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Rhode Island Energy™
a PPL company

January 9, 2024

VIA HAND DELIVERY AND ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket No. 23-49-NG – The Narragansett Electric Company d/b/a Rhode Island Energy's Proposed FY 2025 Gas Infrastructure, Safety, and Reliability Plan
Responses to Division Data Requests – Set 2

Dear Ms. Massaro:

On behalf of The Narragansett Electric Company d/b/a Rhode Island Energy, I have enclosed the Company's complete set of responses to the Division's Second Set of Data Requests in the above-referenced matter.

Thank you for your attention to this matter. If you have any questions, please contact me at 401-316-7429.

Very truly yours,

Jennifer Brooks Hutchinson

Enclosure

cc: Docket No. 23-49-NG Service List

Division 2-1

Request:

Referring Bates Page 30 of the FY 2025 Gas ISR Plan, please expand this table to include 3 prior fiscal years' (FY 2022-2024) actual installation & abandonment mileage.

Response:

Please see Attachment DIV 2-1.

Attachment DIV 2-1

The tables below provide a summary of the FY2025 installation and abandonment targets, along with targets versus actual installation and abandonment mileage for FY2022-Q3 FY2024.
Please note, for FY2024, the Company has provided the full fiscal year targets but the actuals are through the end of Q3 FY2024.

	FY2025		FY2024				FY2023				FY2022			
	Installation	Abandonment	Installation		Abandonment		Installation		Abandonment		Installation		Abandonment	
Investment Categories & Groups	**Target**	**Target***	**Full FY Target**	**Actual Thru Q3**	**Full FY Target**	**Actual Thru Q3**	**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**
A. Main Replacement & Rehabilitation														
*Reactive Main Replacement - Leak Prone Pipe & Maintenance***	4.0	5.5	-	3.3	-	5.0								
CSC/Public Works	13.0	13.0	10.0	13.7	10.0	6.6	14.0	5.9	14.0	8.5	14.0	9.5	14.0	14.0
Gas System Reliability	3.9	3.0	1.6	1.2	1.5	1.0	2.6	0.4	0.1	0.2	-	1.5	-	0.4
Proactive Low Pressure System Elimination	6.5	6.3	1.0	0.1	-	0.5	1.6	-	0.1	-	-	-	-	-
Pipeline Integrity	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Proactive Main Replacement - Leak Prone Pipe (including Atwells Avenue)	31.1	32.8	47.4	24.3	47.8	19.9	39.4	44.4	49.4	55.8	48.7	41.1	55.3	53.2
Gas System Reinforcement (non-ISR)	Not included	0.6	Not included		0.7	0.1	Not included		1.0	1.0	Not included		1.0	0.3
Main Installation and Leak Prone Pipe Abandonment Total	**60.1**	**61.2**	**60.0**	**42.7**	**60.0**	**33.2**	**57.6**	**50.7**	**64.6**	**65.5**	**62.7**	**52.1**	**70.3**	**67.9**
E. PHMSA - Gas Pipeline Leak Detection and Repair (LDAR) **Not included in rates until FY2025 Reconciliation**														
Main Replacement (Mandated) - Leak Prone Pipe (PHMSA)	**4.1**	**2.5**	-	-	-	-	-	-	-	-	-	-	-	-
Main Installation and Leak Prone Pipe Abandonment Total (With PHMSA LDAR)	**64.2**	**63.7**	**60.0**	**42.7**	**60.0**	**33.2**	**57.6**	**50.7**	**64.6**	**65.5**	**62.7**	**52.1**	**70.3**	**67.9**

*Note: Abandonment totals are approximate and may vary inside FY2025 based upon the timing of field work.

**Note: In response to the Rhode Island Public Utilities Commission's ("PUC") questions concerning the categorization of certain project spending in the Gas ISR docket, starting in FY2024, the Company reviewed all FY2024 main replacement jobs being completed for reactionary reasons (i.e. leak prone pipe being replaced ahead of municipal paving, poor pipe condition observed in the field and required replacement of pipe as soon as feasible, or third-party encroachment). Where appropriate, the Company is reporting the FY2024 actual spending, forecast spending, and installation & abandonment miles for those projects under categories that accurately reflect the reason for project advancement even if the initial project scoping and workorder setup originated in another category. The affected categories are: Public Works, Main Replacement (Reactive) – Maintenance (incl Water Intrusion) & Leak Prone Pipe, Main Replacement (Proactive) – Leak Prone Pipe, and Replace Pipe on Bridges. The Company followed the same process to create the FY2025 budget and forecasted installation and abandonment miles.

Division 2-2

Request:

Referring to the System Integrity Report (SIR), Bates Page 91, please subdivide leaks on distribution pipe for each of the last 5 calendar years' SIR by sub-cause.

Response:

Please refer to Attachment DIV 2-2.

	Attachment DIV 2-2						
	Material	Leak Cause	Year				
			2018	2019	2020	2021	2022
1	Cast Iron	Corrosion Failure	9	13	17	40	30
2		Equipment Failure	25	2	10	14	12
3		Excavation Damage	1	4	2	4	2
4		Incorrect Operations	0	0	0	1	0
5		Natural Force Damage	89	65	16	26	52
6		Other Cause	679	760	601	580	450
7		Other Outside Force Damage	0	1	0	0	0
8		Pipe, Weld, or Joint Failure	1	1	2	0	0
9	**Subtotal - Cast Iron**		804	846	648	665	546
10	Ductile Iron	Corrosion Failure	0	0	1	1	0
11		Equipment Failure	0	0	0	0	0
12		Excavation Damage	0	0	0	0	0
13		Incorrect Operations	0	0	0	0	0
14		Natural Force Damage	0	0	0	0	0
15		Other Cause	0	2	13	4	3
16		Other Outside Force Damage	0	0	0	0	0
17		Pipe, Weld, or Joint Failure	0	0	0	0	0
18	**Subtotal - Ductile Iron**		0	2	14	5	3
19	Plastic	Corrosion Failure	0	1	0	1	3
20		Equipment Failure	5	3	1	7	9
21		Excavation Damage	7	8	4	7	10
22		Incorrect Operations	0	0	0	1	2
23		Natural Force Damage	1	0	0	0	1
24		Other Cause	2	8	0	0	0
25		Other Outside Force Damage	1	1	0	1	0
26		Pipe, Weld, or Joint Failure	3	1	0	1	2
27	**Subtotal - Plastic**		19	22	5	18	27
28	Steel - Protected	Corrosion Failure	10	21	12	10	19
29		Equipment Failure	6	0	2	11	10
30		Excavation Damage	0	0	2	1	1
31		Incorrect Operations	0	1	0	0	1
32		Natural Force Damage	0	1	1	1	0
33		Other Cause	4	18	0	0	0
34		Other Outside Force Damage	0	1	0	0	0
35		Pipe, Weld, or Joint Failure	0	2	0	0	0
36	**Subtotal - Steel -Protected**		20	44	17	23	31
37	Steel - Unprotected	Corrosion Failure	69	52	57	68	37
38		Equipment Failure	14	2	0	6	5
39		Excavation Damage	0	0	1	2	0
40		Incorrect Operations	0	0	0	0	0
41		Natural Force Damage	0	0	1	0	0
42		Other Cause	3	14	0	0	0
43		Other Outside Force Damage	0	0	0	0	0
44		Pipe, Weld, or Joint Failure	0	0	0	0	1
45	**Subtotal - Steel - Unprot.**		86	68	59	76	43

Division 2-3

Request:

Regarding the Corrosion Control Program discussed on Bates Page 20, please identify unit cost assumptions and unit quantities assumed that were used to derive the forecast cost.

Response:

The following unit cost and unit quantity assumptions were used to derive the forecast cost:

- Underground Corrosion repair: The unit cost assumptions were $2,500 and the quantities assumed were 60.

- Atmospheric Corrosion repair: The unit cost assumptions were $30,000 and the quantities assumed were 16.

- Atmospheric Major repair (full design, traffic plan, etc.): The unit cost assumptions were $320,000 and the quantities assumed were 4.

Division 2-4

Request:

Please identify the assumed unit cost and unit quantities used to derive the reactive leak cost forecast discussed on Bates Page 21.

Response:

The Fiscal Year ("FY") 2025 cost forecast for the Reactive Leak Program is based upon the actual completed units and total capital spend from FY2023, plus an additional margin to account for inflationary factors for costs such as labor and paving and to account for a potential variation in the number of reactive leak repairs required.

In FY2023 the total cost for the Reactive Leak Program was $7.34 million and the Company repaired 1,106 leaks for a per unit cost of $6,636.53. For FY2025, the Company assumes the number of leaks to repair will be similar to FY2023. Adding a 7 percent margin to account for expected cost increases in fuel and asphalt, materials, and labor brings the expected unit cost to approximately $7,100 per repair. In addition, a margin has been added to account for the standard error of +/- 96.4 leak repairs from the seven-year trendline.

Division 2-5

Request:

Regarding the Scott Rd. Take Station Project discussed on Bates Page 26, please confirm that the replacement is driven by the need for compliance with 49 CFR § 192.624. Please also describe the decision flow that led to replacement being the chosen method for achieving compliance.

Response:

The Scott Road Take Station replacement is driven by many factors. Compliance with 49 CFR § 192.624 as well as 49 CFR § 192.607 for material verification are the primary drivers since they are mandated by the Pipeline and Hazardous Materials Safety Administration ("PHMSA").

The decision flow that led to replacement as the chosen method was as follows in regards to compliance with 49 CFR § 192.624:

1. **Can a pressure test be performed?** Yes, but the material properties would also be required to be known for compliance as well as to ensure safety while introducing approximately 1500 PSIG of pressure to piping from approximately the 1950s and 1960s where records are not Traceable, Verifiable, and Complete. Failures during the pressure test may also result in replacement of the station piping anyway.

2. **Do material properties records exist?** No

3. **Can material properties be verified through destructive and non destructive testing in accordance with § 192.607?** Yes, but destructive tests will require excavating and replacing test sections of pipe anyway and non destructive tests would be extensive and costly.

4. **Is reducing the Maximum Allowable Operating Pressure ("MAOP") practical?** No, material property records would still need to be verified and there could be downstream reliability impacts with lower pressures.

5. **Are there additional benefits associated with replacing the station?** Yes, it would allow for station pipeline components to be configured and constructed according to today's best practices, improve station performance, and significantly mitigate safety and reliability risk associated with existing gate station.

Division 2-6

Request:

Referring the FY 2025 Workplan identified in the Company's response to DIV 1-23, please identify all projects with a difference between main mileage installed and main mileage retired. To the extent that a project exists where more pipe is being installed than retired, please explain why for each such project.

Response:

Please see Attachment DIV 2-6.

Attachment DIV 2-6

City/Town	Street(s)	Installation Mileage	Abandonment Mileage	ISR Program	Reasoning for Variance in Install/Abandonment Mileage
Johnson	Allandale	0.39	0.20	Reliability Planning	System integration (systems are not currently connected)
North Providence	Waterman	0.75	0.00	Reliability Planning	System integration (systems are not currently connected)
Lincoln	Beverly	0.87	0.90	Reliability Planning	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
North Providence	Borah	0.12	0.10	Reliability Planning	Extending high pressure main farther than low pressure abandonment scope to continue future expansion
Providence	Charles	0.94	0.63	LP Elimination	Extending high pressure main further than low pressure abandonment scope to continue future expansion
Woonsocket	Privilege St	2.04	1.96	LP Elimination	Extending high pressure main farther than low pressure abandonment scope to continue future expansion
North Providence	Tiffany	1.48	1.47	LP Elimination	Extending high pressure main farther than low pressure abandonment scope to continue future expansion
Middletown	Wolcott	2.03	2.12	LP Elimination	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Barrington	Bay Spring Av, BRG	0.21	0.19	Proactive MRP	Contains aprx 125 feet of pre-1971 protected coated steel abandonment (not included in Abandonment Mileage - this is leak-prone pipe Abandonment). Abandonment/Install 1:1 with this included.
Coventry	Idaho St, COV	0.47	0.34	Proactive MRP	Contains aprx 765 feet of pre-1971 protected coated steel abandonment (not included in Abandonment Mileage - this is leak-prone pipe abandonment). Abandonment/Install greater than 1:1 with this included.
Cranston	Smith St, CRA	1.68	1.79	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Cranston	364-420 Wellington Av, CRA	0.12	0.44	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Cranston	845-970 Pontiac Av, CRA	0.45	0.80	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Cranston	Plantation Dr - Phase 1, CRA	0.38	0.00	Proactive MRP	Main being installed in a street which is being paved in the Spring. By installed high pressure in this street, it will allow for a larger scale low pressure to high pressure conversion project to be done (Plantation Dr - Phase 2). Otherwise, if this was relayed as low pressure to low pressure, the entire neighborhood would have had to remain low pressure. Abandonment will be done at a later date.
Cranston	Plantation Dr - Phase 2, CRA	4.45	4.21	Proactive MRP	This is a large scale low pressure to high pressure upgrade for an entire neighborhood. There are protected coated steel and plastic mains being abandoned as a part of this scope which are not included in the total included in Abandonment Mileage (this is only leak-prone pipe abandonment). Abandonment/Install greater than 1:1 with this included.
Cumberland	Old Willis Rd, CLD	0.67	0.42	Proactive MRP	Additional install required on England St to bridge the gap between the LP and 60# systems in order to make this a low pressure to high pressure upgrade project
East Providence	Waterman Av, EPV	1.82	1.33	Proactive MRP	Plastic and protected coated steel mains not included in Abandonment Mileage (this is only leak-prone pipe abandonment). Project is a large scale low pressure to high pressure upgrade to eventually allow for the abandonment of a regulator station. These non leak-prone mains must be relayed as a part of this project to allow for this.
East Providence	2464-2556 Pawtucket Av, EPV	1.09	0.98	Proactive MRP	Plastic mains not included in "Abandonment Mileage" (this is only leak-prone pipe abandonment). Project is a large scale low pressure to high pressure upgrade to eventually allow for the abandonment of a regulator station. These non leak-prone mains must be relayed as a part of this project to allow for this.
Lincoln	Railroad Av, LNC	0.00	0.16	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Lincoln	Sutcliffe Av, LNC	0.30	0.28	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay. Negligible difference.

