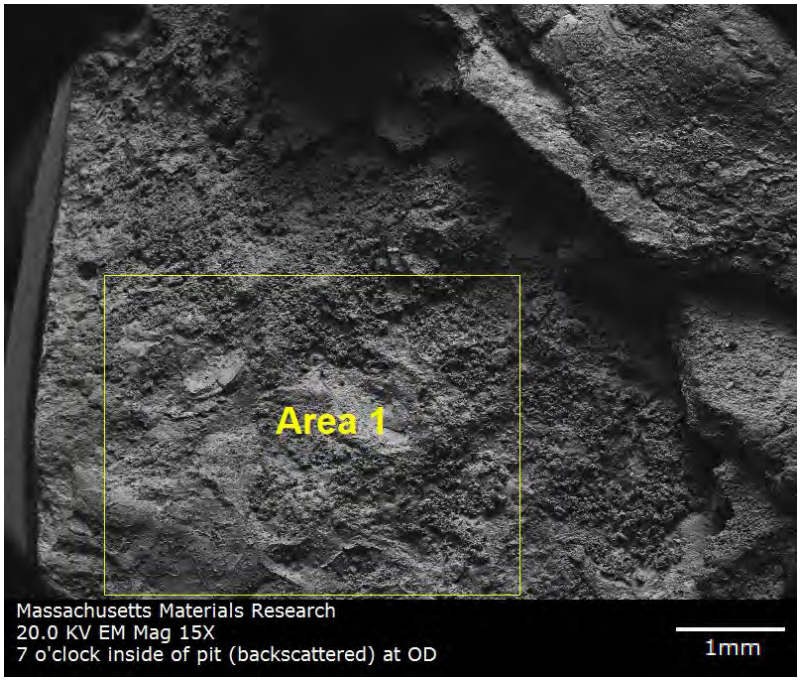


Figure 80:

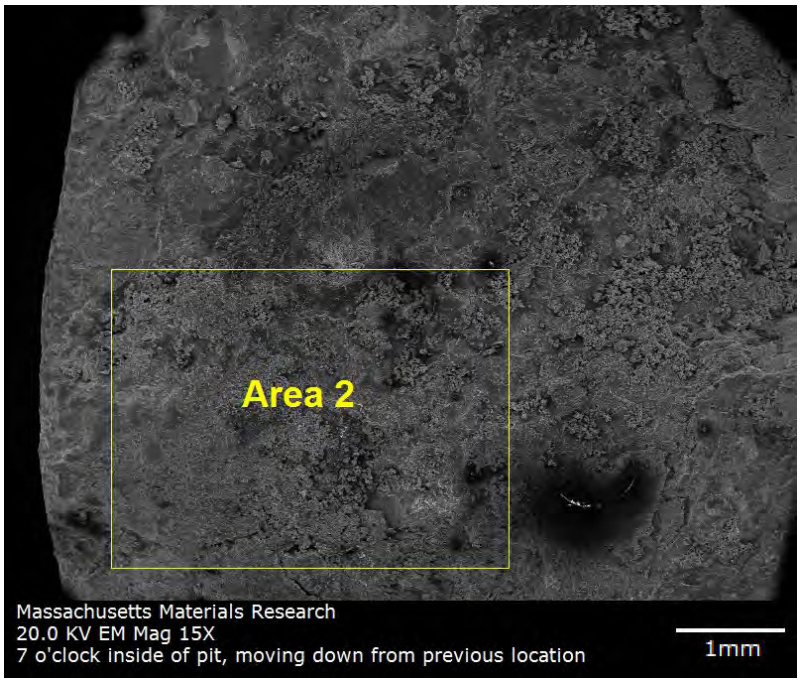


Figure 81:

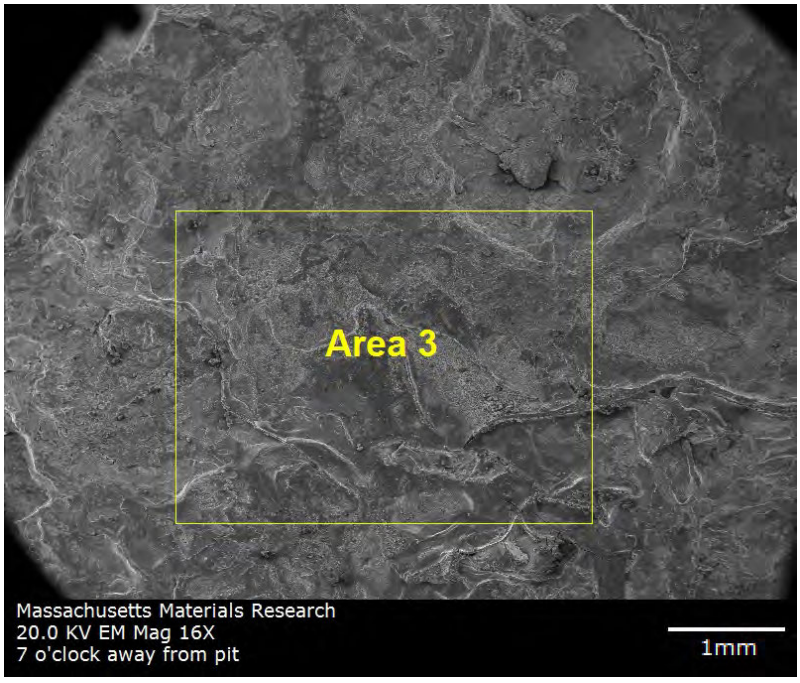


Figure 82:

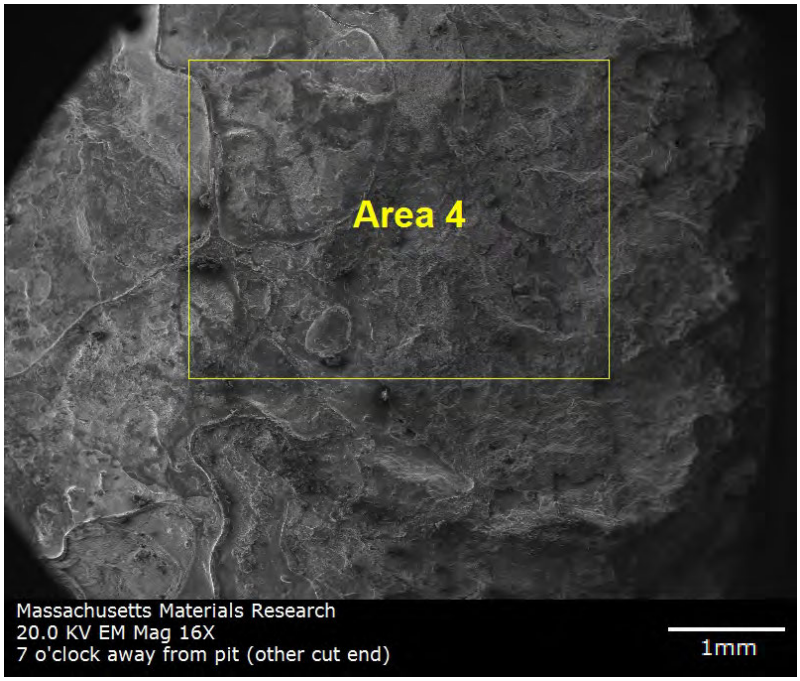
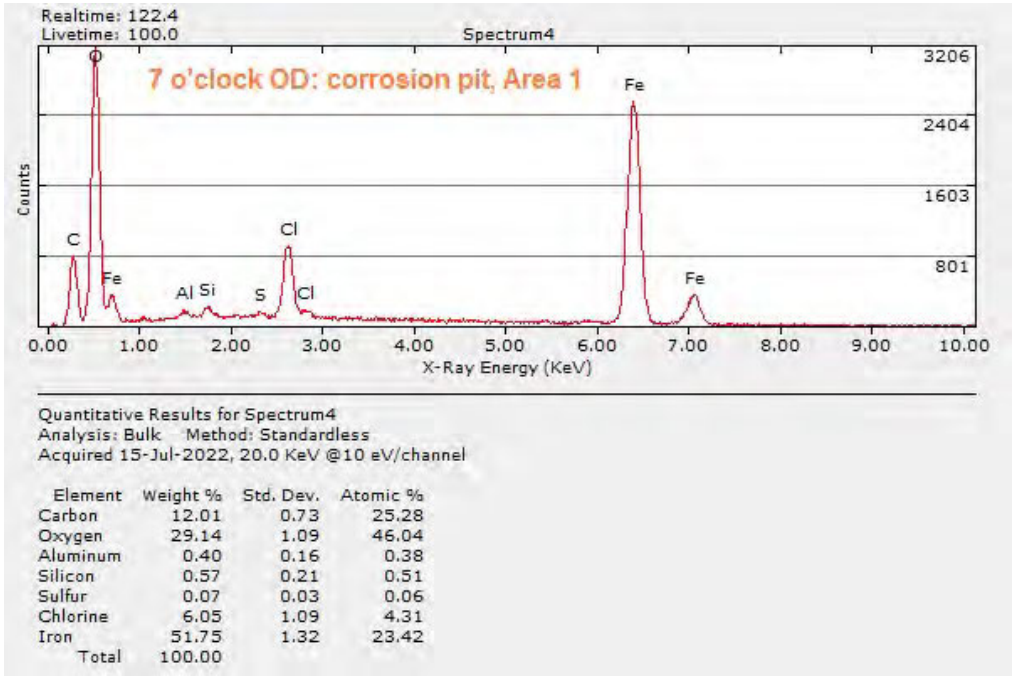
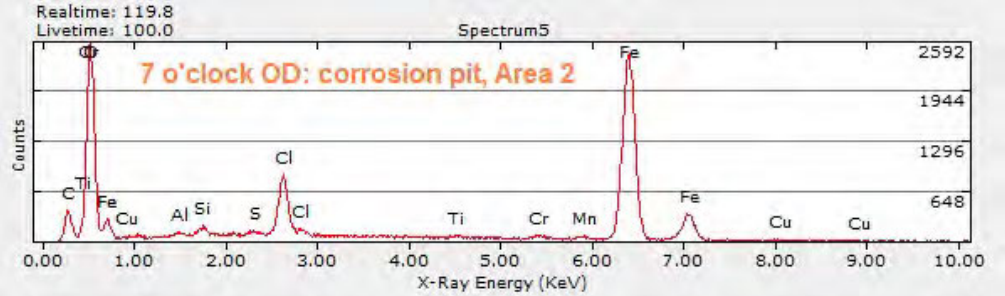


Figure 83:



Element	Weight %	Std. Dev.	Atomic %
Carbon	12.01	0.73	25.28
Oxygen	29.14	1.09	46.04
Aluminum	0.40	0.16	0.38
Silicon	0.57	0.21	0.51
Sulfur	0.07	0.03	0.06
Chlorine	6.05	1.09	4.31
Iron	51.75	1.32	23.42
Total	100.00		

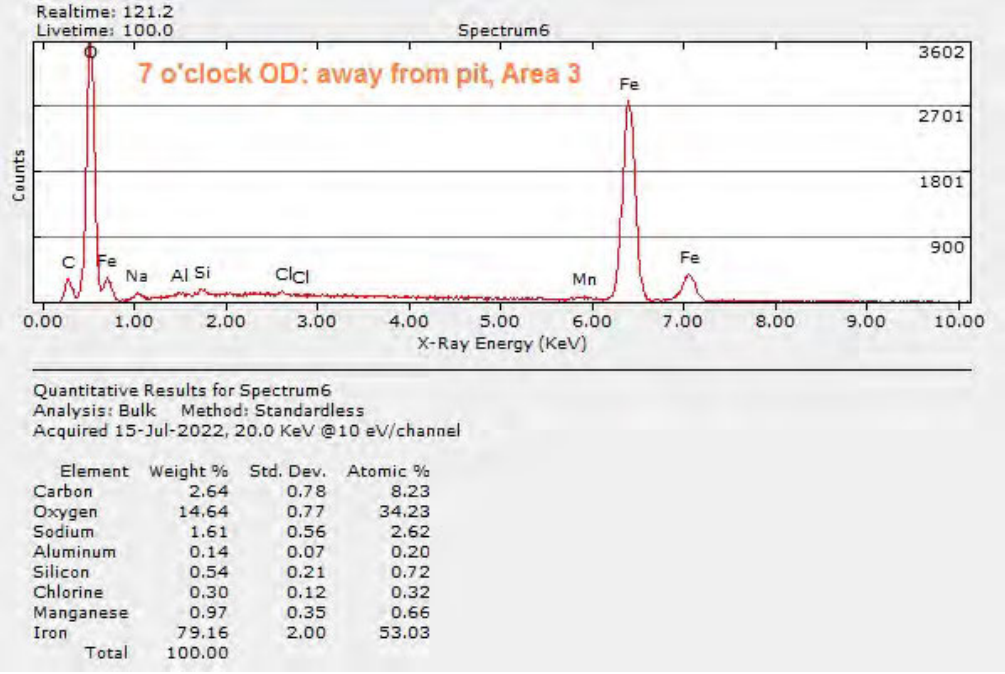
Figure 84:



Quantitative Results for Spectrum5
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	5.54	1.12	13.89
Oxygen	24.22	1.04	45.54
Aluminum	0.28	0.11	0.31
Silicon	0.63	0.24	0.68
Sulfur	0.35	0.13	0.33
Chlorine	6.81	1.07	5.78
Titanium	0.33	0.13	0.20
Chromium	0.55	0.21	0.32
Manganese	0.63	0.24	0.35
Iron	59.80	1.54	32.21
Copper	0.86	0.34	0.41
Total	100.00		

