The Narragansett Electric Company
d/b/a National Grid

Gas Infrastructure, Safety, and Reliability Plan FY 2021 Proposal

Book 1 of 2

December 20, 2019

Docket No. 4996

Submitted to:
Rhode Island Public Utilities Commission

Submitted by:

nationalgrid

Filing Letter

Raquel J. Webster
Senior Counsel

December 20, 2019

BY HAND DELIVERY & ELECTRONIC MAIL

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

RE: National Grid's Proposed FY 2020 Gas Infrastructure, Safety, and Reliability Plan Docket No. 4996

Dear Ms. Massaro:

In compliance with R.I. Gen. Laws § 39-1-27.7.1, I have enclosed 10 copies of National Grid's[1] proposed Gas Infrastructure, Safety, and Reliability (ISR) Plan (Gas ISR Plan or Plan) for fiscal year (FY) 2021. The Gas ISR Plan is designed to enhance the safety and reliability of National Grid's natural gas distribution system. As required by law, National Grid submitted the proposed Plan to the Division of Public Utilities and Carriers (Division) for review. The Division undertook a comprehensive review of the initial plan, which included issuing numerous informal and formal discovery requests to the Company, review of responses to those requests, discussions with Company representatives, and outside consultant review. After further discussions with the Company, the Division and the Company were able to mutually agree on the budget for the Plan. Based on its review of the initial Plan and discussions with the Company, the Division supports the Plan's budget and has indicated its general concurrence with the Plan, including the programs and projects outlined in the Plan. Consistent with prior Gas ISR filings, the Division will continue to review the Plan and its costs after filing.

The Gas ISR Plan is designed to protect and improve the gas delivery system through proactively replacing leak-prone pipe; upgrading the system's custody transfer stations, pressure regulating facilities, and peak shaving plants; responding to emergency leak situations; and addressing conflicts that arise out of state, municipal, and third-party construction projects. The Plan is intended to achieve these safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas distribution infrastructure and directly benefit all Rhode Island gas customers.

[1] The Narragansett Electric Company d/b/a National Grid.

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The Plan includes a description of the categories of work National Grid proposes to perform in FY 2021and the proposed targeted spending levels for each work category. In addition to the Plan, this filing includes the pre-filed direct testimony of four witnesses. Amy Smith introduces the Plan document and describes the program components of the Plan; Lee Gresham, JD, PhD provides testimony regarding the operation and maintenance (O&M) expenses associated with the Plan and, specifically, the Company's proposed Heat Decarbonization Assessment planned work. Melissa A. Little describes the revenue requirement for the Plan; and Ryan M. Scheib describes the calculation of the Gas ISR factors proposed in the Plan and provides the bill impacts from the proposed rate changes.

For the average residential heating customer using 845 therms annually, implementation of the proposed ISR factors for the period of April 1, 2020 through March 31, 2021 will result in an annual increase of $44.08, or 3.7 percent.

For the PUC's convenience, the Company has also included copies of its responses to Division Data Requests Set 1. In connection with the Data Requests, this filing contains a Motion for Protective Treatment of Confidential Information in accordance with 810-RICR-00-00-1-1.3(H)(3) (Rule 1.3(H)) of the PUC's Rules of Practice and Procedure and R.I. Gen. Laws § 38-2-2(4)(B). National Grid seeks protection from public disclosure of certain confidential and privileged information in Attachment DIV 1-11. In compliance with Rule 1.3(H), National Grid has provided the PUC with one complete, unredacted copy of Attachment DIV 1-11 in an envelope marked, **"HIGHLY CONFIDENTIAL INFORMATION - DO NOT RELEASE!**

The Gas ISR Plan presents an opportunity to facilitate and encourage investment in National Grid's gas utility infrastructure and enhance National Grid's ability to provide safe, reliable, and efficient gas service to customers.

Thank you for your attention to this matter. If you have any questions, please contact me at 781-907-2121.

Very truly yours,

Raquel J. Webster

Enclosures
cc: Christy Hetherington, Esq.
Al Mancini, Division
John Bell, Division
Rod Walker, Division

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RHODE ISLAND PUBLIC UTILITIES COMMISSION

Fiscal Year 2021 Gas Infrastructure, Safety, and Reliability Plan	)	Docket No. 4996

NATIONAL GRID'S MOTION FOR PROTECTIVE TREATMENT OF CONFIDENTIAL INFORMATION

National Grid[1] hereby requests that the Rhode Island Public Utilities Commission (PUC) grant protection from public disclosure certain confidential, competitively sensitive, and proprietary information submitted in this proceeding, as permitted by PUC Rule 810-RICR-00-00-1-1.3(H)(3) (Rule 1.3(H)) and R.I. Gen. Laws § 38-2-2(4)(B). National Grid also requests that, pending entry of that finding, the PUC preliminarily grant National Grid's request for confidential treatment pursuant to Rule 1.3(H)(2).

I. BACKGROUND

On December 20, 2019, National Grid submitted its Proposed Fiscal Year 2021 Gas Infrastructure, Safety, and Reliability Plan (Gas ISR or the Plan) with the PUC. For the PUC's convenience, the Company also included its responses to the Rhode Island Division of Public Utilities and Carriers' First Set of Data Requests regarding the Plan. In Data Request Division 1-11, the Division requested a copy of a study relating to the construction of an LNG tank in Cumberland, Rhode Island. In responding to Data Request Division 1-11, National Grid provided a copy of the requested study as Attachment Division 1-11. National Grid requests

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

confidential treatment of this study, which is highly confidential and proprietary because it contains commercially sensitive/trade secret information.

For the reasons described below, the Company requests that, pursuant to R.I. Gen. Laws § 38-2-2(4)(B) and Rule 1.3(H), the PUC afford confidential treatment to the confidential and proprietary information included in Attachment Division 1-11.

II. LEGAL STANDARD

Rule 1.3(H) of the PUC's Rules of Practice and Procedure provides that access to public records shall be granted in accordance with the Access to Public Records Act (APRA), R.I. Gen. Laws § 38-2-1, *et seq.* Under APRA, all documents and materials submitted in connection with the transaction of official business by an agency is deemed to be a "public record," unless the information contained in such documents and materials falls within one of the exceptions specifically identified in R.I. Gen. Laws § 38-2-2(4). To the extent that information provided to the PUC falls within one of the designated exceptions to the public records law, the PUC has the authority under the terms of APRA to deem such information as confidential and to protect that information from public disclosure.

In that regard, R.I. Gen. Laws § 38-2-2(4)(B) provides that the following types of records shall not be deemed public:

> Trade secrets and commercial or financial information obtained from a person, firm, or corporation which is of a privileged or confidential nature.

The Rhode Island Supreme Court has held that this confidential information exemption applies where the disclosure of information would be likely either (1) to impair the government's ability to obtain necessary information in the future; or (2) to cause substantial harm to the competitive

position of the person from whom the information was obtained. *Providence Journal Company v. Convention Center Authority*, 774 A.2d 40 (R.I. 2001).

The first prong of the test is satisfied when information is voluntarily provided to the governmental agency and that information is of a kind that would customarily not be released to the public by the person from whom it was obtained. *Providence Journal*, 774 A.2d at 47. National Grid meets the first and second prongs of this test, which apply here.

III. BASIS FOR CONFIDENTIALITY

The information contained in Attachment DIV 1-11 should be protected from public disclosure because it contains commercially sensitive/trade secret information relating to the study performed in connection with the construction of an LNG tank in Cumberland, Rhode Island. National Grid does not ordinarily make such studies public, and disclosing such commercially sensitive and proprietary information to the public could harm the Company. Moreover, the PUC has previously recognized the proprietary nature of these types of studies.

Accordingly, National Grid respectfully requests that the PUC provide confidential treatment to the confidential study attached as Attachment Division 1-11.

IV. CONCLUSION

For the foregoing reasons, National Grid respectfully requests that the PUC grant its Motion for Protective Treatment of Confidential Information.

Respectfully submitted,

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID
By its attorney,

_____

Raquel J. Webster, Esq. (#9064)
National Grid
40 Sylvan Road
Waltham, MA 02451
781-907-2121

Dated: December 20, 2019

Testimony of
Amy Smith

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4996
RE: FY 2021 GAS INFRASTRUCTURE,
SAFETY, AND RELIABILITY PLAN
WITNESS: AMY SMITH

DIRECT TESTIMONY

OF

AMY SMITH

December 20, 2019

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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Amy Smith. My business address is 40 Sylvan Road, Waltham, MA 02451.

Q. By whom are you employed and in what capacity?

A. I am employed by National Grid USA Service Company, Inc. (Service Company) as the Director, New England Jurisdiction. I am the New England state jurisdictional lead for all gas system issues, including those related to the capital investment strategies for Narragansett Electric Company, d/b/a National Grid (National Grid or the Company). In my role, I work closely with the Rhode Island Jurisdictional President and Jurisdiction staff on all local gas issues related to the Rhode Island gas system in the Rhode Island service territory. My responsibilities include working with regulators on issues related to the gas system, developing strategies to support Company objectives regarding investment in the gas system, and providing testimony regarding capital investments in National Grid's gas system during state regulatory proceedings.

Q. Please describe your educational background and professional experience.

A. In 1982, I graduated from Simmons College with a Bachelor of Arts in Economics and Mathematics. In 1991, I joined Boston Gas Company (now National Grid) as an analyst in Gas Supply Planning. Since that time, I have held a variety of positions in Rates and

Regulation, Performance Measurement, Credit and Collections, Customer Regulatory Relations, Emergency Dispatch, Gas Resource Planning, Network Strategy, Construction, Gas Pipeline Safety and Compliance and Gas Investment, Resource and Rate Case Planning. I assumed my current position on April 1, 2019. In addition, from 1984 to 1989, I worked for the Massachusetts Department of Public Utilities (the Department).

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC)?

A. Yes. In 2019, I filed testimony with the PUC in support of the Company's Reconciliation of the FY 2019 Infrastructure, Safety, and Reliability Plan. In 2011 and 2012, I testified at the PUC in support of the Company's Gas Infrastructure, Safety, and Reliability Plans. In 2011, I testified at a technical session in support of the Company's first Gas ISR Plan and presented the Company's five-year capital plan along with an explanation of how the existing Accelerated Replacement Program (ARP) would be closed out and transitioned to the new Gas ISR Plan (Docket 4219). In 2012, I also testified at a technical session in support of the Company's Gas ISR Plan for FY 2013 and addressed regulatory reporting requirements. (Docket 4306).

In Massachusetts, before the Department of Public Utilities (the Department) and on behalf of Boston Gas Company (Boston Gas) and Colonial Gas Company (Colonial Gas),

each d/b/a National Grid (collectively National Grid or the MA Companies), I have filed testimony and related exhibits in support of capital investment and gas safety and reliability proposals in the MA Companies' last two base rate increase proceedings, dockets D.P.U. 17-170 and D.P.U 10-55, respectively. I also filed testimony in support of the MA Companies' Targeted Infrastructure Replacement Factor filing in docket D.P.U. 11-36. In 2008, I testified at the Department regarding low-income credit and collections practices in docket D.P.U 08-4. In 2005, I testified at a technical session at the Department in support of the MA Companies' service quality performance in docket D.P.U. 04-116. I have also testified before the New Hampshire Public Utilities Commission.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the Company's proposed FY 2021 Gas ISR Plan (Gas ISR Plan or Plan).[1] Through my testimony, I present the Company's Gas ISR Plan, which details the work the Company expects to complete under the Plan and the anticipated capital investments associated with that work. Company witness Lee

[1] The Company is required by statute to annually file an infrastructure, safety, and reliability spending plan with the PUC for review and approval. *See* R.I. Gen. Laws § 39-1-27.7.1(d). In addition to budgeted spending, the annual Gas ISR Plan must contain a reconcilable allowance for the Company's anticipated capital investments and other spending for the upcoming fiscal year. *See* R.I. Gen. Laws § 39-1-27.7.1(c)(2). For FY 2021, the Company's fiscal year is for the period of April 1, 2020 through March 31, 2021, so the Plan would be effective April 1, 2020.

Gresham, JD, PhD is providing testimony on the operation and maintenance (O&M) expenses associated with the Gas ISR Plan, specifically, the Company's proposed Heat Decarbonization Assessment planned work. Company Witness Melissa A. Little is providing testimony on the calculation of the revenue requirement associated with the Company's Plan, and Company Witness Ryan M. Scheib is providing testimony relative to (1) how the Company calculated the rate design for the ISR mechanism; (2) the calculation of the ISR factors; and (3) the customer bill impacts of the proposed ISR factors.

III. OVERVIEW

Q. How did the Company prepare the Gas ISR Plan?

A. The Company prepared the Gas ISR Plan and submitted it to the Rhode Island Division of Public Utilities and Carriers (Division) for review on September 29, 2019.[2] On November 7, 2019 and November 8, 2019, the Company met with the Division regarding the Plan and subsequently responded to informal discovery requests from the Division about various components of the Plan. On November 9, 2019, the Company conducted field visits with the Division to provide the Division with the opportunity to observe

[2] R.I. Gen. Laws § 39-1-27.7.1(d) requires that the Company and the Division work together over the course of 60 days in an attempt to reach an agreement on a proposed plan, which is then submitted to the PUC for review and approval within 90 days.

various capital projects that have been completed, are currently under construction, and/or are planned for future periods. On November 10, 2019, the Company conducted a site visit of the Northboro Massachusetts Gas Control Center with the Division to provide the Division with the opportunity to view capital improvement projects that have been completed and/or are planned for future periods, along with an overview of the Rhode Island gas transmission and distribution systems. The Company and the Division continued to collaborate regarding the proposed Plan on several occasions, including subsequent meetings on November 14, November 21, November 26, and December 5, 2019. The Company also responded to several formal and informal supplemental data requests from the Division. The Division has indicated general concurrence with the proposed Gas ISR Plan, including the programs and projects outlined in the Plan, and will continue to review the Plan and its costs after filing, consistent with prior Gas ISR Plan filings. Overall, the Gas ISR Plan will allow the Company to meet state and federal safety and reliability requirements, maintain its gas distribution system in a safe and reliable condition and assess the feasibility of several decarbonization methods for the gas system. The Plan has been developed to improve the safety and reliability of the Company's gas system for the immediate and long-term benefit of Rhode Island's natural gas customers.

Q. What is the Gas ISR Plan designed to accomplish?

A. The Gas ISR Plan is designed to establish a spending plan, together with a reconcilable allowance for the anticipated capital investments and other spending needed to maintain and upgrade the Company's gas delivery system, such as proactively replacing leak-prone gas mains; upgrading the system's plant, pressure regulating systems, and piping; responding to emergency leak situations; and addressing conflicts that arise out of public works projects. The Plan attempts to attain the Company's safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas pipeline infrastructure and directly benefit Rhode Island gas customers. The Company now submits the Plan to the PUC for review and approval in accordance with Rhode Island law.[3]

Q. Are you sponsoring any exhibits through your testimony?

A. Yes. The proposed Gas ISR Plan is attached as Exhibit 1 to my testimony. The Plan is organized as follows:

[3] *See* R.I. Gen. Laws § 39-1-27.7.1(d).

Section 1 – Introduction and Summary

Section 2 – Gas Capital Investment Plan (including major categories of work)

Section 3 – Revenue Requirement Calculation

Section 4 – Rate Design and Bill Impacts

Attachment 1 – 2018 System Integrity Report

My testimony focuses on Sections 1 and 2 of the Plan. As noted earlier, Mr. Gresham is sponsoring the O&M – Heat Decarbonization Assessment testimony included in Section 2 of the Plan; Ms. Little is sponsoring the revenue requirement calculation included in Section 3 of the Plan; and Mr. Scheib is sponsoring the rate design and bill impacts included in Section 4 of the Plan.

Q. What types of infrastructure, safety, and reliability work does the Gas ISR Plan include?

A. The Gas ISR Plan seeks not only to maintain the Company's distribution system, but also to proactively upgrade the system's condition to address problems before they arise. A safe and reliable gas delivery system in Rhode Island is essential to the health, safety, and well-being of its citizens, and for maintaining a healthy economy and continuing to attract new residents and businesses to Rhode Island. In 2008, the PUC embarked on a course of addressing Rhode Island's aging gas infrastructure with the establishment of

the Accelerated Replacement Plan. The Company filed its first Gas ISR Plan on December 20, 2010 for FY 2012. In addition to the type of infrastructure, safety, and reliability work performed under the Accelerated Replacement Plan, the Gas ISR Plan contains spending related to safety and reliability for Public Works, Mandated programs, and Reliability programs, including Gas Expansion. Included in the Plan document is a description of the Company's proposed budget for capital investment and associated O&M expenses for FY 2021 and a capital forecast for FY 2022 through FY 2025. As agreed with the Division in the FY 2020 ISR Plan, given the magnitude of the scope and cost for the Southern Rhode Island Gas Expansion Project (Southern RI Gas Expansion), the Company will continue to manage any deviations from the FY 2021 Southern RI Gas Expansion Project budget separately from the overall Discretionary budget under the Plan. If deviations do occur with the Southern RI Gas Expansion Project, the Company will neither advance nor delay other Discretionary work to compensate for those changes in FY 2021 costs. This year's Plan also includes a section describing the history and effectiveness of the Gas ISR Plan and a copy of the most recent System Integrity Report, as ordered by the PUC in Docket No. 4781. Additionally, the Plan provides funding, as O&M, for Heat Decarbonization Assessments; testimony for this category is provided by Lee Gresham.

IV. CAPITAL INVESTMENT PLAN

Q. What levels of spending are proposed in the Gas ISR Plan?

A. For FY 2021, the Company proposes to invest a total of $199.61 million, including $39.30 million for Non-Discretionary capital expenditures; $144.79 million for Discretionary capital expenditures, which includes $40.46 million for the Southern RI Gas Expansion Project; $1.52 million for PE Stamps; $13.01 million for incremental curb to curb paving costs estimated in accordance with the new RI paving law; and $1.00 million of O&M spending to begin assessing capital investment options for heat decarbonization. The incremental paving costs include $2.61 million for incremental paving specific to the Southern RI Gas Expansion Project. The Plan is broken down into categories of Non-Discretionary, Discretionary, O&M, and Incremental Costs, each of which contain programs designed to maintain the safety and reliability of the Company's gas delivery infrastructure. Non-Discretionary programs include work required by legal, regulatory code, and/or agreement, or a result of damage or failure, with limited exceptions. Discretionary programs are not required by legal, regulatory code, and/or agreement, with limited exceptions. The O&M expenses are also discretionary but are categorized separately because they are not capital expenses. The Incremental Costs are broken out separately for tracking purposes, but they support work in both the Non-Discretionary and Discretionary categories.

Q. What levels of spending is the Company proposing for Non-Discretionary programs?

A. For each Non-Discretionary program category in the Gas ISR Plan, the Company proposes the following levels of spending:

- $17.37 million net investment for Public Works programs, including $18.77 million in capital spend and $1.40 million in reimbursements;
- $21.68 million for Mandated Programs (i.e., Corrosion, Purchase Meter Replacements, Reactive Leaks (Cast Iron Joint Encapsulation/Service Replacement), Service Replacement (Reactive) – Non-Leak/Other, Main Replacement (Reactive) – Maintenance (including Water Intrusion), Transmission Station Integrity; and
- $0.25 million for Damage/Failure programs.

Q. What levels of spending is the Company proposing for Discretionary programs?

A. For each Discretionary program category in the Gas ISR Plan, the Company proposes the following levels of spending:

- $67.73 million for the Proactive Main Replacement program (i.e., Proactive Main Replacement, Large Diameter, and Atwells Avenue project);
- $0.35 million for the new Proactive Service Replacement program;
- $36.25 million for Gas System Reliability, including work relative to Gas System Control, System Automation, Heater Program, Pressure Regulating Facilities, Allens Avenue Multi Station Rebuild, Valve Installation Replacement, Take Station Refurbishment, Gas System Reliability Enhancement, Instrumentation and Regulation – Reactive, Distribution

Station Over Pressure Protection, Liquefied Natural Gas (LNG) facilities, Replace Pipe on Bridges, Access Protection Remediation, and Tools and Equipment; and

- $40.46 million for the Southern Rhode Island Gas Expansion Project (Southern RI Gas Expansion).

Q. What level of spending is the Company proposing for the O&M Expenses category?

A. For the O&M Expenses category in the Gas ISR Plan, the Company proposes the following levels of spending:

- $1.00 million for Heat Decarbonization Assessments.

Q. What levels of spending is the Company proposing for the Incremental Costs category?

A. For the Incremental Costs category in the Gas ISR Plan, the Company proposes the following levels of spending:

- $1.52 million for Professional Engineer (PE) Stamps;
- $13.01 million for Incremental Curb to Curb Paving Costs, including Southern RI Gas Expansion and All Other ISR Work.

The Company will continue to file quarterly reports with the Division and PUC detailing the progress of its Gas ISR Plan programs for FY 2021.

Q. The Company has included $1.52 million for PE Stamps in response to the new Rhode Island statutory requirements regarding review and approval of certain work by a Professional Engineer. How did you arrive at that estimate?

A. The Company based its estimate on its experience with similar requirements in Massachusetts, using the work types and volumes proposed in the FY 2021 RI Gas ISR Plan.

Q. Do you anticipate any variance from the proposed estimate of PE Stamp costs?

A. Actual costs may vary based on the individual characteristics and complexity of each job, and whether any changes to a job occur after the job has started, such as change in scope or field conditions that require a PE to update and approve revised plans.