Attachment DIV 2-6

City/Town	Street(s)	Installation Mileage	Abandonment Mileage	ISR Program	Reasoning for Variance in Install/Abandonment Mileage
Lincoln	Moshassuck Rd, LNC	0.33	0.30	Proactive MRP	Main running line currently outside of the right of way. Moving back into the road as a part of relay project. Slightly longer distance.
Newport	Broadway, NPR	0.31	0.32	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
North Providence	957-1074 Mineral Spring Av, NPV	0.68	0.78	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
North Smithfield	Morse Av, NSF	0.95	1.27	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Pawtucket	Seneca Av, PAW	1.51	1.14	Proactive MRP	Large scale low pressure to high pressure upgrade. Some existing plastic is being relayed and is not included in Abandonment Mileage (this is only leak-prone pipe abandonment). Also, small gaps in portions of streets where gas mains do not currently exist are being filled as a part of this work order for system reliability.
Pawtucket	Gorizia St, PAW	1.36	1.34	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in "Abandonment Mileage", leak-prone pipe only). Negligible difference.
Providence	330-505 Silver Spring St, PVD	1.04	0.67	Proactive MRP	Plastic mains not included in Abandonment Mileage (this is only LPP abandonment). Project is a large scale low pressure to high pressure upgrade to eventually allow for the abandonment of a regulator station. These non leak-prone mains must be relayed as a part of this project to allow for this.
Providence	Woodbine St, PVD	1.06	0.90	Proactive MRP	Plastic mains not included in Abandonment Mileage (this is only leak-prone pipe abandonment). Project is a large scale low pressure to high pressure upgrade. These non leak-prone mains must be relayed as a part of this project to allow for this.
Providence	Abbott St, PVD	0.61	0.55	Proactive MRP	Additional install required on Knowles St to bridge the gap between the LP and 99# systems in order to make this a low pressure to high pressure upgrade project
Providence	Ivy St, PVD	0.45	0.48	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	585-1000 Douglas Av, PVD	1.07	1.01	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in Abandonment Mileage, leak-prone pipe only). Negligible difference.
Providence	Dudley St, PVD	0.33	0.41	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Anthony Av, PVD	0.80	0.79	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in Abandonment Mileage, leak-prone pipe only). Negligible difference.
Providence	Somerset St, PVD	0.50	0.51	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	336-463 Benefit St, PVD	0.40	0.39	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in Abandonment Mileage, leak-prone pipe only). Negligible difference.
Providence	Glenham St, PVD	0.18	0.42	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Narragansett Av, PVD	0.77	0.84	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Whittier Av, PVD	1.53	1.55	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	168-340 Eaton St, PVD	1.46	1.55	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	1-168 Eaton St, PVD	1.60	1.63	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	205-482 Broadway, PVD	0.60	1.01	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Warwick	Elmwood Av, WWK	2.11	1.72	Proactive MRP	Plastic and protected coated steel mains not included in Abandonment Mileage (this is only leak-prone pipe abandonment). Project is a large scale low pressure to high pressure upgrade to eventually allow for the abandonment of a regulator station. These non leak-prone mains must be relayed as a part of this project to allow for this.

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City/Town	Street(s)	Installation Mileage	Abandonment Mileage	ISR Program	Reasoning for Variance in Install/Abandonment Mileage
Warwick	Milton Rd, WWK	1.68	1.34	Proactive MRP	Plastic mains not included in Abandonment Mileage (this is only leak-prone pipe abandonment). Project is a large scale low pressure to high pressure upgrade. These non leak-prone mains must be relayed as a part of this project to allow for this.
Warwick	Harding Av, WWK	0.32	0.26	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in Abandonment Mileage, leak-prone pipe only). Negligible difference.
Woonsocket	S Main St, WSO	0.38	0.54	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Woonsocket	West St, WSO	0.61	0.63	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Woonsocket	Mason St - LP Abandonment, WSO	0.00	0.43	Proactive MRP	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Woonsocket	Nursery Av, WSO	0.71	0.70	Proactive MRP	Short segments of plastic in midst of other leak-prone pipe being relay (non leak-prone pipe not included in Abandonment Mileage, leak-prone pipe only). Negligible difference.
Coventry	Wood St	0.41	0.22	PW - Non Reimb	Additional required for loop feed
Coventry	Prospect St Area	0.57	0.54	PW - Non Reimb	Additional required for loop feed
Coventry	Overview Dr	0.11	0.11	PW - Non Reimb	Install and abandonment are the same (rounding error on initial file)
Coventry	Twin Lakes Ave	0.04	0.05	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Cumberland	RIDOT Mendon Rd Brdg 60# CLD	0.08	0.08	PW - 50% Reimb.	Install and abandonment are the same (rounding error on initial file)
Cumberland	RIDOT Mendon Rd Brdg 99#	0.08	0.08	PW - 50% Reimb.	Install and abandonment are the same (rounding error on initial file)
East Providence	Wilmarth Ave	0.31	0.26	PW - Non Reimb	Additional required for loop feed
East Providence	Summit St	0.43	0.97	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
East Providence	Almeida Ave	0.06	0.07	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
East Providence	Boston St	0.12	0.12	PW - Non Reimb	Install and abandonment are the same (rounding error on initial file)
East Providence	Follett & Bentley St	0.31	0.31	PW - Non Reimb	Install and abandonment are the same (rounding error on initial file)
East Providence	Sunset Ave	0.07	0.08	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Lincoln	Woodland St 99	1.35	1.33	PW - Non Reimb	Additional required for loop feed.
Lincoln	Woodland St LP	0.39	0.00	PW - Non Reimb	This is a LP interconnect required to do the above relay as it is in advance of paving.
Middletown	Navy Base Steam Line Gas Relays	0.02	0.00	PWorks - 100% Reimb	Abandonment here is non LPP.
North Kingstown	RIDOT Davisville Brdg	0.03	0.00	PWorks - 100% Reimb	Abandonment here is non LPP.
North Providence	Douglas Ave	0.31	0.26	PW - Non Reimb	A portion of this abandonment is not LPP but necessary to connect to existing plastic.
Pawtucket	Pine St	0.18	0.52	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Pawtucket	Abbott St	0.03	0.08	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)

Attachment DIV 2-6

City/Town	Street(s)	Installation Mileage	Abandonment Mileage	ISR Program	Reasoning for Variance in Install/Abandonment Mileage
Pawtucket	Campbell St	0.07	0.12	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Pawtucket	Dean St	0.12	0.14	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Pawtucket	Owen Ave	0.24	0.21	PW - Non Reimb	A portion of this abandonment is non LPP but not practical to leave.
Pawtucket	Paris St	0.17	0.10	PW - Non Reimb	Additional install required to connect with higher pressure.
Pawtucket	Pollard Ave	0.07	0.09	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	780-895 Elmwood Av 99# Install	0.36	0.00	PW - 50% Reimb.	The (4) identified WOs are located at the Elmwood Av Area and are interconnected and interdependent and should be evaluated as one neighborhood style work order. The area was split into (4) for WO preparation with a combined installation of 1.04 miles which is less than the combined LPP abandonment of 1.14 miles. The installations are system interconnects required to complete the four WOs.
Providence	RIDOT Cadillac Dr Bridge Abandonment	0.00	0.08	PW - 50% Reimb.	The (4) identified WOs are located at the Elmwood Av Area and are interconnected and interdependent and should be evaluated as one neighborhood style work order. The area was split into (4) for WO preparation with a combined installation of 1.04 miles which is less than the combined LPP abandonment of 1.14 miles. The installations are system interconnects required to complete the four WOs.
Providence	RIDOT - West River St Bridge Relay	0.05	0.00	PW - 50% Reimb.	The (4) identified WOs are located at the Elmwood Av Area and are interconnected and interdependent and should be evaluated as one neighborhood style work order. The area was split into (4) for WO preparation with a combined installation of 1.04 miles which is less than the combined LPP abandonment of 1.14 miles. The installations are system interconnects required to complete the four WOs.
Providence	705-1045 Elmwood Av LP Relay	0.60	1.06	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Pine St	0.86	1.05	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Willard Av	1.54	1.57	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Providence	Access Rd at Elmwood Av 99# Install by PW	0.08	0.00	PW - Non Reimb	The (4) identified WOs are located at the Elmwood Av Area and are interconnected and interdependent and should be evaluated as one neighborhood style work order. The area was split into (4) for WO preparation with a combined installation of 1.04 miles which is less than the combined LPP abandonment of 1.14 miles. The installations are system interconnects required to complete the four WOs.
Warren	Market St	0.72	0.72	PW - Non Reimb	Install and abandonment are the same (rounding error on initial file)
Woonsocket	Mendon Rd	0.52	0.97	PW - Non Reimb	Abandonment greater than install (Question requests explanations for situations where install is greater than abandonment)
Woonsocket	Gaulin Ave	0.16	0.15	PW - Non Reimb	Additional install required to connect with higher pressure.

Division 2-7

Request:

Provide all leak receipts for CY 2023 by month and type (Grade 1, 2, 2a or 3). Please separate main leaks from service leaks.

Response:

The table below shows all leak receipts for the period from January 1 to December 14, 2023.

The Company is not able to determine whether a leak receipt was the result of a main leak or a service leak until the leak is repaired.

	Leak Grade at Receipt				
Month	Grade 1	Grade 2A	**Grade 2**	Grade 3	Total
January	46	7	51	36	140
February	40	13	48	39	140
March	46	6	54	69	175
April	48	6	36	58	148
May	41	4	34	64	143
June	31	5	22	48	106
July	32	3	13	19	67
August	53	5	10	23	91
September	28	2	11	29	70
October	43	1	25	26	95
November	43	2	14	30	89
December*	24	1	3	3	31
Total	475	55	321	444	1295

Prepared by or under the supervision of: Barry Foster

Division 2-8

Request:

What are the Company's current practices for repairing Grade 1, 2, 2a or 3 leaks? Specifically, provide all procedures and policies describing repair timeframes and/or criteria for each grade.

Response:

Please see Attachment DIV 2-8-1 for Company Procedure CNST02010 – Leak Response and Repair. This procedure explains the current practices for repairing leaks.

Please see Attachment DIV 2-8-2 for Company Procedure CNST02009 – Classifying Gas Leaks. This procedure explains the repair timeframes and criteria for each grade.

Rhode Island Energy™	Gas Work Method **Leak Control**	Doc. # **CNST02010** Page 1 of 8
	Leak Response and Repair	Revision 0 – 12/1/2022

Leak Response and Repair – CNST02010

1. Purpose

The purpose of this work method is to describe the procedure for the pinpointing, repair and record keeping of previously investigated and classified leaks.

2. Responsibilities

Field Operations or its designee, shall be responsible to:

- Respond to and mitigate gas leaks as assigned.
- Pinpoint leak sources as assigned.
- Make repairs of leaks originating upstream of the regulator or service valve on buried gas mains and services.
- Complete records of repairs made to the gas system.

Work Support or its designee shall be responsible to:

- Perform/ accept the estimation
- As-built the leak and forwards paperwork to Maps and Records

Maps and Records shall be responsible to:

- Maintain up to date records of the location of buried mains and services and other underground infrastructure indicated on the work orders (e.g., regulator stations, valves, other utilities, etc.).

3. Personal & Process Safety

All personnel shall wear and utilize appropriate personal protective equipment (PPE) in accordance with **General Safety Requirements SHE01001.**

All personnel shall perform job briefs to communicate the particular hazards associated with the job.

Actively manage the jobsite to ensure safety of the crew and the public.

4. Operator Qualification Required Tasks [Qualified or Directed & Observed]

Please refer to the OQT&C Task-to-Title Matrices for the applicable OQ Requirement(s) for performing work in accordance with this document.

5. Content

Gas Leak Pinpointing	
	The primary responsibility of the repair crew shall be the mitigation of existing or potential hazards.