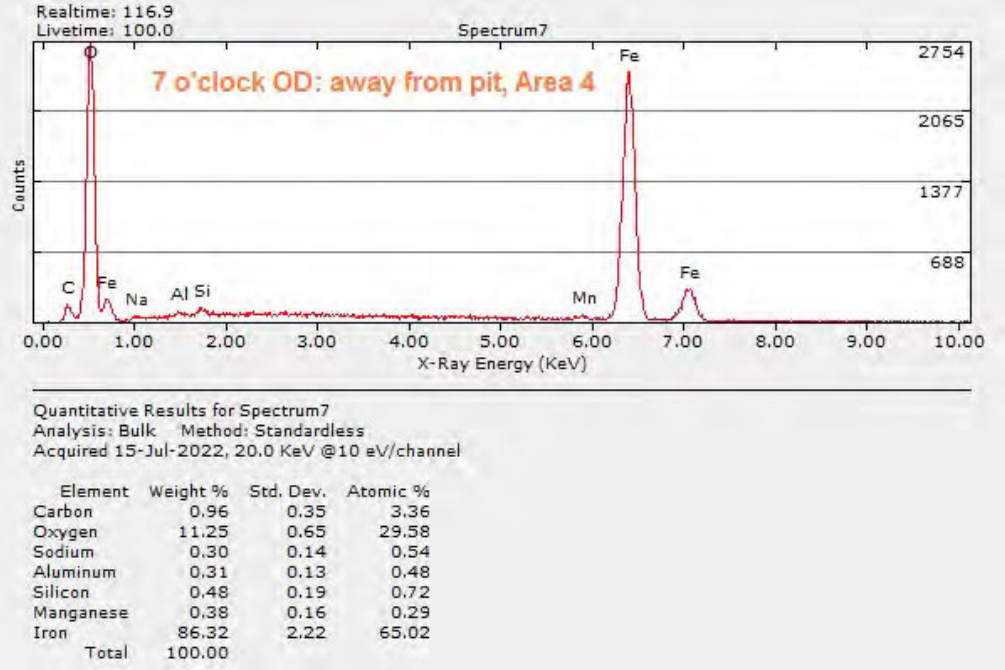
Figure 85:



Quantitative Results for Spectrum6
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	2.64	0.78	8.23
Oxygen	14.64	0.77	34.23
Sodium	1.61	0.56	2.62
Aluminum	0.14	0.07	0.20
Silicon	0.54	0.21	0.72
Chlorine	0.30	0.12	0.32
Manganese	0.97	0.35	0.66
Iron	79.16	2.00	53.03
Total	100.00		

Figure 86:



Quantitative Results for Spectrum7
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Carbon	0.96	0.35	3.36
Oxygen	11.25	0.65	29.58
Sodium	0.30	0.14	0.54
Aluminum	0.31	0.13	0.48
Silicon	0.48	0.19	0.72
Manganese	0.38	0.16	0.29
Iron	86.32	2.22	65.02
Total	100.00		

Figure 87:

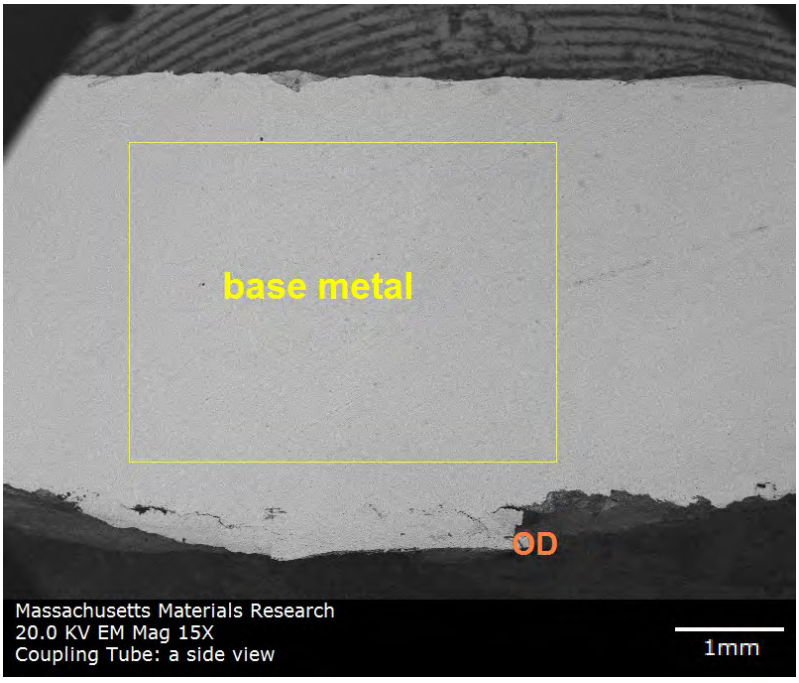
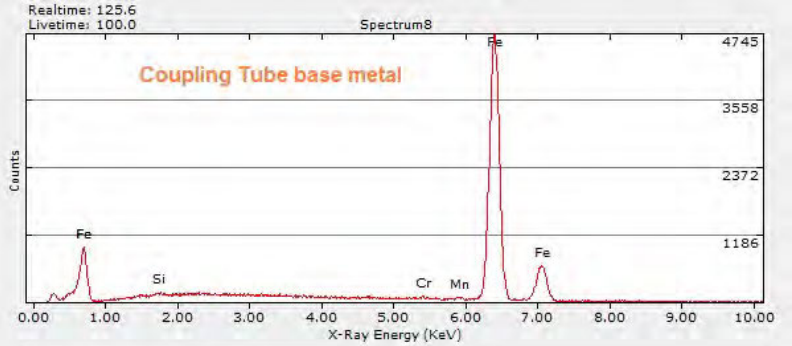


Figure 88:



Quantitative Results for Spectrum8
Analysis: Bulk Method: Standardless
Acquired 15-Jul-2022, 20.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %
Silicon	0.44	0.17	0.87
Chromium	0.25	0.10	0.26
Manganese	0.39	0.16	0.40
Iron	98.92	2.38	98.47
Total	100.00		

Figure 89:

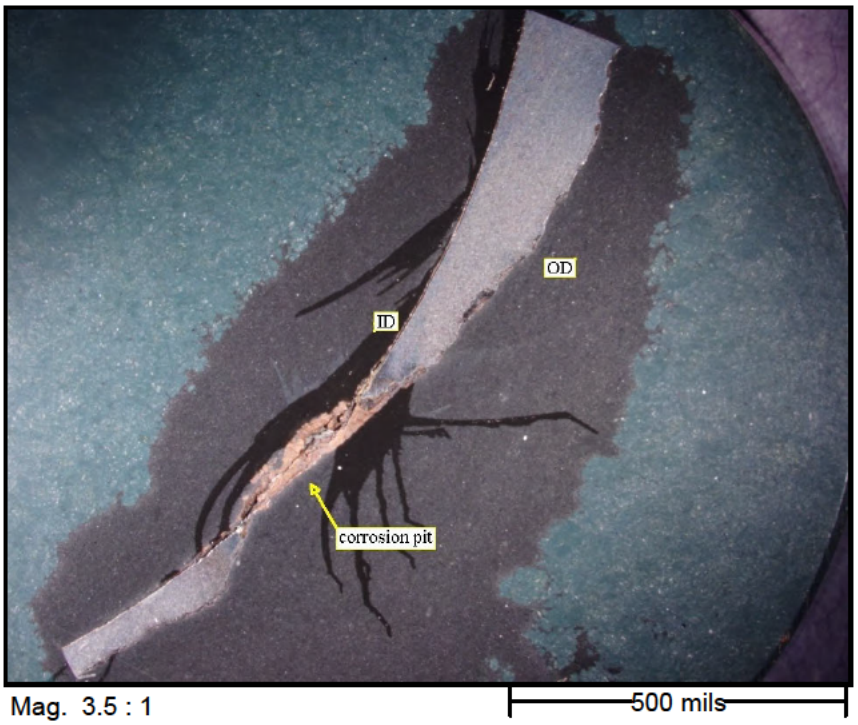


Figure 90: 4 o'clock: An overall view of the mounted cross-section.

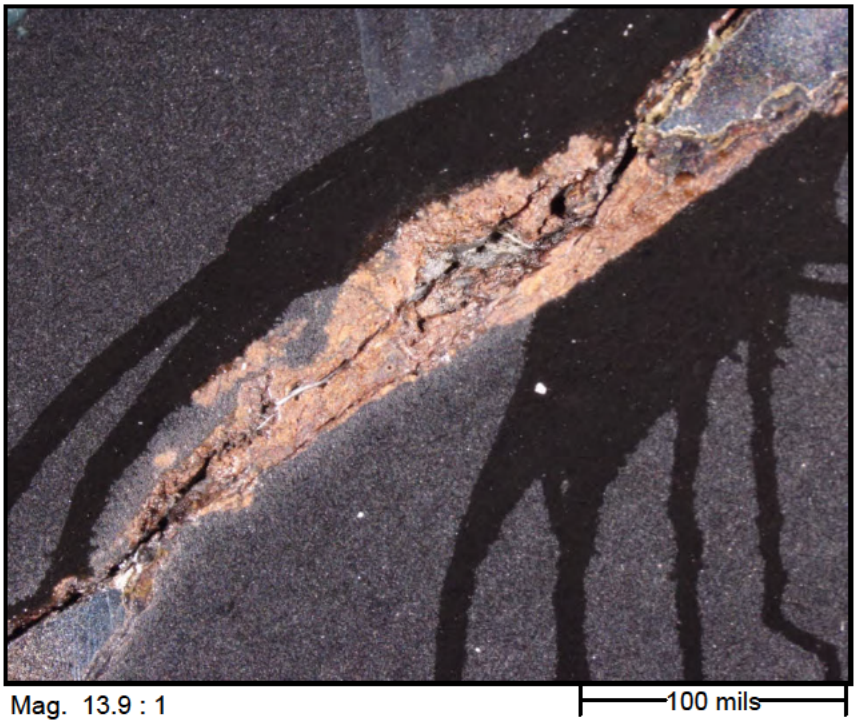


Figure 91: 4 o'clock: An overall view of the mounted cross-section. A higher magnification view of the corrosion debris tightly packed in the pit.

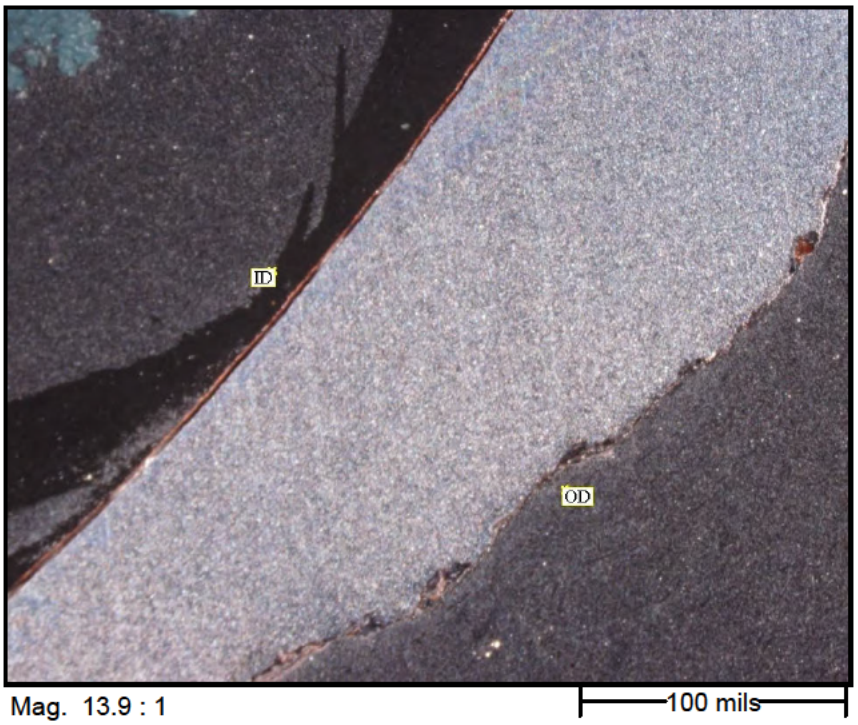


Figure 92: 4 o'clock: An overall view of the mounted cross-section. Note general corrosion on the OD. On the ID a reddish coating layer is present; no corrosion on the ID.

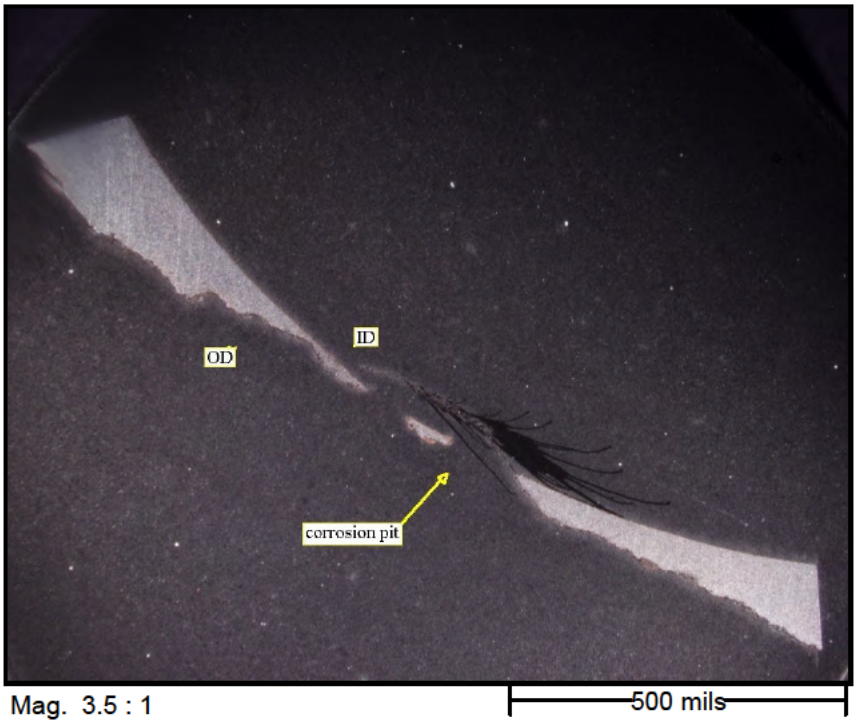


Figure 93: 7 o'clock: An overall view of the mounted cross-section.

Figure 94: 7 o'clock: An overall view of the mounted cross-section. A higher magnification view of the pit edge in the previous image. Note the reduction of the wall to knife edge.