Q. Explain why the company has included incremental curb to curb paving costs in this plan.

A. In the Summer of 2019, the Governor signed the new Rhode Island Utility Fair Share Roadway Repair Act into law. The Act requires public utilities or utility facilities to repave and repair roadways that they alter or excavate from curb to curb or as required in accordance with state or municipal utility permit requirements. Historically, the Company's typical area of pavement restoration for work in roadways has been isolated to the side of the street where the work occurred, an approximately 8-11 feet width off

the curb and the length of the trench. The Company estimates that the new paving law will result in $13.01 million in incremental paving costs for FY 2021, which includes $2.61 million for incremental paving costs for the Southern Rhode Island Gas Expansion Project (Southern RI Gas Expansion Project) and $10.40 million for all other ISR work. The Company has included the estimated incremental paving costs in the FY 2021 Gas ISR plan because they will be costs incurred in direct relation to the capital investment work contained in the Gas ISR.

Q. The Company has included $13.01 million for incremental curb to curb paving costs including the Southern RI Gas Expansion project and all other ISR Work. Please explain how this cost was estimated.

A. The incremental curb to curb paving cost estimate of $13.01 million is comprised of three cost categories: Main Installation for $5.60 million; Patches for $4.80 million; and the Southern RI Gas Expansion Project for $2.61 million. A summary of the total estimate for the FY 2021 Gas ISR Incremental Curb to Curb Paving Costs is presented in the table below. For the Main Installation incremental cost estimate, the Company estimated the current final restoration paving width to be 10.28 feet or 6,033 square yards of paving per mile and the average curb to curb restoration will be 26 feet or 15,253 square yards per mile. Based on a cost per square yard of $12.50 for the current average paving, the cost per mile is approximately $0.08 million. When the final restoration width is extended to

curb-to-curb, the Company anticipates additional costs of approximately 20% will be incurred for incremental work such as driveway aprons, line striping, drainage, sewer, intersection sensors and other miscellaneous work. Therefore, the estimated cost per mile for curb to curb restoration is $0.23 million per mile, resulting in an incremental cost per mile of $0.15 million to extend paving to curb to curb. After deducting the estimated miles that are already paved curb to curb and included in the average width of 10.28 feet, the Company estimates the incremental cost of paving curb to curb will be $5.60 million.

For final restoration patches, the Company estimates that 3,429 ISR patches will be completed in FY 2021. The cost of a standard patch is approximately $1,400. The Company estimates that for 50% of the patches, the state and municipal permits will require patch areas that are larger than a current standard patch. The Company anticipates those patch widths will be extended to curb to center line and curb to curb and therefore the average patch cost is anticipated to be $2,800 per patch, resulting in an incremental cost per patch of $1,400 or $4.80 million for all final restoration patches.

For the Southern RI Gas Expansion project, the incremental paving costs of $2.57 million reflect the cost of extending the width of the final restoration paving and the cost of

complying with new Rhode Island Department of Transportation (RIDOT) concrete base restoration guidelines.

FY 2021
Incremental Curb to Curb Paving Costs
Main Installation, Patches, and Southern RI Gas Expansion Project

Planned Main Installation Paving Miles	42.3

*Note that minus the ~14% which is already paved curb to curb, this number is effectively approximately 36.5 miles

Main Installation Paving	**Sq Yards/ Mile**	**Cost/ Sq Yd**	**Added Costs %***	**Cost/Mile**	**Total Cost for 42.92 Miles**	**Budget**
Minimum 8ft Restoration	4,693	$ 12.50		$ 58,663	$ 2,480,837	
Average 10.28ft Restoration	6,033	$ 12.50		$ 75,410	$ 3,189,089	
Curb to Curb 26 ft Restoration	15,253	$ 12.50	20%	$ 228,800	$ 9,675,952	
Curb to Curb minus Average = Incremental Cost/mile				$ 153,390	$ 6,486,863	
Deduct ~14% for roads already paved curb to curb					$ 890,889	
Total Incremental Cost for curb to curb main installation paving					$ 5,595,974	**$ 5,596,000**

*Added Costs for paving curb to curb such as driveway aprons, striping, drainage, sewer, intersection sensors, etc.

Planned ISR Patches	3,429

Patching Paving Costs	**Average Cost/Patch**	**Total Cost for 3,429 Patches**	**Budget**
Standard	$ 1,400	$ 4,800,600	
Mix of curb to curb and curb to center @ 50% adoption rate	$ 2,800	$ 9,601,200	
"Curb to Curb" minus Standard = Incremental Cost/Patch	$ 1,400	$ 4,800,600	**$ 4,801,000**

Southern RI Gas Expansion Incremental Paving Costs	**Incremental Paving Cost**	**Budget**
Main Installation*	$ 2,565,078	$ 2,565,000
Other Investment - MOP Increase from 150 to 200 psi	$ 49,000	$ 49,000
Total Incremental Southern RI Gas Expansion Paving Costs	$ 2,614,078	**$ 2,614,000**

*Cost also includes impact of new RIDOT concrete restoration guidelines

FY 2021 Gas ISR Incremental Paving Costs by Category	**Incremental Paving Cost**	**Budget**
Main Installation - 44.43 miles	$ 5,595,974	$ 5,596,000
Patches - 3,429 @ 50% (mix curb to curb and curb to center)	$ 4,800,600	$ 4,801,000
Southern RI Gas Expansion	$ 2,614,078	$ 2,614,000
Total FY 2021 ISR Incremental Paving Costs	**$ 13,010,652**	**$ 13,011,000**

Q. How does the Company plan to treat the replacement of leak-prone pipe in Rhode Island in FY 2021?

A. To continue to provide safe and reliable gas service to its Rhode Island customers, the Company is proposing to abandon approximately 62 miles and rehabilitate approximately 1 mile of leak-prone pipe in FY 2021, which is an increase of 1 abandonment mile compared to the FY 2020 ISR Plan and keeps pace with the 20-year Proactive Main Replacement program. The Large Diameter program accounts for approximately 1 mile of rehabilitation by utilizing sealing and lining techniques. The Atwells Avenue Main Replacement project is contributing approximately 0.6 miles to the abandonment total. The Public Works program is contributing 13 miles to the abandonment total. The Proactive Main Replacement – Leak Prone Pipe program is contributing approximately 47.4 miles to the abandonment total. The Company is proposing FY 2021 spending of $67.73 million for the Proactive Main Replacement program, which includes $5.08 million for the Atwells Avenue project, and $17.37 million for the Public Works program. The value of and need for targeted spending on the replacement of leak-prone gas main is well-documented and is only increasing in importance as these facilities continue to age. The 20-year Proactive Main Replacement program and corresponding five-year plan call for the abandonment of 70 miles of leak-prone pipe per year from FY 2022 to 2025. The Company is currently assessing the feasibility of increasing the abandonment target by 8 miles from FY 2021 to FY 2022 and beyond.

Q. What is the difference between installation miles and abandonment miles in relation to the replacement of leak-prone pipe?

A. Installation miles represent the units of new main that are required to be connected to the distribution system. Thus, installation miles represent the main driver for unit costs when combined with service relays and tie overs. Abandonment miles represent the total of the old leak-prone pipe that is retired or disconnected from the distribution system. In some instances, the existence of parallel leak-prone main provides the Company with the opportunity to install a single section of new main to abandon two sections of existing leak-prone main; the current FY 2021 workplan contains approximately 3.9 miles of parallel main to be abandoned (the FY 2020 workplan originally contained 3.0 miles of parallel main). This will result in annual leak-prone pipe replacement program targets where total abandonment miles exceed total installation miles.

Q. How do the FY 2021 leak-prone pipe replacement programs compare to the FY 2020 programs?

A. The Public Works program abandonment and installation miles will remain the same at 13 miles. The table below provides a comparison of the Main Replacement – Leak Prone Pipe program between FY 2020 and FY 2021, including the estimated cost per mile for installed and abandoned main in urban, suburban, and rural areas. This table excludes the Large Diameter program and the costs for the Atwells Avenue Main Replacement

program because the nature of those programs are not suitable for year-over-year comparison. The average installation cost per mile for work in rural locations is estimated to increase from $0.86 million in FY 2020 to $0.97 million in FY 2021. The average installation cost per mile for work in suburban locations is estimated to increase from $1.13 million in FY 2020 to $1.24 million in FY 2021. The average installation cost per mile for work in urban locations is estimated to decrease from $1.83 million in FY 2020 to $1.77 million in FY 2021 because the FY 2021 plan contains a slightly higher volume of replacements that are changing from low-pressure to high-pressure and calls for the installation of 2-inch and 4-inch main instead of 6-inch and 8-inch main which results in a cost savings per mile.

FY 2020 (Plan as of 12/19/2018)				
	Installation Miles	Abandonment Miles	Installation Cost/Mile	Abandonment Cost/Mile
Rural	5.9	6.6	$0.86M	$0.76M
Suburban	18.4	20.1	$1.13M	$1.04M
Urban	17.1	20.3	$1.83M	$1.54M
Total	41.3	47.0	$1.38M	$1.22M

FY 2021 (Plan as of 12/18/2019)				
	Installation Miles	Abandonment Miles	Installation Cost/Mile	Abandonment Cost/Mile
Rural	4.0	4.6	$0.97M	$0.84M
Suburban	21.9	23.6	$1.24M	$1.15M
Urban	16.4	19.2	$1.77M	$1.51M
Total	42.3	47.4	$1.42M	$1.27M

Q. Have the Company's efforts at replacing leak-prone pipe been effective?

A. Yes. When the ISR program was first implemented in FY 2012, approximately 48 percent of the Company's gas distribution system in Rhode Island was comprised of leak-prone pipe. Through the FY 2019 Gas ISR Plan, the Company has abandoned a total of 445 miles of leak-prone pipe, which has contributed to an estimated reduction of 1,235 gas leaks. An important system performance indicator regarding the effectiveness of the Company's leak-prone pipe abandonment program is the number of leak receipts. Since 2008, the Company has seen an overall downward trend on leak receipts, which indicates that the ISR program and former Accelerated Replacement Program have contributed to this result. More details regarding the effectiveness of the Gas ISR Plan are provided in the Company's most recent System Integrity Report (2018), which is included as an attachment to the Plan.

Q. Has the Company made any modifications in the Plan related to the replacement of leak-prone pipe?

A. Yes. The Company will continue its renewed Large Diameter Program, where there is an inventory of 37 miles of leak-prone pipe greater than 12-inches in diameter. The Company forecasts that this program will result in an underspend in FY 2020 because the Company was unable to complete planned segments of work in Providence due to permitting issues. Therefore, the delayed work has been deferred until FY 2021. For 2021 the Company proposes to spend $3.40 million to address approximately 1 mile of

large diameter main through lining or sealing techniques. The Company originally put this program on hold in FY 2019 to mitigate the impact of the Special Projects that needed to be funded in that Plan, but the need to replace the large diameter inventory necessitated the inclusion of the program in FY 2020 and again in FY 2021.

In addition, the FY 2021 Plan continues to include the Atwells Avenue Main Replacement project, which will be year two of a three-year project. In the 2017-2018 winter period, the Company experienced four main breaks on Atwells Avenue in Providence on 12-inch low pressure cast iron main installed in the 1870s. This main is located in one of the busiest streets within Providence, with a heavy concentration of restaurants. Upon completion of an integrity analysis, the Company deemed it necessary to abandon over 1 mile of cast iron main and replace it with over 1 mile (5,505 feet) of high-density polyethylene (HDPE) plastic pipe between FY 2020 and FY 2022. The project is broken into 4 segments; 1A – 1,565 feet; 1B – 1,565 feet; 2 – 965 feet; and 3 – 1,410 feet. In FY 2020, the Company is addressing the highest risk segment, Segment 2. In mid-September 2019, the City of Providence granted the Company a permit to begin that work. Due to the later than anticipated field work start date, the Company was unable to accelerate the Segment 1A work into FY 2020 and Segment 1A is now part of the FY 2021 workplan. The $5.08 million budget in FY 2021 includes the completion of Segments 1A and 1B and the engineering and design work in preparation of Segment 3,

which is scheduled to be completed in FY 2022. The final restoration work associated with Segment 2 is anticipated to be completed in FY 2020. The final restoration work associated with Segments 1A and 1B, along with the field work for Segment 3 are scheduled to be completed as part of the estimated FY 2022 budget of $5.19 million. The total estimated cost for the Atwells Avenue main replacement project is approximately $11.63 million, although the estimate is subject to change.

Q. What is the Southern Rhode Island Gas Expansion Project?

A. As was detailed in the FY 2020 Gas ISR, the Company has identified a need and has begun to build in increased capacity in the Southern Rhode Island service territory. The more than 30,000 customers in the Company's Southern Rhode Island service territory are served by almost 600 miles of distribution infrastructure, including approximately 77 miles of distribution main operating at pressures of 99 psig and above (the Southern Rhode Island Distribution Mains). As of 2018, growth forecasts indicated the maximum vaporization capacity at the Exeter LNG facility would be exceeded by calendar year 2019. This could have resulted in approximately 3,750 customers with below minimum pressures and them being at risk of losing service. In addition, several regulator station inlet pressures are predicted to fall below the minimum threshold, which would cause problems on the downstream pressure systems if the regulator stations cannot maintain their outlet set pressure. Increasing capacity in Southern Rhode Island mitigates the risk

of customers in the region losing service in the event of an outage at the Exeter LNG facility. Moreover, many commercial customers seeking to expand existing and new operations in the Southern Rhode Island region, such as in and around Quonset Point, cannot be served without this project. Without this project, the Company may have needed to impose a moratorium on all new gas service requests, as well as requests for expansion of existing gas service, to prevent service interruptions to existing customers. To address these capacity issues, in FY 2020, the Company began construction on a project to reinforce the Southern Rhode Island Distribution Mains by installing approximately five miles of new 20-inch steel distribution main parallel to the existing 12-inch distribution main located beneath Route 2 (a Rhode Island Department of Transportation right-of-way) through the towns of Warwick, West Warwick, and East Greenwich. The parallel distribution main is being constructed to be in-line inspected, initially operated at 99 psig, and designed for a maximum allowable operating pressure (MAOP) of 200 psig to meet future demand. The new distribution main will be placed in-service in phases between FY 2020 and FY 2022, with normal operation at 99 psig and the potential to operate at 200 psig after a district regulator station is installed in the future near South Road in East Greenwich. This project will also require work on existing regulator and take stations from FY 2021 through FY 2023. Based on current forecasts, each segment will add immediate growth capacity. Once all of the segments are completed, the Company expects that approximately 1,100 dekatherms per hour of

additional capacity will be available. The installation of a second distribution main will also improve the reliability of the Company's gas distribution system in the area by decreasing the Company's dependence on pressure support from the Exeter LNG facility and by introducing redundancy that reduces the risk associated with a distribution main being out of service.

Q. What is the cost and scope of work for the Southern Rhode Island Project?

A. Between FY 2020 and FY 2024, the Company estimates that it will spend a total of $125.53 million for the Southern Rhode Island Project, which includes $3.54 million for incremental curb to curb paving along with costs associated with new RIDOT concrete base restoration guidelines. The work is comprised of main installation, regulation station investment, and other upgrades and investment. For the main installation portion of the Southern Rhode Island Project, the Company plans to install a total of 5 miles (26,625 feet) of new 20-inch steel distribution main. Between FY 2020 and FY 2023, the total estimated cost for the main installation work is currently $96.79 million, based on a completed design and an 80 percent level of confidence based on identified risks and future unknown risks, which includes incremental paving costs of $3.49 million. Factors contributing to the 80 percent project confidence level include the known increase of contractor pricing for the awarded phase two and three contracts versus the original estimates, assumptions around the increased presence of ledge based on phase one field conditions, changes to the RI paving law, new RIDOT concrete base restoration

guidelines, permitting and work hour restrictions, requirements for night work, and handling of contaminated soil and ground water. For FY 2021, the Company expects to spend a total of $41.36 million for the main installation work, which includes incremental paving costs of $2.57 million.

In FY 2021, the Company plans to continue preparation work, such as planning, engineering, and site planning, for regulator stations associated with the Southern Rhode Island Project. Between FY 2021 and FY 2023, the Company plans to upgrade the Cranston Take Station and the Cowesett Regulator Station. The total estimated cost for the FY 2020 through FY 2024 regulator station work is currently $17.58 million. Additional funding of $5.79 million is included for a planned new regulator station located at the southern end of the main installation to reduce the system pressure from a MAOP of 200 psig to 99 psig before feeding back into the distribution system, with the majority of construction planned for FY 2023.

Other upgrades and investment for the Southern Rhode Island Project include the installation of a launcher and receiver to support in-line inspections of the 200 psig main, material testing to support the maximum operating pressure (MOP) increase from 150 psig to 200 psig for 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick, and the installation of a remote operating valve (ROV). The total estimated

cost for the FY 2020 through FY 2023 other upgrades and investment work is currently $11.16 million, which includes incremental paving costs of $0.05 million related roadway patches for the MOP increase. For FY 2020, the Company estimates that it will spend $3.55 million for the material testing. For FY 2021, the Company estimates that it will spend $0.98 million to complete the remainder of the material testing, which includes incremental paving costs of $0.05 million. All other work in this category is planned to occur in FY 2022 and FY 2023. The estimates related to the FY 2022 and FY 2023 work are considered preliminary and will be updated as part of the Company's FY 2022 Gas ISR Plan.

Q. Is the Company including any proposed operation and maintenance (O&M) expense in the FY 2021 Gas ISR Plan, as it has in prior Plans?

A. Yes. In prior years, the Company has included O&M expenses associated with supporting the ISR Plan. In FY 2021, the Plan includes $1.00 million of O&M expenses to support the Heat Decarbonization Assessment category. The testimony of Lee Gresham, JD, PhD provides further detail regarding the planned work for that category.

Q. Does the FY 2021 Gas ISR Plan fulfill the statutory requirements for the safety and reliability of the Company's gas distribution system in Rhode Island?

A. Yes. The FY 2021 Gas ISR Plan establishes the capital investment in Rhode Island that is necessary to meet the needs of the Company's customers, together with a spending and work plan to maintain the overall safety and reliability of the Company's Rhode Island gas distribution system.

V. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

Exhibit 1
Gas ISR FY2021

The Narragansett Electric Company
d/b/a National Grid

FY 2021 Gas Infrastructure, Safety, and Reliability Plan Proposal

December 20, 2019

Submitted to:
Rhode Island Public Utilities Commission

nationalgrid

Section 1
Introduction

Section 1

Introduction and Summary
FY 2021 Proposal

Introduction and Summary
FY 2021 Proposal

In consultation with the Rhode Island Division of Public Utilities and Carriers (Division), National Grid[1] has developed the following proposed fiscal year (FY) 2021[2] gas infrastructure, safety, and reliability (ISR) plan (Gas ISR Plan or Plan) in compliance with R.I. Gen. Laws § 39-1-27.7.1 (Revenue Decoupling Law), which provides for the filing of "[a]n annual gas infrastructure, safety and reliability spending plan for each fiscal year and an annual rate reconciliation mechanism that includes a reconcilable allowance for the anticipated capital investments and other spending pursuant to the annual pre-approved budget."[3] The proposed Gas ISR Plan addresses capital spending on gas infrastructure and other costs related to maintaining the safety and reliability of the Company's gas distribution system. Through the Plan, the Company will maintain and upgrade its gas delivery system by proactively replacing leak-prone pipe; upgrading the gas delivery system's custody transfer stations, pressure regulating facilities, and peak shaving plants; responding to emergency leak situations; addressing infrastructure conflicts that arise out of state, municipal, and third-party construction projects. The Company will also begin assessing capital investment options for heat decarbonization. The Plan intends to attain these safety and reliability goals through a cost-effective, coordinated work plan. The level of work that the Plan provides will sustain and enhance the safety and reliability of the Rhode Island gas pipeline infrastructure, promote

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

[2] FY 2021 is defined as the 12 months ending March 31, 2021.

[3] R.I. Gen. Laws § 39-1-27.7.1(c)(2).

efficiency in the management and operation of the gas distribution system, and directly benefit Rhode Island gas customers. The Company now submits the Plan to the Rhode Island Public Utilities Commission (PUC) for review and approval.[4]

This Introduction and Summary presents (1) a history of the Gas ISR program in Rhode Island and a statement regarding how the ISR program has contributed to safety and reliability; (2) an overview of the proposed FY 2021 Plan for the statutory categories of costs; (3) the resulting FY 2021 revenue requirement associated with the proposed Plan; and (4) the rate design based upon that revenue requirement and estimated typical bill impacts resulting from the rate design.

The Gas ISR Plan describes the Company's safety and reliability activities and the multi-year plan upon which the FY 2021 Plan is based. The Plan also addresses capital investment in utility infrastructure for the upcoming fiscal year. The Plan itemizes the recommended work activities by general category and provides budgets for capital investment and associated operation and maintenance (O&M) expenses.

As envisioned in the Revenue Decoupling Law, after the end of the fiscal year, the Company will true up the Gas ISR Plan's budgeted levels to its actual investment and expenditures and reconcile the revenue requirement associated with the actual investment and expenditures with the revenue billed from the rate[2] adjustments implemented at the beginning of each fiscal year. The Company will continue to file quarterly reports with the Division and PUC

[4] In accordance with R.I. Gen. Laws § 39-1-27.7.1(d), the Company and the Division must work together over the course of 60 days in an attempt to reach an agreement on a proposed Plan, which must then be submitted to the Public Utilities Commission (PUC) for review and approval within 90 days.

concerning the progress of its Gas ISR programs. In addition, when the Company makes its reconciliation and rate adjustment filing described below, the Company will file an annual report on the prior fiscal year's activities. In implementing an ISR plan in any fiscal year, the circumstances encountered during the year may require reasonable deviations from the original ISR plan. In such cases, the Company will include in its quarterly reports an explanation of any significant deviations.