	Perform a visual inspection of the ground surface in the leak area to observe utility markings or otherwise help determine the location of any underground utilities (e.g., “Reading the Street”) including conformation of a valid Dig Safe.
	A cable avoidance tool (CAT) shall be used in conjunction with evaluation of any old or existing marks, when determining appropriate locations for test / bar holes.
	Repair crew personnel should utilize pinpointing techniques to determine the location of the leak, or series of leaks, in an area. The following items should be considered when trying to pinpoint a gas leak: Evaluation of the leak data provided by the first responder / leak investigator. A review of maps and records and/or utilization of pipe locating equipment to help determine the location of underground piping. Visual observation of surface conditions (e.g., depressions in the road’s surface, recently backfilled excavations, manholes and valve boxes in the area, etc.). The taking of additional combustible gas indicator readings at bar holes, uniformly spaced and at a consistent depth, until a meaningful pattern of leakage has been established. This pattern should then be compared to the location of gas facilities to determine the likely location of the leak. The investigation information should be used to determine how to proceed (e.g., dig and repair, insert, replace, etc.).
	If during the course of the repair crew’s surveillance or pinpointing operations, an increase in the levels of natural gas is observed, a reinvestigation of the leak migration pattern may be required including stand-by and / or monitoring procedures. Repair crew personnel shall notify their Area Supervisor or Dispatch and Scheduling as needed.
	The use of mechanized equipment (i.e., rock drill / rotary gun) in bar holing should be limited to penetration of the road surface and bed. Bar holing beneath the pavement bed should be performed with a sledgehammer or other Company accepted hand tool. In situations where all underground facilities have been marked and cleared, mechanized equipment shall only be used outside the tolerance zone. See **Excavation and Excavation Notification Requirements for Underground Facilities DAM01011.**
	When bar-holing, the tech shall exercise caution to avoid striking a main or service while investigating a leak. Approximate the location of the main or service by looking for valve boxes, service risers, meters, mark outs or other markings. Probe approximately 18” on either side (perpendicular distance) from the expected location.

	If the work location is within 200 feet of a gas regulator station or gate station, special precautions must be observed, including notification to Emergency Dispatch. This applies to both above ground and buried station facilities. See **Excavation and Excavation Notification Requirements for Underground Facilities DAM01011.**
	It may be necessary to aerate the ground in order to reduce the concentration of natural gas and wait for a period of time to allow the gas to begin to build before reinvestigating, in order to pinpoint the exact leak location.
	When gas is present in a duct or sewer network, bar holing should start over the mains and services nearest the manhole with the highest reading of natural gas.
	An opening should be made based on the main and service information provided and the results of the bar hole investigation.
	Pre and post repair readings shall be taken in accordance with the documents **Classifying Gas Leaks CNST02009** and **Surveillance of Classified Leaks CNST02011.**

	Cast Iron Gas Main Repairs
	Mechanical Joints • Leaking mechanical joints on the cast iron system may be repaired by any of the following methods: o The bolts and nuts shall be cleaned and inspected for integrity, replacing where necessary. o The bolts shall then be tightened evenly until the leakage is stopped. o The installation of a coupling encapsulation kit. o Other approved methods.
	Mechanical Coupling and Fittings • Leaking mechanical couplings or fitting may be repaired by: o Re-tightening of the proper portion of the coupling or fitting if an insufficient seal has been achieved o Encapsulation of the fitting is an acceptable repair. o Removing and replacing either a component of, or the entire coupling or fitting, if a defect or abnormality is indicated. o The removal of the entire component is not recommended. Extreme caution is to be used when removing components from live mains.

	Bell and Spigot Joints
	• Leaking bell and spigot joints on the cast iron system may be repaired by any of the following methods:
	  ○ For repairs involving joint encapsulation, see the document **Encapsulate Cast Iron Joints CNST02014.**
	  ○ For repairs involving anaerobic sealant injection see the document **Inject Anaerobic Sealant CNST02015.**

	Breaks or Cracks:
	• Breaks or cracks on cast iron mains may be repaired by any of the following methods:
	  ○ The installation of a full encirclement sleeve or a split sleeve approved for such repairs.
	  ○ Removal and replacement of the cracked segment of the cast iron with plastic or steel pipe.
	• The installation of a coupling encapsulation kit is an approved method of permanent repair when applied over leaking mechanical couplings.
	  ○ For cracked bell and spigot joints, boot encapsulation kits may be used as a TEMPORARY repair method only, until a permanent repair can be affected.
	Boot encapsulation kits are not approved for permanent repairs of cracked bell and spigot joints

	Longitudinal Cracks • For small cracks drilling both ends of the crack and installing a full encirclement sleeve or split sleeve of sufficient length to seal to the outside of the cracked region For long cracks, removal and replacement of the cracked segment of the cast iron with plastic or steel pipe.
	Temporary Repairs • In situations where a permanent cast iron main repair must be delayed due to field conditions, temporary wrapping of the leaking portion of the main may be used to reduce leakage, until a permanent repair can be scheduled. The leakage must be reduced to a nonhazardous level in order for the wrapping to be used as a temporary repair. When a temporary repair is made Leak Survey and CMS shall be alerted to the location of the repair so the leak can be monitored.

	Graphitization and Remedial Actions • If the graphitization is localized in an area that may be repaired by installation of a full encirclement or split sleeve, that method of repair shall be acceptable. • If a cast iron main is exposed and extensive graphitization is discovered, the leak shall be repaired temporarily and the section of main shall be referred for replacement. See **Inspecting Exposed Cast or Ductile Iron Pipe for Graphitization COR02021** for the full inspection procedure

	Steel Gas Main Repairs
	Any leak clamps or fittings installed on steel mains shall have cathodic protection installed in accordance with **Installation of Anodes on Leak Clamp Installation COR04006.**
	For instructions on repairs associated with plastic mains or services located near underground steam lines or significant heat sources or ground that is contaminated with Hydrocarbons, refer to **Installing Plastic Mains CNST04008** or **Installing Services CNST06002**
	Corrosion Repairs on Steel Gas Mains: If a corrosion leak is detected on steel main or associated fittings, the repair shall be made in accordance with one of the following methods: • If the corrosion is localized in an area that may be repaired by installation of a full encirclement or split sleeve, that method of repair shall be acceptable. • If the corrosion is extensive, the leak shall be repaired temporarily and the section of main shall be referred for replacement.

	Repairs of Welds on Steel Gas Mains:
	• If a leak is detected on a weld on a steel main, a repair shall be made by one of the following methods:
	  ○ Installation of a full reinforcement sleeve over the affected weld
	  ○ Removal and replacement of the pipe segment containing the weld

	Mechanical Coupling and Fitting Repair for Steel Gas Mains
	• If a leak is detected on a mechanical coupling or fitting, a repair shall be made by one of the following applicable methods:
	  ○ Re-tightening of the proper portion of the coupling or fitting if an insufficient seal has been achieved.
	  ○ The installation of a coupling encapsulation kit.
	  ○ Removing and replacing either a component of or the entire coupling fitting if a defect or abnormality is indicated.
	The removal of the entire component is not recommended.
	Extreme caution is to be used when removing components from live mains.

	Mechanical fitting failure resulting in a Grade 1 Leak shall be recorded on a purpose-built electronic system on the Gas Work Methods site. See **Reporting Nonconforming Material GEN01009.**

	Plastic Gas Main Repairs

	If a leak is detected on a plastic main, a repair shall be made by one of the following methods:
	• Removal of the damaged or defective portion as a cylinder and replacement with an acceptable piece of plastic piping using one or more of the following methods:
	  ○ Butt fusion (preferred method) and/or
	  ○ Electro-fusion and/or
	  ○ Mechanical couplings
	• Sidewall fusion, or electro-fusion, of an accepted patching saddle arrangement (branch outlet and cap) over the damaged or defective area, provided that:
	  ○ Plastic pipe in the repair area shall be free of scratches or defects.
	  ○ The damaged or defective area shall be fully encircled by the inside diameter of the saddle and shall not lie within the fusion zone.
	  ○ After installation of an accepted patching saddle arrangement, only soap testing shall be performed for leak checking. Air testing shall not be performed against a squeeze off or isolation valve in order to prevent air entry in the gas main.
	• No repair shall be performed at a plastic pipe location where gas is discharging from the damaged or defective area.
	  ○ Leaking gas shall be isolated from a remote location (e.g., valved off, squeezed off, etc.) prior to repairs being made, on leaking plastic mains and services.

	If a leak is detected on a mechanical coupling or fitting, a repair shall be made by one of the following applicable methods: • Retightening of the proper portion of the coupling or fitting if an insufficient seal has been achieved • Removal and replacement of either a component of, or the entire fitting or coupling if a defect or abnormality is indicated
	In the case of a leak on Plastic Pipe, the leak shall be recorded on a purpose-built electronic system on the Gas Work Method site. See **Reporting Nonconforming Material GEN01009.**
	Mechanical leak repair clamps shall not be used as a permanent repair of plastic pipe.
	Stainless steel repair clamps are not allowed to be installed on PE pipe, except as a last resort to alleviate an immediate hazard while more complex permanent repairs are planned out (Engineering analysis, bypassing, SOP's etc.). The decision to install a clamp must be approved by the Operations Vice President, or delegated authority (VP or delegate approval shall be noted on the work order). The location of the temporary repair shall be reported to CMS/ Leak survey for monitoring. See **Make Safe Actions for Gas Releases Migrating and Blowing Gas CNST03003.**

	Gas Service Repairs
	Acceptable methods of leak repair on steel services shall include: • Replacement of the service (full or partial), either by insertion or relay • Application of leak repair clamp The section of leaking pipe shall be cut out as a cylinder and replaced with a length of plastic.
	For instructions on repairs associated with plastic mains or services located near underground steam lines, significant heat sources, or ground contaminated with hydrocarbons refer to the procedures **Installing Plastic Mains CNST04008** or **Installing Services CNST06002.**
	Permanent repairs of leaks on leak prone services shall not be permitted. Service materials meeting the definition for leak prone pipe include: • Copper • Non-cathodically protected steel • Cast Iron • Wrought Iron

	Permanent repairs of leaks on any of these service materials shall be made by insertion or replacement of the leaking segment of service. Permanent repairs of leaks on plastic services shall be limited to removing the section leaking pipe by cutting out a cylinder and replacing it with a length of plastic pipe.
	See **Reporting Non-Conforming Material GEN01009** for information on the form required to be filled out on the Gas Work Methods site for the failed pipe or fitting found in the field.

	Make safe actions and continuous surveillance of Grade 1 leaks and temporary repairs of cracked cast iron bell and spigot joints.
	If a permanent repair cannot be affected at the time of response by the repair crew, make safe actions may be applied (cast iron encapsulation kit). In this situation, continuous surveillance shall be required.
	Grade 1 leak, made safe through positive action taken to mitigate the hazard but still pending repair, requires daily surveillance until reclassified and or repaired. Examples of positive action include: • Installation of a vent box • Duct sealing foundation penetrations in conjunction with other actions against situations of future inaccessibility • Other actions as determined by qualified on scene personnel based on site conditions
	For Grade 1 leaks with inside readings (on daily surveillance) previously made safe, make safe actions shall consider future inaccessibility.

6. Regulatory Codes

49 CFR	192.465	External corrosion control: Monitoring
49 CFR	192.491	Corrosion control records

Classifying Gas Leaks – CNST02009

1. Purpose

The purpose of this document is to state Rhode Island Energy's policy for classifying leaks.

This document covers:

- Classification of gas leak migration patterns
- Leak grade reclassification
- Leak repair schedule

Leaks on above ground (exposed) piping should not be classified and shall be handled in accordance with Emergency Response Procedures (See **First Responder CNST02013**).

Leaks inside a structure, downstream of the service valve, shall be repaired or made safe in accordance with **Warning Tag Procedure CMS04009**.

2. Responsibilities

Gas Operations or designee shall:

- Serve as the lead organization for this policy document
- Classify leak migration patterns

Customer Meter Services or a designee shall:

- Provide clerical support for leak management
- Maintain a leak database
- Scan leak classification tickets and maintain on a shared drive
- Classify leak migration patterns
- Document results of investigation on the Leak Investigation Report (Green Leak Ticket)

3. Personal & Process Safety

Leaks shall be classified in accordance with this policy document.

Surveillance schedules are found in **CNST02011**.

Leak Response and Repair is found in **CNST02010**.

4. Operator Qualification Required Tasks [Qualified or Directed & Observed]

Please refer to the OQT&C Task-to-Title Matrices for the applicable OQ Requirement(s) for performing work in accordance with this document.

Not all personnel shall be required to perform all tasks associated with this document. Therefore, Operations personnel shall only be required to qualify on those tasks associated with the tasks they will perform.