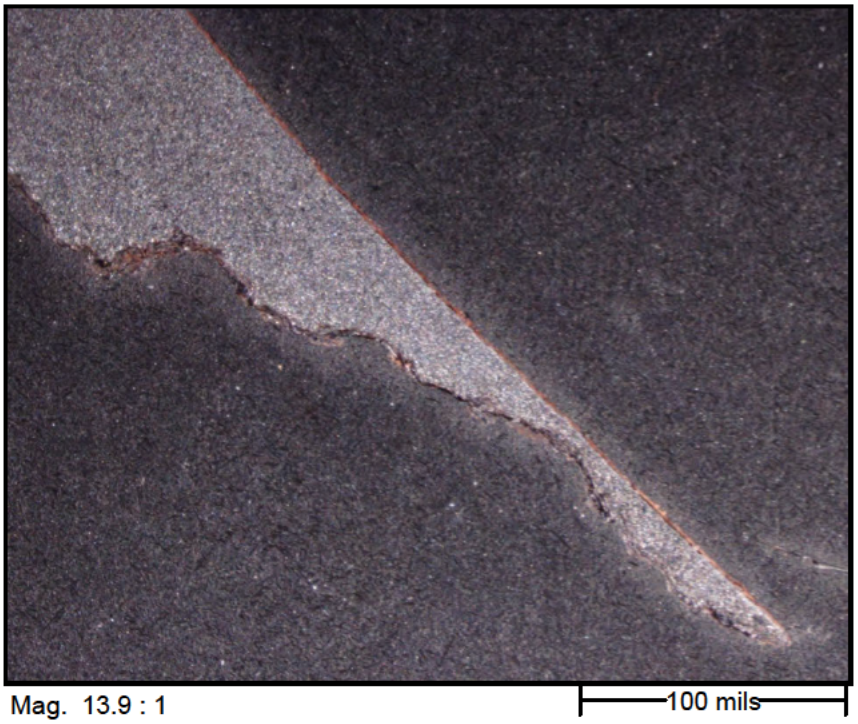


Figure 95: 7 o'clock: An overall view of the mounted cross-section. A higher magnification view of the pit edge. Note the general wall thinning due to corrosion on the tube from the OD and reduction of the wall to knife edge.

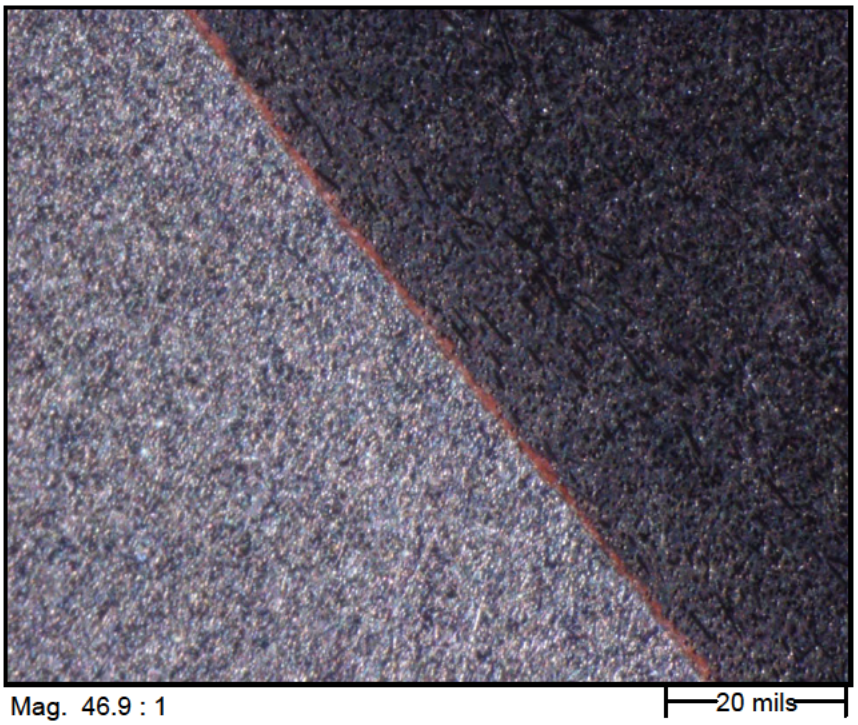


Figure 96: 7 o'clock: Note the reddish paint layer on the ID and no corrosion.

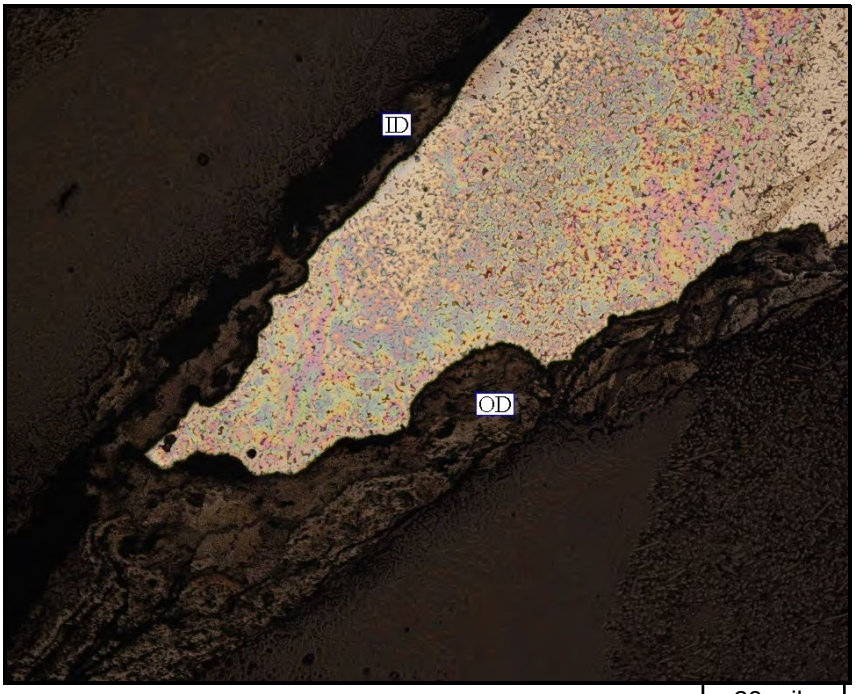


Figure 97: Mount at 4 o'clock: the view shows an edge of the through wall corrosion pit.

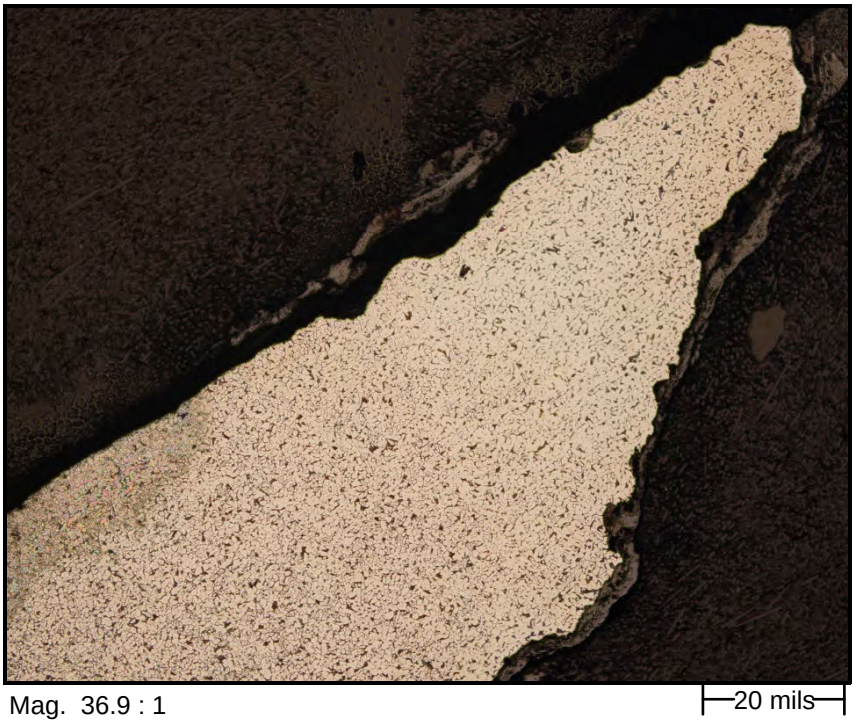


Figure 98: Mount at 4 o'clock: the view shows the opposite edge of the through wall corrosion pit.

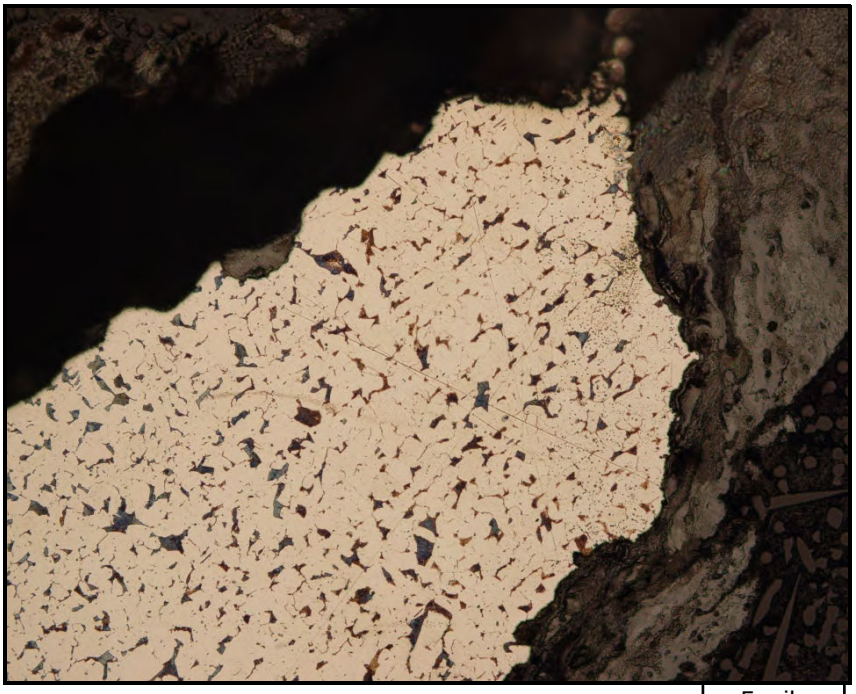


Figure 99: Mount at 4 o'clock: the view shows the opposite edge of the through wall corrosion pit. A higher magnification view of the previous image showing the microstructure.

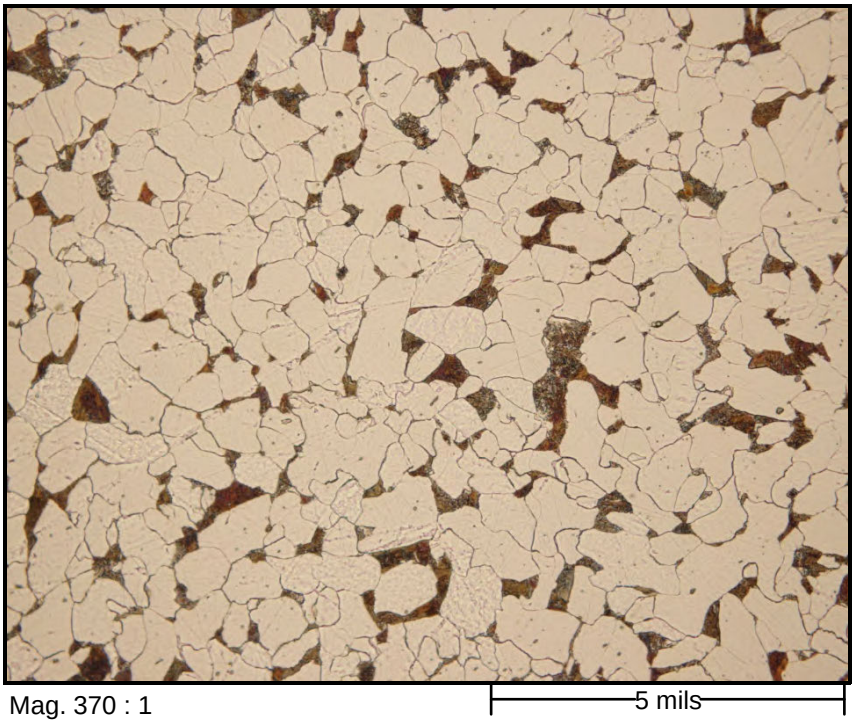


Figure 100: Mount at 4 o'clock: A representative view of the microstructure.

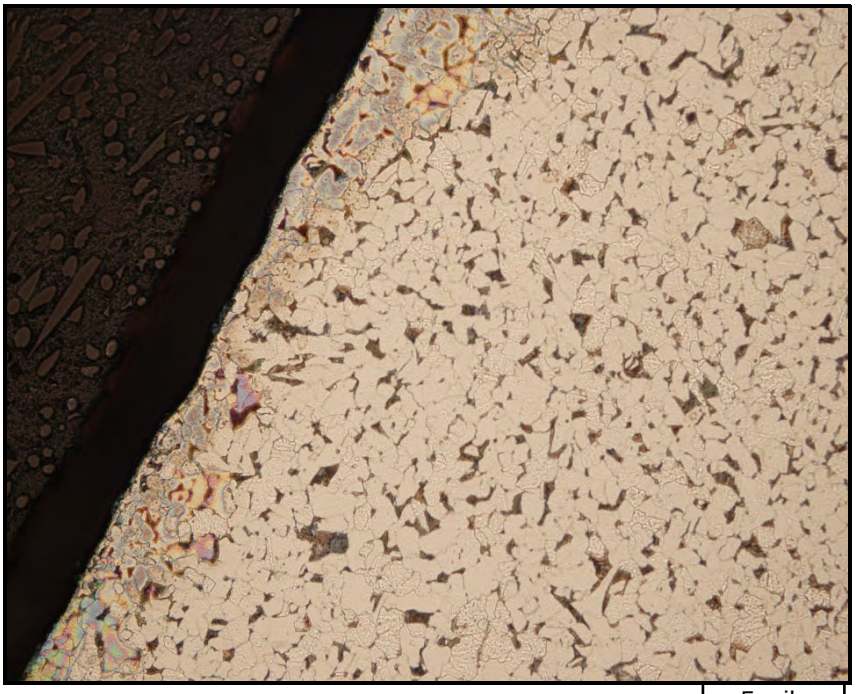


Figure 101: Mount at 4 o'clock: The ID of the tube shows no corrosion.