In the Summer of 2019, the Governor signed the new Rhode Island Utility Fair Share Roadway Repair Act into law. The Act requires public utilities or utility facilities to repave and repair roadways that they alter or excavate from curb to curb or as required in accordance with state or municipal utility permit requirements. Historically, the Company's typical area of pavement restoration for work in roadways has been isolated to the side of the street where the work occurred, an approximately 8-11 feet width off the curb and the length of the trench. The Company estimates that the new paving law will result in $13.01 million in incremental paving costs for FY 2021, which includes $2.61 million for incremental paving costs for the Southern Rhode Island Gas Expansion Project (Southern RI Gas Expansion Project) and $10.40 million for all other ISR work. Details of the incremental paving costs are detailed below. Estimated paving incremental costs are not included in each category, but rather, are shown in a separate line item against which the Company will track actual incremental paving costs associated with the new law.

The FY 2021 level of capital and related O&M spending provided in the Gas ISR Plan to maintain the safety and reliability of the Company's gas delivery infrastructure is $199.61 million. As described in more detail below, this amount includes $40.46 million to continue the

Southern RI Gas Expansion Project, which the Company manages as a distinct spending portfolio, $2.61 million for incremental curb to curb paving costs for that project, $10.40 million in incremental curb to curb paving costs for all other ISR work, $1.52 million to implement new statutory requirements to have natural gas infrastructure design plans and specifications approved by a Rhode Island registered Professional Engineer (PE Stamp) when the work could pose a material risk to public safety, and $144.63 million for the rest of the Plan. .

A description of the Company's proposed capital investment plan for FY 2021 is provided in Section 2. The revenue requirement description and calculations are contained in Section 3. A description of the rate design and bill impacts are provided in Section 4.

History of the ISR Plan

The Rhode Island natural gas distribution system is one of the oldest in the United States and includes a large proportion of leak-prone and deteriorating infrastructure installed, in some instances, more than 100 years ago. The Company, which owns and operates the gas distribution system, has an obligation to provide safe and reliable service to customers in compliance with applicable state and federal pipeline safety statutes and regulations. However, the challenge of meeting this obligation is amplified on the portions of the distribution system containing leak-prone pipe, which consists of unprotected steel, cast iron and wrought iron, and vintage Aldyl-A and Polybutylene plastic pipe.

In accordance with the Revenue Decoupling Law, the Company filed its first Gas ISR plan on December 20, 2010 for FY 2012. The ISR program replaced the Accelerated Replacement Program (ARP), which began as part of the Company's 2008 rate case in

Docket No. 3943. The ARP targeted the replacement of cast iron and non-cathodically protected steel mains and non-cathodically protected steel inside services. The ISR program expanded on the ARP through inclusion of other capital programs related to safety and reliability for public works, mandated programs, and reliability. From FY 2012 to FY 2019, the Company has invested a total of $661 million through the Gas ISR program. This includes a total of $416 million that targeted the replacement of leak-prone pipe through the Company's Proactive Main Replacement and Public Works programs. When the ISR program was first implemented, approximately 48 percent of the Company's gas distribution system in Rhode Island was comprised of leak-prone pipe. The table below highlights a total of 445 miles of leak-prone pipe abandoned through the FY 2019 ISR Plan that has contributed to an estimated reduction of 1,235 leaks.

Description	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	Total
Total ISR Abandonment Miles	46	47	53	55	59	63	62	60	445
Gas Leaks Eliminated	191	186	140	121	150	109	178	160	1,235

To monitor its system performance, the Company prepares an annual System Integrity Report. A copy of the most recent System Integrity Report (2018) is provided as Schedule 1 at the end of the Plan. The System Integrity Report provides historical data on leak receipts, leak repairs, open leaks, and inventory of mains and services. Additional data is provided around material type for each of the listed categories. The Company considers leak receipts to be an important system performance indicator regarding the effectiveness of its leak-prone pipe abandonment program. Since 2008, the Company has seen an overall downward trend on leak receipts, which would indicate that the ISR and ARP programs have contributed to this result.

Notably, variability in year-to-year annual leaks per mile will occur. Contributing factors include weather, public awareness, and overall system deterioration rates.

Section 2: Gas Capital Investment Plan

The Company's proposed gas capital investment plan set forth in Section 2 summarizes the Company's planned capital investments in terms of the following key Discretionary[5] and Non-Discretionary[6] categories, Incremental Costs, and Operation and Maintenance Expenses:

Non-Discretionary:

A. Public Works
B. Mandated Programs
C. Damage/Failure

Discretionary:

A. Proactive Main Replacement
B. Proactive Service Replacement
C. Heat Decarbonization
D. Gas System Reliability
E. Southern RI Gas Expansion

Incremental Costs:

A. Professional Engineering Stamps
B. Curb to Curb Paving - all ISR Work (excluding Southern RI Gas Expansion)
C. Curb to Curb Paving - Southern RI Gas Expansion

Operation and Maintenance Expenses:

A. Heat Decarbonization

[5] Discretionary programs are not required by legal, regulatory code, or agreement, or a result of damage or failure, with limited exceptions.

[6] Non-Discretionary programs include projects that are required by legal, regulatory code, and/or agreement, or which are the result of damage or failure, with limited exceptions.

Section 2 itemizes the proposed activities by sub-categories and provides budgets for each sub-category. The Company has included its capital budget, identified the relevant projects that would be part of the Gas ISR Plan, and provided its rationale for the need for and benefit of performing such work to provide safe and reliable service to its customers. The Company has also provided a five-year capital plan to provide a longer-term approach to infrastructure, safety, and reliability and to demonstrate how the FY 2021 Plan would be incorporated into that longer-term planning approach.

The Company's FY 2021 Plan includes the elimination or rehabilitation of a total of approximately 63 miles of leak-prone pipe (approximately 48 miles of proactive main replacement, 1 mile of rehabilitation work, 13 miles of public works replacement, and 1 mile of reinforcement work). This resulting abandonment target of approximately 62 miles for FY 2021 is an increase of 1 mile compared to the FY 2020 ISR Plan and keeps pace with the 20-year Proactive Main Replacement program. The Company has increased the Proactive Main Replacement program cast iron abandonment percentage from 60 percent to 61 percent. Cast iron represents 63 percent of the Company's total leak-prone pipe inventory.

The FY 2021 Gas ISR Plan also includes a category for Gas Expansion, namely, to reinforce the distribution mains in Southern Rhode Island (the Southern RI Gas Expansion Project). As noted in the FY 2020 Gas ISR Plan, the Southern RI Gas Expansion Project presents unique challenges for the Company with managing the Plan due to its size, cost, and complexity. As part of the execution of the Southern RI Gas Expansion Project, the forecasted spend in FY 2021, and in future fiscal years, may change as risks occur and/or cost savings are achieved. If the Southern Rhode Island Project is managed with the overall Discretionary

portfolio, any changes may result in the need to advance or delay several projects, especially if the variance is significant. Instead, the Company will continue to manage the Southern RI Gas Expansion Project as a distinct portfolio of spend and not advance or delay other projects if over- or under-spend occurs on the Southern RI Gas Expansion Project.

Section 3: Revenue Requirement

The Company has provided a calculation of the cumulative revenue requirement resulting from the proposed FY 2021 capital investment plan. Section 3 of the Plan contains a description of the revenue requirement model for FY 2021 and an illustrative calculation for FY 2022. This calculation would form the basis for the Plan rate adjustment, which would become effective April 1, 2020 upon PUC approval. As provided in Section 3 of the Plan, in accordance with the Company's gas tariff, RIPUC NG-GAS No. 101, Section 3, Schedule A, Item No. 3.3, the Company will reconcile this rate adjustment as part of its annual Distribution Adjustment Charge filing. The pre-tax rate of return on rate base is the rate of return approved by the PUC in the Amended Settlement Agreement in the Company's most recent general rate case, Docket No. 4770. In the future, the pre-tax rate of return would change to reflect changes to the rate of return approved by the PUC in future rate case proceedings. Any change in the rate of return would be applicable on a prospective basis, effective at the time of the change.

Section 4: Rate Design

For purposes of rate design, the revenue requirement associated with the capital investment is allocated to rate classes based upon the most recent rate base allocator approved in

the Amended Settlement Agreement in Docket No. 4770. For each rate class, the allocated revenue requirement is divided by the applicable fiscal year forecasted therm deliveries to arrive at a per-therm factor unique to each rate class.

The estimated typical bill impacts associated with the rate design and bill impacts are provided in Section 4. Including the $1.52 million cost associated with PE Stamps, and the incremental $13.01 million cost associated with the new RI curb to curb paving law, the bill impact of the Gas ISR Plan for the average Residential Heating customer for the period April 1, 2020 through March 31, 2021 would be an annual increase of $44.08, or 3.7 percent, from last year's bills. Excluding the incremental $13.01 million for paving costs, the bill impact would be an annual increase of $41.46, or 3.4%, from last year's bills.

Attachment 1
2018 System Integrity Rept

Attachment 1

The 2018 System Integrity Report is included as an attachment to this report.

Please see Attachment 1

2018 SYSTEM INTEGRITY REPORT

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Enterprise
Gas Distribution Systems
Trend-Based Integrity Analysis

RI

Gas Distribution Engineering
Gas Asset Management– Gas Process & Engineering

Saadat Khan (631) 710-3510 Director – Gas Distribution Engineering
Leomary Bader (781) 907-2785 Manager – Gas Distribution Engineering
Aamir Khizar (631) 770-3511 Senior Engineer – Gas Distribution Engineering
Yan Wang-jiang (781) 907-2241 Engineer – Gas Distribution Engineering
Kevin Lim (315) 428-6399 Engineer – Gas Distribution Engineering
Jim MacMartin (315) 428-5054 Engineer – Gas Distribution Engineering
Kevin Peters (631) 770-3438 Engineer – Gas Distribution Engineering
Prathiba Seetharam (516) 448-8673 Engineer – Gas Distribution Engineering
Madeline Blaisdell (781) 907-4164 Assoc. Engineer – Gas Distribution Engineering

2018 SYSTEM INTEGRITY REPORT

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2018 SYSTEM INTEGRITY REPORT

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2018 SYSTEM INTEGRITY REPORT

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Overall Regional Gas Distribution Integrity Assessment Summary

2018 SYSTEM INTEGRITY REPORT

Overall Regional Distribution Integrity Assessment Summary

Distribution Engineering has reviewed all of the findings in the annual Trend-Based Distribution System Integrity Analysis (*System Integrity Report*) in accordance with our Distribution Integrity Management Plan (DIMP), and finds that leak receipts have decreased slightly for MA. NYS and RI have experienced only slight increases in the amount of leak receipts despite an elevated number of Heating Degree Days which is a testament to the effectiveness of the accelerated LPP replacement program in identifying the correct LLP for replacement. There are no immediate causes for concern that would warrant changes to DIMP. Any anomalies found were either explained as non-systemic or set up for continued research and/or monitoring. These will be explained in notes to this report. CI main break rates have increased in every region which has been attributed to a combination of an elevated number of Heating Degree Days as well as milder average temperatures which resulted in a higher number of freeze-thaw cycles.

Below is a summary of the individual key integrity measure results for Rhode Island.

NATIONAL GRID 2018 System Integrity Report Summary	
REGIONS	RI
ITEMS	
• Leak Receipts	↑
• Workable Leak Backlog	↑
• LPP Main and Service Inventories	↓
• Overall Main Leak Rate	↑
• Cast Iron Main Break Rate	↑
• Steel Main Corrosion Leak Rate	→
• Service Leak Rate	↓

↑ Increase ↑ Slight Increase → No Change ↓ Decrease

2018 SYSTEM INTEGRITY REPORT

LEAK RECEIPTS, REPAIRS AND BACKLOG BY HDD TREND (Main & Service)

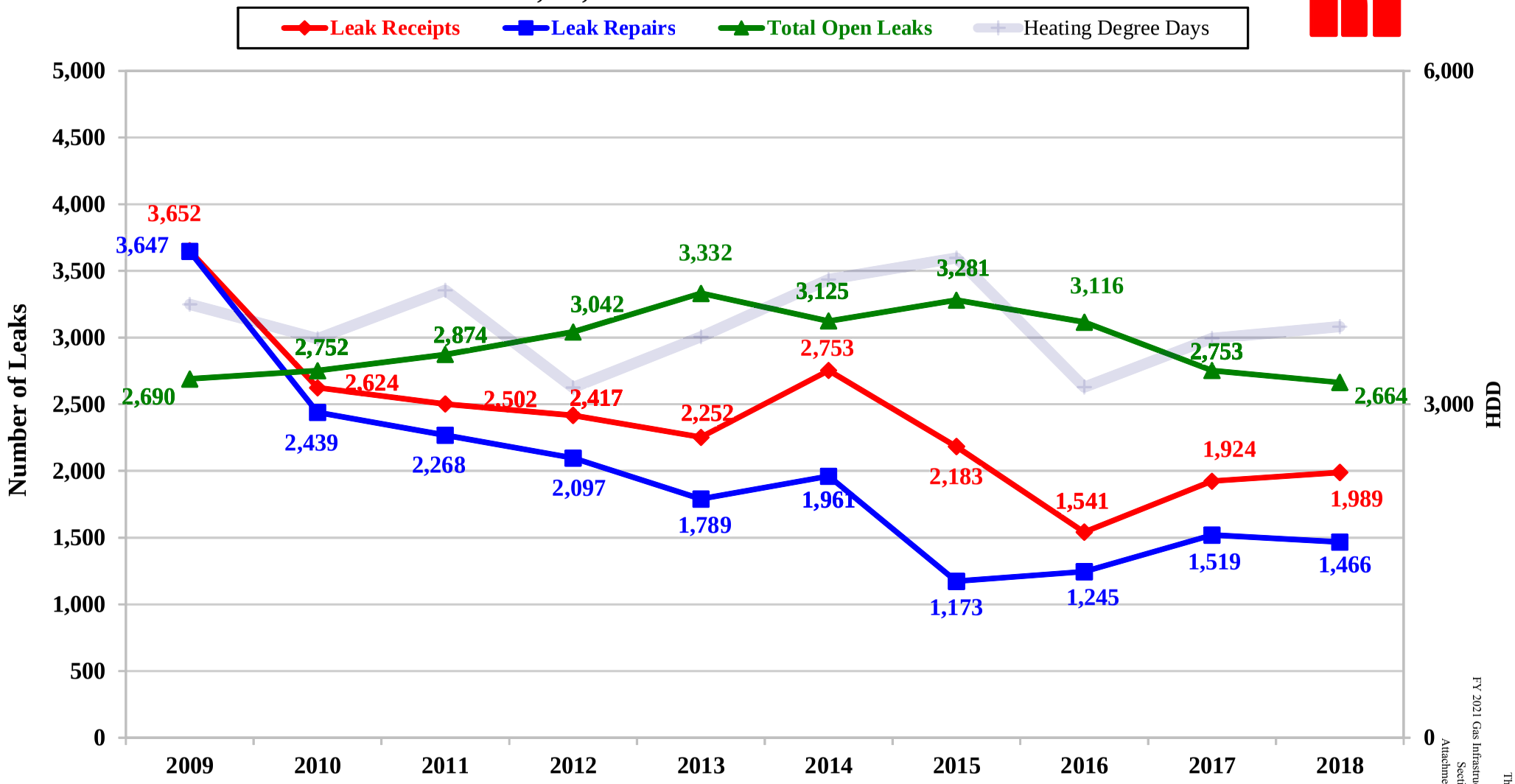
NOTE: Heating Degree Day (HDD)

2018 SYSTEM INTEGRITY REPORT

TOTAL LEAK RECEIPTS, REPAIRS & BACKLOG

RI

INCLUDES ALL TYPE 1, 2A, 2 and 3 LEAKS DISCOVERED - EXCLUDING DAMAGES



Leak Receipts and Repairs and Backlog:

2018 RI Leak Repairs = ↓ 2018 RI Leak Receipts = ↑ 2018 RI Leak Backlogs = ↓

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2018 SYSTEM INTEGRITY REPORT

Overall Regional Distribution Integrity Assessment Summary

Rhode Island (RI)

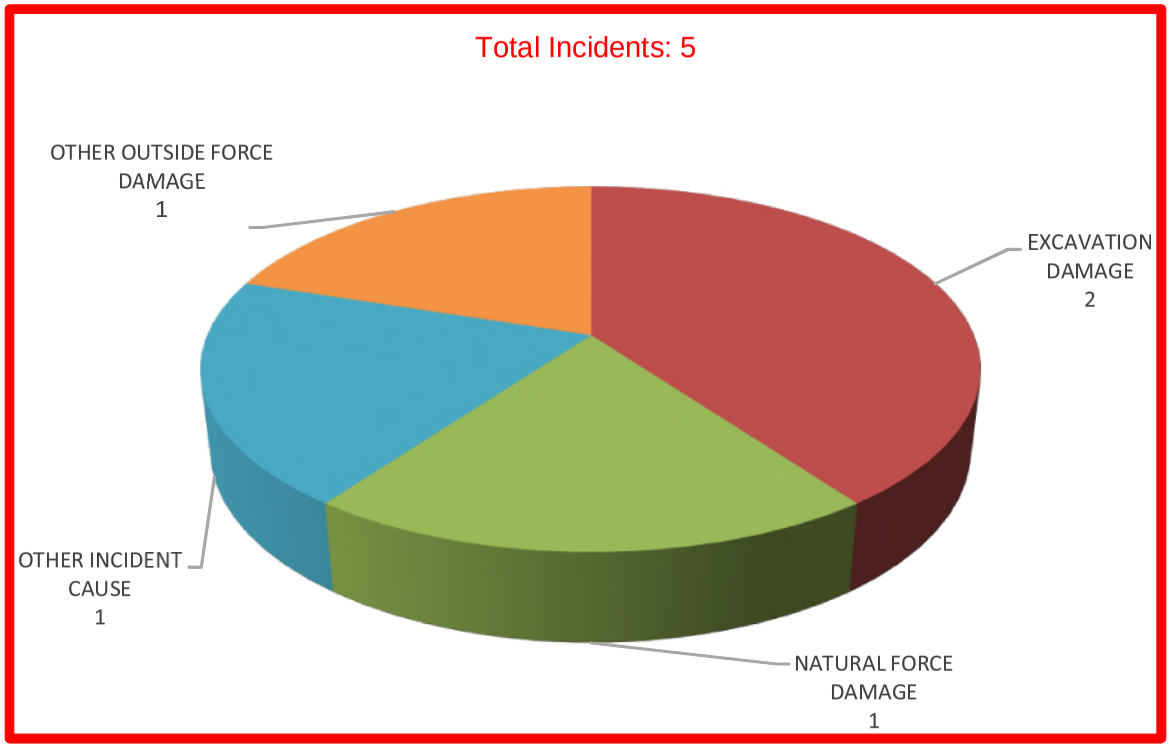
- Leak receipts increased.
- Workable leak backlog decreased.
- Leak prone main and service inventories continue to decline steadily.
- Overall main leak rate increased. Steel main corrosion rate decreased and Cast Iron main break rate increased.
- Service leak rate decreased.