5. Content

5.1. **Classification of Leaks** – **General**

a. Pipeline leaks on below ground facilities have the potential to migrate to nearby structures or substructures, where they may accumulate to combustible levels. The purpose of classifying below ground gas leaks is to assign the appropriate hazard classification based on the potential for leak migration.

b. During the defined Winter Operations period, newly discovered leaks should be classified under the guidance for continuous pavement (left side of leak classification guide). Leaks may be re-evaluated in the weeks following suspension of the Winter Operations period. See **Winter Leak Operations CNST02004.**

c. Leaks on above ground piping shall not be classified

1) Above ground piping is defined as piping that is not buried below ground and which presents no migration hazard to surrounding structures or sub-structures. Outside leaks on above ground piping vent freely into the atmosphere and therefore present no below ground migration or accumulation hazard. For this reason, leaks on above ground piping (e.g., meter headers, above ground regulator stations, mains on bridges, etc.) shall not be classified (Grade 1, 2A, 2 or 3), nor documented on the standard Leak Classification (Green) Form. However, an appropriate priority shall be applied to remediation based on the severity of the hazard as noted below.

2) For above ground leaks, a determination shall be made if the leak presents an immediate hazard or if it is considered non-hazardous as described in the procedure document: **First Responder CNST02013.**

d. Individual below ground leak classification shall be determined based on percentage of gas, surface conditions, and proximity to confined spaces, including buildings and sub-structures, as specified in the applicable leak classification guidelines, see **Attachment 1 CM4 Leak Classification Guide.**

e. For the purpose of classifying leaks in manholes, sustained readings on a CGI shall be taken in an enclosed atmosphere either by:

1) Inserting the probe of the CGI through the manhole cover vent holes, or

2) By cracking the seal open of the manhole cover slightly (e.g., prying open) to allow the insertion of the CGI probe into the outer edge crack of the manhole for atmosphere readings in the manhole, without substantially venting the reading to a lesser concentration

5.2. Grade 1 Leaks

a. Grade 1 leak migration pattern is a gas leak that represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until the condition is no longer hazardous.

Grade 1 leak migration patterns include, but are not limited to the following:

1) Damage to gas facilities resulting in leakage.
2) Blowing gas and/or strong unlocatable odor of gas.
3) Any indication on a combustible gas indicator of natural gas migrating into a structure.
4) Any leak which, in the judgment of the operating personnel at the scene, is regarded as hazardous.

5.3. Grade 2A Leaks

a. Grade 2A leak is a gas leak that is recognized as being non-hazardous at the time of detection, but justifies scheduled repair based on probable future hazard and shall be scheduled for surveillance until repaired.

5.4. Grade 2 Leaks

a. Grade 2 leak is a gas leak that is recognized as being non-hazardous at the time of detection, but justifies scheduled repair based on probable future hazard and shall be scheduled for surveillance until it is repaired.

5.5 Grade 3 Leaks

a. Grade 3 leak is a gas leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous and does not require repair, however, shall be scheduled for surveillance annually.

5.6 Leak Reclassification

a. The classification of a leak migration pattern shall be upgraded after only one increased reading of a higher classification, in the level of natural gas.

b. If the Grade 1 leak has been repaired, yet after re-check still has gas readings, it may be reclassified to the appropriate grade.

c. In situations in which no repair has been affected and the leak is demonstrating readings of a lower classification:

A. Grade 1 leak:

Where a Grade 1 leak demonstrates readings of a lower classification, or no reading, at the time of the hand off between the repair crew and the first responder, before repair action is

taken, the company shall document the bar hole readings and the leak may be classified or canceled.

B. For a Grade 2A, 2, and 3 leaks:

If a leak demonstrates readings of a lower classification during surveillance, or at the time of a scheduled repair, at which time the leak may be downgraded or closed based on readings.

Leak Repair Schedule

a. Grade 1 Leaks:

1. Grade 1 leaks require continuous action to be taken, or a repair to be affected, until the condition is deemed no longer hazardous.
2. The repair crew shall verify all previously recorded readings prior to commencing and pinpoint or repair work.
3. The repair crew shall document post repair readings upon completion of repair(s).

b. Grade 2A Leaks:

1. Repair of a grade 2A leak should be made within 6 months from the date the leak was classified at this classification.
2. The repair crew shall verify all previously recorded readings prior to commencing and pinpoint or repair work.
3. The repair crew shall document post repair readings upon completion of repair(s).

c. Grade 2 Leaks:

1. Repair of a grade 2 leak should be made within 12 months from the date the leak was classified at this classification.
2. The repair crew shall verify all previously recorded readings prior to commencing and pinpoint or repair work.
3. The repair crew shall document post repair readings upon completion of repair(s).

d. Grade 3 Leak:

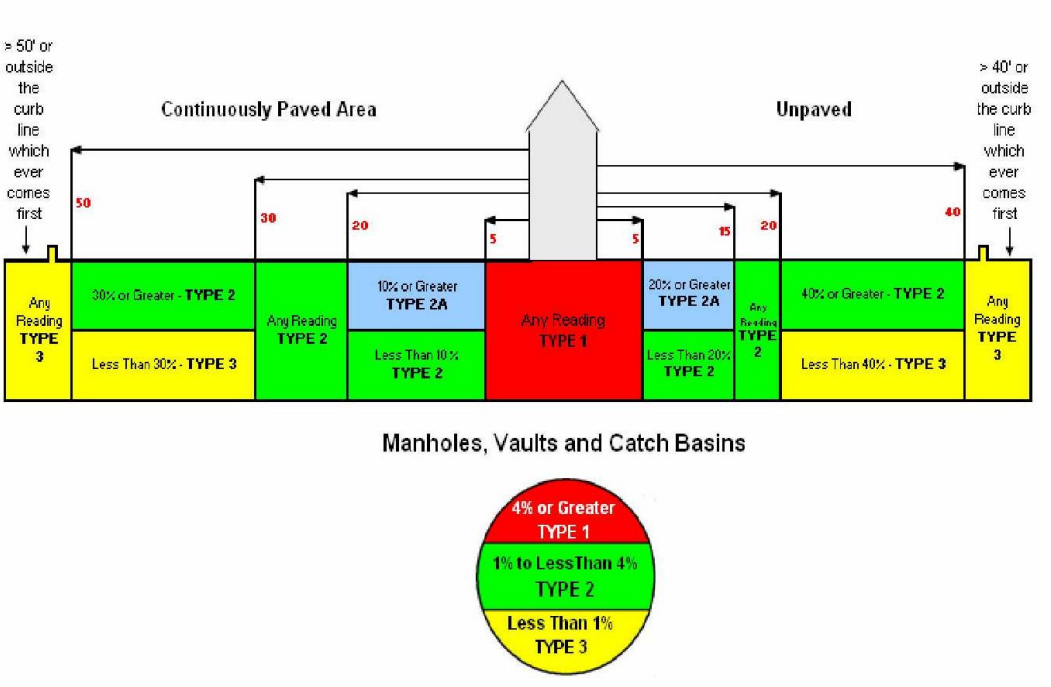
1. Grade 3 leaks are considered non-hazardous in nature and do not require a set repair schedule.
2. The company may schedule a Grade 3 leak for repair at any time. Reasons include, but are not limited to Pre-paving surveys, nuisance leaks, high volume leaks, or any other reason the company deems necessary.

6. Attachments

Attachment 1: Leak Classification Guide CM4

Rhode Island Energy™	Gas Policy **Leak Control**	Doc. # **CNST02009** Page 5 of 5
	Classifying Gas Leaks	Revision 0 – 12/1/2022

Attachment 1: Leak Classification Guide CM4



Division 2-9

Request:

Referring to the Proactive Service Replacement Program on Bates Page 33 which states *"The average cost per service was assumed to be $6,579 in FY 2025 to account for inflationary factors."* Please identify these "inflationary factors" and provide the supporting calculations including historic costs for service replacements.

Response:

The Company calculated a per service cost using the average of two full fiscal years of data for the Proactive Service Replacements and then added an inflation assumption of 7% for FY2025 planning. Inflationary factors include the cost of labor, materials, fuel, and paving/asphalt.

In FY2022, the Company completed 56 services, plus remaining restoration on 57 services from the previous fiscal year, for a total cost of $0.396 million.

In FY 2023, the Company completed 34 services, plus the remaining restoration on 56 services from the previous fiscal year, for a total cost of $0.158 million.

The average per service cost on these 90 services over 2 years was $6,149. Adding an inflationary factor, to forecast FY2025, arrives at the assumed cost per service of $6,579 for FY2025.

Note: The current fiscal year costs for FY2024, were not included in this calculation as the Company is still collecting charges associated with the current work.

Division 2-10

Request:

Referring to the Smithfield Gate Station Refurbishment discussed on Bates Page 36, what is the basis for using three layers of over pressure projection (OPP)? For the regulator station refurbishments, it appears the Company is relying on two layers of OPP (two bypass valves). Please explain.

Response:

The purpose of over pressure protection ("OPP") is to mitigate the potential of a downstream lower pressure system becoming overpressurized by incoming high pressure due to a failure of pressure regulating equipment. In the case of Smithfield, the incoming pressure is 975 PSIG, which is regulated down to a maximum of 99 PSIG and 35 PSIG in the downstream systems. Overpressure protection of this system is best achieved by the installation of an additional third layer device in addition to a primary and monitor regulator. The installation of a third layer device has been a best practice since first adopted prior to the transition to Rhode Island Energy and was reinforced by the American Gas Association in 2018.

Although bypass valve failure can result in an overpressurization, bypass valves are not considered OPP devices since they do not sense, regulate, or relieve pressure. Bypass valves primarily fail due to seal leakage or incorrect operation, which historically has been rare, but nonetheless warrants using two bypass valves to eliminate a potential single point of failure. If a station is replaced, a second regulator run with three layers of OPP is installed in lieu of a bypass valve.

Prepared by or under the supervision of: Justin Zaccari

Division 2-11

Request:

Referring to the access staircase tower project to access the top of the Exeter LNG Tank discussed on Bates Page 41, please describe the bidding and/or budgeting process for this project.

Response:

Engineering Design is scheduled to be completed by Summer 2024 (FY2025). The construction bid process will start after the design is complete and takes approximately 8-12 weeks to award. Once awarded, the Company will work with the successful bidder on a schedule. The Company is targeting the end of calendar year 2024 (Q3 FY2025) to complete the foundation work and plans to construct the staircase in calendar year 2025 (FY2026).

The estimated spend in FY2024 is $0.150 million for engineering. Estimated spend for FY2025 is $0.500 million for engineering and foundation work. The estimated spend in FY2026 is $2.300 million to install the switchback stairs. The estimated spend for FY2027 is $0.010 million for project closeout. The overall estimated budget for this project is $2.960 million.

The budget for this project was based on a similar National Grid Project in Long Island, New York.

Division 2-12

Request:

Regarding the discussion on greenhouse gas emissions (Bates Page 8) which states *"From 2012 through 2022 the Company has reduced emissions from its gas distribution system by 106,967 thousand cubic feet ("MCF"). In FY2025 the Company plans to reduce emissions by an estimated 15,457 MCF through the abandonment of 61 miles of leak prone pipe,"* please provide the basis and supporting calculations for these figures. What is the Company's definition of emissions?

Response:

The Company uses Table W-7 to Subpart W of Part 98, Title 40 from the Code of Federal Regulations to calculate the emissions of its distribution system, which can be viewed here: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W/appendix-Table%20W-7%20to%20Subpart%20W%20of%20Part%2098. The table from the CFR lists methane emissions factors for miles of main and number of services by material. Using the factors in this table, the Company calculates expected annual methane emissions from its gas distribution system.

To arrive at the 106,967 MCF reduction from 2012 to 2022, the Company calculated what its system was emitting in 2012 based on its main and service material breakdown and then did the same for 2022. The difference between these two figures, or the reduction in annual methane emissions from the system over that time, is 106,967 MCF. Please see Attachment DIV 2-12-1 for the calculation.

To arrive at the 15,457 MCF reduction, which will be the result of the FY2025 planned work, the Company calculated the annual emissions for 61 miles of leak-prone main and 1,350 leak-prone services. The Company is targeting a 90% cast iron work plan for FY2025, so 55 miles of cast iron and 6 miles of unprotected steel were used for the calculation. The 1,350 total unprotected steel services used was estimated using an average total service count per mile developed from a list of planned FY2025 projects. That was further broken down using the overall system service material demographics to determine which portion of those were likely to be unprotected steel. Then, the same was done for 61 miles of plastic main and 1,350 plastic services, assuming all assets previously identified would be replaced with plastic. To arrive at the 15,457 MCF, the difference between these two calculations was determined. Please see Attachment DIV 2-12-2 for the calculation.