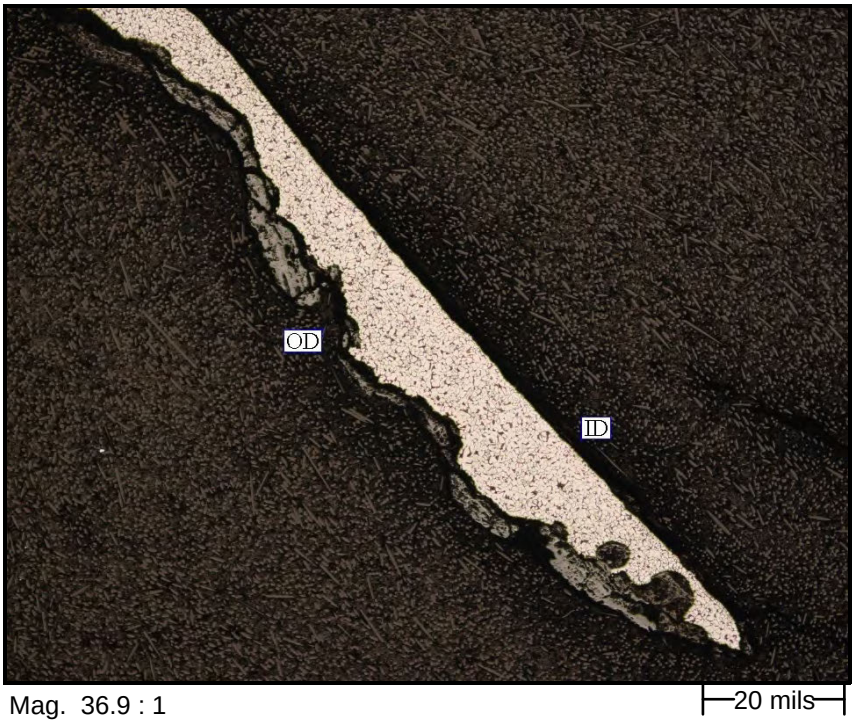


Figure 102: Mount at 7 o'clock: the view shows an edge of the through wall corrosion pit.

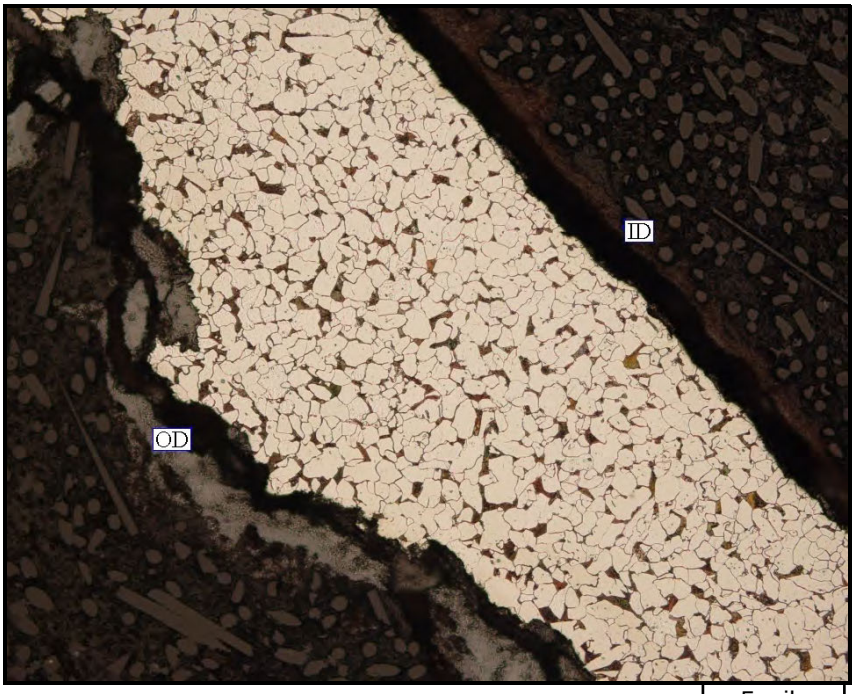


Figure 103: Mount at 7 o'clock: the view shows general corrosion attack on the OD. No corrosion noted on the ID.

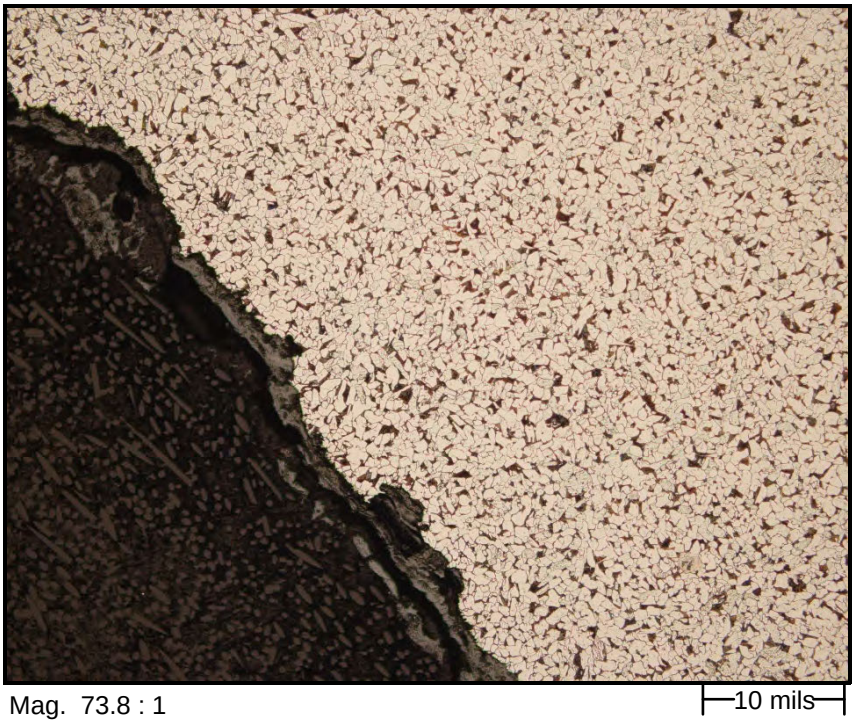


Figure 104: Mount at 7 o'clock: the view shows general corrosion attck on the OD.

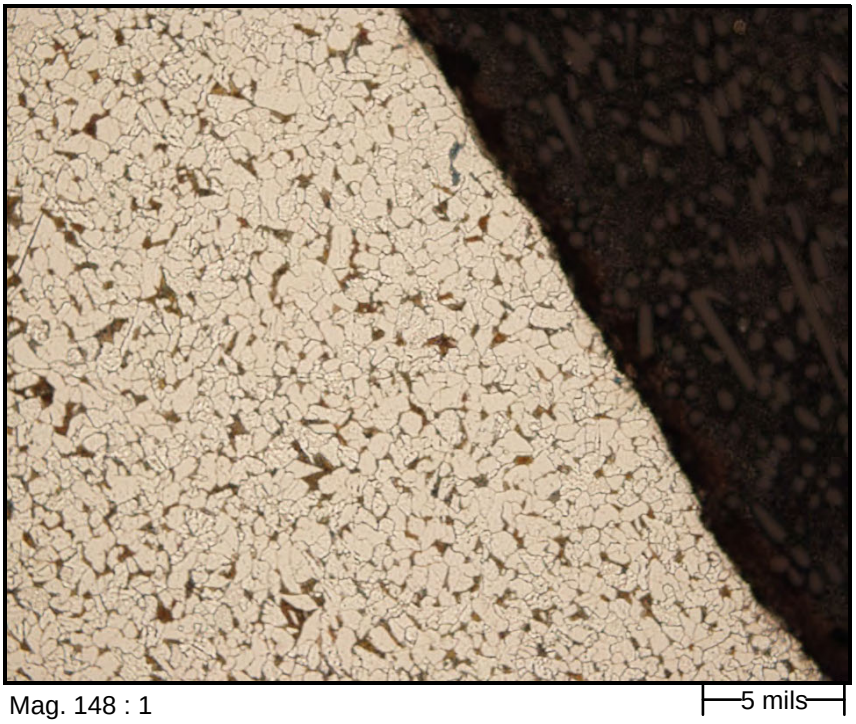


Figure 105: Mount at 7 o'clock: the view shows no corrosion attack on the ID.

Appendix A

Sign-In Sheets
(July 13-15, 2022)

Day 1

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 13, 2022

Affiliation & Address (i.e. Business card)	Representing
Fahmida Hussain, PhD Director of Materials Engineering MMR T 508.835.6262 E fhossain@massmaterials.com Massachusetts Materials Research 1500 Century Dr., West Boylston, MA 01583 MASSMATERIALS.COM | [illegible]	
Ronald Parsons Wright Group, Inc. wgi **Fire Investigation & Forensic Engineering** 125 Stanphyl Road Rear Uxbridge, MA 01569 www.wgifire.com Phone: (508) 749-3200 Fax: (508) 749 3206 info@wgifire.com	Eversource
Matthew Wagenhofer PhD,PE,CFEI Mechanical/Materials Engineer 410-497-7277 410-567-5350 MatWag@MWForensics.com 163 Mitchells Chance Road, #182 Edgewater, MD 21037	Eversource

MMR
A Subsidiary of THE MMR GROUP, INC.
Massachusetts Materials Research, Inc.
P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 13, 2022

Affiliation & Address (i.e. Business card)	Representing
KATHLEEN A. VORCE *Attorney At Law* 555 Liberty Square Road Boxborough, MA 01719 P.O. Box 554 978.264.0554 West Acton, MA 01720 Fax 263.0554 kav@vorcelaw.com	
GAI ENGINEERS *Forensic Engineering since 1934* Andrew D. Ellison, P.E. *Senior Associate* 378 Page Street - Building 10 Stoughton, MA 02072-1141 Office: 781-297-3500 Fax: 781-297-7050 Email: aellison@gaiengineers.com	[redacted]
The Commonwealth of Massachusetts Department of Public Utilities **William Downs** Public Utilities Engineer Pipeline Safety Division One South Station Boston, MA 02110 William.Downs@mass.gov Tel: (617) 305-3698 Cell: (857) 348-4054 Fax: (617) 478-2589	

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 13, 2022

Affiliation & Address (i.e. Business card)	Representing
Stow Fire Department **Gregg Silverio** Fire Investigator 511 Great Road Stow, MA 01775 (978) 897-4537 Fax: (978) 461-1400 fdinvestigator@stow-ma.gov	
The Commonwealth of Massachusetts Department of Public Utilities **Justin R. Evans** Assistant Director Pipeline Safety Division Tel: (617) 305-3693 Cell: (857) 348-4048 justin.r.evans@mass.gov One South Station Boston, MA 02110	
Mahmood Rabi, P.E., P. Eng. SENIOR ENGINEER (401) 965-8110 mobile (401) 267-0110 tel (401) 267-0170 fax mrabi@fap-inc.com 85 Commerce Park Road North Kingstown, RI 02852 F·A·P FAILURE ANALYSIS & PREVENTION, INC.	

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 13, 2022

Affiliation & Address (i.e. Business card)	Representing
Jorge A. Santi Director - Meter Services EVERSOURCE ENERGY 107 Selden Street Berlin, CT 06037 cell: 617-719-6340 jorge.santi@eversource.com	
MUBASHAR AHMED Senior Program Administrator, Process Safety Gas Business Unit EVERSOURCE ENERGY 107 Selden Street Berlin, CT 06037 **347-277-2751** mubashar.ahmed@eversource.com	
Ryan Lewis Manager, Gas Operations EVERSOURCE ENERGY 157 Cordaville Road Southborough, MA 01772 **508-326-3472** Ryan.Lewis@Eversource.com	

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 13, 2022

Affiliation & Address (i.e. Business card)	Representing
Marissa A. Goldberg Senior Counsel EVERSOURCE ENERGY 800 Boylston Street, 17th Floor Boston, MA 02199-8003 **617-424-2114** cell: 617-448-9757 marissa.goldberg@eversource.com	
The Commonwealth of Massachusetts Department of Public Utilities **Janine D'Amico Vargas** Assistant General Counsel Pipeline Safety Division One South Station, 5th Floor Boston, MA 02110 Tel: (617) 305-3617 Fax: (617) 478-2589 Janine.Vargas@mass.gov	

Day 2

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 14, 2022

Affiliation & Address (i.e. Business card)	Representing
Matthew Wagenhofer PhD,PE,CFEI Mechanical/Materials Engineer 410-497-7277 410-567-5350 MatWag@MWForensics.com 163 Mitchells Chance Road, #182 Edgewater, MD 21037	Eversource
The Commonwealth of Massachusetts Department of Public Utilities **Justin R. Evans** Assistant Director Pipeline Safety Division One South Station Boston, MA 02110 Tel: (617) 305-3693 Cell: (857) 348-4048 justin.r.evans@mass.gov	
The Commonwealth of Massachusetts Department of Public Utilities **William Downs** Public Utilities Engineer Pipeline Safety Division One South Station Boston, MA 02110 William.Downs@mass.gov Tel: (617) 305-3698 Cell: (857) 348-4054 Fax: (617) 478-2589	

A Subsidiary of THE MMR GROUP, INC.
Massachusetts Materials Research, Inc.
P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 14, 2022

Affiliation & Address (i.e. Business card)	Representing
GAI ENGINEERS *Forensic Engineering since 1934* Andrew D. Ellison, P.E. *Senior Associate* 378 Page Street - Building 10 Stoughton, MA 02072-1141 Office: 781-297-3500 Fax: 781-297-7050 Email: aellison@gaiengineers.com	[redacted] Travelers
Ronald Parsons Wright Group, Inc. wgi **Fire Investigation & Forensic Engineering** 125 Stanphyl Road Rear Uxbridge, MA 01569 www.wgifire.com Phone: (508) 749-3200 Fax: (508) 749 3206 info@wgifire.com	Plaintiff
	Jorge Sanchez Engineer