PHMSA Reported Incidents

2018 SYSTEM INTEGRITY REPORT

RI

PHMSA Reported Incidents



LEAK MANAGEMENT ANALYSIS

(Mains & Services)

2018 SYSTEM INTEGRITY REPORT

2018 LEAK RECEIPTS

RI

1,989 Leak Receipts

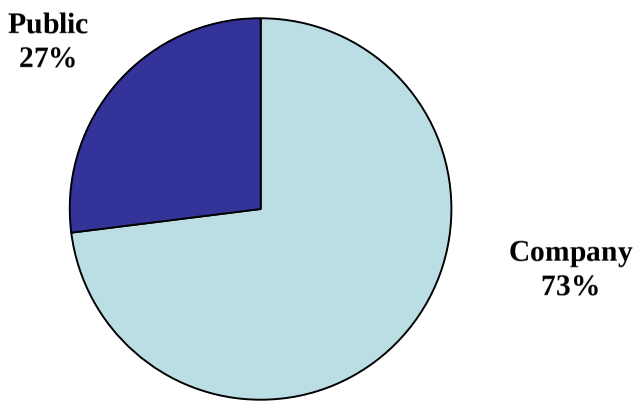
3,201 miles of Main
197,147 #'s of Services
(2,483 miles)

5,684 total miles of pipe

0.35 Leak Receipts per Mile of Pipe

2018 LEAK RECEIPTS BY DISCOVERY SOURCE

RI

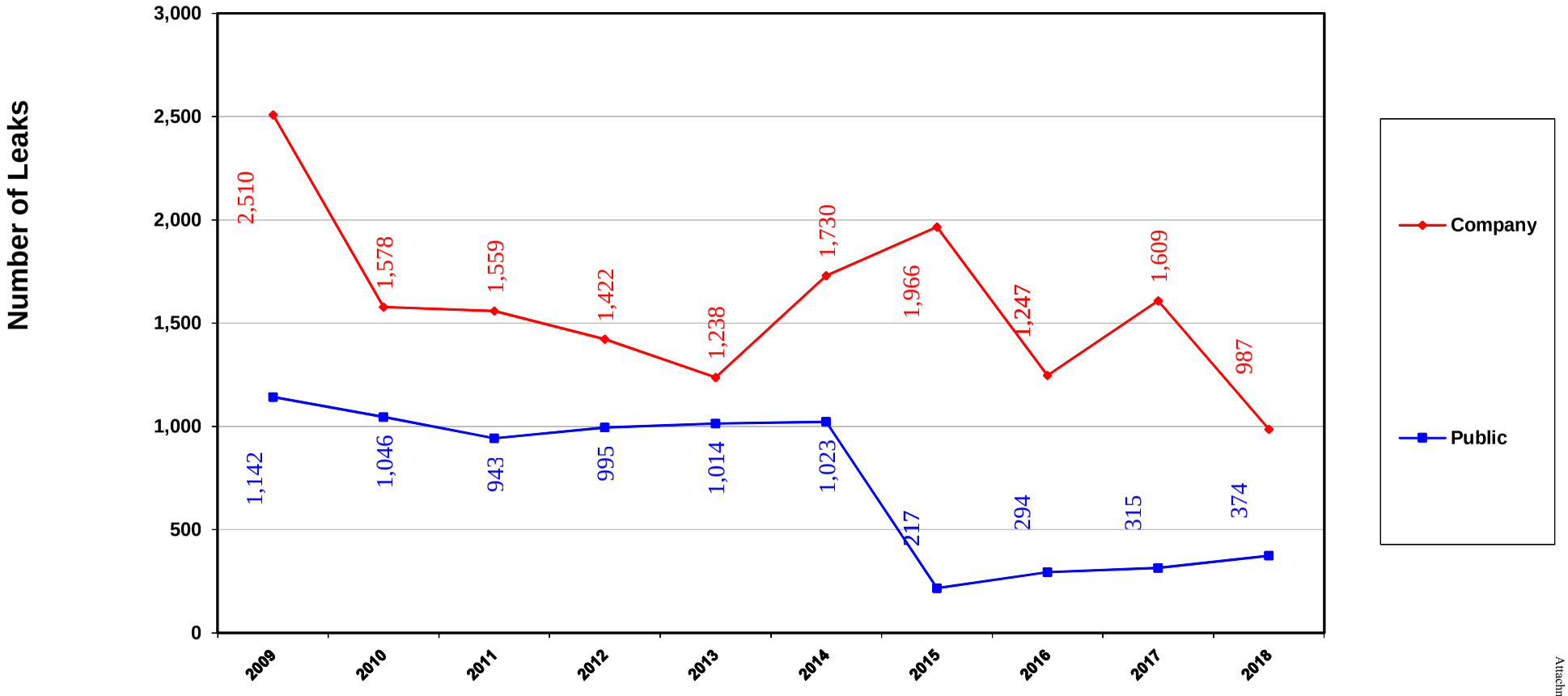


2018 SYSTEM INTEGRITY REPORT

2009 - 2018 LEAK RECEIPTS

RI

By Discovery Source (Excluding Damages)



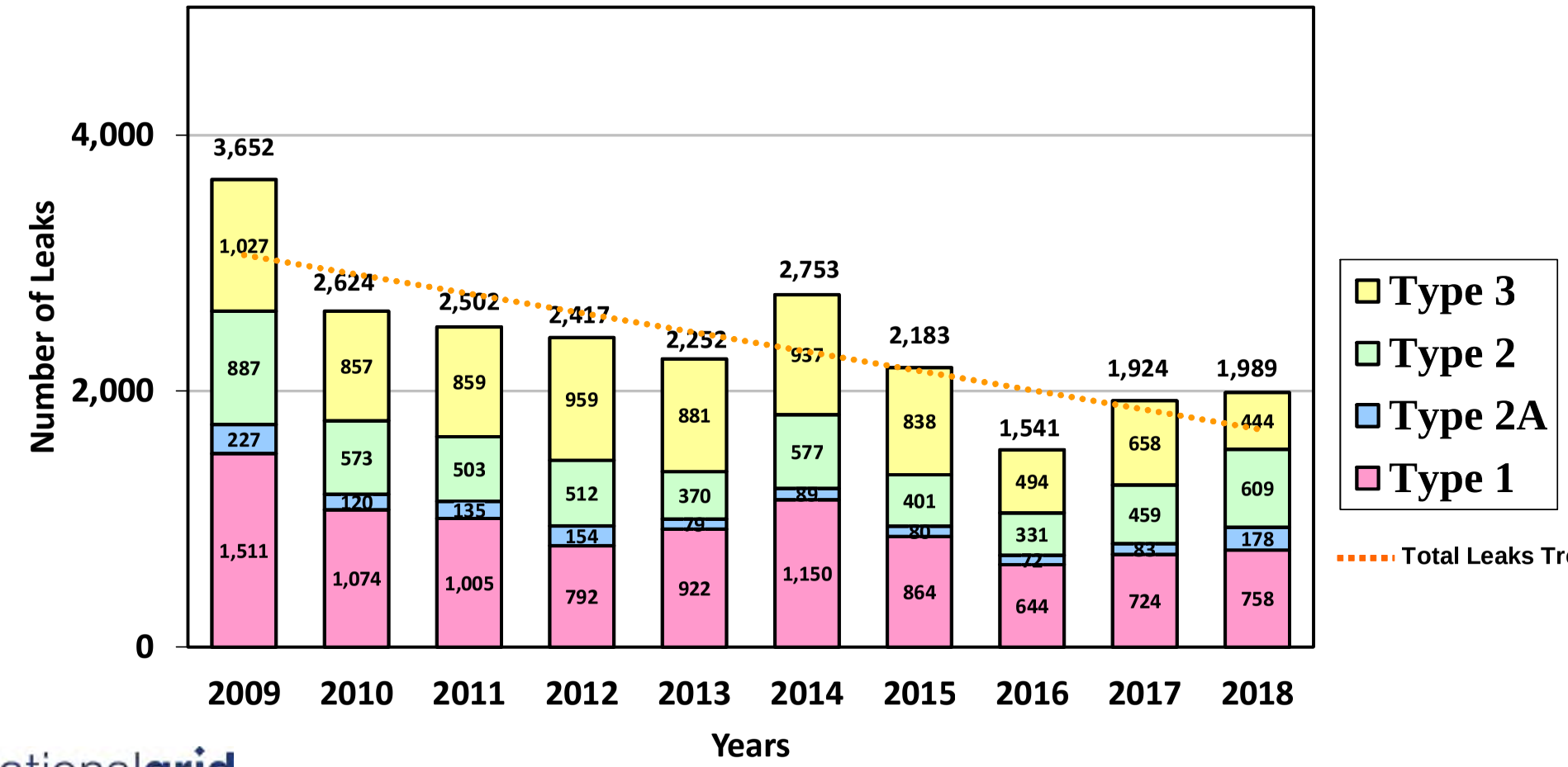
2018 SYSTEM INTEGRITY REPORT

LEAK RECEIPTS

RI

By ORIGINAL Type

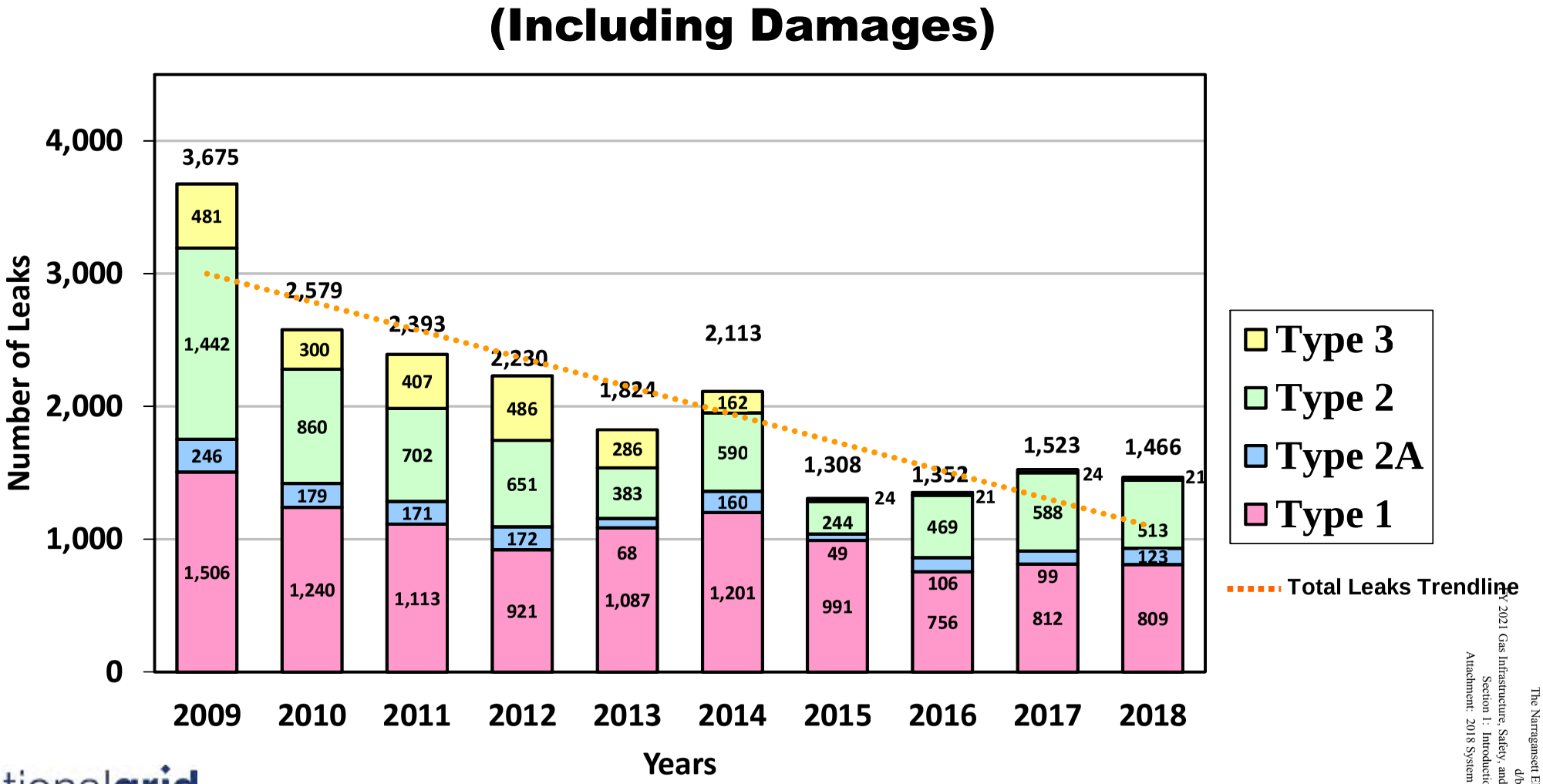
(Excluding Damages)



2018 SYSTEM INTEGRITY REPORT

RI

LEAKS REPAIRED
By REPAIRED Type



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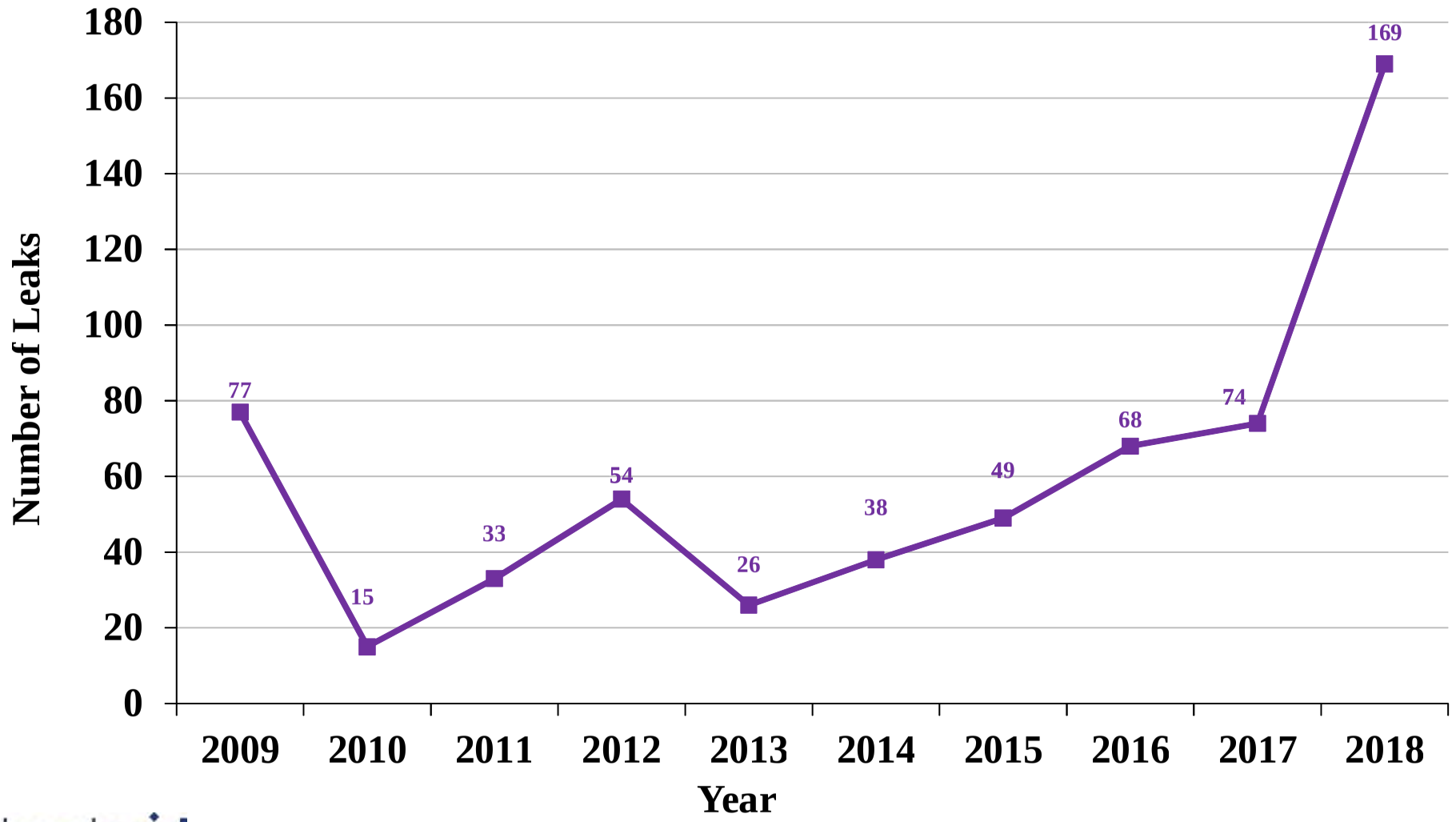
2018 SYSTEM INTEGRITY REPORT

RI

YEAR-END WORKABLE LEAK BACKLOGS

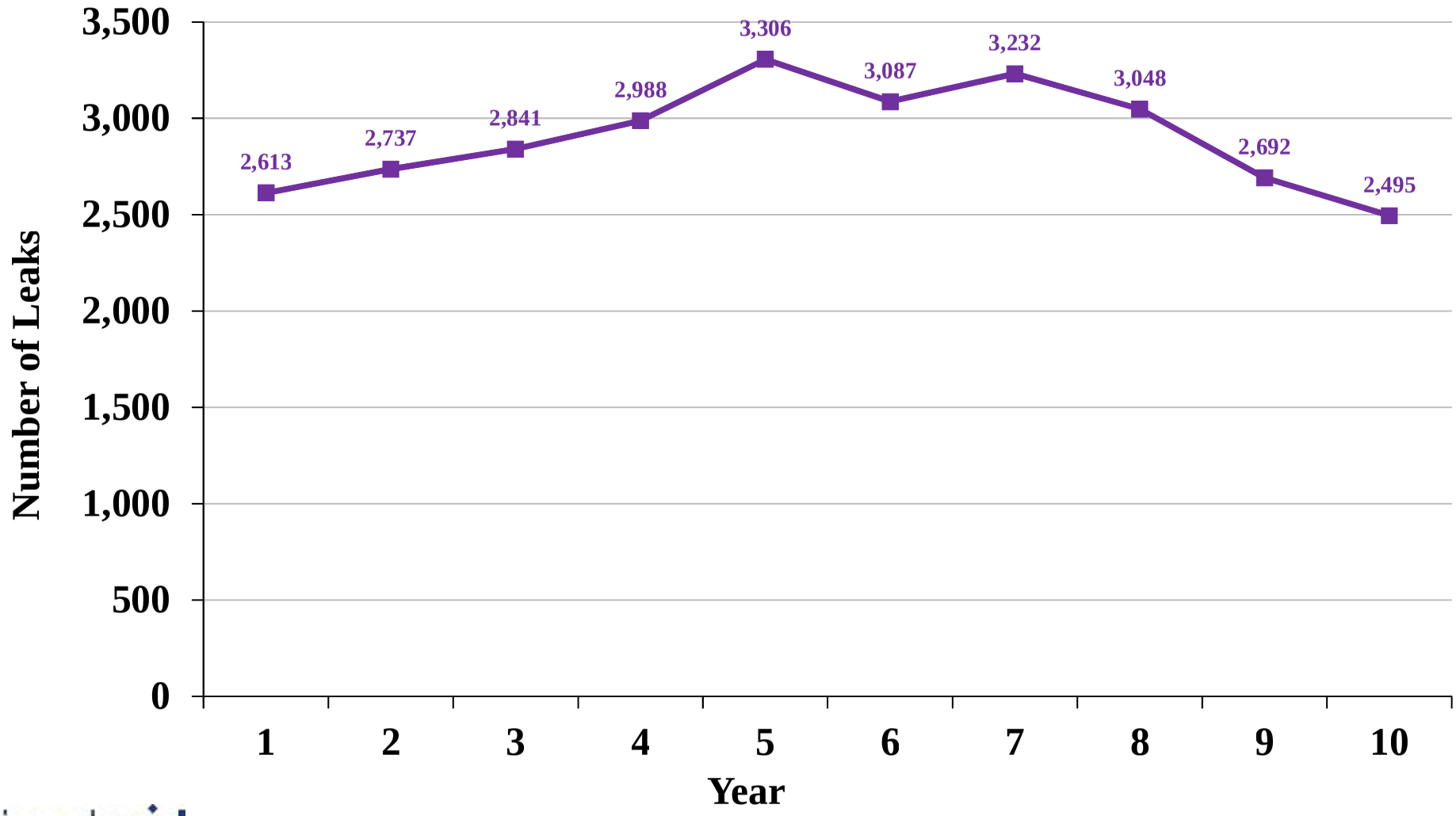


Note: 2018 experienced an increase in the backlog due to implementation of the Work Continuation Plan.

2018 SYSTEM INTEGRITY REPORT

RI

YEAR-END OPEN TYPE 3



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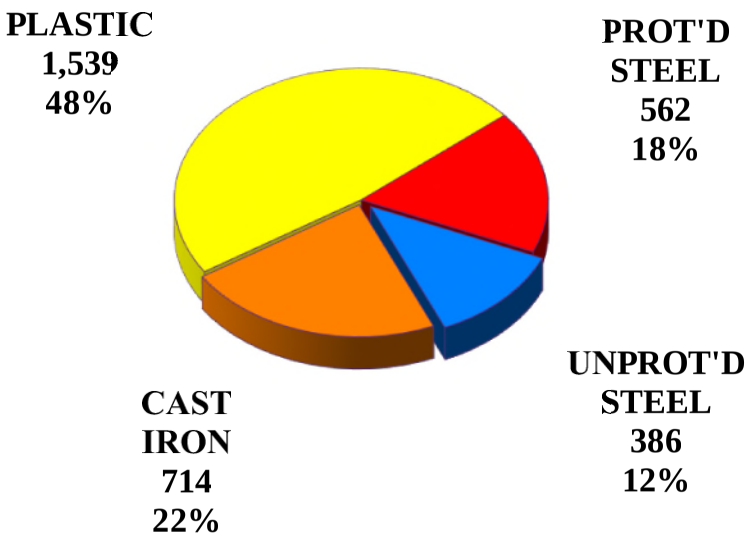
MAIN INVENTORY ANALYSIS

2018 SYSTEM INTEGRITY REPORT
MAIN INVENTORY

Rhode Island

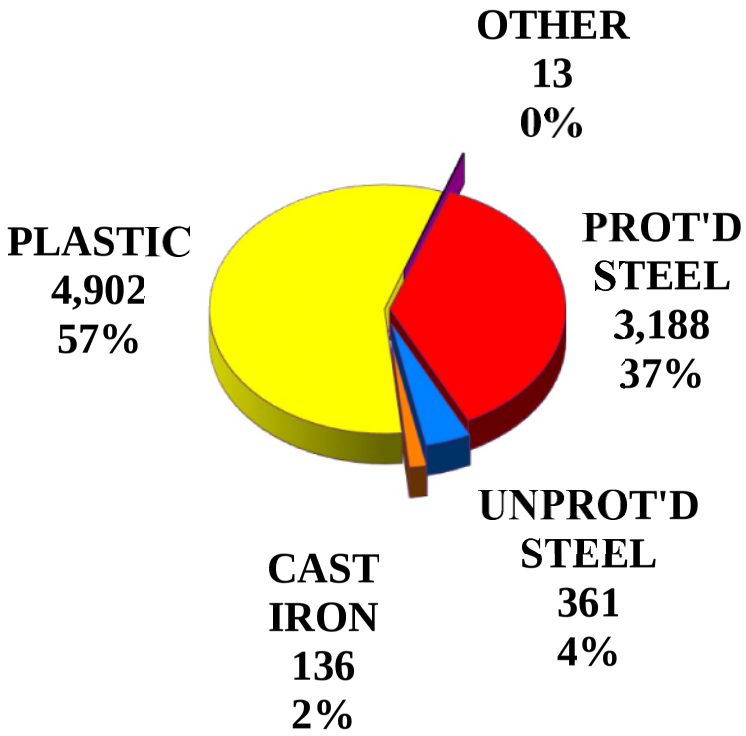
3,201 MILES



2018 PHMSA Average

124 Companies with 2,000+ miles

8,600 MILES



2018 SYSTEM INTEGRITY REPORT

NATIONAL GRID MAIN REPLACEMENT

Rate Case Supported "Leak-Prone" Main Replacement Levels										
Region	2018 Total Main (Miles)	2018 Leak Prone Main (Miles)	Leaks/Miles of Total Main (Repair rate)	Leaks/Miles of Leak Prone Main (Repair rate)	[5]2018 Annual "Planned" Replacement (Miles)	Planned Replacement % of Leak prone system	[5]2018 Annual "Actual" Replacement (Miles)	Actual Replacement % of Leak prone system	[5]2019 Annual "Planned" Replacement (Miles)	Years to LPP Main Elimination based on "Current" annual plan
RI	3,187	1,086	0.32	0.81	60.0	5.5%	67.5	6.2%	55.0	15

Note:

1. Leaks per mile of total main excludes Excavation leaks.
2. Leaks per mile of Leak-Prone main (LPP) excludes Excavation leaks and Plastic leaks.
3. Leak-Prone Pipe = Unprotected steel (Bare & Coated) + CI/WI + Aldyl-A (MD, 1985 and prior) + Other.
4. Miles of Leak-Prone main replaced includes all Proactive programs (Main Replacement program & System Reinforcement) and all Reactive programs (Public Works, Water Intrusion & Leak/reactive).
5. Annual planned and actual replacement miles are CY.
6. Data sources are 2016, 2017, 2018 US Gas Leak Prone Pipe Replacement Programs monthly reports from Gas Resource Management CMS.