Attachment DIV 2-12-1						
Main/Service Material	CFR Factors*	Converted CFR Factors (from cubic foot per hour to thousand cubic feet per year)	Year			
			2012		2022	
Mains	CF / hour / mile	MCF / year / mile	Miles of Main in System (as of 12/31/2012)	Estimated Annual Methane Emissions from Mains (MCF) (Converted CFR Factor x Miles of Main)	Miles of Main in System (as of 12/31/2022)	Estimated Annual Methane Emissions from Mains (MCF) (Converted CFR Factor x Miles of Main)
Cast Iron**	27.25	238.71	875	208,871	604	144,064
Protected Steel	0.35	3.066	597	1,830	583	1,787
Unprotected Steel	12.58	110.2008	534	58,847	276	30,391
Plastic***	1.13	9.8988	1,168	11,562	1,759	17,412
Services	CF / hour / # of services	MCF / year / # of services	Number of Services (as of 12/31/2012)	Estimated Annual Methane Emissions from Services (MCF) (Converted CFR Factor x # of services)	Number of Services (as of 12/31/2022)	Estimated Annual Methane Emissions from Services (MCF) (Converted CFR Factor x # of services)
Copper	0.03	0.2628	208	55	49	13
Protected Steel	0.02	0.1752	10,285	1,802	6,569	1,151
Unprotected Steel****	0.19	1.6644	53,638	89,275	42,235	70,296
Plastic*****	0.001	0.00876	127,559	1,117	146,009	1,279
			Total Estimated Annual Methane Emissions from System (MCF) (2012)	373,360	Total Estimated Annual Methane Emissions from System (MCF) (2022)	266,393
			Reduction in Annual Methane Emissions from 2012 to 2022 (MCF)		106,967	

CF = Cubic foot
MCF = Thousands of cubic feet

Assumptions:
*See https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W/appendix-Table%20W-7%20to%20Subpart%20W%20of%20Part%2098;
**Cast iron mains include ductile iron and wrought iron mains.
***Plastic mains include reconditioned cast iron mains.
****Unprotected steel services include cast iron services.
*****Plastic services include "Other" services.

Attachment DIV 2-12-2						
Main/Service Material	CFR Factors*	Converted CFR Factors (from cubic foot per hour to thousand cubic feet per year)	Proposed Mains and Services to be Abandoned		Replacement of Mains and Services to be Abandoned with Plastic	
Mains	CF / hour / mile	MCF / year / mile	Miles of Main - Proposed for Abandonment in FY2025	Estimated Annual Methane Emissions from Mains (MCF) (Converted CFR Factor x Miles of Main)	Miles of Main - Proposed for Installation in FY2025	Estimated Annual Methane Emissions from Mains (MCF) (Converted CFR Factor x Miles of Main)
Cast Iron*	27.25	238.71	55	13,110	0	0
Protected Steel	0.35	3.066	0	0	0	0
Unprotected Steel	12.58	110.2008	6	715	0	0
Plastic**	1.13	9.8988	0	0	61	604
Services	CF / hour / # of services	MCF / year / # of services	Number of Services - Proposed for Abandonment in FY2025	Estimated Annual Methane Emissions from Services (MCF) (Converted CFR Factor x # of services)	Number of Services - Proposed for Installation in FY2025	Estimated Annual Methane Emissions from Services (MCF) (Converted CFR Factor x # of services)
Copper	0.03	0.2628	0	0	0	0
Protected Steel	0.02	0.1752	0	0	0	0
Unprotected Steel***	0.19	1.6644	1,350	2,247	0	0
Plastic****	0.001	0.00876	0	0	1,350	12
			Total Estimated Annual Methane Emissions from Mains and Services Proposed for Abandonment in FY2025 (MCF)	16,072	Total Estimated Annual Methane Emissions from Mains and Services Proposed for Installation in FY2025 (MCF)	616
			Reduction in Annual Methane Emissions as a Result of FY2025 Planned Work (MCF)		15,457	

CF = Cubic foot
MCF = Thousands of cubic feet

Assumptions:
*See https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W/appendix-Table%20W-7%20to%20Subpart%20W%20of%20Part%2098
**Cast iron mains include ductile iron and wrought iron mains.
***Plastic mains include reconditioned cast iron mains.
****Unprotected steel services include cast iron services.
*****Plastic services include "Other" services.

Division 2-13

Request:

How does the abandonment of 61 miles of LPP equate to 15,457 Mcf of natural gas? Methane? CO2?

Response:

The Company uses Table W-7 to Subpart W of Part 98, Title 40 from the Code of Federal Regulations to calculate the emissions of its distribution system, which can be viewed here: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W/appendix-Table%20W-7%20to%20Subpart%20W%20of%20Part%2098. The table from the CFR lists methane emissions factors for miles of main and number of services by material. Using the factors, the Company calculated the expected methane emissions for 61 miles of leak-prone mains and the associated number of leak prone services it plans to abandon in FY25. The Company then calculated the methane emissions for 61 miles of plastic mains and an identical number of plastic services. The difference between these two calculations is the estimated reduction in annual methane emissions from the system resulting from the Company's planned FY25 main and service replacement work. Therefore, the 15,457 MCF represents methane emissions.

Division 2-14

Request:

Please provide a copy of the Company's Transmission Integrity Maintenance Plan and explain how the Company plans to meet the 50% MAOP reconfirmation by 2028 and total compliance with the "TVC" rule by 2035.

Response:

Please see Attachment DIV 2-14 for the Company's Station Integrity Management Plan ("SIMP"). The Company refers to its transmission station integrity management plan as the SIMP, because the only transmission assets that the Company owns and maintains are at stations.

Eight stations will have new or replaced piping by 2026. Six stations will need to be tested and may result in full or partial replacement after testing is complete. Fifty nine percent verification will be complete by replacing or testing stations by 2026. The remaining 41 percent will be verified or replaced by 2035.

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STATION INTEGRITY MANAGEMENT PROGRAM (SIMP)

December 2023

OVERVIEW

- In order to comply with federal regulation 49 CFR 192.607, Verification of Pipeline Material Properties and Attributes: Onshore steel transmission pipelines, take station facilities found to be lacking material documentation would need to be subjected to material verification testing as well as having TVC pressure test records. Per CFR192, at least 50% of this pipeline mileage is required to be tested by July 3, 2028 and 100% by July 2, 2035.

- National Grid compiled an initial list of 15 take station facilities needing historical records reviewed. RIE has updated the list to 12 take stations facilities needing historical records review.

- G2 Consulting Group was hired to review all station documentation and generate summary reports

- Upon commencement of Rhode Island Energy, a review of the located records and summary reports was begun in order to confirm locations needing testing

- Campos EPC will be performing material verification testing at select stations

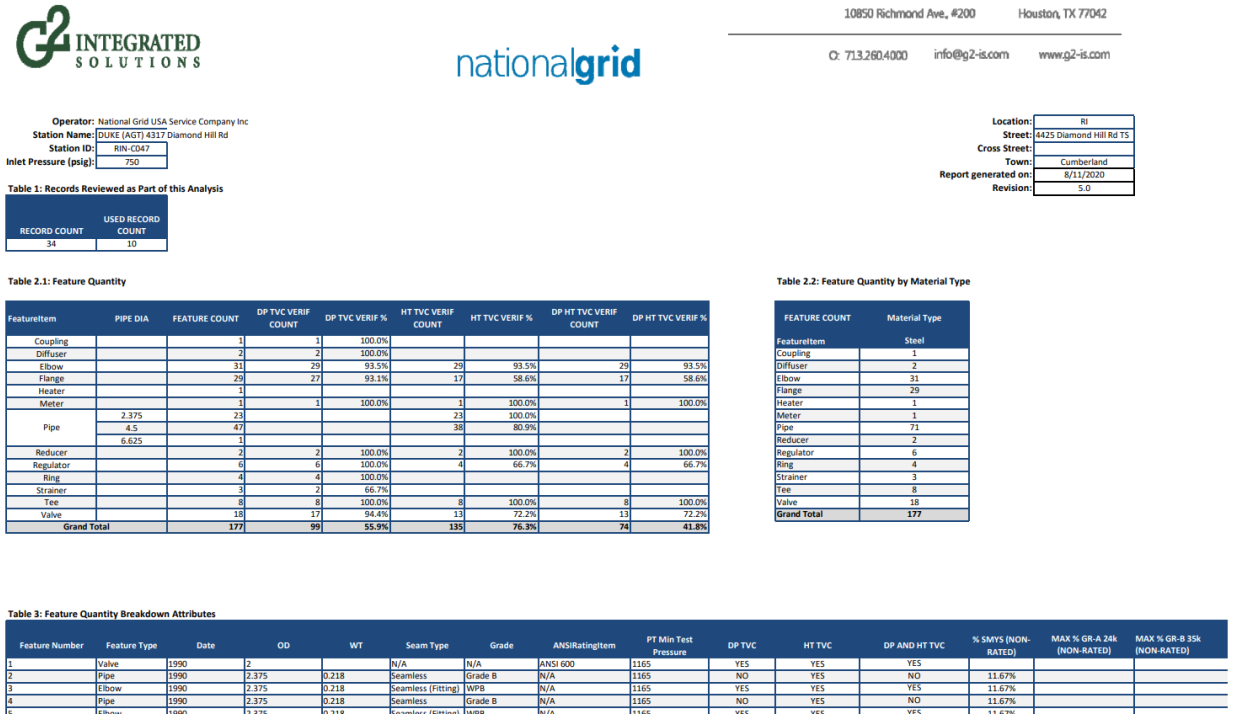
STATIONS TO BE REVIEWED

1. ~~**Crary Street/30 Allens Ave, Providence**~~
2. ~~**27 Dey Street, East Providence**~~
3. 67 Laten Knight Road, Cranston
4. 347 Putnam Pike, Smithfield
5. 68 Scott Road, Cumberland
6. Wampanoag Trail, East Providence
7. 4317 Diamond Hill Road, Cumberland
8. ~~**71 Canal Street, Westerly**~~
9. 600 George Washington Highway, Lincoln
10. Manchester Street/30 Allens Ave, Providence
11. 135 Old Mill Lane, Portsmouth
12. 1085 Wallum Lake Road, Burillville
13. 28 Brown Street, Warren
14. ~~**Cowesett Ave @ Quaker Lane, West Warwick**~~
15. ~~**Main Road @ Beardsworth Road, Tiverton**~~

G2 REPORT CRITERIA

Includes feature details such as:

- Type (Pipe/Elbow/Flange/etc.)
- Quantity
- Size (OD & WT)
- Date Installed
- Test Pressure
- Traceable Verifiable Complete (TVC) Records Available for Materials & Pressure Test
- Assumed Grade & Specified Minimum Yield Strength (%SMYS)



G2 INTEGRATED SOLUTIONS

nationalgrid

10850 Richmond Ave., #200 Houston, TX 77042

O: 713.260.4000 info@g2-is.com www.g2-is.com

Operator: National Grid USA Service Company Inc
Station Name: DUKE (AGT) 4317 Diamond Hill Rd
Station ID: RIN-C047
Inlet Pressure (psig): 750

Location: RI
Street: 4425 Diamond Hill Rd TS
Cross Street:
Town: Cumberland
Report generated on: 8/11/2020
Revision: 5.0

Table 1: Records Reviewed as Part of this Analysis

RECORD COUNT	USED RECORD COUNT
34	10

Table 2.1: Feature Quantity

FeatureItem	PIPE DIA	FEATURE COUNT	DP TVC VERIF COUNT	DP TVC VERIF %	HT TVC VERIF COUNT	HT TVC VERIF %	DP HT TVC VERIF COUNT	DP HT TVC VERIF %
Coupling		1	1	100.0%				
Diffuser		2	2	100.0%				
Elbow		31	29	93.5%	29	93.5%	29	93.5%
Flange		29	27	93.1%	17	58.6%	17	58.6%
Heater		1						
Meter		1	1	100.0%	1	100.0%	1	100.0%
Pipe	2.375	23			23	100.0%		
	4.5	47			38	80.9%		
	6.625	1						
Reducer		2	2	100.0%	2	100.0%	2	100.0%
Regulator		6	6	100.0%	4	66.7%	4	66.7%
Ring		4	4	100.0%				
Strainer		3	2	66.7%				
Tee		8	8	100.0%	8	100.0%	8	100.0%
Valve		18	17	94.4%	13	72.2%	13	72.2%
Grand Total		**177**	**99**	**55.9%**	**135**	**76.3%**	**74**	**41.8%**