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 14, 2022

Affiliation & Address (i.e. Business card)	Representing
	Travelers
Jonathan P. Cardosi 247 Station Drive, SE-100 Westwood, MA	EVERSOURCE

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 14, 2022

Affiliation & Address (i.e. Business card)	Representing
Ryan Lewis Manager, Gas Operations EVERSOURCE ENERGY 157 Cordaville Road Southborough, MA 01772 **508-326-3472** Ryan.Lewis@Eversource.com	Ryan Lewis Eversource
Fahmida Hussain, PhD Director of Materials Engineering MMR T 508.835.6262 E fhossain@massmaterials.com Massachusetts Materials Research 1500 Century Dr., West Boylston, MA 01583 MASSMATERIALS.COM | ACUREB.COM	
KATHLEEN A. VORCE *Attorney At Law* 555 Liberty Square Road Boxborough, MA 01719 P.O. Box 554 West Acton, MA 01720 978.264.0554 Fax 263.0554 ktjd@verizon.net	[redacted]

Day 3

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 15, 2022

Affiliation & Address (i.e. Business card)	Representing
The Commonwealth of Massachusetts Department of Public Utilities **Justin R. Evans** Assistant Director Pipeline Safety Division One South Station Boston, MA 02110 Tel: (617) 305-3693 Cell: (857) 348-4048 justin.r.evans@mass.gov	
Ronald Parsons Wright Group, Inc. wgi **Fire Investigation & Forensic Engineering** 125 Stanphyl Road Rear Uxbridge, MA 01569 www.wgifire.com Phone: (508) 749-3200 Fax: (508) 749 3206 info@wgifire.com	Eversource
Mikal C. Balmforth, PE, CWI SENIOR ENGINEER (401) 996-2324 mobile (401) 267-0110 tel (401) 267-0170 fax mbalmforth@fap-inc.com 85 Commerce Park Road North Kingstown, RI 02852 FAP FAILURE ANALYSIS & PREVENTION, INC.	Travelers

A Subsidiary of THE MMR GROUP, INC.

Massachusetts Materials Research, Inc.

P.O. BOX 810 • 1500 CENTURY DRIVE • WEST BOYLSTON, MA 01583 • TEL. 508-835-6262 • FAX 508-835-9025

Gas Pipe Investigation
MMR Project No. 142001
Sign-in Sheet
July 15, 2022

Affiliation & Address (i.e. Business card)	Representing
	Eversource
Fahmida Hossain, Ph.D. Director of Materials Engineering MMR T 508.835.6262 E fhossain@massmaterials.com Massachusetts Materials Research 1500 Century Dr., West Boylston, MA 01583 MASSMATERIALS.COM | ACUREN.COM	

MMR letters and reports apply to the specific materials, products, or processes tested, examined, surveyed, inspected, or calculated; and are not necessarily indicative of the qualities of apparently identical or similar materials, products, or processes. The liability of Massachusetts Materials Research, Inc., with respect to the services rendered, shall be limited to the amount of the consideration paid for such services and not include any consequential damages.

EXHIBIT 5

D.P.U. 22-PL-82, Contractor OQs Notice of Probable Violation and Informal Review Decision

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

MAURA T. HEALEY
GOVERNOR

KIMBERLEY DRISCOLL
LIEUTENANT GOVERNOR

REBECCA L. TEPPER
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

ONE SOUTH STATION
BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

NOTICE OF PROBABLE VIOLATION
CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 9, 2023 D.P.U. 22-PL-82

Mr. Gregory Hill
Vice President, Gas Engineering
Eversource Energy
247 Station Drive
Westwood, MA 02090

Re: D.P.U. 22-PL-82, Contractor OQs (Maynard IRs)

Dear Mr. Hill:

The Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") issues this Notice of Probable Violation ("NOPV") to NSTAR Gas Company d/b/a Eversource Energy ("Eversource" or "Respondent") pursuant to 220 CMR 69.03 and Delegation Order, D.P.U. 18-44-B (2020).

On October 25, 2021, the Pipeline Safety Division ("Division") of the Department of Public Utilities issued an initial set of information requests (IR1 21-PL-74) to Eversource related to the Division's investigation of the Incident at 27 Park Street, Maynard, pursuant to G.L. c.164, §§ 76 and 105A, and 220 CMR 69.02. Eversource responded to that information request on

December 1, 2021. The Division issued two subsequent information requests on this matter, IR2 21-PL-74 issued April 6, 2022 and IR3 21-PL-74 issued November 8, 2022. Eversource responded to these information requests on April 27, 2022, and November 22, 2022, respectively. Each response included information about Operator Qualifications ("OQs") of contractors performing work on behalf of Eversource. On November 30, 2022, the Division issued an Exit Letter outlining preliminary findings from the inspection, to which the company responded with further information on December 30, 2022. As discussed in detail below, the Division conducted further investigation into the matter and has reason to believe that Respondent may have violated 49 C.F.R. Part 192 ("Part 192"). -

I. FINDINGS

The Division found that Eversource failed to follow its written qualification program, which states in OQ-001 Rev 1 in section XIV. G. "An individual who fails a test will have an opportunity to retake a test within a reasonable period as determined by Eversource, but in all cases a minimum wait time of 48 hours must be observed." It also states in section XIV. H. "After three unsuccessful attempts an individual will be prohibited from retaking a test for three months." Rev 2 of OQ-001 ("Rev 2") moved the minimum wait times of 48 hours to section XIV. H. and three months to section XIV. I. Rev 2 also stated "Three unsuccessful attempts to pass G-01, Properties of Natural Gas shall result in a prohibition from qualification in all tasks for three months, regardless of qualification status in any other specific task."

In 21-PL-74 IR 3-7 a. the Division asked for all contractors who retested within the 48 hour wait time. Eversource responded with a 19-page Activity Report listing contractors and the date and time of written qualification test attempts. In reviewing this document, the Division

counted approximately 421 violations of the 48-hour wait time to retest after a failed attempt, and approximately 316 violations of the three month wait time following three unsuccessful attempts. The Division also counted 13 occasions where individuals attempted to pass G-01, Properties of Natural Gas at least 4 times, suggesting three unsuccessful attempts, though all of them were prior to Revision 2 of OQ-001 when three failed attempts of that task prohibited qualification in all tasks.

II. ALLEGATIONS

Based on the investigation, the Division has reason to believe that Respondent's failure to follow its OQ plan and ensure that individuals performing covered tasks are qualified may be in violation of certain sections of federal pipeline safety regulations, Part 192. The alleged violations of Part 192 are as follows:

1. §192.13 What general requirements apply to pipelines regulated under this part?

   (c) Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part.

2. §192.805 Qualification program.

   Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

III. PRIOR CONSENT ORDER VIOLATIONS

Eversource has signed the following Consent Order that pertains to similar violations of Part 192, §§ 192.805(b): 21-PL-13

IV. PROPOSED CIVIL PENALTY

Under G.L. c. 164, § 105A, Eversource is subject to a civil penalty not to exceed $500,000 for each violation for each day that the violation exists, up to a maximum of $10,000,000 for any related series of violations. These dollar amounts shall be doubled if the department determines that the violator has engaged in one or more similar violations in the three years preceding the violation.

In determining the amount of the civil penalty, the Division shall consider the following, pursuant to G.L. c. 164, § 105A: the appropriateness of the penalty to the size of the business of the person, firm, or corporation charged; the gravity of the violation; and the good faith of the person, firm, or corporation charged in attempting to achieve compliance, after notification of a violation.

In the present matter, the Division has reviewed the circumstances of the allegations and is prepared to resolve this matter upon Eversource's agreement to the terms in the attached Consent Order and payment of a civil penalty in the amount of $75,000.

V. RESPONSE TO THIS NOPV

Within 30 days of receipt of this NOPV, Eversource shall respond to the Division in one of the following ways, pursuant to 220 CMR 69.04:

1. Sign and return the attached Consent Order, thus agreeing to remit payment of the civil penalty by check or money order made payable to the Commonwealth of Massachusetts;

2. Submit an offer in compromise of the proposed civil penalty under 220 CMR 69.04(2);

3. Request an informal conference under 220 CMR 69.05; or

4. Submit a written reply to the Division disputing the allegation(s) contained in the NOPV. The reply must include a complete statement of all relevant facts and authority and full description of the reasons why the Respondent disputes the allegation(s) contained in the NOPV.

Failure to respond within 30 days of receipt of this NOPV will be deemed an admission to the allegations contained herein and a waiver of Eversource's right to contest the allegations. If Eversource fails to respond within 30 days, the Department may, without further notice, find the facts to be as alleged herein and issue a final Order, pursuant to 220 CMR 69.04(3).

Very truly yours,

Richard Enright, Director
Pipeline Safety Division

Enclosures: Consent Order
Compliance Agreement

Cc: Erin Engstrom, Eversource
Kristen Gasparonis, Eversource
Jessica Bottoms, Eversource
Susan Kulberg, Eversource
Katherine Silver, Eversource
Laurie Pereria, Eversource
Danielle Winter, esq, Keegan Werlin
Brendan Vaughan, esq, Keegan Werlin
Justin R. Evans, Assistant Director, Pipeline Safety Division
Phillip Denton, Assistant Director, Pipeline Safety Division
Janine D'Amico Vargas, Assistant General Counsel, Pipeline Safety Division

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

CONSENT ORDER

January 9, 2023 D.P.U. 22-PL-82

In the matter of NSTAR Gas Company d/b/a Eversource Energy

I. JURISDICTION

1. This document, with the attached Compliance Agreement, is a Consent Order entered into between the Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") and NSTAR Gas Company d/b/a Eversource Energy ("Respondent"), and is executed in accordance with 220 CMR 69.08.
2. The Division has authority to enter into this Consent Order on behalf of the Department pursuant to Delegation Order, D.P.U. 18-44-B (2020).
3. Failure to comply with the terms of this Order may result in the assessment of civil penalties and referral of this matter to the Attorney General for appropriate action.
4. The terms and conditions of this Order become effective upon signing by the authorized representatives of the Respondent and the Department.
5. Respondent has stipulated and consented to the issuance of this Consent Order.

II. VIOLATIONS AND CIVIL PENALTY

1. Pursuant to G.L. c. 164, §§ 76 and 105A, and 220 CMR 69.02, the Division conducted a pipeline safety inspection of the Respondent's facilities and records. As a result of the inspection, the Director of the Division issued to the Respondent a Notice of Probable Violation ("NOPV"), D.P.U. 22-PL-82, dated January 9, 2023, in accordance with 220 CMR 69.03. The NOPV is attached hereto and made a part hereof.
2. Based on information contained in the NOPV, the Division finds that the Respondent violated pipeline safety regulations contained in 49 C.F.R. Part 192, specifically:

   Part 192, § 192.13(c) - What general requirements apply to pipelines regulated under this part?
   Part 192, § 192.805(b) - Qualification program.

3. Pursuant to G.L. c. 164, § 105A, the Division hereby imposes upon the Respondent a civil penalty in the amount of $75,000 for the above-noted violations.

4. The Respondent hereby agrees, upon signing and returning this Consent Order to the Division, to remit payment of the civil penalty by check or money order in the amount of $75,000 made payable to the Commonwealth of Massachusetts, One South Station, Boston, MA 02110.

III. RESPONDENT REQUIREMENTS

1. **Respondent shall sign the Stipulation below and return this complete document to the Division.**
2. All submissions by Respondent in accordance with this Consent Order shall be addressed to:

Director
Pipeline Safety Division
Department of Public Utilities
One South Station
Boston, MA 02110

IV. STIPULATED TERMS

Pursuant to 220 CMR 69.08(1), the Respondent through the signature below, by the person to whom this Consent Order is issued or a duly authorized representative, acknowledges agreement to the terms contained herein without admitting or denying that a violation of any Department or federal pipeline safety law or regulation occurred in relation to the above-noted matters. Further, Respondent agrees to issuance of this Consent Order and stipulates to the following:

1. Respondent, by signing the Stipulation, hereby waives:
   (a) All rights to informal review pursuant to 220 CMR 69.05;
   (b) All rights to a hearing pursuant to 220 CMR 69.06;
   (c) Any and all procedural rights available in connection with the issuance of the Consent Order;
   (d) All rights to seek any type of administrative or judicial review of the Consent Order; and
   (e) Any and all rights to challenge or contest the validity of the Consent Order.
2. Respondent expressly acknowledges that neither Respondent nor the Division has any intention to enter into a contract.
3. The terms and provisions of this Consent Order and Stipulation shall be binding upon, and inure to the benefit of, Respondent and the Division and their successors in interest.
4. Nothing in these Stipulated Terms shall preclude any proceedings brought by the Department to enforce the terms of the Consent Order, and nothing in these Stipulated Terms constitute, nor shall Respondent contend that they constitute, a waiver of any right,

power, or authority of any other representative of the Commonwealth or an agency thereof to bring other actions deemed appropriate.

V. FINAL ORDER

1. This Consent Order and Stipulation is intended to be, and shall be construed to be, a final order of the Department issued pursuant to G.L. c. 25, § 5, having the force and effect of a remedial order, pursuant to 220 CMR 69.07(2), and expressly does not form, and may not be considered to form, a contract binding on the Division, the Department, or the Commonwealth of Massachusetts.
2. The terms of this Consent Order and Stipulation, including this paragraph, are not subject to amendment or modification by any extraneous expression, prior agreement, or prior arrangements between the Division and the Respondent, whether oral or written.

By Order of the Division

_____ Date: _____
Richard Enright, Director
Pipeline Safety Division
Department of Public Utilities

The undersigned, duly authorized, stipulates to and acknowledges agreement to the terms herein.