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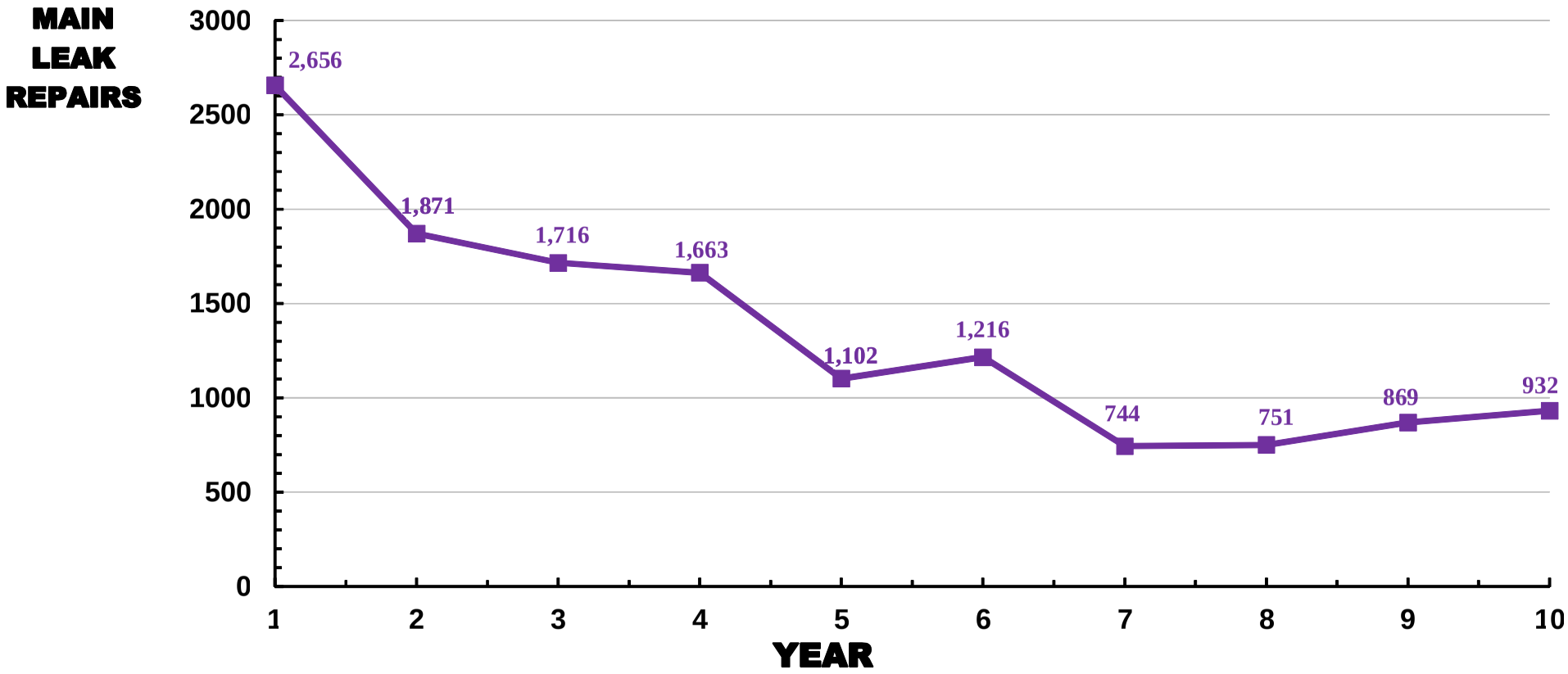
MAIN LEAK REPAIR ANALYSIS

2018 SYSTEM INTEGRITY REPORT

TOTAL MAIN LEAK REPAIRS

INCLUDING Damages



NOTE: **Cast Iron Leaks Count Total Individual Joint Repairs**

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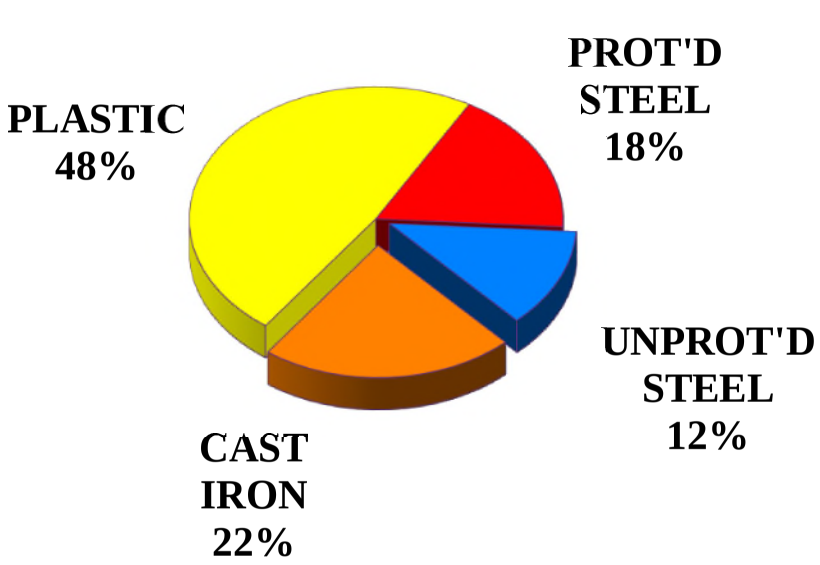
2018 SYSTEM INTEGRITY REPORT

RI

TOTAL MAIN INVENTORY COMPARED TO LEAK REPAIRS

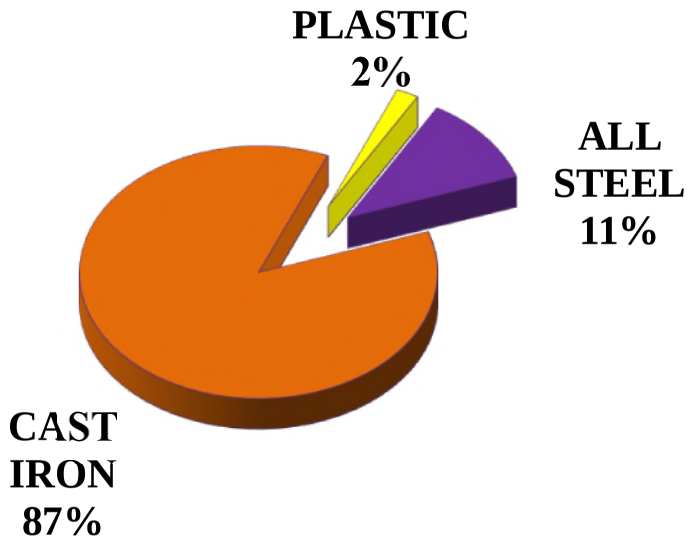
TOTAL MAIN INVENTORY *BY MATERIAL*

3,201 MILES



TOTAL MAIN LEAK REPAIRS *BY MATERIAL*

929 LEAKS (including damages)



NOTE: (*) CI Leaks include Other material Leaks.
Each Repair is Counted as an Individual Leak.

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2018 SYSTEM INTEGRITY REPORT

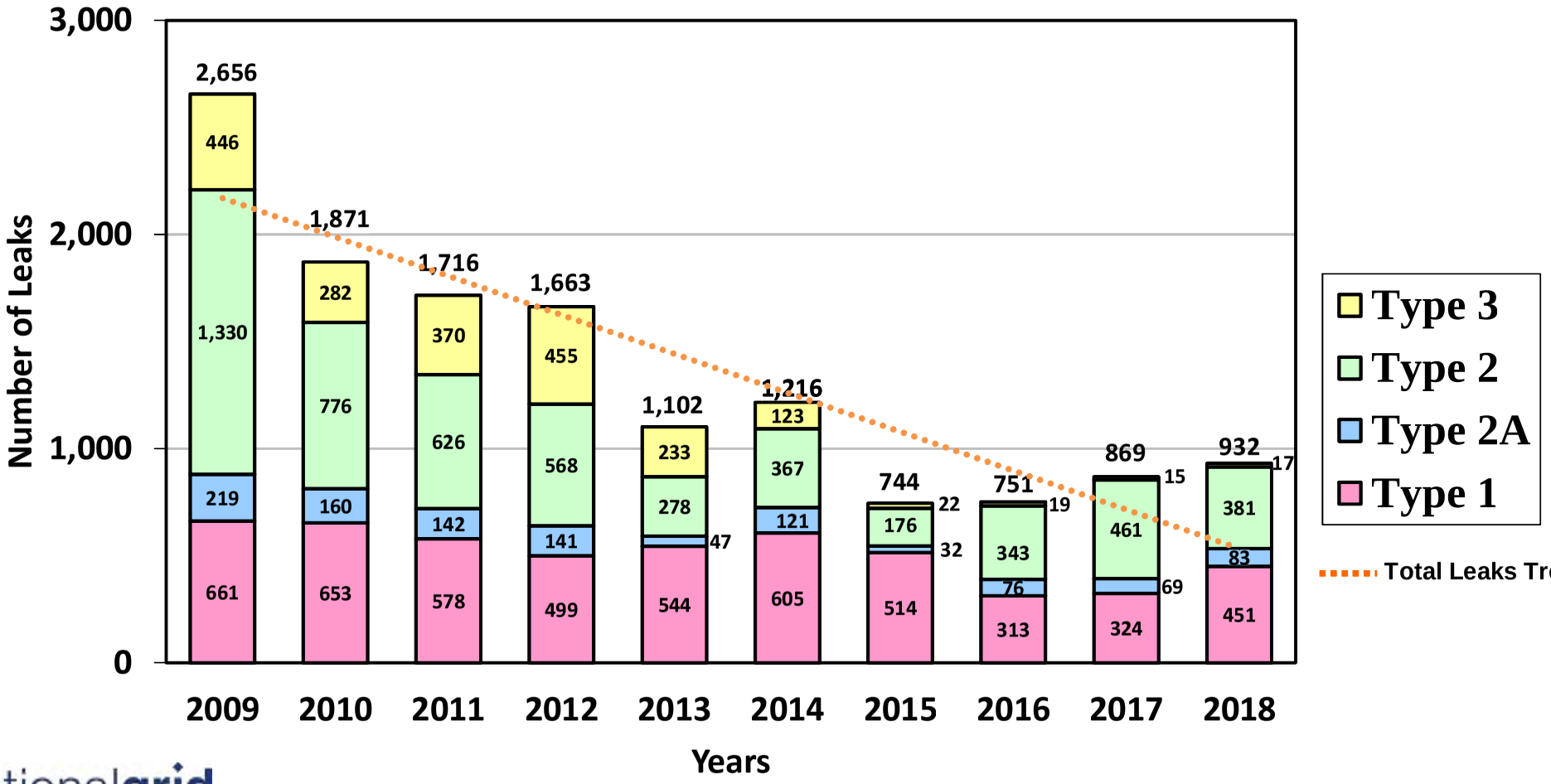
LEAKS REPAIRED

RI

MAIN

By Type

(Including Damages)

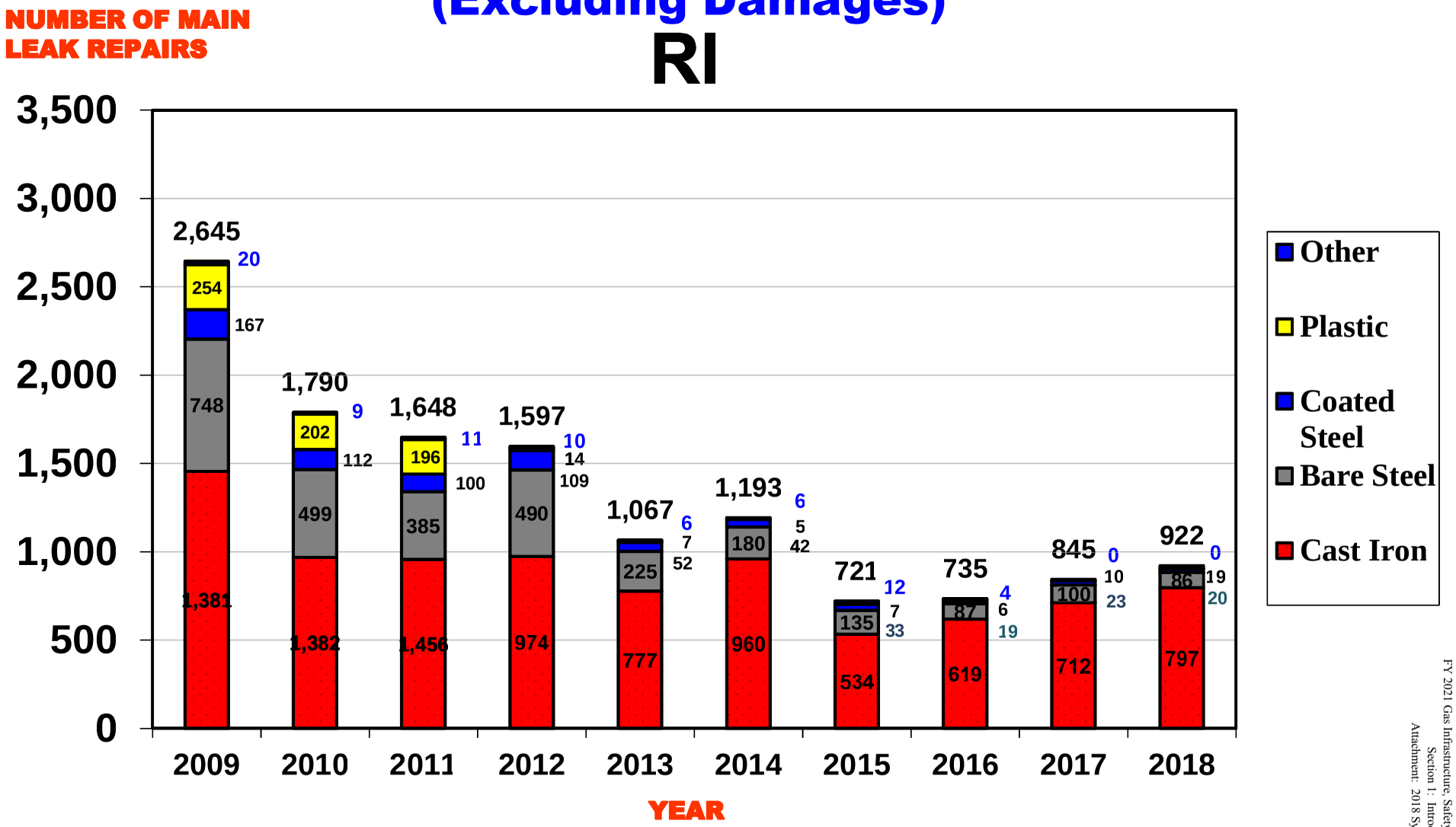


2018 SYSTEM INTEGRITY REPORT

2009 - 2018 MAIN LEAK REPAIRS

All Main Leak Repairs by Material

(Excluding Damages)



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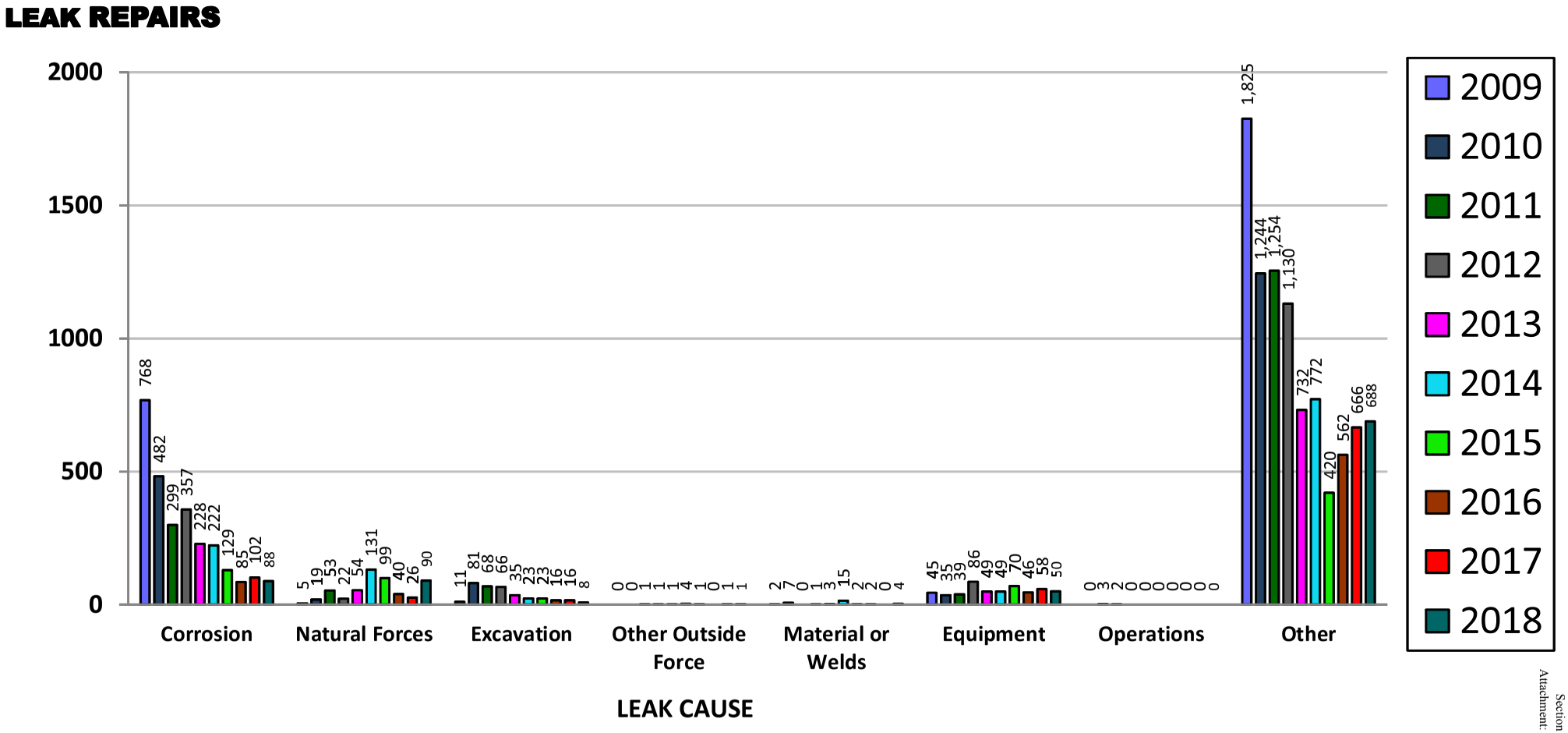
2018 SYSTEM INTEGRITY REPORT