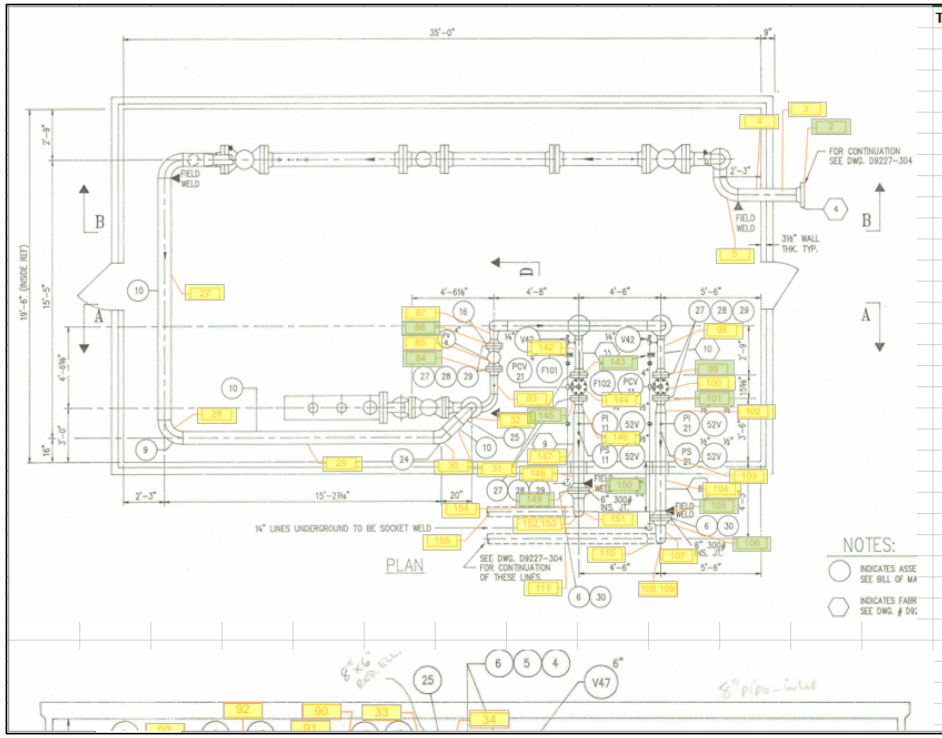
Table 2.2: Feature Quantity by Material Type

FEATURE COUNT	Material Type
FeatureItem	Steel
Coupling	1
Diffuser	2
Elbow	31
Flange	29
Heater	1
Meter	1
Pipe	71
Reducer	2
Regulator	6
Ring	4
Strainer	3
Tee	8
Valve	18
Grand Total	**177**

Table 3: Feature Quantity Breakdown Attributes

Feature Number	Feature Type	Date	OD	WT	Seam Type	Grade	ANSIRatingItem	PT Min Test Pressure	DP TVC	HT TVC	DP AND HT TVC	% SMYS (NON-RATED)	MAX % GR-A 24k (NON-RATED)	MAX % GR-B 35k (NON-RATED)
1	Valve	1990	2		N/A	N/A	ANSI 600	1165	YES	YES	YES			
2	Pipe	1990	2.375	0.218	Seamless	Grade B	N/A	1165	NO	YES	NO	11.67%		
3	Elbow	1990	2.375	0.218	Seamless (Fitting)	WPB	N/A	1165	YES	YES	YES	11.67%		
4	Pipe	1990	2.375	0.218	Seamless	Grade B	N/A	1165	NO	YES	NO	11.67%		

INTERNAL REVIEW



Test Needed	Item	Length	Description	
	1	1.5	Valve	INLET VALVE (Regulator Run #1) 8" 600# RF WKM Trunion Style Ball Valve (Station
X	2	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	3	2.06	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe (Outside Building). Length calculated fro
X	4	2	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe (Inside Building). Length calculated from
X	5	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 90 deg Elbow (Right)
X	6	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 90 deg Elbow (Under)
X	7	1.17	Tee	(Regulator Run #1) 8" STD WT Straight Tee. Branch connects to FMN 8. Run connect
X	8	1.08	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	9	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
	10	1.5	Valve	(Regulator Run #1) 8" 600# RF WKM Trunion Style Ball Valve (Meter Run Inlet Valve
X	11	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	12	4.1	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	13	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	14	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	15	5.46	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	16	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	17	1.97	Meter	(Regulator Run #1) 8" Turbine Meter. PO noted for the Tube. Assumed the Tube is
X	18	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	19	6.83	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	20	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
	21	1.5	Valve	(Regulator Run #1) 8" 600# RF WKM Trunion Style Ball Valve (Meter Run Outlet Val
X	22	0.44	Flange	(Regulator Run #1) 8" 600# RF WN Flange
X	23	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 90 deg Elbow (Under)
X	24	2.91	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Vertical. Length calculated from drawing
X	25	1.17	Tee	(Regulator Run #1) 8" STD WT Straight Tee. Branch connects to FMN 24. Run connec
X	26	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 90 deg Elbow (Left)
X	27	13.42	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	28	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 90 deg Elbow (Left)
X	29	13.79	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	30	1.57	Elbow	(Regulator Run #1) 8" LR STD WT 45 deg Elbow (Left)
X	31	1.76	Pipe	(Regulator Run #1) 8" Sch 40 Grade B Pipe. Length calculated from drawing.
X	32	1.57	Elbow	(Regulator Run #1) 8" x 6" STD WT 90 deg Elbow (Over)
X	33	2	Pipe	(Regulator Run #1) 6" Sch 40 Grade B Pipe. Vertical. Length calculated from drawing

Green – Marked by G2 as having material record / Yellow – G2 did not locate material record / Orange – Incomplete material record found during review

TOTAL FOOTAGE OF STATIONS

Station Location	Footage
Diamond Hill Road, Cumberland	197
George Washington Hwy, Lincoln	445
Manchester Street, Providence	411
Old Mill Lane, Portsmouth	89
Wallum Lake Road, Burrillville	15
Brown Street, Warren	10
~~Canal Street, Westerly~~	N/A - See Next Slide

Station Location	Footage
~~Crary Street, Providence~~	493
~~Dey Street, East Providence~~	259
~~Cowesett Avenue, West Warwick~~	676
~~Main Road, Tiverton~~	122
Laten Knight Road, Cranston	241
Putnam Pike, Smithfield	188
Scott Road, Cumberland	526
Wampanoag Trail, East Providence	177

Total Footage	3849

REVIEW SUMMARY – STATIONS TO BE TESTED

Station Location	Total Station Components	Components To Review and/or Test	Total Footage	Footage without PT	Footage to be Tested	% of Total Footage Needing Testing
Diamond Hill Road, Cumberland	109	**81**	**197**	**71**	138	4%
George Washington Hwy, Lincoln	183	**129**	**445**	**6**	317	8%
Manchester Street, Providence	206	**206**	**411**	**411**	411	11%
Old Mill Lane, Portsmouth	46	**38**	**89**	**89**	74	2%
Wallum Lake Road, Burrillville	20	**7**	**15**	**0**	15	<1%
Brown Street, Warren	11	**7**	**10**	**0**	10	<1%

REVIEW SUMMARY – STATIONS REPLACED/TO BE REPLACED

Location	Replacement Status	Footage	% of Total Footage
Crary Street, Providence	**Complete - 2017**	493	13%
Dey Street, East Providence	**Complete - 2018**	259	7%
Wampanoag Trail, East Providence	Scheduled - 2025	177	5%
Main Road, Tiverton	**Complete - 2022**	122	3%
Laten Knight Road, Cranston	Scheduled – 2023/24	241	6%
Putnam Pike, Smithfield	Scheduled – 2024/25	188	5%
Scott Road, Cumberland	Scheduled – 2024/25	526	14%
Canal Street, Westerly	*N/A – Rhode Island Energy takes ownership at 75 psig / %SMYS at ~ 4.19% assuming Grade A, RIE and Enbridge plan to Replace this station by 2035 and RIE will take over the all the regulation*		

REVIEW SUMMARY – STATIONS WITH COMPLETED TESTING

Location	Replacement Status	Footage	% of Total Footage
Cowesett Avenue, West Warwick	Complete (2019)- tested and confirmed below 20% SMYS	676	18%

REVIEW SUMMARY – TOTAL FIGURES

Requirements per 49 CFR 192		
	RIE station footage	Percentage of total footage
Needing Reverification by 2028	1925	50%
Needing Reverification by 2035	3849	100%

Rhode Island Energy Forecast		
	RIE station footage	Percentage of total footage
Verified or Scheduled to be Verified/Replaced by 2026	2682	70%
Scheduled to be Reverified thru Testing by 2028 (using total Station Footage)	1167	30%
Additional Replacement after Testing is Complete	TBD	TBD

SCHEDULE AND ACTION ITEMS

- 2024 to 2028 the goal is to complete all verifications
- 2028 to 2035 the goal is to replace all components that are not verified or is above 20% SMYS
- Hire Campos EPC to perform material verification testing at select stations
- Verify Procedure to perform testing

REFERENCE – MAINS ABOVE 125 PSIG – DOES NOT NEED VERIFICATION-ALL BELOW 20% SMYS

	PSI	Size	Install Date	Footage (mi)	% SMYS
Laten Knight TS to W. Natick Road @ Bald Hill Road	200	8" – 20"	1991/ 1992	1.9	8 - 18
Bald Hill Road to Quaker Lane Reg Station	200	12" – 20"	2000/ 2007	3.4	10 - 18
Wampanoag Trail TS to East Side of Providence River	200	4" – 16"	1953 - 2010	1.9	5 - 15
Providence River Crossing	200	10"	1953	1.5	6
West Side of Providence River to Allens Ave LNG Facility	200	12"	2017	0.3	12
Manchester Street TS to Dominion Energy	350	12"	1993	0.3	17
Inlet to Smithfield TS	975	12"	1999	0.1	14

PROCEDURES

- Rhode Island Energy procedure ENG03036 will be followed during station testing
- Additional procedure will be created by Campos EPC and approved by Gas Engineering

Rhode Island Energy™	Gas Work Method **Design of Gas Transmission Lines**	Doc. # **ENG03036** Page 1 of 13
	Non-Destructive Evaluation of Pipeline Material Properties and Attributes	Revision 1 – 12/01/21

Non-Destructive Evaluation of Pipeline Material Properties and Attributes ENG03036

1. Purpose

This procedure shall be used for conducting non-destructive examination and testing required to verify the material properties and attributes of line pipe and components in pipelines with a MAOP of 125 psig and above in accordance with Material Verification Policy for Legacy Pipelines Designed to Operate at or Above 125 PSIG [ENG03035] and 49 CFR §192.607. It provides requirements and guidance for determining material grade, wall thickness, pipe size, and seam type, as well as component ratings. Material toughness testing is not covered in this procedure. Alternative methodologies may be employed for material verification provided they are approved by the Director of Gas Transmission Engineering.

CAMPOS | EPC

SCOPE OF WORK

The proposed project execution will consist of the following tasks:

1. **Material Verification Procedure Development**

CEPC will develop a detailed Material Verification Procedure in conformance to 49 CFR 192.607 "*Verification of Pipeline Material Properties and Attributes: Onshore steel transmission pipelines*" and any advised Company-specific requirements. The procedure is to include requirements and guidance covering:

a) Non-Destructive Testing;
b) Destructive Testing;
c) Pipe Populations and Sampling;
d) Forms – Chain of Custody, Material Verification Reporting;
e) NDT Guidance – Line Pipe & Buttwelding Fittings;
f) NDT Guidance – Flanged Components;
g) Destructive Testing Guidance – Line Pipe;
h) Fracture Toughness;
i) Weld Seam Identification Guidance;
j) Chemical Composition Testing Guidance; and
k) Historic API 5L Line Pipe Tensile Properties.

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TESTING TO BEGIN 2024

Division 2-15

Request:

How many miles of transmission main does the Company operate within its distribution system? Please explain how it classifies transmission vs. distribution main.

Response:

The Company is currently reviewing the amount of mains that it classifies as transmission mains and the potential amount is 0.46 miles (initially estimated to be 0.73 miles). The Company adopts the definitions in Title 49 Code of Federal Regulations Part 192.3, which classifies pipelines with a Maximimum Allowable Operating Pressure ("MAOP") of 20 percent or more of Specified Mininum Yield Strength ("SMYS") as transmission lines. The Company classifies mains having an MAOP of less than 20 percent SMYS as distribution mains.

Division 2-16

Request:

Please identify any specific equipment or specialty tools that the Company plans on purchasing within the $1.21 M budget for Capital Tools and Equipment.

Response:

Table 1, below is a summary of the total proposed FY2025 Capital Tools and Equipment budget of $1.21 million, which is comprised of both 1) regular and recurring small tools and other items, and 2) the specific equipment and specialty tools the Company plans on purchasing in FY2025.

The specific equipment and specialty tools comprise $0.352 million of the total proposed budget, and are further described and broken out in Table 2, below.

Table 1

Summary $(millions)	**Tools & Equipment - All**	**Tools & Equipment - Meter Testing**	**Total - Tools & Equipment Budget**
FY2025 Proposed Budget	**$ 1.074**	**$ 0.137**	**$ 1.211**
TBD - Regular and recurring small tools and other items	$ 0.820	$ 0.039	$ 0.859
Specified - Equipment & Specialty Tools to be purchased (see breakout, below)	$ 0.254	$ 0.098	$ 0.352

Table 2

Breakout **Specified - Equipment & Specialty Tools to be purchased $(millions)**	**Quantity**	**Unit Cost**	**Tools & Equipment - All**	**Tools & Equipment - Meter Testing**	**Total Tools & Equipment Budget**
12 inch TD Williamson Valves	2	$ 0.050	$ 0.100		$ 0.100
6 & 8 inch TD Williamson Valves	3	$ 0.035	$ 0.105		$ 0.105
Road Plates	6	$ 0.004	$ 0.024		$ 0.024
Window cutters for Cast Iron and Steel Mains	1	$ 0.010	$ 0.010		$ 0.010
Replace 1 backfill screener	1	$ 0.015	$ 0.015		$ 0.015
Gas Meter Prover	1	$ 0.051		$ 0.05	$ 0.051
Wet Meter Leak Tester	1	$ 0.047		$ 0.05	$ 0.047
Total - Specified - Equipment & Specialty Tools			**$ 0.254**	**$ 0.098**	**$ 0.352**

Prepared by or under the supervision of: Phil LaFond and Nathan Kocon

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Division 2-17

Request:

Referring to Page 61 of the Company's 2022 Distribution Integrity Management Plan (DIMP), please provide a copy of the risk ranking model used for mains & services, and instrumentation & regulation facilities.