NSTAR GAS COMPANY D/B/A EVERSOURCE ENERGY

_____ Date: _____
Mr. Gregory Hill
Vice President, Gas Engineering

COMPLIANCE AGREEMENT
BETWEEN THE DEPARTMENT OF PUBLIC UTILITIES
AND NSTAR GAS COMPANY D/B/A EVERSOURCE ENERGY

D.P.U. 22-PL-82

NSTAR Gas Company d/b/a Eversource Energy ("Eversource") agrees to take the following actions within the specified time periods:

1. Within 30 days of the effective date of this Order, Eversource shall pay a civil penalty of $75,000 to the Commonwealth of Massachusetts.

2. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division that all contractor employees able to retake a qualification immediately after failing had their qualification status: retested, suspended, expired, inactivated, or revoked as identified in Eversource's response to 21-PL-74 IR 2-10.

3. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division showing that all contractor employees that failed two or more qualification tests completed an instructor led review sessions before retesting, consistent with Eversource's OQ-001.

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

ONE SOUTH STATION
BOSTON, MA 02110
(617) 305-3500

INFORMAL REVIEW DECISION

ELECTRONIC MAIL--RETURN RECEIPT REQUESTED

May 16, 2023 D.P.U. 22-PL-82

Mr. Gregory Hill
Vice President, Gas Engineering
Eversource Energy
247 Station Drive
Westwood, MA 02090

Re: D.P.U. 22-PL-82, Contractor OQs (Maynard IRs)

Dear Mr. Hill:

On January 9, 2023, the Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") issued a Notice of Probable Violation ("NOPV"), D.P.U. 22-PL-82,[1] to NSTAR Gas Company d/b/a Eversource Energy ("Eversource" or "Respondent").

[1] Pursuant to 220 CMR 1.10(3), the Division incorporates by reference the above-noted NOPV and all documents that the Respondent has filed with the Division with respect to this enforcement action.

According to the NOPV, the Division had reason to believe that Eversource may have violated certain sections of the federal pipeline safety regulations, 49 C.F.R. Part 192 ("Part 192"). The violations alleged in the NOPV were as follows:

1. Part 192, §192.13(c) - What general requirements apply to pipelines regulated under this part?
2. Part 192, §192.805(b) - Qualification program.

The Division conducted an informal conference with Eversource on March 8, 2023, pursuant to 220 CMR 69.05. At the informal conference, Eversource did not contest the findings alleged in the NOPV or the civil penalty amount but requested consideration of the following items in the Compliance Agreement:

2. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division that all contractor employees able to retake a qualification immediately after failing had their qualification status: retested, suspended, expired, inactivated, or revoked as identified in Eversource's response to 21-PL-74 IR 2-10.

3. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division showing that all contractor employees that failed two or more qualification tests completed an instructor led review sessions before retesting, consistent with Eversource's OQ-001.

With regard to these two Items, Eversource contended it is unable to comply where Eversource did not properly address certain individuals' qualifications or previously require contractor companies to maintain or report documentation verifying instructor led review sessions. The Division emphasizes that each of these compliance Items was to ensure proper oversight by Eversource of its contractor employees, and that each was required by Eversource's OQ plan. Nevertheless, the Division has reviewed the facts and circumstances of the allegations set forth in the NOPV and has concluded that Eversource violated the following pipeline safety

regulations: Part 192, §§192.13(c) and 192.805(b). Given the facts presented during the informal conference, the Division will amend Items 2 and 3 of the Compliance Agreement as follows:

2. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division indicating all contractor employees able to retake a qualification immediately after failing had their qualification status: retested, suspended, expired, inactivated, or revoked as identified in Eversource's response to 21-PL-74 IR 2-10, or provide a written statement indicating which contractor employees did not have a change in their qualification status at the time of the response to 21-PL-74 IR 2-10.

3. Within 60 days of the effective date of this Order, Eversource shall implement a process to confirm all contractor employees that fail two or more qualification tests complete an instructor led review session before retesting, consistent with Eversource's OQ-001, and provide documentation of the process to the Division.

Under G.L. c. 164, § 105A, Eversource is subject to a civil penalty not to exceed $500,000 for each violation for each day that the violation exists, up to a maximum of $10,000,000 for any related series of violations. These dollar amounts shall be doubled if the department determines that the violator has engaged in one or more similar violations in the three years preceding the violation. In determining the amount of the civil penalty, the Division shall consider the following, pursuant to G.L. c. 164, § 105A: the appropriateness of the penalty to the size of the business of the person, firm, or corporation charged; the gravity of the violation; and the good faith of the person, firm, or corporation charged in attempting to achieve compliance, after notification of a violation.

After due consideration of all the facts in their entirety, the Division has determined that the civil penalty for the violations in D.P.U. 22-PL-82 is $75,000. To resolve this matter, the

Division is prepared to accept Eversource's agreement to the terms in the attached Consent Order and Compliance Agreement, which would put the Respondent in compliance with the cited federal pipeline safety regulations.

Within seven days of the date of this Informal Review Decision, the Respondent shall respond to the Division in one of the following ways, pursuant to 220 CMR 69.05:

(1) Sign and return the attached Consent Order, thus agreeing to remit payment of the civil penalty by check or money order made payable to the Commonwealth of Massachusetts; or

(2) Request an adjudicatory hearing in writing, in accordance with 220 CMR 69.05(3). The request must be received by the Division within seven days of the date of this decision. **Until further notice, the Department requires that the written request be submitted in electronic format to dpu.efiling@mass.gov.**

Failure to request an adjudicatory hearing within the time allowed will be deemed an admission to the allegations contained in this decision, and the Respondent shall be held liable to pay the civil penalty in the NOPV, pursuant to 220 CMR 69.05(3). If the Respondent fails to respond, the Department may, without further notice, find the facts to be as alleged herein and issue a final Order.

Very truly yours,

Richard Enright, Director
Pipeline Safety Division

Enclosures: Consent Order
Compliance Agreement

Cc: Erin Engstrom, Eversource
Kristen Gasparonis, Eversource
Jessica Bottoms, Eversource

Susan Kulberg, Eversource
Katherine Silver, Eversource
Laurie Pereria, Eversource
Danielle Winter, Esq, Keegan Werlin
Brendan Vaughan, Esq, Keegan Werlin
Justin R. Evans, Assistant Director, Pipeline Safety Division
Phillip Denton, Assistant Director, Pipeline Safety Division
Janine D'Amico Vargas, Assistant General Counsel, Pipeline Safety Division

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

CONSENT ORDER

May 16, 2023 D.P.U. 22-PL-82

In the matter of NSTAR Gas Company d/b/a Eversource Energy

I. JURISDICTION

1. This document, with the attached Compliance Agreement, is a Consent Order entered into between the Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") and NSTAR Gas Company d/b/a Eversource Energy ("Respondent"), and is executed in accordance with 220 CMR 69.08.
2. The Division has authority to enter into this Consent Order on behalf of the Department pursuant to Delegation Order, D.P.U. 18-44-B (2020).
3. Failure to comply with the terms of this Order may result in the assessment of civil penalties and referral of this matter to the Attorney General for appropriate action.
4. The terms and conditions of this Order become effective upon signing by the authorized representatives of the Respondent and the Department.
5. Respondent has stipulated and consented to the issuance of this Consent Order.

II. VIOLATIONS AND CIVIL PENALTY

1. Pursuant to G.L. c. 164, §§ 76 and 105A, and 220 CMR 69.02, the Division conducted a pipeline safety inspection of the Respondent's facilities and records. As a result of the inspection, the Director of the Division issued to the Respondent a Notice of Probable Violation ("NOPV"), D.P.U. 22-PL-82, dated January 9, 2023, in accordance with 220 CMR 69.03. The NOPV is attached hereto and made a part hereof.
2. Based on information contained in the NOPV, the Division finds that the Respondent violated pipeline safety regulations contained in 49 C.F.R. Part 192, specifically:
    1. **Part 192, §192.13(c) – What general requirements apply to pipelines regulated under this part?**
    2. **Part 192, §192.805(b) – Qualification program.**
3. Pursuant to G.L. c. 164, § 105A, the Division hereby imposes upon the Respondent a civil penalty in the amount of $75,000 for the above-noted violations.

4. The Respondent hereby agrees, upon signing and returning this Consent Order to the Division, to remit payment of the civil penalty by check or money order in the amount of $75,000 made payable to the Commonwealth of Massachusetts, One South Station, Boston, MA 02110.

III. RESPONDENT REQUIREMENTS

1. **Respondent shall sign the Stipulation below and return this complete document to the Division.**
2. All submissions by Respondent in accordance with this Consent Order shall be addressed to:

Director Richard Enright
Pipeline Safety Division
Department of Public Utilities
One South Station
Boston, MA 02110

IV. STIPULATED TERMS

Pursuant to 220 CMR 69.08(1), the Respondent through the signature below, by the person to whom this Consent Order is issued or a duly authorized representative, acknowledges agreement to the terms contained herein without admitting or denying that a violation of any Department or federal pipeline safety law or regulation occurred in relation to the above-noted matters. Further, Respondent agrees to issuance of this Consent Order and stipulates to the following:

1. Respondent, by signing the Stipulation, hereby waives:
   (a) All rights to informal review pursuant to 220 CMR 69.05;
   (b) All rights to a hearing pursuant to 220 CMR 69.06;
   (c) Any and all procedural rights available in connection with the issuance of the Consent Order;
   (d) All rights to seek any type of administrative or judicial review of the Consent Order; and
   (e) Any and all rights to challenge or contest the validity of the Consent Order.
2. Respondent expressly acknowledges that neither Respondent nor the Division has any intention to enter into a contract.
3. The terms and provisions of this Consent Order and Stipulation shall be binding upon, and inure to the benefit of, Respondent and the Division and their successors in interest.
4. Nothing in these Stipulated Terms shall preclude any proceedings brought by the Department to enforce the terms of the Consent Order, and nothing in these Stipulated Terms constitute, nor shall Respondent contend that they constitute, a waiver of any right,

power, or authority of any other representative of the Commonwealth or an agency thereof to bring other actions deemed appropriate.

V. FINAL ORDER

1. This Consent Order and Stipulation is intended to be, and shall be construed to be, a final order of the Department issued pursuant to G.L. c. 25, § 5, having the force and effect of a remedial order, pursuant to 220 CMR 69.07(2), and expressly does not form, and may not be considered to form, a contract binding on the Division, the Department, or the Commonwealth of Massachusetts.
2. The terms of this Consent Order and Stipulation, including this paragraph, are not subject to amendment or modification by any extraneous expression, prior agreement, or prior arrangements between the Division and the Respondent, whether oral or written.

By Order of the Division

_____ Date: 5/23/2023
Richard Enright, Director
Pipeline Safety Division
Department of Public Utilities

The undersigned, duly authorized, stipulates to and acknowledges agreement to the terms herein.

NSTAR GAS COMPANY D/B/A EVERSOURCE ENERGY

_____ Date: _5/23/23_____
Gregory Hill
Vice President, Gas Engineering

COMPLIANCE AGREEMENT
BETWEEN THE DEPARTMENT OF PUBLIC UTILITIES
AND NSTAR GAS COMPANY D/B/A EVERSOURCE ENERGY

D.P.U. 22-PL-82

NSTAR Gas Company d/b/a Eversource Energy ("Eversource") agrees to take the following actions within the specified time periods:

1. Within 30 days of the effective date of this Order, Eversource shall pay a civil penalty of $75,000 to the Commonwealth of Massachusetts.

2. Within 60 days of the effective date of this Order, Eversource shall provide documentation to the Pipeline Safety Division indicating all contractor employees able to retake a qualification immediately after failing had their qualification status: retested, suspended, expired, inactivated, or revoked as identified in Eversource's response to 21-PL-74 IR 2-10, or provide a written statement indicating which contractor employees did not have a change in their qualification status at the time of the response to 21-PL-74 IR 2-10.

3. Within 60 days of the effective date of this Order, Eversource shall implement a process to confirm all contractor employees that fail two or more qualification tests complete an instructor led review session before retesting, consistent with Eversource's OQ-001, and provide documentation of the process to the Division.

EXHIBIT 6

D.P.U. 21-PL-74, Maynard Incident Notice of Probable Violation

THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

MAURA T. HEALEY
GOVERNOR

KIMBERLEY DRISCOLL
LIEUTENANT GOVERNOR

REBECCA L. TEPPER
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

ONE SOUTH STATION
BOSTON, MA 02110
(617) 305-3500

JAMES VAN NOSTRAND
CHAIR

CECILE M. FRASER
COMMISSIONER

STACI RUBIN
COMMISSIONER

NOTICE OF PROBABLE VIOLATION
ELECTRONIC MAIL – RETURN RECEIPT REQUESTED

August 9, 2023 D.P.U. 21-PL-74

VIA EMAIL ONLY

Mr. William J. Akley
President of Gas Operations
Eversource Energy
157 Cordaville Road
Southborough, MA 01772

Re: D.P.U. 21-PL-74, 27 Park Street, Maynard (September 2, 2021)

Dear Mr. Akley:

The Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") issues this Notice of Probable Violation ("NOPV") to NSTAR Gas Company d/b/a Eversource Energy ("Eversource" or "Respondent") pursuant to 220 CMR 69.03 and Delegation Order, D.P.U. 18-44-B (2020).

On September 2, 2021, the Pipeline Safety Division ("Division") of the Department of Public Utilities responded to a report of a gas-related reportable incident, ("Incident") as defined in 49 CFR Part 191, §191.3, at the NSTAR Gas Company d/b/a Eversource Energy

("Eversource") facilities at 27 Park Street, Maynard. The Division began an investigation pursuant to G.L. c.164, §§ 76 and 105A, and 220 CMR 69.02. The investigation included incident response, service restoration, pipeline replacement, and materials testing. The Division collected a portion of the pipe which was brought to Massachusetts Materials Research ("MMR") for analysis. The investigation also included a review of applicable Eversource records to ascertain the root cause of the Incident. On October 25, 2021, the Division issued an initial set of information requests to Eversource related to the Division's investigation of the Incident. Eversource responded to that information request on December 1, 2021. The Division issued two subsequent information requests on April 6, 2022, and November 8, 2022. Eversource responded to these information requests on April 27, 2022, and November 22, 2022, respectively. On March 1, 2023, the Division issued an Exit Letter outlining preliminary findings from the investigation, to which the company provided a response on April 14, 2023. On June 6, 2023, the Division issued a fourth set of information requests. Eversource responded on June 23, 2023. As discussed in detail below, the Division conducted further investigation into the matter and has reason to believe that Respondent may have violated 49 C.F.R. Part 192 ("Part 192").