RI

MAIN LEAKS REPAIRED

COMPARISON BY LEAK CAUSES



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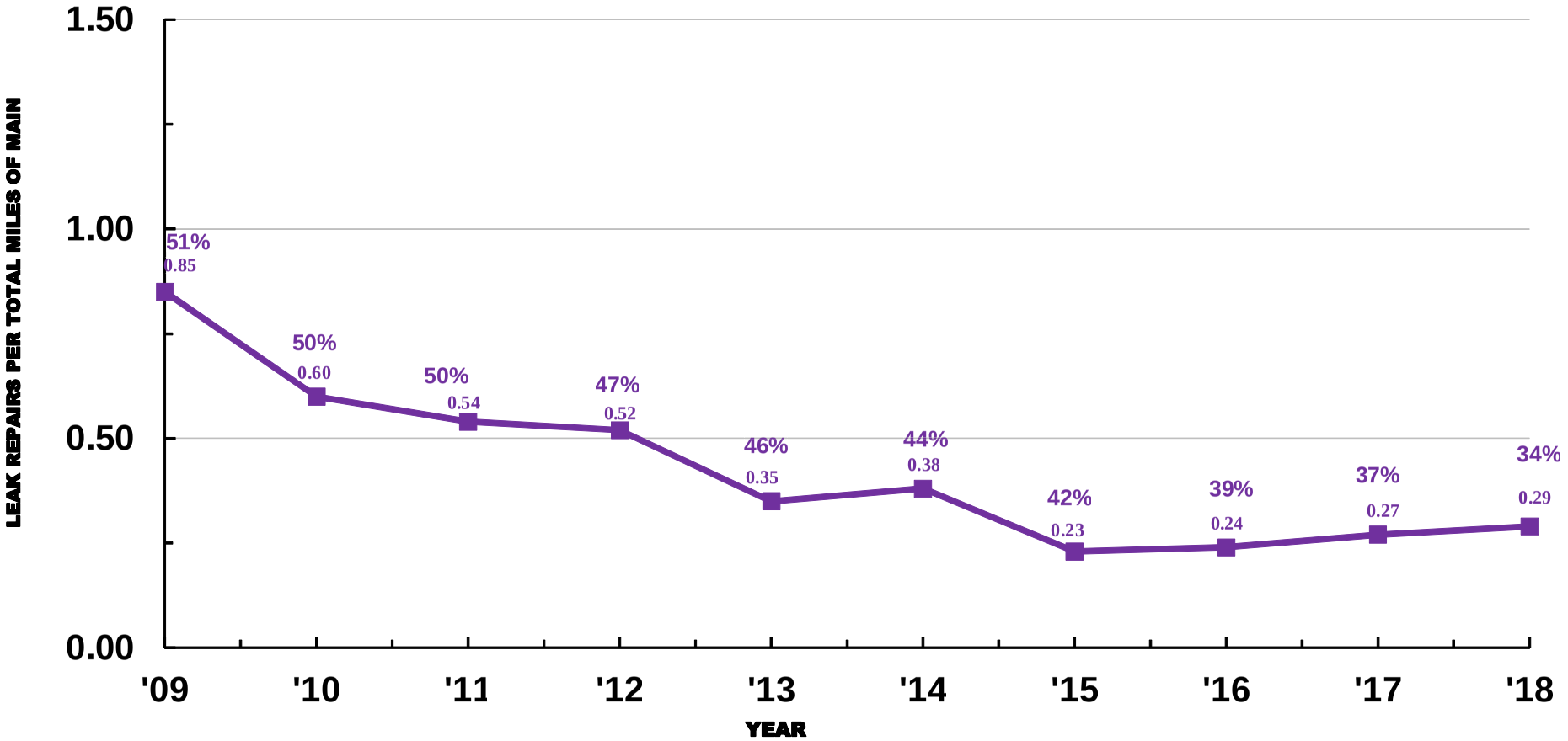
2018 SYSTEM INTEGRITY REPORT

TOTAL MAIN LEAK "RATES"

INCLUDING Damages

PERCENTAGES SHOWN ARE PERCENT OF LEAK-PRONE PIPE



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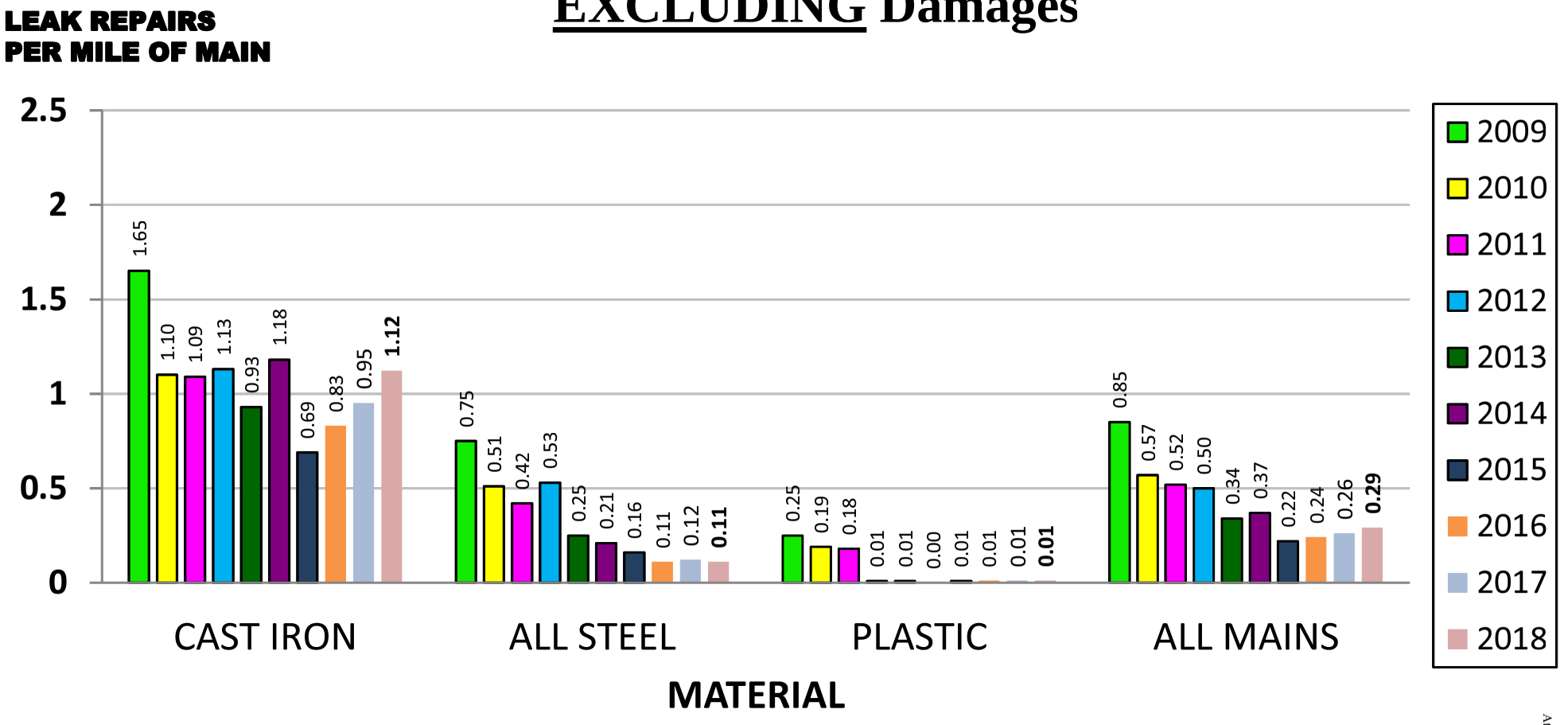
2018 SYSTEM INTEGRITY REPORT

RI

MAIN LEAK "RATES"

COMPARISON BY MATERIAL

EXCLUDING Damages



COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

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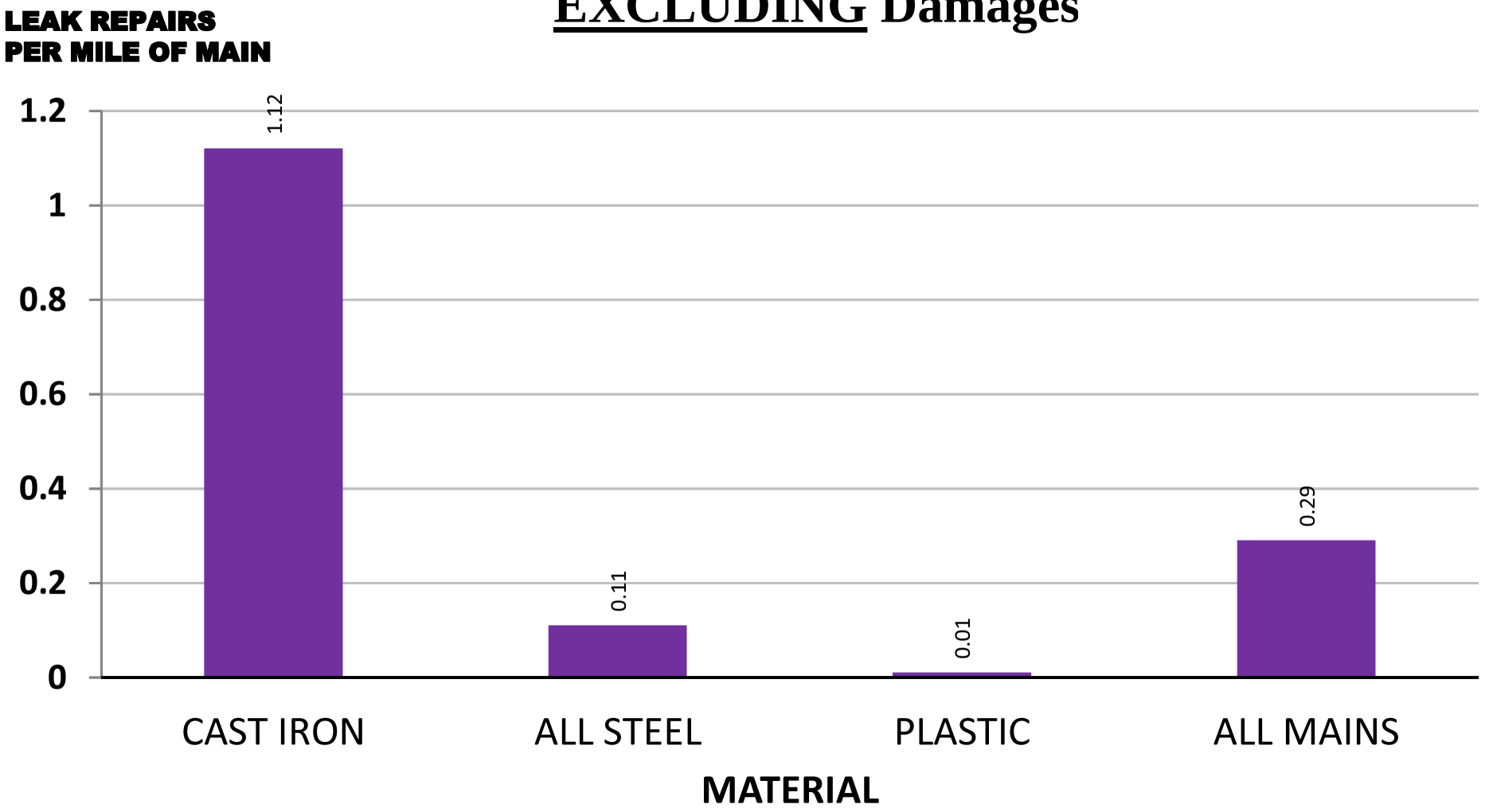
2018 SYSTEM INTEGRITY REPORT

RI

MAIN LEAK "RATES"

COMPARISON BY MATERIAL

EXCLUDING Damages



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2018 SYSTEM INTEGRITY REPORT

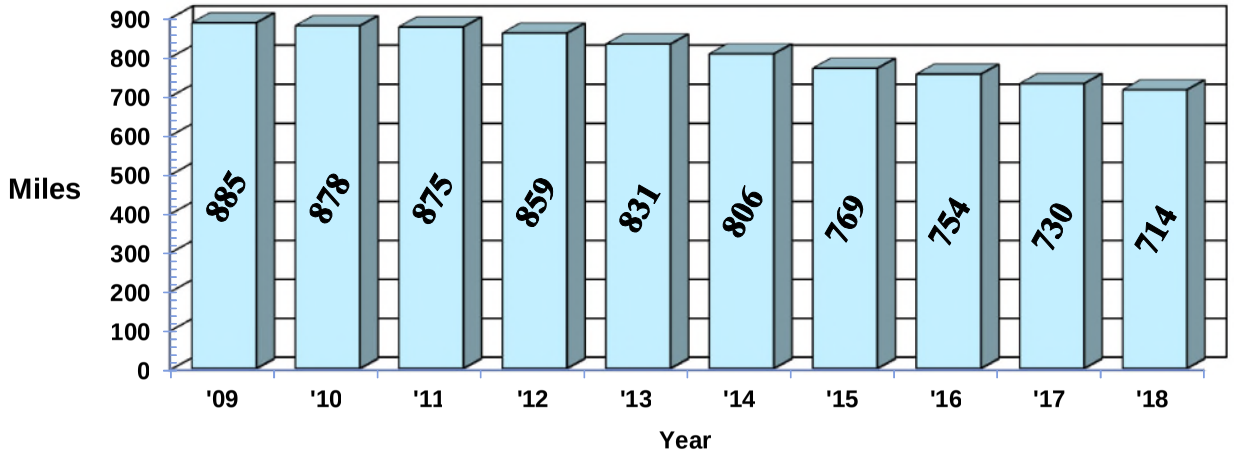
A CLOSER LOOK AT CAST IRON MAINS

2018 SYSTEM INTEGRITY REPORT

RI

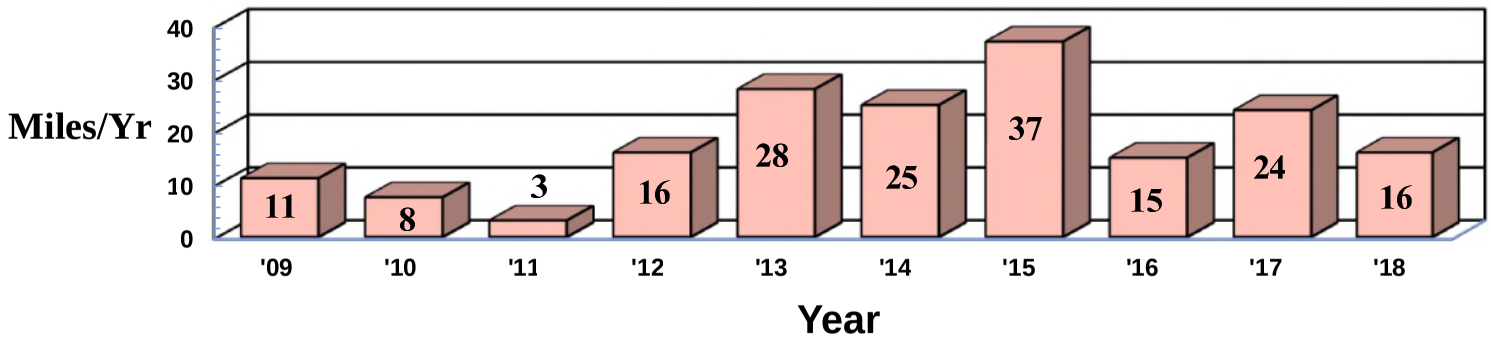
CAST IRON MAIN INVENTORY

DOT-Reported Pipe Inventories



CAST IRON ATTRITION RATE

Avg 10-Yr Attrition Rate: 18.27 Miles/Year (2.56%)



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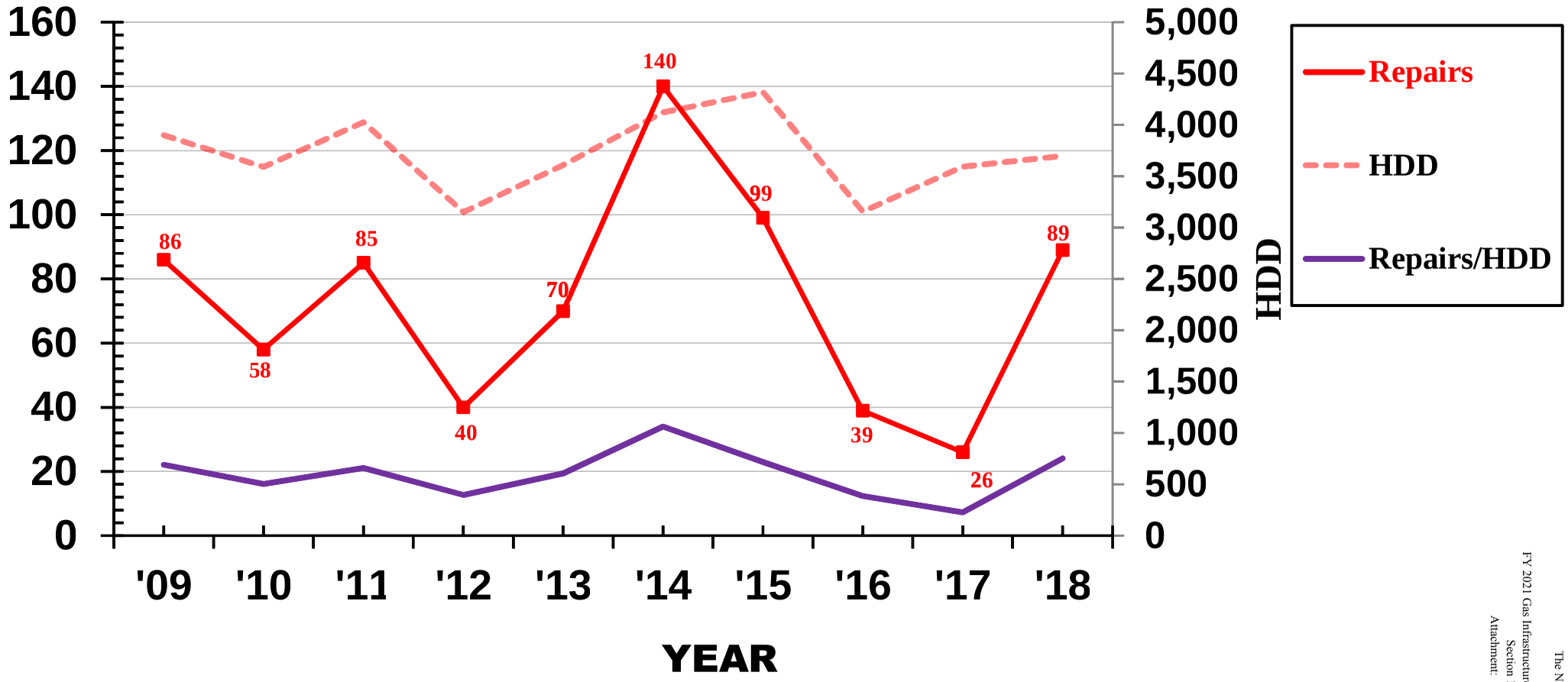
2018 SYSTEM INTEGRITY REPORT

RI BREAKS

TOTAL CAST IRON MAIN BREAKS - HDD



Repairs/HDD is Multiplied by 1,000

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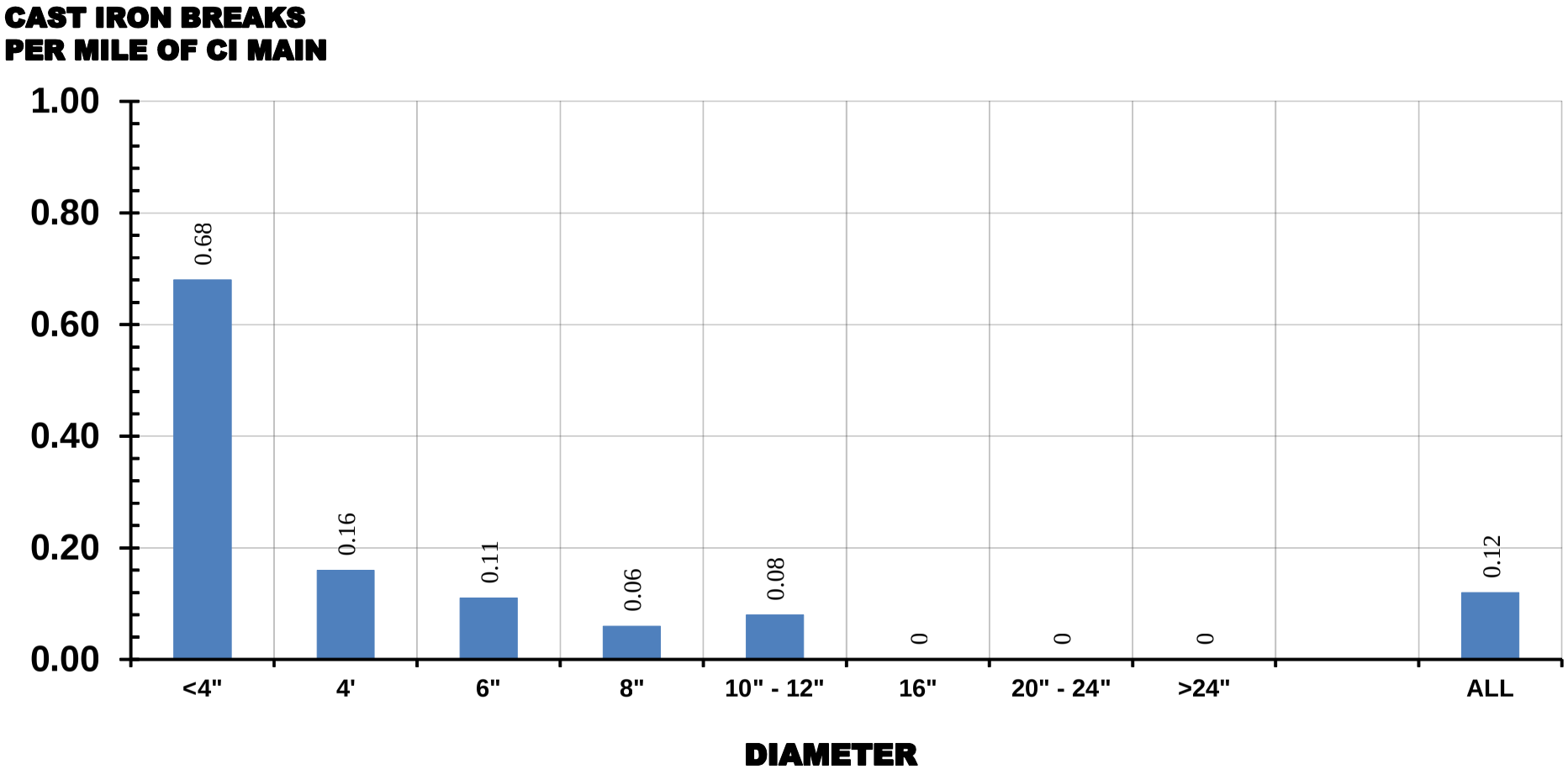
2018 SYSTEM INTEGRITY REPORT