Response:

Please see Attacment DIV 2-17-1 for Company Procedure ENG04043 – Identification, Evaluation and Prioritization of Distribution Main Segments for Replacement. This is the model used for risk ranking of mains and services. Attachment DIV 2-17-2 and Attachment DIV 2-17-3 are the factors used for mains and services respectively in the model.

Instrumentation and Regulation facilities are manually and individually ranked based upon the following factors:

- Design type
  - Number of runs (one or two)
  - Number of regulators (two or 3 layer)
- Number of customers
- Age
- Condition
- Ability to respond to failure
- Multiply by impact of a failure
- Discussions with I&R
- Discussions with Corrosion
- Discussions with Operations Engineering

Identification, Evaluation and Prioritization of Distribution Main Segments for Replacement ENG04030

1. Purpose

This procedure describes and details the identification, evaluation, and prioritization of distribution main segments for replacement, and prescribes methods to be used for corrective action.

Potential areas of active corrosion are identified using leakage surveys in conjunction with an analysis of the corrosion and leak history records.

2. Responsibilities

Distribution Engineering or designee shall be responsible for:

- Serving as Process Owner / Lead Organization for this policy document.
- Gathering and evaluating gas facility and leak data and determine required calculations.
- Determining qualification and prioritization procedure and remedial action for active corrosion, non-active continuing corrosion, and other systemic integrity issues.
- Identifying main segments for replacement and prioritizing them according to this procedure.

Corrosion Engineering or designee shall be responsible for:

- Evaluating and reclassifying pre-1971 gas piping with cathodic protection (CP).

3. Personal & Process Safety

All required PPE shall be worn or utilized in accordance with the current Rhode Island Energy Safety Policy when performing tasks associated with this document.

4. Operator Qualification Required Tasks [Qualified or Directed & Observed]

Not applicable.

5. Content

5.1 Identification of Main Segments for Replacement

a. Main segment candidates are identified through four avenues:
   1) Field Requests, which will be reviewed throughout the year.
   2) Mains located in Public Improvement Job Areas, which will also be reviewed throughout the year, as requested by Field Operations and/or Public Works employees.
   3) Annual screenings by Main and Service Engineering, as deemed appropriate. Screenings will vary among the regions, based on the data and tools available for the systems.
   4) Lab failure analysis reports reviewed by Distribution Engineering for systemic issues.

b. All identified main segment candidates shall be evaluated and prioritized by Distribution Engineering in accordance with the criteria set forth in this procedure. Minimum segment lengths for screening and engineering review will vary among the regions; however, no Engineering review is required for replacements up to 300 feet. Segments identified by Distribution Engineering for systemic integrity issues will be replaced and prioritized as determined appropriate.

c. Where possible, the system should be upgraded to high pressure while retiring low pressure mains.

d. Leak prone pipe replacement includes replacement of associated leak prone services listed below:
   1) All steel services except large diameter, industrial and commercial services with CP
      **Note: Services that cannot be relayed should be transferred and follow corrosion policies. A test station sketch should be sent to corrosion department.
   2) Plastic
      i. Pre-1985: Aldyl-A (usually pink or grey)
      ii. Pre-1974: HDPE (black)
      iii. Polybutylene (PB) - (tan or yellow)
   3) Copper
   4) Cast Iron
   5) Wrought Iron

e. Large diameter remediation includes Lining and CISBOT of leak prone steel mains and cast iron mains greater than 12 inches in diameter
   1) Lining and replacement are the preferred remediation methods. Lining is not possible when there are too many services or there is presence of mitered bends or back-to-back 45s or main cannot be taken out of service (require expensive bypass), or main is too deep. CISBOT will be used when lining is not feasible.

f. All identified main segment candidates shall be reviewed by Distribution Engineering with Corrosion Engineering to ensure that none of the job or part of the job is pre 1971 protected main.

5.2 Evaluation/Prioritization of Steel Main Segments for Replacement

a. Data Collection - Minimum Data Required:
   1) All Repaired Corrosion Leaks on Main Segment for the last 10 years
   2) All repaired corrosion leaks on services for last 10 years. (In order to consider service leaks in main prioritization calculation, there should be main leaks)
   3) All Open Leaks that are believed to be on the actual Main Segment

b. For all applicable leaks, the following data is required:
   1) Leak Number
   2) Date (date found for open leaks, date repaired for repaired leaks)
   3) Leak Class (original class for open leaks, repaired class for repaired leaks)
   4) For repaired leaks, the following additional data is also required:
      i. Number of clamps installed to repair and specific clamp locations.
      ii. Condition of main when repaired.
      iii. Address based leak location.
      iv. Length of segment exhibiting significant leak activity (i.e., from first leak to last leak).
      v. Building Types in Area of Main Segment (None, Single Family Houses, Small Buildings, Public Buildings).

c. Calculate a main deterioration factor (“D”) using the formula:

$$D = N \times 500 / L_{(calc)}$$

Where:

$L_{(calc)}$ = Length of Segment exhibiting significant leak activity (i.e., first leak to last leak) or 500 feet, whichever is larger. However, if the total length of the segment considered for replacement is less than 500 feet, Lcalc shall be the length of the main considered,

The segment length used in calculations is not necessarily the total length being considered for replacement. "L" should be determined by the evaluating engineer as the length of the segment exhibiting significant leak activity. In no case should the length used for calculations extend beyond the locations of the leaks).

and

N = Repair Factor (within the defined "L_{calc}").

1) If the leak is still open (except for grade 3 high emitter leaks), N=1 for each open leak.
2) If the leak is still open and is a grade 3 high emitter leak, N=2 for each open leak.
3) If leak was repaired with 1 clamp, by another method or associated with service corrosion leak repair, N = 1.
4) If the leak was repaired with 2 – 3 clamps, N = 2.
5) If the leak was repaired with 4 – 5 clamps, N = 3.
6) If the leak was repaired with 6 – 7 clamps, N = 4.
7) If the leak was repaired with > 7 clamps, N = 5.
8) If the leak was repaired by replacing a section of a pipe less than 10', N=7 and N=9 for replacement pipe 10' or greater.

THE SUM OF ALL THE "N"s FOR EACH LEAK IS PLUGGED INTO THE FORMULA

This method estimates the deterioration according to the actual number of physical repairs and normalizes it for the length of the segment.

d. Calculate an incident probability factor ("P") using the formula:

$$P = \{[(\#\ Class1\ Leaks/0.5) + (\#\ Class2A\ Leaks/1.5) + (\#\ Class2\ Leaks/2) + (\#\ Class3\ Leaks/3)] \times 500\} / L_{(calc)}$$

This method estimates public safety incident probability by weighting each leak based on how far the gas migrated toward buildings, again normalized according to the segment length. (Note – If leak class is unknown, Class 2A will be assumed).

e. Calculate a risk factor ("R") using the formula:

$$R = P \times C$$

Where:

P = Probability Factor Calculated in previous step.
C = Consequence Factor

1) If there are no buildings in the area, C = 0.
2) If there are only single-family homes, C = 1.

3) If there are small buildings (multi-family, strip mall, etc.), C = 1.2.
4) If there are public buildings (school, church, hospital, etc.) C = 1.5.

This is the standard Risk Analysis calculation where Risk is defined as the product of the likelihood of an event and the potential consequence of that event. Consequences increase with building size and number of people affected.

f. Calculate the preliminary prioritization factor ("Pr") using the formula:

$$Pr = D + R + IM$$

Where:

D = Deterioration Factor Calculated in "c".
R = Risk Factor Calculated in "e".
IM = DIMP factor as found in Rhode Island Energy's Distribution Integrity Management Program (DIMP) listed in attachment 1

The prioritization calculation considers both the deterioration of the main and the risk to public safety.

IM factor is applied to help accelerate the attrition of mains which belong to an asset group known to have a higher likelihood of incident or is of a high relative risk.

g. The following adjustments may be needed:
1) Before making a final determination and prioritization of a main segment replacement, the details of the job are reviewed and "engineering judgment" is applied where appropriate. This application may result in the following types of adjustments:
   i. Changing the priority of the job
   ii. Increasing or decreasing the job length/scope
   iii. Breaking the job into smaller segments
   iv. Merging several segments into one job
2) These adjustments may be made based on the following types of information, if available and applicable:
   i. Analysis of the age of the leaks and any increasing frequency of leak occurrences
   ii. Pipe vintage and service insert activity associated with the main
   iii. Service leaks at the main connection due to corrosion
   iv. Adjustments based on very long or very short segments
   v. Observed pipe condition from leak repair data
   vi. Observed pipe condition from recent field exposure
   vii. Clustering of repairs and/or clamps along the segment
   viii. Other replacement jobs in the vicinity
   ix. Cathodic protection systems in place
   x. Specific locations of intersections, fittings, material transitions, diameter transitions, etc.
   xi. Customer complaints, Executive complaints, Regulatory Agency complaints
   xii. Corporate good will

xiii. Unusual hazards or exposure in the area
xiv. Proximity to gas regulating equipment
xv. Proximity to transmission main
xvi. Unusual difficulty or expense of repairs
xvii. Main location
xviii. Identification of outdated construction methods or problematic materials or fittings
xix. Depth of cover and soil conditions
xx. High open leak counts
xxi. Water intrusion or other geographic considerations
xxii. Any special or unusual conditions or considerations identified by Field Operations
xxiii. Any other safety, integrity, operational or economic factors that are available and deemed appropriate

Segments that qualify based on their preliminary prioritization calculation may not be disqualified by adjustments.

h. Qualification of job for replacement:

1) Jobs will be approved and prioritized based on the calculated Prioritization Factor (“Pr”) and applied adjustments. Enough jobs should be approved to accommodate the replacement levels determined by the model(s) in use at the time.

Some jobs will be mandatory to replace.

2) In general, a condition of “Active Corrosion” will be determined when the preliminary Pr calculation is greater than 20 (Pr > 20).
3) Use the following labels for each job to provide a macro view as to the type of work to be performed throughout the year.
   i. A “TS 300” label is associated with any steel job with a preliminary Prioritization Factor (“Pr”) calculation of greater than 20 (Pr > 20), known as “Active Corrosion.”
   ii. A TS 900 label is given to any job which has received additional points from Public Works considerations (as described below).
   iii. A TS 800 label is given to the remainder of the jobs.

i. Impact Identification:
   1) Every approved job should be processed through the Strategic Asset and System Planning and Corrosion Engineering for:
      i. Sizing (determining the appropriate replacement material and diameter).
      ii. Determining if the replacement will have any impact on existing cathodic protection systems.
      iii. Determining if abandonment is an appropriate option over replacement.
      iv. Determining if a system uprating is an appropriate option as part of the replacement.

j. Non-Pipeline Alternative Evaluation (NPA):

1) All jobs will be evaluated for NPA feasibility. If NPA is not feasible, reason(s) will be provided.

5.3 Evaluation/prioritization of cast iron main segments for replacement

a. Cast Iron Main Segments will be evaluated in a similar manner as Steel Main segments, where the Prioritization factor will be the sum of the Deterioration Factor, Risk factor and DIMP factor (Pr = D + R + IM).

b. Candidates are reviewed based primarily on breakage and/or graphitization history; and all segments that contain 1or more breaks and/or graphitization repairs must be reviewed.

c. If the candidate segment has had two (2) or more breaks and/or graphitization repairs within 400 feet. and the MAOP is greater than six inches of water column – the segment has automatic approval for replacement. The Prioritization score will automatically be set at 21.

d. If the candidate segment doesn't have at least 2 breaks and/or graphitization repairs or if the pressure is six inches of water column– approval will be based on the Prioritization calculation

   i. If "Pr" is greater than 20 (Pr > 20), replacement will be required (however, a cast iron segment is not deemed active corrosion)

   ii. If "Pr" is less than or equal to 20 (Pr ≤ 20), prioritize and replace according to resources and replacement level recommendations

e. The Repair Factor "N" (as defined 5.2 – c for steel evaluation), will be assigned for each leak, as follows:

1) For cast iron – main breaks, graphitization (corrosion of cast iron) and joint leak repairs are examined.

   i. If the leak is still open or associated service corrosion leak repair, N = 1.

   ii. If the leak was repaired only by joint sealing, N = 0.5.

   iii. If the leak was a break, crack or graphitization, N = 3.

f. Engineering judgment should also be applied to both the prioritization and determination of the segment length to be replaced based on the pressure, diameter, dates of failures, surrounding areas, etc.