I. OVERVIEW OF INCIDENT

On September 2, 2021, the Division responded to a report of a gas-related Incident, as defined in 49 CFR Part 191, §191.3, at the Eversource facilities at 27 Park Street, Maynard. The Division had been notified by Telephonic Incident Notification (Exhibit 1) at approximately 7:38 pm that there was a suspected gas-related house explosion with one fatality. The two neighboring homes at 25 and 26 Park Street were also evacuated.

The Maynard fire department received a report of a strange odor in the house at 27 Park Street at 4:14 pm on the business line, not the emergency line. When the Maynard Fire Department arrived they found that the structure was on fire and materials from the home were scattered in the roadway and property. The fire was extinguished and did not spread to any neighboring structures. The resident of 27 Park Street was pronounced deceased at 4:52 pm by fire crews on the scene. The Massachusetts Fire District Fourteen Fire Origin and Cause Investigation Report ("Report") determined he died as a result of the explosion / fire and was found against a door separating the finished basement from the dirt basement. The Report also concluded that the origin of the fire was the dirt basement, and the most probable source of ignition was a spark from the light in the dirt basement as the deceased entered to investigate the "strange odor" later determined to be natural gas.

The first Eversource service technician arrived on site at 5:12 pm, and a gas maintenance crew arrived at 6:15 pm. Eversource first responders made contact with the fire chief, cleared the curb valve, and shut off gas service to 27 Park Street. Eversource began a leak investigation with the help of the fire department and found significant readings inside the main valve, on the Sherman Street side of 27 Park Street, inside 25 Park Street, and inside 26 Park Street. Eversource established an Incident Command System ("ICS") and began identifying the source of the leak, began purging out the ground which was saturated with gas around 25, 26 and 27 Park Street, and constructed a bypass to be able remove the leaking pipe without interrupting the supply of gas to customers. The crew quickly located the leak around the dresser coupling on Sherman Street, but delayed exposing the coupling to further contain the leak. At 2:50 am on

September 3, Eversource activated the [redacted] plastic bypass. At 3:02 am, Eversource uncovered the leaking [redacted] mechanical coupling. A length of pipe about three feet in either direction of the leaking coupling was cut out and removed from the trench. Eversource continued purging gas around the homes on Park Street until a zero percent gas reading was achieved on September 8, 2021.

The Division arrived to the scene at 8:25 pm on September 2, 2023. The Division stayed through Eversource building a bypass to maintain customers and removing the leaking coupling, and oversaw its delivery to the MMR on September 3, 2021.

II. FINDINGS

Operator Qualifications:

The Division reviewed Operator Qualification ("OQ") records received as part of IR 1-18 and IR 1-21 to ensure compliance with 49 CFR Part 192 ("Part 192") § 192.805(b). The Division has significant concerns about the qualifications of individuals performing covered tasks in response to the Incident. Specifically, several individuals had OQ failures on the same date as some of their qualification dates in violation of Eversource's written qualification program, OQ-001. The Division addressed this issue in NOPV 22-PL-82, however six violations listed in response to IR 1-18 and four in response to IR 1-21 were not listed in IR 3-7, which was the basis for that NOPV.

Several of these violations were for the current qualifications of those individuals and for the covered tasks they were performing in response to the Incident. Specifically, the responses to IR 1-18 and IR 1-21 show several contractor employees without adequate OQs for Leak Investigation inside only (LM02), Leak Investigation outside only (LM03), Classifying Leaks-

LM-04), Properties of Natural Gas(G-01), Abnormal Operating Conditions (G-02), Inspecting for Atmospheric & Internal Corrosion(M-01), and Inspection of Meters and Regulators (MS-05). Several contractor employees failed these OQ tests and requalified on the same day, in violation of Eversource OQ-001, and they did not requalify until after the Incident.

According to OQ-001 Rev 2, the Revision current at the time of the Incident, Section I D. "No company employee, employee of a contractor or any other person may perform any covered task identified in this Plan unless the requirements of this Plan have been satisfied." The above-mentioned contractor employees were not qualified in accordance with Eversource's OQ plan and were performing covered tasks. In its Exit Letter Response, Eversource acknowledged omitting several contractor employees from its response to IR 3-7 and confirmed that six individuals performed covered tasks in violation of OQ-001 on or after the day of the Incident.

Unprotected Pipe Evaluations:

As required in Part 192, §192.465(e), every company must conduct a three-year evaluation of unprotected pipe to determine areas of active corrosion. The Division requested the last two unprotected pipe evaluations performed at Park and Sherman Streets. Eversource's procedure, OM-160 ADM, states "Cathodically un-protected older steel pipelines must be routinely evaluated for active corrosion as required by regulations. The Gas Main Replacement Index ("GMRI") analysis provides this analysis for NSTAR Gas." The GMRI process calculates a score, known as an Index Value, to determine whether a pipeline is experiencing active corrosion. The written program, provided in response to IR 1-33, states "The Index Value is engineered so that active corrosion can exist without consideration of variables that have no

impact upon corrosion of a pipe. Similarly, the Index Value is engineered so that active corrosion cannot exist on a pipeline that is not experiencing corrosion." In response to IR 2-4, Eversource stated it has not performed inspections per this code section because its pipe ranking system has not identified any areas of corrosion. Eversource has not provided documentation to support a three-year evaluation of the pipe on Park Street or review of ranking as required by 192.465(e). In response to the Exit Letter Eversource stated the following: "Unprotected pipe segments are evaluated through an annual review of the GMRI as the basis to prioritize pipe segments for replacement under the Company's Gas System Enhancement Plan ("GSEP"). Once the list of projects is developed for the GSEP, the list is reviewed with subject matter experts including those in Operations to identify any pipe segments that should be included in the GSEP program due to the observed condition of pipe segments in the field. The development of the list of projects for the annual GSEP filing is the evaluation of unprotected pipe."

The variables that Eversource uses to prioritize pipeline replacements under GSEP does not match up with the variables that would indicate active corrosion. Part 192.465 (e) elaborates "… However, on distribution lines and where an electrical survey is impractical on transmission lines, areas of active corrosion may be determined by other means that include review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records, and the pipeline environment." The GMRI process does include leak growth rate and leaks / 1000 feet of pipeline, both of which measure leak repair and inspection records. It also includes soil conditions which represents the pipeline environment. Eversource's model does not include variables representing corrosion monitoring records or exposed pipe inspection

records. Furthermore, the remaining variables it does consider in the GMRI represent risk (location, service density, pipeline pressure, and material) or opportunities for cost reduction (utility construction). While these variables might serve well for the GSEP program in replacing leak prone pipe and minimizing rate payer expenses, they have no bearing on the presence of active corrosion.

Eversource also expressed that the scenarios outlined in the Exit letter, which specific values were chosen for some of the variables used by the GMRI is not in line with the construct of the GMRI ranking system. All variables must be considered based on actual data or SME knowledge to arrive at a determination of active corrosion. The Division would like to reiterate its concern here, with a different example. Taking the three variables identified above as being indicative of active corrosion (leak growth rate, leaks / 1000 feet, and soil conditions) and assigning them the highest possible values (13, 35, and 20 respectively) the GMRI Index Value is 68. Adding in the risk related variables will generate a GMRI Index Value somewhere between 71 and 91. The utility construction cost related variable can add between 0 and 30 points to that Index Value. This refutes Eversource's statement that "the Index Value is engineered so that active corrosion cannot exist on a pipeline that is not experiencing corrosion." It is very clear that the GMRI's over reliance on risk and cost make this tool less likely to identify active corrosion in rural and suburban areas, where risk is lower and the opportunities for joint trenching utilities are less frequent.

In the fourth set of IRs Eversource explained that in addition to leak information, a pipe segment may be updated in the GMRI whenever new information becomes available. Since

most of the other variables in the GMRI remain static over time, changes are most often associated with paving information from municipalities (R_Index), system reliability needs (F_Index), municipal or customer complaints (C_Index) and other construction in the area (U_Index). Pipe segments are also updated and marked as complete in the GMRI when a project that replaces the pipe segment is completed.

The Division also has concerns about the quality of the data being used in the GMRI. The Division asked about a segment of pipe featuring both bare steel and coated steel on Sherman Street, Maynard. In response to IR 4-5, Eversource acknowledged that they should have used the higher score, the bare steel, on this segment and an entry error led to an inaccurate GMRI score on the Sherman Street segment.

In response to the Exit Letter, Eversource reiterated the definition of active corrosion in Part 192.3: continuing corrosion that, unless controlled, could result in a condition that is detrimental to public safety. It further stated, "The Company's active corrosion program and the manner in which it determines the presence of active corrosion is compliant with the federal pipeline safety regulations." The Division does not believe the GMRI process, as written at the time of the Incident, meets the requirements of 192.465(e).

Replacement Ranking (IR-3-1)

As required in Part 192, §192.1007(e)(1)(i), every company must monitor the number of hazardous leaks eliminated or repaired. As stated in the response to IR 2-4, Eversource counts leaks by each unique leak event location and associated repair record. Each leak clamp does not

generate a record. For example, in response to IR 1-24(e) Eversource provided an activity report for a leak repair at 11 Sherman Street. The description identifies a need to extend the trench where four leak clamps were used on "very poor bare steel main." Eversource counts this as one leak event, however, if this were counted as four separate leaks it would increase the GMRI Index Value of this segment of pipe.

In this particular case, that one repair record would have increased the leak index score of Sherman Street in the GMRI, provided in IR 2-4(b), by 10 points. The failure to count each installed leak repair clamp results in a ranking/leak index that is not representative of the number of leaks repaired and affects the ranking of pipe segments.

Eversource explained that there was one leak location found on a main in the area of 11 Sherman Street. The area of the main that needed to be exposed to make the repairs was less than 48 inches. In order to properly address the one identified leak, the Company had to install a total of four clamps. According to Eversource the four clamps are not indicative of four separate leaks. IR 1-33 documents the activity report that contains information on the four clamps. As noted in the activity report, Company personnel determined that 11 Sherman Street had one leak location, with one single cause corrosion failure. Eversource believes this is consistent with PHMSA's Leak Cause classified as Corrosion Failure.

In Information Request 3-1, Eversource stated that leaks are counted by each unique leak event location and associated repair record. Therefore, each leak clamp installed does not generate a separate record. Multiple leak clamps may be required to repair a leak at a location. Based on this explanation the current replacement ranking does not adequately address a single

location where multiple leaks are repaired. The Division believes that if a pipe has corrosion so widespread as to require multiple clamps, each clamp should be counted as a separate leak.

Leak survey and repair:

The Division's investigation included an examination of Eversource's leak history, leak survey, and leak repair records near the Incident location. Upon the Division's request, Eversource provided documentation regarding all leak history from January 1, 2011 through September 2, 2021 for Sherman Street and Park Street in Maynard. The Division found several areas of concern regarding one leak record in particular, which is identified as leak #MA270688. The areas of concern include misclassification of leak, improperly tracking leaks, and inadequate leak response.

Misclassification of leak. Leak #MA270688 was initially identified on July 20, 2017 via walking survey and was incorrectly classified as a grade three leak, as stated by Eversource in its response to the Exit Letter on April 14, 2023. The leak was identified on the threads of the riser shut off valve, which is an above-ground location near the structure. Grade three leaks as defined in part by Eversource standard OM-120 are subsurface and at least 20 feet away from any structures in non-continuously paved areas. This misclassification triggered an inadequate leak response.

Furthermore, regarding the classification of leaks, in its response to the Exit Letter, Eversource stated that this leak should have correctly been classified as an "above-ground non-hazardous leak." In its response to Information Request 4-1, Eversource stated that "Eversource

procedure does not specifically define the classification and response criteria for above-ground non-hazardous leaks."

Improperly tracking leaks. The leak identified as #MA270688 was updated to #MA276179 after a reevaluation on November 1, 2018 due to a maintenance management software update. The subsequent reevaluation conducted on October 16, 2019 found that there was no leak at the originally identified location, however, there was another leak located 43 feet away from the structure. A new leak number was not created for this newly identified leak. The next evaluation results on October 5, 2020 found that there was no underground leak, however, the originally identified leak at the riser was present. A new leak number should have been created for the underground leak discovered on October 16, 2019.

Inadequate leak response. Due to the misclassification of leak #MA270688, Eversource's leak response was to follow standards for a grade three leak. Based on the evidence provided, the leak identified as #MA270688 should have been classified as an above-ground hazardous leak and repaired promptly.

Eversource standard OM-120 sets forth response criteria for grade three leaks. The recheck interval stated in Eversource standard OM-120-ADM calls for a reevaluation within twelve months of the last evaluation. In its response to IR 2-8, Eversource stated that the recheck interval of 12 months was exceeded for leak #MA270688. Additionally, OM-120 requires subsurface structures within 200 feet in all directions to be checked. Eversource was unable to provide any documentation that this was completed.

Public Awareness Program:

Part 192 §192.616(c) states "The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety." API RP 1162, First Edition, Section 3.3 identifies public officials as "Local, city, county or state officials and/or their staffs having land use and street/road jurisdiction along the pipeline route." In Eversource's response to IR 1-35, Eversource identifies the same individuals, the Fire Chief and the Police Chief, as the stakeholder audience for both emergency officials and public officials. Public safety chiefs are an appropriate stakeholder audience for emergency officials, however, it appears that Eversource did not correctly identify the audience for public officials and did not send the appropriate public awareness messaging. In its response to the Exit Letter, Eversource confirmed that annual public awareness notices was being addressed to public safety officials, but since November 2021 it has begun sending notices to public officials as defined in API RP 1162.