CAST IRON MAIN BREAK "RATES"

"RI" COMPARISON BY DIAMETER



Size	CI Inventory 2017	CI Inventory 2018
< 4"	5 mi	5 mi
4"	281 mi	272 mi

Size	CI Inventory 2017	CI Inventory 2018
6"	303 mi	296 mi
8"	31 mi	31 mi

Size	CI Inventory 2017	CI Inventory 2018
10" - 12"	71 mi	71 mi
16"	17 mi	17 mi

Size	CI Inventory 2017	CI Inventory 2018
20" - 24"	13 mi	13 mi
24"	5 mi	5 mi

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2018 SYSTEM INTEGRITY REPORT

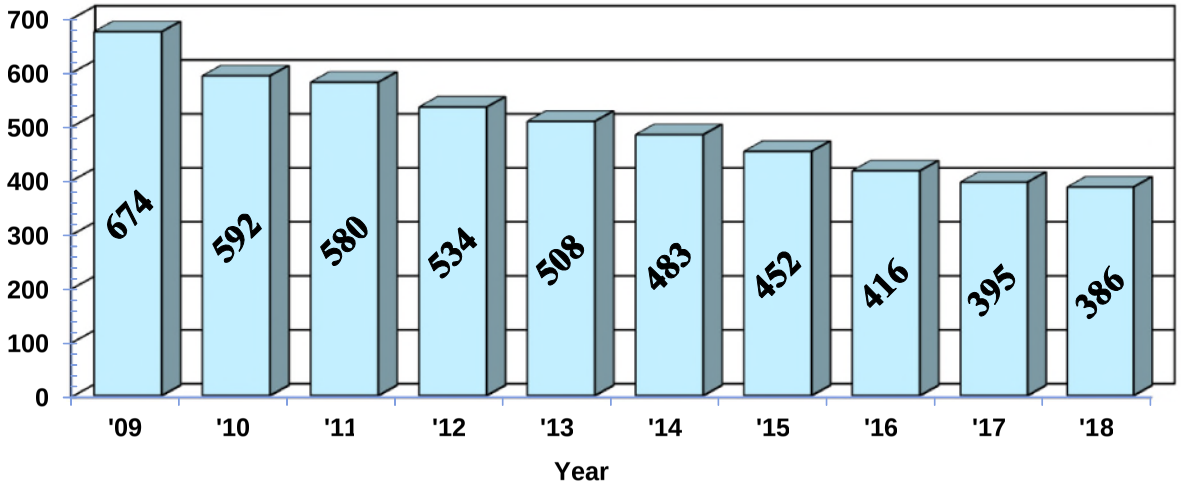
A CLOSER LOOK AT STEEL MAINS

2018 SYSTEM INTEGRITY REPORT

RI

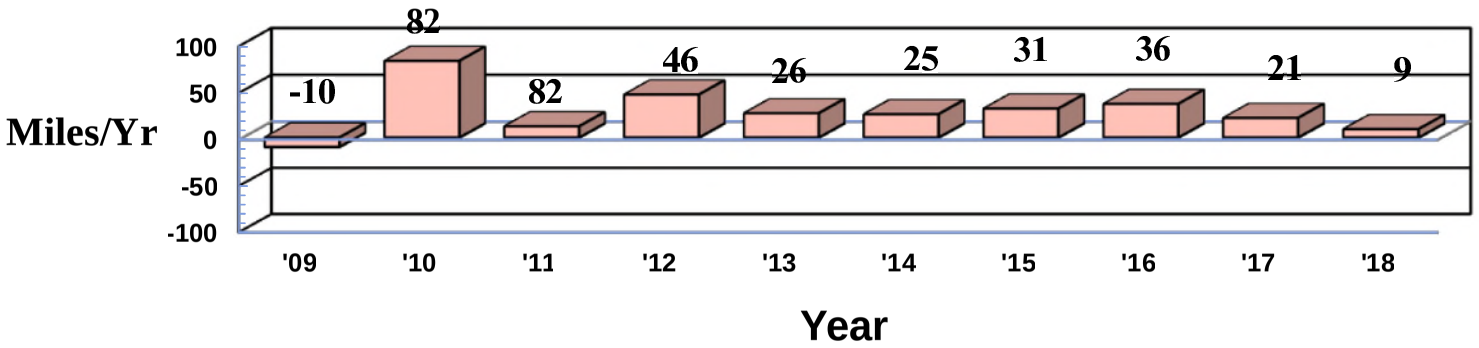
UNPROTECTED STEEL MAIN INVENTORY

DOT-Reported Pipe Inventories



UNPROTECTED STEEL ATTRITION RATE

Avg 10 -Yr Attrition Rate: 27.79 Miles/Year (7.20%)



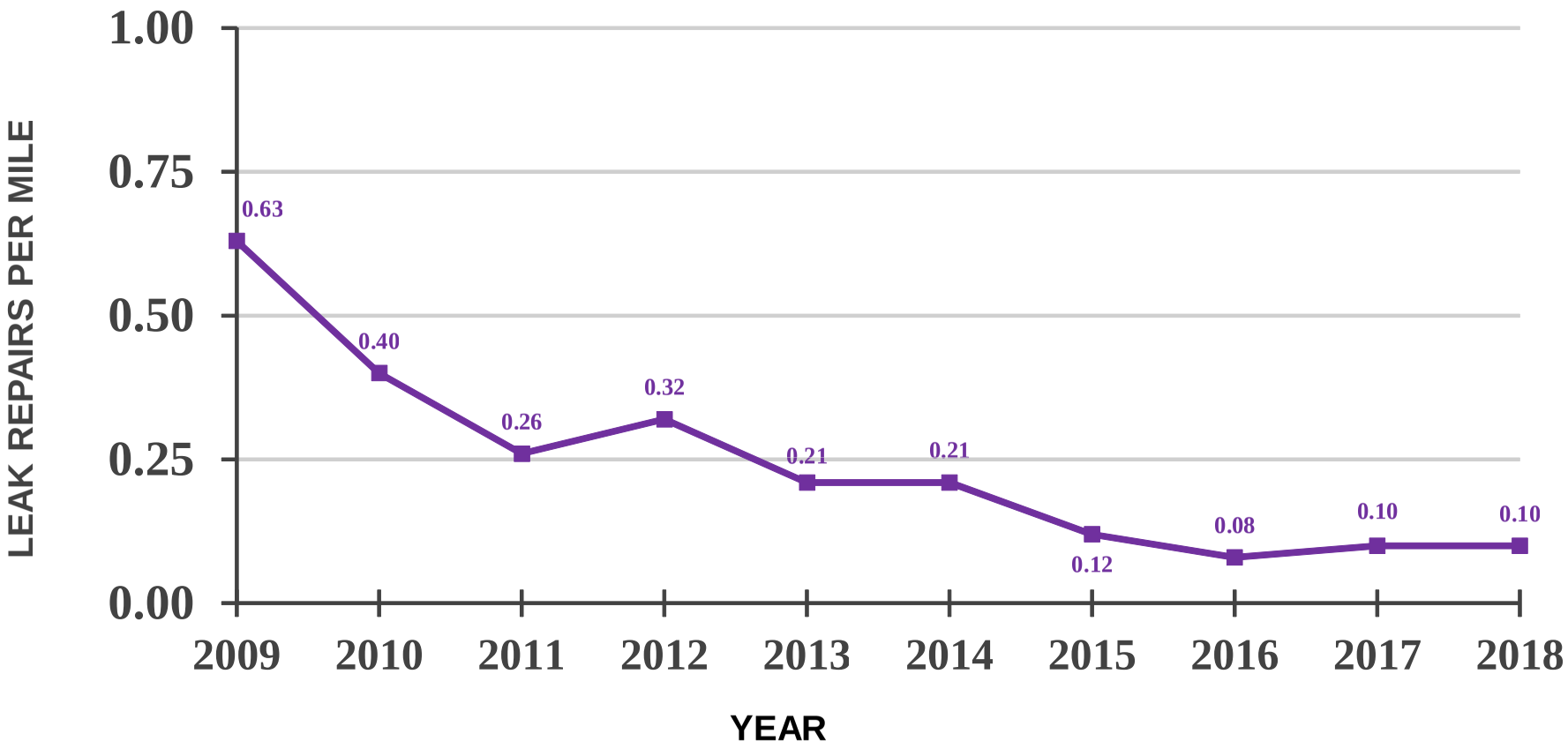
NOTE: In RI, Attrition is due to both replacement and "added" cathodic protection.

2018 SYSTEM INTEGRITY REPORT

MAIN CORROSION LEAK "RATES"

CORROSION Leak Repairs Per Mile of "TOTAL" Steel

INCLUDES **ALL** CORROSION LEAKS, REGARDLESS OF MAIN MATERIAL

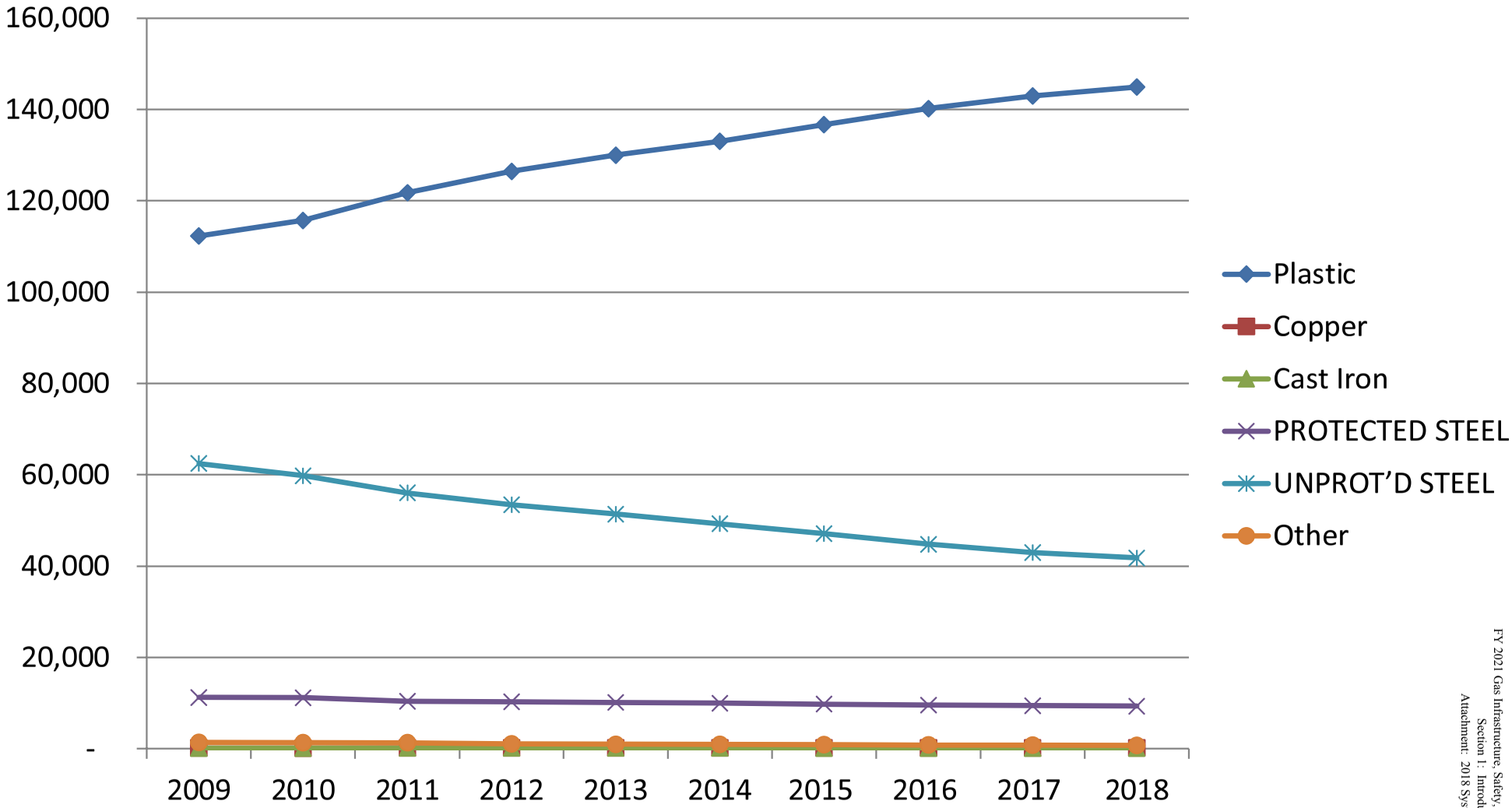


SERVICE INVENTORY ANALYSIS

2018 SYSTEM INTEGRITY REPORT

SERVICE INVENTORY TREND

RI



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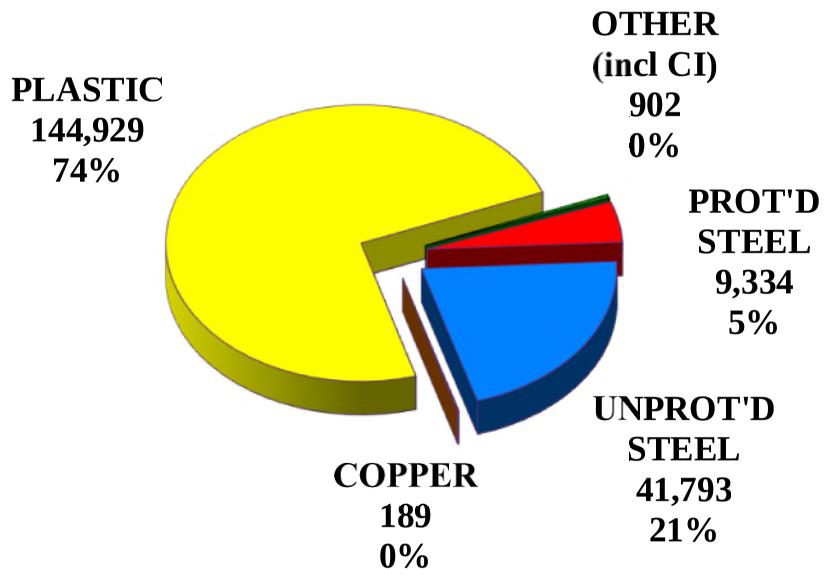
2018 SYSTEM INTEGRITY REPORT
SERVICE INVENTORY

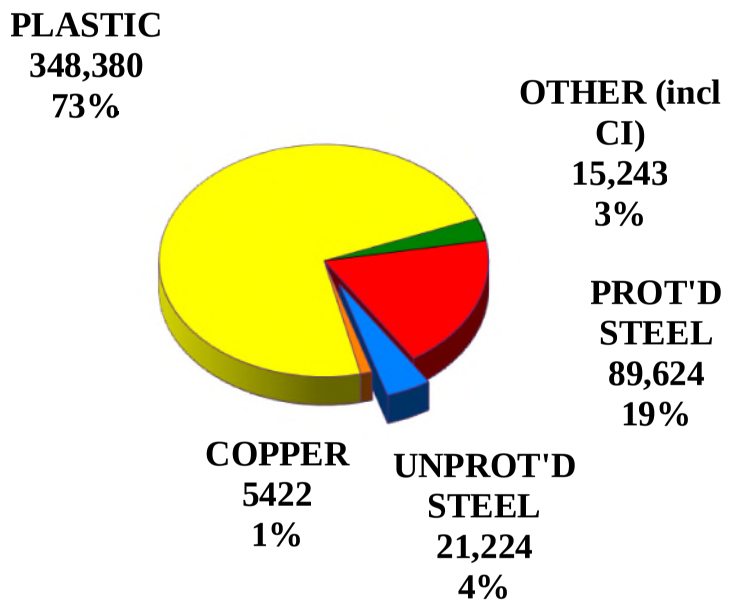
RI

197,147 SERVICES



PHMSA Average

479,894 SERVICES



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SERVICE LEAK REPAIR ANALYSIS

NOTE: Above Ground Leaks, which are included in the DOT Reports (beginning in 2012), are excluded from this report in order to maintain the integrity of our trend analyses for distribution (not CMS) piping.

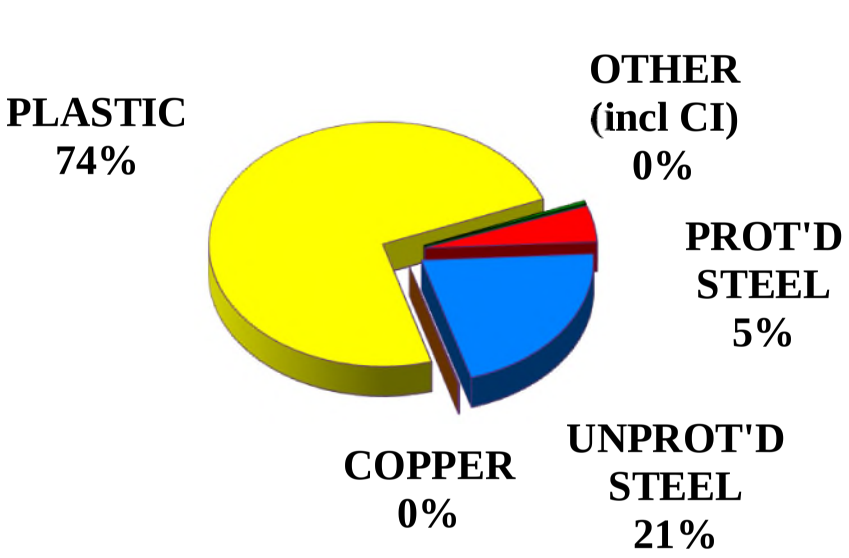
2018 SYSTEM INTEGRITY REPORT

RI TOTAL SERVICE LEAK REPAIRS

INCLUDING Damages

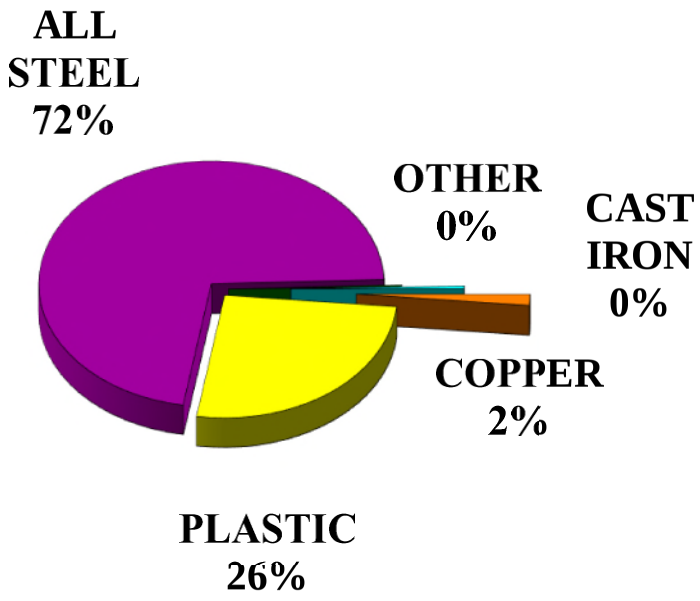
TOTAL SERVICE INVENTORY BY MATERIAL

197,147 SERVICES



TOTAL SERVICE LEAK REPAIRS BY MATERIAL

534 LEAKS



IMPORTANT: *Service Repairs are identified by the service material. This is not necessarily the material that leaked. For example - a leak caused by corrosion of a steel valve or fitting on a plastic service is shown as a plastic service leak.*

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2018 SYSTEM INTEGRITY REPORT