5.4 Evaluation/prioritization of plastic main segments for replacement

a. Vintage Plastic Main Segments shall be evaluated by Distribution Engineering based on Lab Failure Analysis Reports that are reviewed for systemic issues.

   I. If Distribution Engineering determines that a systemic issue exists in a specific main segment due to improper fusion or other construction defects, the entire affected section of main will be forwarded to Main and Service Replacement Group for prioritization and expedited replacement.

b. Plastic Main Segments (including non-vintage plastic) will be evaluated in a similar manner as Steel Main segments, where the Prioritization factor will be the sum of the Deterioration Factor, Risk factor and DIMP factor (Pr = D + R + IM).

c. For plastic pipe segments in "b", above, the following criteria shall apply:

   1) For plastic – Previous squeeze-offs, point loading failures (e.g. – rock impingement) and material defects (e.g. – cracking) and construction defect failures (e.g. – butt fusion joint) are examined.

      Where:

N = Repair Factor (within the defined "L")

i. If the leak is still open, N = 1
ii. If the leak was the result of an improper squeeze-off, N = 2 x (the number known squeeze-offs on ALDYL-A pre 1985 pipe)
iii. If the leak was the result of a point loading failure, N = 2
iv. If the leak was the result of a construction defect or material defect, N = 3

5.5 Evaluation and Reclassification of Pre-1971 Gas Piping with Cathodic Protection

a. The following factors should be considered in evaluating and reclassify Pre-DOT CP pipe:
   1) The Corrosion Engineering department shall identify inadequately protected sections of mains and services on the basis of:
      i. Frequently failed readings in the last 5 years
      ii. Failed readings despite additional anode installation
      iii. Unusually low resistance or high current demand as determined by Corrosion Control
      iv. Excessive Coating degradation determined by integrity assessments
      v. High corrosion leak activity
      vi. Any other unusual or abnormal condition determined by Corrosion Control

   2) The section identified in section 1 above shall be removed from the CP monitoring program. The Electronic Monitoring Database and the Corrosion Control section folders shall be updated accordingly. In PCS, the section shall be marked as "inactive" and a statement that the section has been removed from the CP monitoring program along with an effective date with explanation of reclassification will be provided in the permanent remarks section. Reclassified pipe will be marked as "removed from CP" where Electronic Monitoring Database is available.
   3) Once the section is removed from the CP monitoring program, it shall be treated as unprotected coated/bare main.
   4) Every six months, the Corrosion Engineering department will run a report listing which sections of pipe have been reclassified from CP to unprotected coated/bare main. The Corrosion Engineering department will check this list against Corrosion Control mapping records to ensure consistency. This list will be sent to the Distribution Engineering.

b. The following steps are used to evaluate and reclassify Pre-DOT CP pipe when Distribution Engineering or field employees identify inadequacies:
   1) Distribution Engineering shall consult with the Corrosion Engineering department to evaluate the effectiveness of the cathodic protection on the section identified. Corrosion Engineering department will evaluate the section of main based on section 1 above.
      i. Distribution Engineering shall incorporate the reclassified unprotected coated/bare main section into the LPP main replacement program on the basis of priority.

5.6 Reinforcements, Jobs in Public Works Areas, or Storm Hardening

a. Additional adjustment shall be applied for candidate segments in flood zones – by the addition of a storm hardening factor to the Prioritization calculation. An exception to the flood zone factor may be applied. Any exception to the flood zone factor shall be documented as part of the prioritization calculation.

b. Additional adjustments may be applied for candidate segments in public works areas or for which reinforcement opportunities have been identified - by the addition of a Public Works (PW) and/or Reinforcement (RI) factor to the Prioritization calculation:

$$Pr = D + R + IM + PW + RI + SH$$

1) For Road Resurfacing, PW = 2.4
2) For Road Reconstruction, PW = 4.2
3) For Size-Pressure Upgrade Reinforcement, RI = 2.5
4) For 100-yr FEMA defined flood zone, SH = 2
5) For 500-yr FEMA defined flood zone, SH = 1

These factors are applied because of potential cost savings in combining main replacements with other work, as well as anticipated avoidance of performing work on protected streets that were recently improved.

6. References

Code	Section	Description
49 CFR	192.457	External corrosion control: Buried or submerged pipelines installed before August 1, 1971

7. Attachments

Attachment 1: ENG04030 Attachment 1 DIMP factors

DIMP Factor-2022

STATE: RHODE ISLAND
REGION: ALL
FACILITY: MAINS

Mitigation Will Be As Per Appendix D, Except As Otherwise Indicated In Notes

Material	Pressure	Diameter	Mileage	Risk Score	Threat Category	Known Incident (2012 to 2022)	Additional Mitigation Notes	DIMP Factor
Unprotected Bare Steel	HP	Over 8"	3.79	2.57	MATERIAL/WELD	**Known Incident** Yr 2022 - Weld Failure	Yr 2023 - Weld Failure	3.00
Protected Coated Steel	HP	Up to 4"	210.83	1.13	EXCAVATION	**Known Incident** Yr 2017 -Damage by contractor.	Yr 2017 -Damage by contractor.	3.00
Protected Coated Steel	> 60 PSI, Not T	Over 8"	102.87	1.77	EXCAVATION	**Known Incident** Yr 2017 - Dresser coupling failed after nearby excavation caused earth to shift	Yr 2017 - Dresser coupling failed after nearby excavation caused earth to shift	3.00
Cast Iron	LP	4" Thru 8"	483.45	2.00	NATURAL FORCE	**Known Incident** Yr 2015 - Pipe in frozen ground	Yr 2015 - Pipe in frozen ground	3.00
Protected Coated Steel	HP	Over 4" Thru 8"	105.18	1.13	EXCAVATION	**Known Incident** Yr 2013 - Mechanical puncture on gas	Yr 2013 - Mechanical puncture on gas	3.00
Cast Iron	HP	Under 4"	0.01	4.39	CORROSION / NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	3.00
Wrought Iron	HP	Under 4"	0.12	4.39	CORROSION / NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	3.00
Wrought Iron	LP	Under 4"	0.68	3.47	NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	2.37
Cast Iron	LP	Under 4"	3.48	3.47	NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	2.37
Unprotected Bare Steel	> 60 PSI, Not T	Over 8"	1.90	3.25	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	2.22
Unprotected Bare Steel	> 60 PSI, Not T	Over 4" Thru 8"	0.67	3.25	CORROSION / EXCAVATION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	2.22
Unprotected Bare Steel	> 60 PSI, Not T	Up to 4"	0.99	3.25	CORROSION / EXCAVATION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	2.22
Material	**Pressure**	**Diameter**	**Mileage**	**Risk Score**	**Threat Category**	**Known Incident (2012 to 2022)**	**Additional Mitigation Notes**	**DIMP Factor**
Cast Iron	HP	4" Thru 8"	2.35	2.62	CORROSION / NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	1.79
Unprotected Bare Steel	HP	Over 4" Thru 8"	16.32	2.57	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.75
Unprotected Bare Steel	HP	Up to 4"	59.66	2.57	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.75
Plastic	> 60 PSI, Not T	Over 4" Thru 8"	35.23	2.50	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.71
Plastic	> 60 PSI, Not T	Over 8"	3.57	2.50	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.71
Plastic	> 60 PSI, Not T	Up to 4"	115.86	2.50	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.71
Unprotected Coated Steel	> 60 PSI, Not T	Over 4" Thru 8"	1.80	2.24	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.53
Unprotected Coated Steel	> 60 PSI, Not T	Over 8"	4.23	2.24	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.53
Unprotected Coated Steel	> 60 PSI, Not T	Up to 4"	1.65	2.24	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.53
Ductile Iron	HP	Over 4" Thru 8"	0.58	2.12	CORROSION / MATERIAL/WELD / NATURAL FORCE		The replacement strategy will be based on the failure analysis and SME Input.	1.45
Cast Iron	HP	Over 8"	14.82	2.12	CORROSION / NATURAL FORCE / OTHER		The replacement strategy will be based on the failure analysis and SME Input.	1.45
Plastic	HP	Upto 4"	1039.84	2.02	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.38
Plastic	HP	Over 4" Thru 8"	214.40	2.02	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.38
Plastic	HP	Over 8"	10.94	2.02	EXCAVATION / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		The replacement strategy will be based on the lab results of failures.	1.38

DIMP Factor-2022

STATE: RHODE ISLAND
REGION: ALL
FACILITY: SERVICES

Mitigation Will Be As Per Appendix D, Except As Otherwise Indicated In Notes

Material	Pressure	Meter Set	Quantity	Risk Score	Threat Category	Known Incident (2012 to 2022)	Additional Mitigation Notes
Plastic	LP	Outside	23,936	1.77	O. O. FORCE	Known Incident Yr 2017 - Vehicle Crash into Riser	Service Performances are included in the Main Replacement Prioritization.
Copper	HP	Inside	30	8.68	CORROSION / EQ. FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Copper	HP	Outside	13	6.95	EQ. FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE		Service Performances are included in the Main Replacement Prioritization.
Copper	LP	Inside	5	6.87	CORROSION / EQ. FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Copper	LP	Outside	1	5.08	EQ. FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	> 60 PSI, Not T	Inside	95	4.88	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	> 60 PSI, Not T	Outside	221	4.88	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	HP	Inside	756	4.72	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	HP	Outside	1,722	3.77	CORROSION / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	> 60 PSI, Not T	Inside	42	3.16	CORROSION /EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	> 60 PSI, Not T	Outside	76	3.16	CORROSION /EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Material	**Pressure**	**Meter Set**	**Quantity**	**Risk Score**	**Threat Category**	**Known Incident (2012 to 2022)**	**Additional Mitigation Notes**
Plastic	> 60 PSI,Not T	Inside	1,985	3.09	EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Plastic	> 60 PSI,Not T	Outside	7,893	3.09	EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Plastic	HP	Inside	17,047	3.09	EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	LP	Outside	3,325	3.08	CORROSION / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	HP	Inside	1,496	3.05	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Cast Iron	LP	Inside	15	2.85	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE / O.O. FORCE / OTHER		Service Performances are included in the Main Replacement Prioritization.
Plastic	LP	Inside	26,403	2.83	EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	LP	Inside	1,317	2.77	CORROSION / EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Plastic	HP	Outside	67,795	2.49	EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	HP	Outside	2,754	2.44	CORROSION / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Cast Iron	LP	Outside	10	2.17	EXCAVATION / INCORRECT OPERATIONS NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Bare Steel	LP	Inside	30,268	2.14	EQUIPMENT FAILURE / EXCAVATION / INCORRECT OPERATIONS / NATURAL FORCE / MATERIAL/WELD / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.
Plastic	LP	Outside	23,970	2.12	EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE		Service Performances are included in the Main Replacement Prioritization.
Unprotected Coated Steel	LP	Outside	138	2.08	CORROSION / EXCAVATION / INCORRECT OPERATIONS / MATERIAL/WELD / NATURAL FORCE / O.O. FORCE		Service Performances are included in the Main Replacement Prioritization.

Division 2-18

Request:

Regarding Unaccounted Gas trends depicted on Bates Page 129 and 130 of the SIR, please explain the increasing Unaccounted Gas trends since 2016, including an explanation of Gross and Net.

Response:

Gross unaccounted for gas is the Company's total annual sendout (as measured at the gate-station) minus the volume the Company billed for that year (as measured at customer meters in the Company's billing systems) divided by the Company's total annual sendout (expressed as a percentage). The formula for this calculation is:

(Sendout Volume – Volume of Gas Billed) / Sendout Volume

Net unaccounted for gas subtracts the estimated annual emissions from the system from the numerator of the formula used for gross unaccounted for gas. The process the Company uses to calculate the estimated annual emissions from its system is highlighted in the responses to Division 2-12 and Division 2-13, utilizing Table W-7 to Subpart W of Part 98, Title 40 from the Code of Federal Regulations to calculate the emissions of its distribution system, which can be viewed here: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-W/appendix-Table%20W-7%20to%20Subpart%20W%20of%20Part%2098. The formula for this calculation is:

(Sendout Volume – Volume of Gas Billed – Estimated Annual Emissions from the System) / Sendout Volume

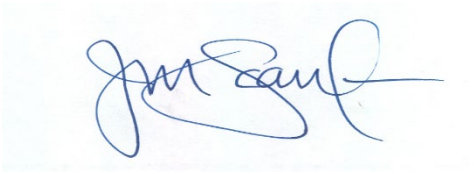
There are a variety of factors that may contribute to unaccounted for gas. The Company is actively reviewing the data and data sources associated with sendout volume and billed sales to identify the cause of the trends cited in this data request. The Company will supplement its response to this data request to the extent that its data review reveals the cause(s) of the increasing unaccounted for gas trends observed.

Prepared by or under the supervision of: Corey Hogg and Barry Foster

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

January 9, 2024
Date

Docket No. 23-49-NG- RI Energy's Gas Infrastructure, Safety and Reliability (ISR) Plan 2025 - Service List 12//19/2023

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