Corrosion Inspections:

Part 192, § 192.491(c) states "Each operator shall maintain a record of each test, survey, or inspection required by this subpart in sufficient detail to demonstrate the adequacy of corrosion control measures or that a corrosive condition does not exist." Eversource's procedure OM-66 -Corrosion Control addresses internal inspections performed between 2012-2016. The

procedure requires internal inspections and records to be maintained for the life of the pipe, however the procedure is silent as to how to document the internal inspections.

Eversource documents its internal corrosion inspections on its Daily Activity Reports which are completed by field personnel. The company provided records dating back 2011. Prior to 2018, Eversource did not document its internal corrosion inspections. OM-66 and §192.491(c)(1) require these records to be maintained for the life of the pipe. Eversource provided Daily Activity Reports records in response to IR 1-33 of external inspections of buried pipe when exposed from 2011 to present. The areas of concerns are noted below:

Date	Location	Concerns
10/9/12	Park@Sudbury	1) The Daily Report does not include the pipe material inspected. 2) The Daily Report does not state that Eversource performed an internal inspection. Eversource stated that the Daily Activity Report ("DAR") in 2012 did not contain a specific placeholder for internal corrosion inspections or the pipe material inspected. The pipe material was understood, at that time, to be the existing pipe that was in the ground, as indicated by the GIS records or recorded elsewhere on the DAR.
9/14/19	26 Park St	1) The Daily Report did not state Eversource installed an anode. 2) The clamp manufacturer is not noted. Eversource further explained that when it converted from paper DARs to digital forms in 2018, the check box for 'anode installation' was not included. The pipe associated with the anode has since been retired. Clamp manufacturer is not a not a required field on the DAR, but the Company has identified Smith-Blair® as the clamp manufacturer.

Conclusions:

Several of the Division's findings, namely the Public Awareness Program and corrosion inspection record findings, had no direct bearing on the Incident. However, some of the findings address deficiencies by Eversource which could have contributed to the likelihood of a gas incident in this neighborhood. Eversource's leak records showed a number of issues in classifying, tracking, and responding to leaks on Sherman Street between 2017 and 2021. Additionally, as addressed in DPU 22-PL-82, and further addressed in this NOPV, Eversource failed to properly qualify a large number of individuals to perform leak investigation, classification, and related activities. Six of those individuals were contractors that responded to the Incident either the night of or in the days following the explosion. The Division also found flaws with the methodology and accuracy of data used to calculate a GMRI index score. Eversource uses this score both to assess pipeline segments for areas of active corrosion and as a system to identify risk when prioritizing projects for Gas System Enhancement Plan's submitted annually to the DPU. The segment on Sherman Street had a GMRI Index of 44. If Eversource had counted each leak clamp as a separate leak in the 2016 corrosion leak repair at 11 Sherman Street, as the Division believes it should have, and if Eversource had correctly identified the pipe material as bare steel when calculating a GMRI Index the value would have been 61. In Eversource's 2022 GSEP filing, 22-GSEP-06, the average GMRI Index value across its 279 projects was just under 49. Additionally, the Division has methodological concerns with the GMRI process itself being applied as both a tool to identify active corrosion and identify risk when prioritizing projects for GSEP. This dual use diminishes its effectiveness as a tool to identify active corrosion according to the requirements of 192.465(e), particularly in areas that

are less densely populated and where there are not opportunities with cost saving by joint trenching utilities.

III. ALLEGATIONS

Based on the investigation, the Division has reason to believe that Eversource's failure to properly follow its procedures may be in violation of certain sections of federal pipeline safety regulations, Part 192. The alleged violations of Part 192 are as follows:

1. 49 CFR §192.465(e) - External corrosion control: Monitoring and remediation.

After the initial evaluation required by §§192.455(b) and (c) and 192.457(b), each operator must, not less than every 3 years at intervals not exceeding 39 months, reevaluate its unprotected pipelines and cathodically protect them in accordance with this subpart in areas in which active corrosion is found. The operator must determine the areas of active corrosion by electrical survey. However, on distribution lines and where an electrical survey is impractical on transmission lines, areas of active corrosion may be determined by other means that include review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records, and the pipeline environment.

2. 49 CFR §192.491(c)(1) - Corrosion control records.

Each operator shall maintain a record of each test, survey, or inspection required by this subpart in sufficient detail to demonstrate the adequacy of corrosion control measures or that a corrosive condition does not exist. These records must be retained for at least 5 years with the following exceptions:

(1) Operators must retain records related to §§ 192.465(a) and (e) and 192.475(b) for as long as the pipeline remains in service.

3. 49 CFR § 192.605(a) – Procedural manual for operations, maintenance, and emergencies.

General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response. For transmission lines, the manual must also include procedures for handling abnormal operations. This manual must be reviewed and updated by the operator at intervals not exceeding 15 months, but at least once each calendar year. This manual

must be prepared before operations of a pipeline system commence. Appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.

4. 49 CFR § 192.616(c) – Public Awareness.

The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

5. 49 CFR § 192.805(b) – Qualification program.

Each operator shall have and follow a written qualification program. The program shall include provisions to: (b) Ensure through evaluation that individuals performing covered tasks are qualified;

6. 49 CFR §192.1007(e)(1)(i) What are the required elements of an integrity management plan?

Measure performance, monitor results, and evaluate effectiveness.

(1) Develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program. An operator must consider the results of its performance monitoring in periodically re-evaluating the threats and risks. These performance measures must include the following:

(i) Number of hazardous leaks either eliminated or repaired as required by § 192.703(c) of this subchapter (or total number of leaks if all leaks are repaired when found), categorized by cause;

IV. PRIOR CONSENT ORDER VIOLATIONS

Eversource has signed the following Consent Orders that pertain to similar violations of Part 192, § 192.605(a): 14-PL-03, 14-PL-05, 14-PL-07, 16-PL-01, 20-PL-32, 21-PL-12, 21-PL-13, 21-PL-56, 21-PL-76, 22-PL-68, 23-PL-07

Part 192, §§ 192.805(b): 21-PL-13, 22-PL-82

V. PROPOSED CIVIL PENALTY

Under G.L. c. 164, § 105A, Eversource is subject to a civil penalty not to exceed $500,000 for each violation for each day that the violation exists, up to a maximum of $10,000,000 for any related series of violations. These dollar amounts shall be doubled if the department determines that the violator has engaged in one or more similar violations in the three years preceding the violation.

In determining the amount of the civil penalty, the Division shall consider the following, pursuant to G.L. c. 164, § 105A: the appropriateness of the penalty to the size of the business of the person, firm, or corporation charged; the gravity of the violation; and the good faith of the person, firm, or corporation charged in attempting to achieve compliance, after notification of a violation.

In the present matter, the Division has reviewed the circumstances of the allegations and is prepared to resolve this matter upon Eversource's agreement to the terms in the attached Consent Order and payment of a civil penalty in the amount of $1,500,000.

VI. RESPONSE TO THIS NOPV

Within 30 days of receipt of this NOPV, Eversource shall respond to the Division in one of the following ways, pursuant to 220 CMR 69.04:

1. Sign and return the attached Consent Order, thus agreeing to remit payment of the civil penalty by check or money order made payable to the Commonwealth of Massachusetts;

2. Submit an offer in compromise of the proposed civil penalty under 220 CMR 69.04(2);

3. Request an informal conference under 220 CMR 69.05; or

4. Submit a written reply to the Division disputing the allegation(s) contained in the NOPV. The reply must include a complete statement of all relevant facts and authority and full description of the reasons why the Respondent disputes the allegation(s) contained in the NOPV.

Failure to respond within 30 days of receipt of this NOPV will be deemed an admission to the allegations contained herein and a waiver of Eversource's right to contest the allegations. If Eversource fails to respond within 30 days, the Department may, without further notice, find the facts to be as alleged herein and issue a final Order, pursuant to 220 CMR 69.04(3).

Very truly yours,

Richard Enright, Director
Pipeline Safety Division

Enclosures: Consent Order
Compliance Agreement

Cc: Erin Engstrom, Director of Regulatory Affairs, Eversource
Laurie Pereria, Regulatory Gas Manager, Eversource
Kristen Gasparonis, Eversource
Karen Lane-Newell, Eversource
Rosmarvy Pena, Eversource
Katherine Silver, Eversource
Phillip Denton, Assistant Director, Pipeline Safety Division
Justin Evans, Assistant Director, Pipeline Safety Division
Janine Vargas, Assistant General Counsel, Pipeline Safety Division
Emily Hamrock, Division Counsel, Pipeline Safety Division

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

CONSENT ORDER

August 9, 2023 D.P.U. 21-PL-74

In the matter of NSTAR Gas Company d/b/a Eversource Energy

I. JURISDICTION

1. This document, with the attached Compliance Agreement, is a Consent Order entered into between the Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") and NSTAR Gas Company d/b/a Eversource Energy ("Respondent"), and is executed in accordance with 220 CMR 69.08.
2. The Division has authority to enter into this Consent Order on behalf of the Department pursuant to Delegation Order, D.P.U. 18-44-B (2020).
3. Failure to comply with the terms of this Order may result in the assessment of civil penalties and referral of this matter to the Attorney General for appropriate action.
4. The terms and conditions of this Order become effective upon signing by the authorized representatives of the Respondent and the Department.
5. Respondent has stipulated and consented to the issuance of this Consent Order.

II. VIOLATIONS AND CIVIL PENALTY

1. Pursuant to G.L. c. 164, §§ 76 and 105A, and 220 CMR 69.02, the Division conducted a pipeline safety inspection of the Respondent's facilities and records. As a result of the inspection, the Director of the Division issued to the Respondent a Notice of Probable Violation ("NOPV"), D.P.U. 21-PL-74, dated August 9, 2023, in accordance with 220 CMR 69.03. The NOPV is attached hereto and made a part hereof.
2. Based on information contained in the NOPV, the Division finds that the Respondent violated pipeline safety regulations contained in 49 C.F.R. Part 192, specifically:

   Part 192, § 192.465(e) External corrosion control: Monitoring and remediation.
   Part 192, §192.491(c)(1) Corrosion control records.
   Part 192, § 192.605(a) Procedural manual for operations, maintenance, and emergencies.
   Part 192, § 192.616(c) Public Awareness.
   Part 192, § 192.805(b) Qualification program.

Part 192, §192.1007(e)(1)(i) What are the required elements of an integrity management plan?

3. Pursuant to G.L. c. 164, § 105A, the Division hereby imposes upon the Respondent a civil penalty in the amount of $1,500,000 for the above-noted violations.
4. The Respondent hereby agrees, upon signing and returning this Consent Order to the Division, to remit payment of the civil penalty by check or money order in the amount of $1,500,000 made payable to the Commonwealth of Massachusetts, One South Station, Boston, MA 02110.

III. RESPONDENT REQUIREMENTS

1. **Respondent shall sign the Stipulation below and return this complete document to the Division.**
2. All submissions by Respondent in accordance with this Consent Order shall be addressed to:

Director
Pipeline Safety Division
Department of Public Utilities
One South Station
Boston, MA 02110

IV. STIPULATED TERMS

Pursuant to 220 CMR 69.08(1), the Respondent through the signature below, by the person to whom this Consent Order is issued or a duly authorized representative, acknowledges agreement to the terms contained herein without admitting or denying that a violation of any Department or federal pipeline safety law or regulation occurred in relation to the above-noted matters. Further, Respondent agrees to issuance of this Consent Order and stipulates to the following:

1. Respondent, by signing the Stipulation, hereby waives:
   (a) All rights to informal review pursuant to 220 CMR 69.05;
   (b) All rights to a hearing pursuant to 220 CMR 69.06;
   (c) Any and all procedural rights available in connection with the issuance of the Consent Order;
   (d) All rights to seek any type of administrative or judicial review of the Consent Order; and
   (e) Any and all rights to challenge or contest the validity of the Consent Order.
2. Respondent expressly acknowledges that neither Respondent nor the Division has any intention to enter into a contract.

3. The terms and provisions of this Consent Order and Stipulation shall be binding upon, and inure to the benefit of, Respondent and the Division and their successors in interest.

4. Nothing in these Stipulated Terms shall preclude any proceedings brought by the Department to enforce the terms of the Consent Order, and nothing in these Stipulated Terms constitute, nor shall Respondent contend that they constitute, a waiver of any right, power, or authority of any other representative of the Commonwealth or an agency thereof to bring other actions deemed appropriate.

V. FINAL ORDER

1. This Consent Order and Stipulation is intended to be, and shall be construed to be, a final order of the Department issued pursuant to G.L. c. 25, § 5, having the force and effect of a remedial order, pursuant to 220 CMR 69.07(2), and expressly does not form, and may not be considered to form, a contract binding on the Division, the Department, or the Commonwealth of Massachusetts.

2. The terms of this Consent Order and Stipulation, including this paragraph, are not subject to amendment or modification by any extraneous expression, prior agreement, or prior arrangements between the Division and the Respondent, whether oral or written.

By Order of the Division

_____ Date: _____

Richard Enright, Director
Pipeline Safety Division
Department of Public Utilities

The undersigned, duly authorized, stipulates to and acknowledges agreement to the terms herein.

NSTAR GAS COMPANY D/B/A EVERSOURCE ENERGY

_____ Date: _____

William Akley
President of Gas Operations

COMPLIANCE AGREEMENT
BETWEEN THE DEPARTMENT OF PUBLIC UTILITIES
AND NSTAR GAS COMAPANY D/B/A EVERSOURCE ENERGY

D.P.U. 21-PL-74

NSTAR Gas Company d/b/a Eversource Energy ("Eversource") agrees to take the following actions within the specified time periods:

1. Within 30 days of the effective date of this Order, Eversource shall pay a civil penalty of $1,500,000 to the Commonwealth of Massachusetts.

2. Within 60 days of the effective date of this Order, Eversource shall review the process it uses to identify Active Corrosion to verify that it meets all the requirements of 192.465(e) and determines whether a pipeline is experiencing active corrosion without considering cost of replacement.

3. Within 60 days of the effective date of this Order, Eversource shall begin counting each leak by number of leak clamps used to make repairs, and not the number of leak "events" with a single cause.