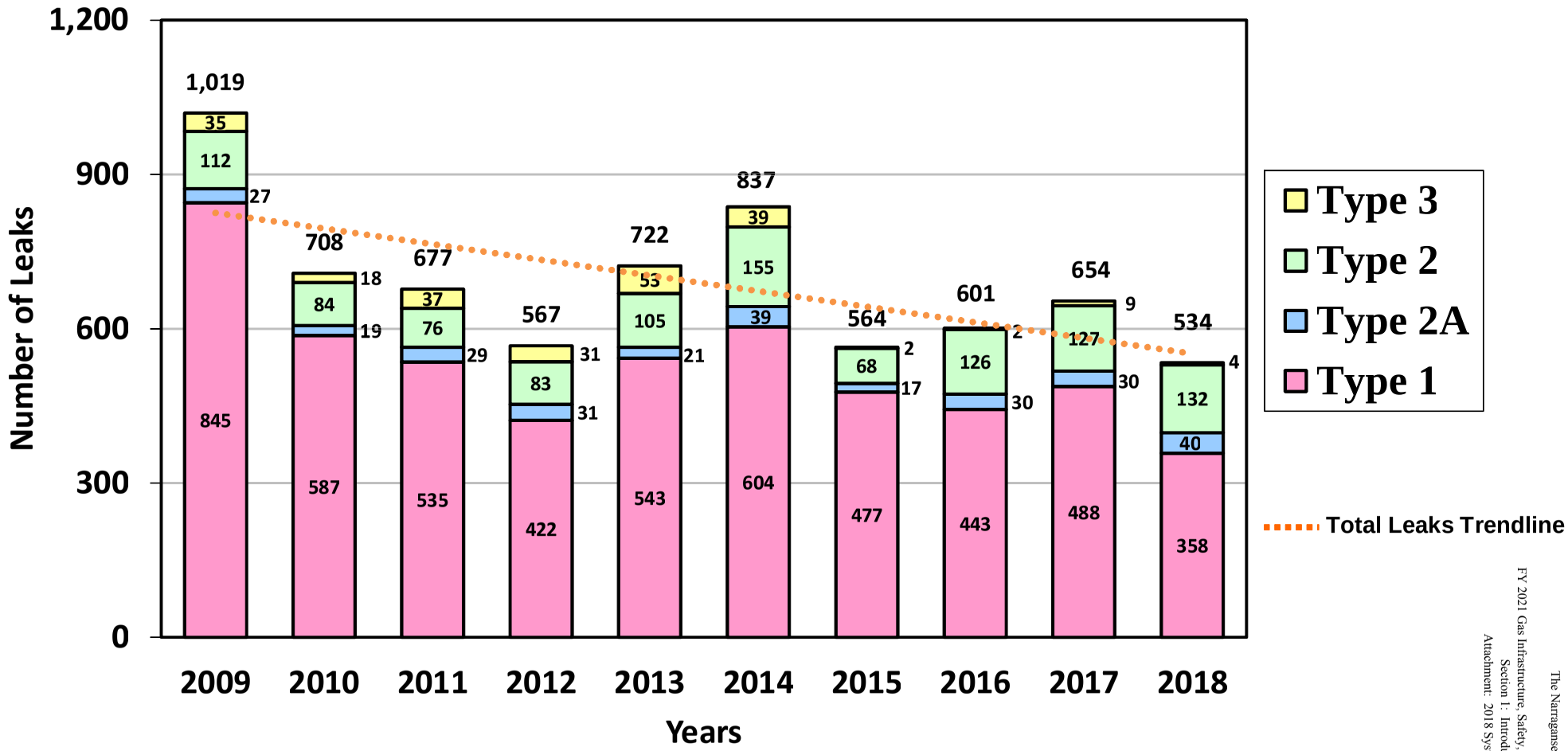
RI

LEAKS REPAIRED

By REPAIRED Type

(Including Damages)

SERVICE



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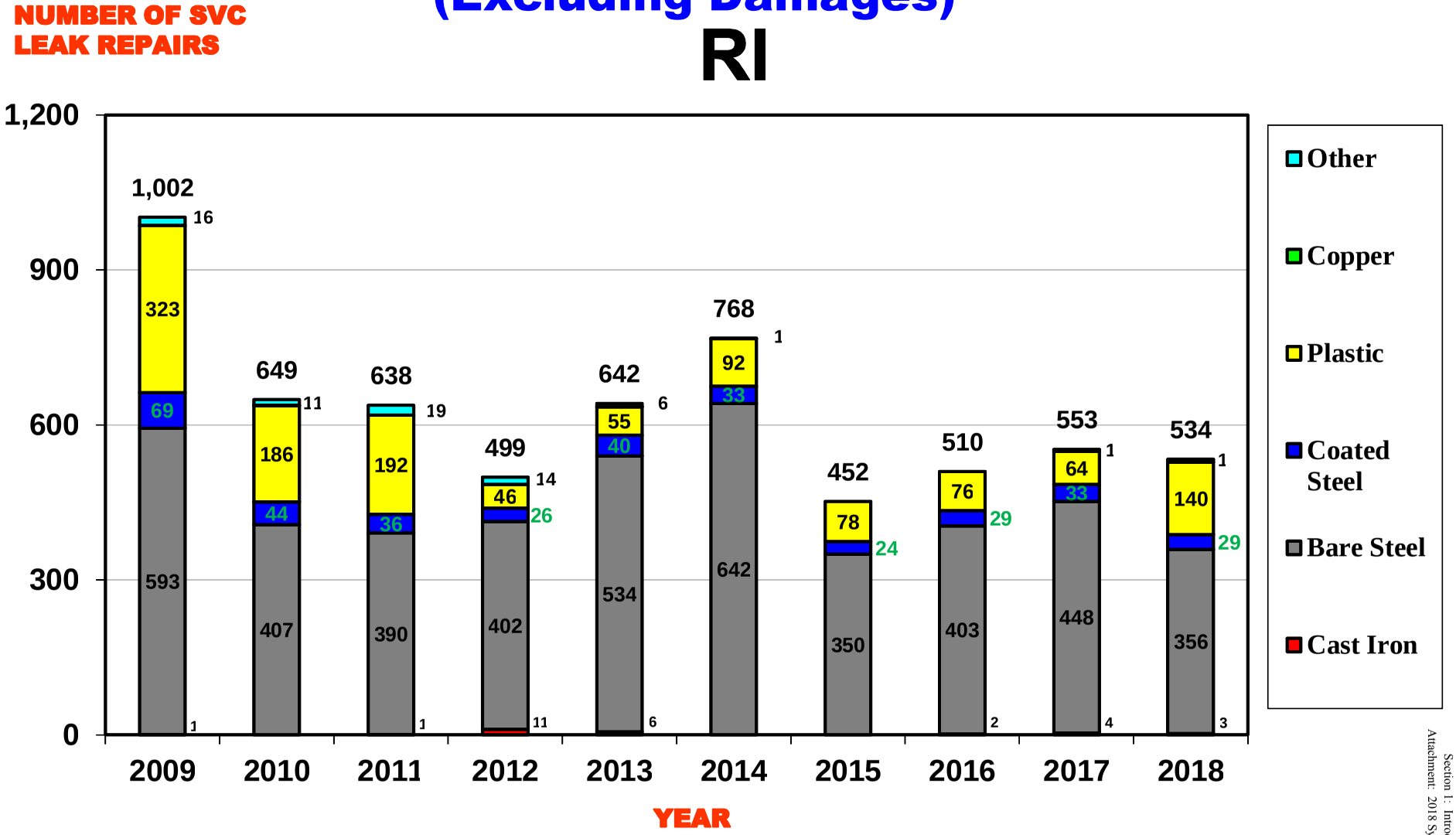
2018 SYSTEM INTEGRITY REPORT
2009 - 2018 SERVICE LEAK REPAIRS

All Service Leak Repairs by Material
(Excluding Damages)



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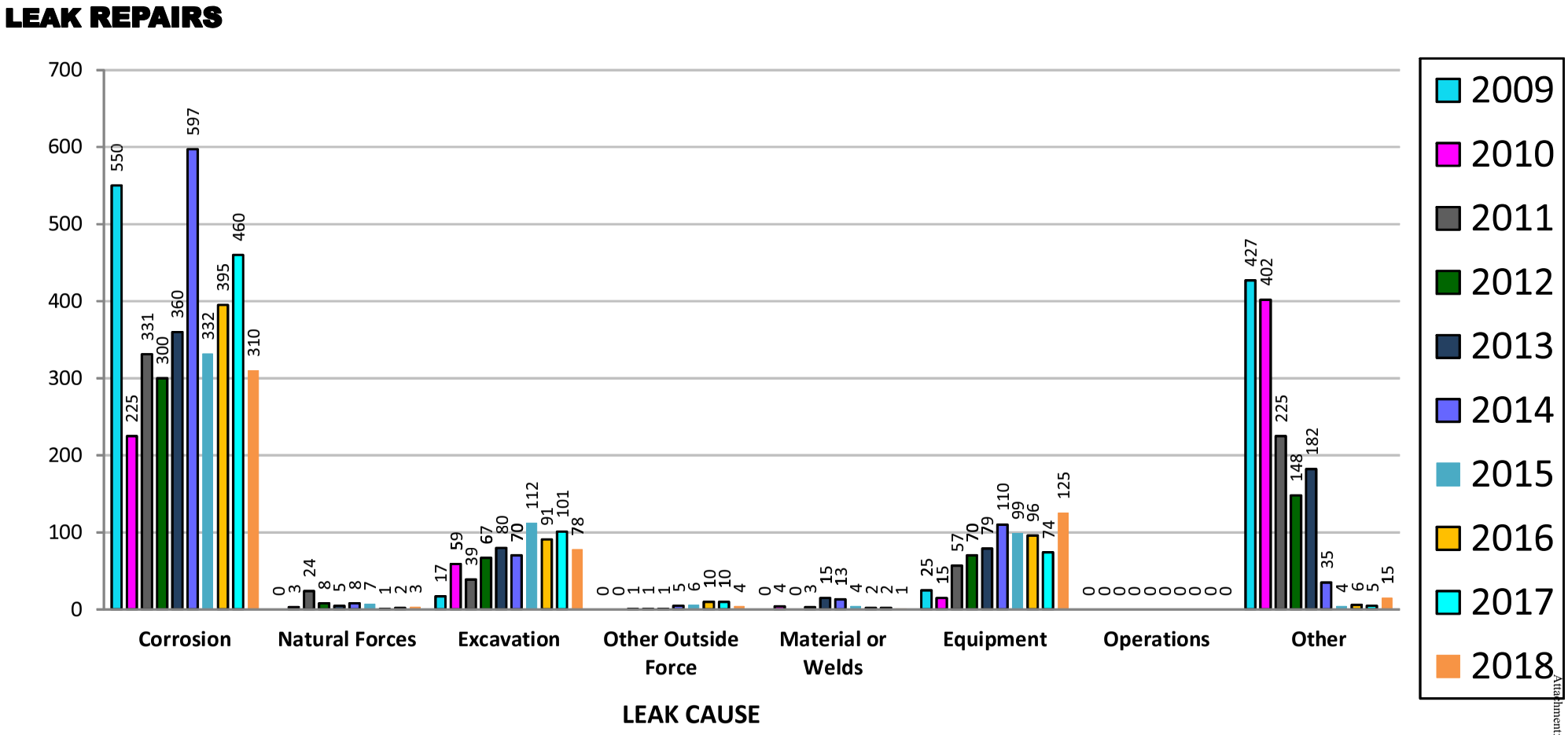
2018 SYSTEM INTEGRITY REPORT

RI

SERVICE LEAKS REPAIRED

COMPARISON BY LEAK CAUSES



COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

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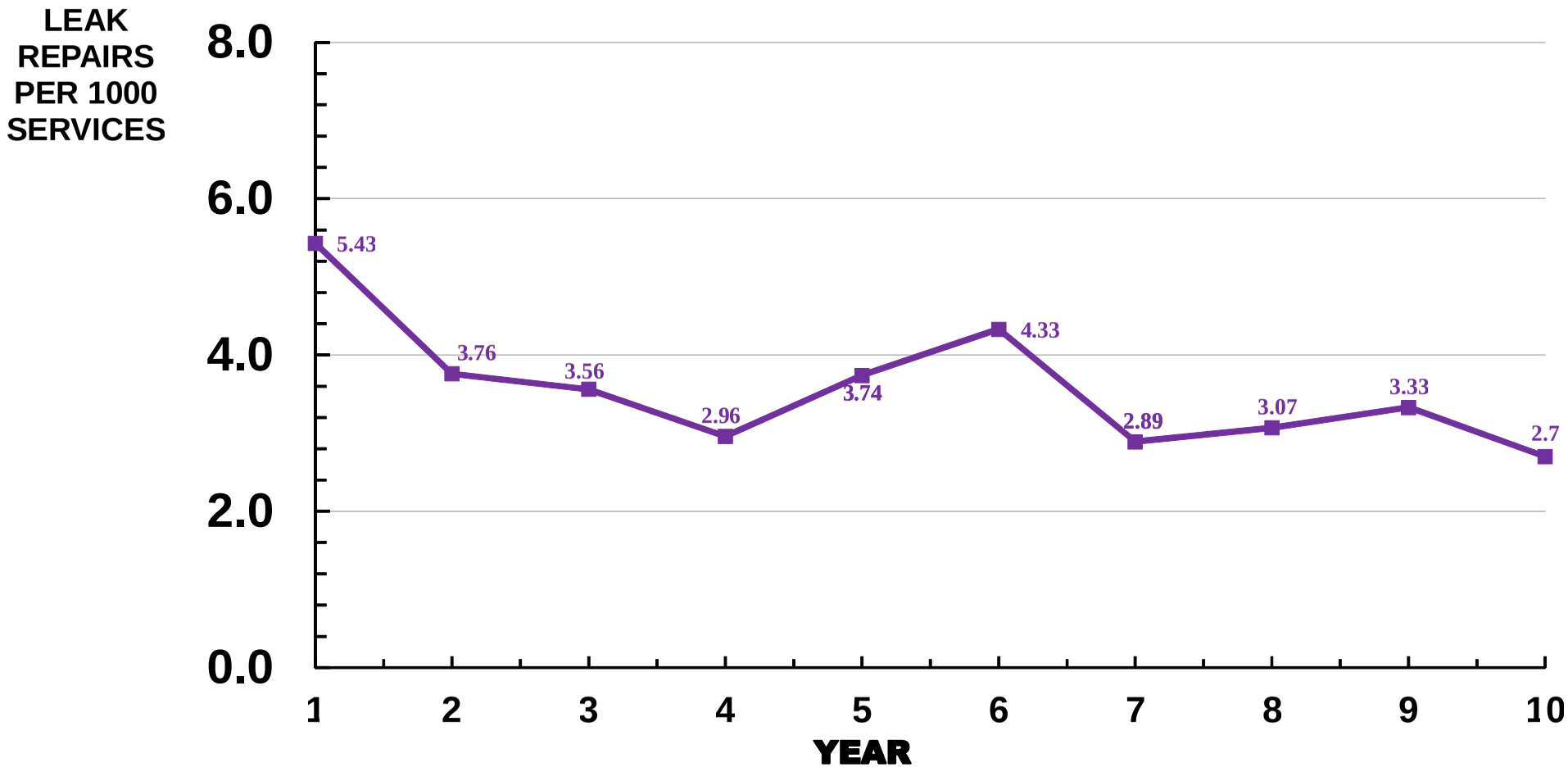
2018 SYSTEM INTEGRITY REPORT

TOTAL SERVICE LEAK "RATES"

INCLUDING Damages



2018 SYSTEM INTEGRITY REPORT

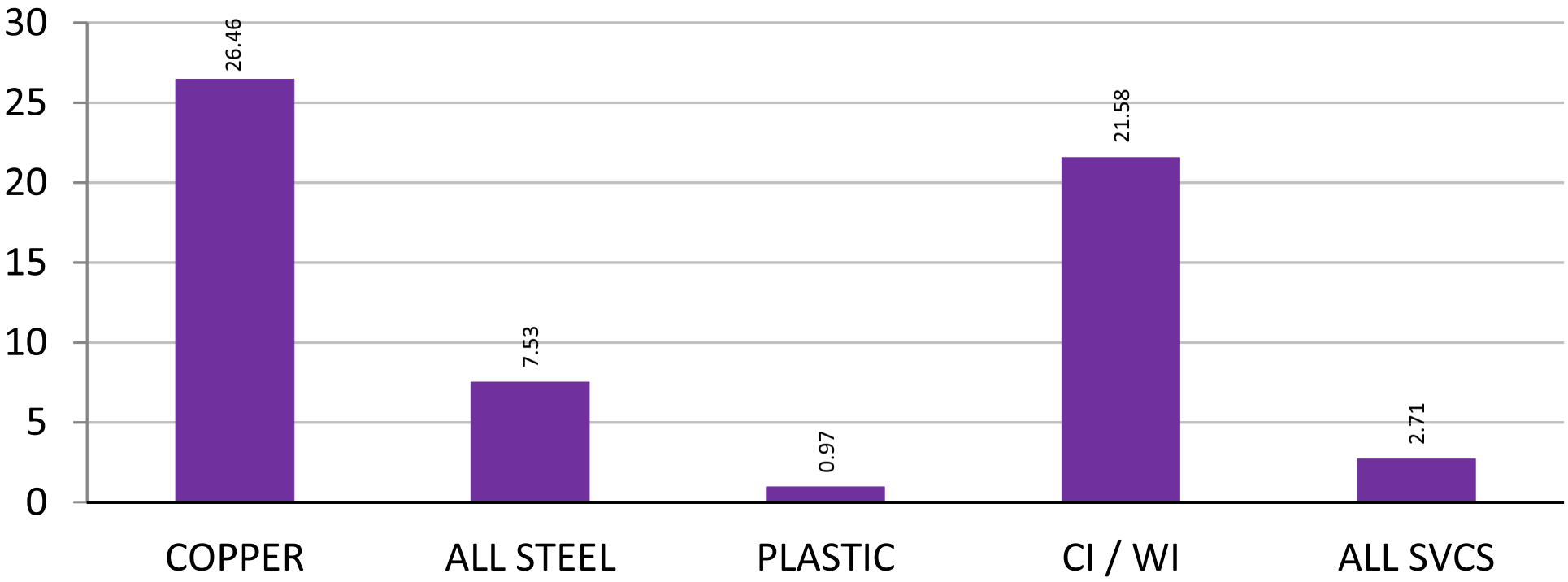
SERVICE LEAK "RATES"

COMPARISON BY MATERIAL

RI

EXCLUDING Damages

LEAK REPAIRS PER 1000 SERVICES



	2017	2018
Plastic	142,956	144,929

	2017	2018
Copper	192	189

	2017	2018
Cast Iron	129	127

	2017	2018
Total Steel	52,425	51,127

COUNTING EACH INDIVIDUAL REPAIR AS A LEAK

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2018 SYSTEM INTEGRITY REPORT

2017/2018
DISTRIBUTION
DOT REPORT
DATA COMPARISONS

2018 SYSTEM INTEGRITY REPORT

		LPP					
	General Data Correction						
	Explanation Needed	1,100	Main	1,140	Main		
	Discussed & Approved	42,109	Service	43,290	Service		
2017 - 2018 DOT Comparisons		**RI**					
		2018		**2017**		**Delta(18-17)**	**%**
Main Inventory	Cast Iron	700	miles	730	miles	-29	-4.0%
	Reconditioned Cast Iron	0	miles	0	miles	+0	N/A
	Plastic	1,539	miles	1,476	miles	+63	4.3%
	UP Bare Steel	199	miles	224	miles	-25	-11.2%
	UP Coated Steel	187	miles	171	miles	+16	9.4%
	Total UP Steel	386	miles	395	miles	-9	-2.3%
	CP Bare Steel	0	miles	0	miles	+0	N/A
	CP Coated Steel	562	miles	590	miles	-27	-4.6%
	Total CP Steel	562	miles	590	miles	-27	-4.6%
	Other	0	miles	0	miles	+0	0.0%
	Ductile Iron	14	miles	16	miles	-2	-12.6%
	TOTAL MAIN	**3,201**	**miles**	**3,205**	**miles**	**-4**	**-0.1%**
Main Leaks	Corrosion	102	repairs	102	repairs	+0	0.0%
	Natural Forces	94	repairs	26	repairs	+68	261.5%
	Excavation	12	repairs	16	repairs	-4	-25.0%
	Other Outside Force	1	repairs	1	repairs	+0	0.0%
	Material or Welds	5	repairs	0	repairs	+5	N/A
	Equipment	57	repairs	58	repairs	-1	-1.7%
	Operations	0	repairs	0	repairs	+0	N/A
	Other	756	repairs	666	repairs	+90	13.5%
	TOTAL MAIN LEAKS	**1,027**	**repairs**	**869**	**repairs**	**+158**	**18.2%**
Service Inventory	Copper	189	svcs	192	svcs	-3	-1.6%
	Plastic	144,929	svcs	142,956	svcs	+1973	1.4%
	UP Bare Steel	33,726	svcs	34,701	svcs	-975	-2.8%
	UP Coated Steel	8,067	svcs	8,268	svcs	-201	-2.4%
	Total UP Steel	41,793	svcs	42,969	svcs	-1176	-2.7%
	CP Bare Steel	0	svcs	0	svcs	+0	N/A
	CP Coated Steel	9,334	svcs	9,456	svcs	-122	-1.3%
	Total CP Steel	9,334	svcs	9,456	svcs	-122	-1.3%
	Other	763	svcs	803	svcs	-40	-5.0%
	Cast Iron / Wrought Iron	127	svcs	129	svcs	-2	-1.6%
	TOTAL SERVICES	**197,135**	**svcs**	**196,505**	**svcs**	+630	**0.3%**
Service Leaks Excluding Above Ground Leaks	Corrosion	333	repairs	460	repairs	-127	-27.6%
	Natural Forces	3	repairs	2	repairs	+1	50.0%
	Excavation	88	repairs	101	repairs	-13	-12.9%
	Other Outside Force	5	repairs	10	repairs	-5	-50.0%
	Material or Welds	2	repairs	2	repairs	+0	0.0%
	Equipment	135	repairs	74	repairs	+61	82.4%
	Operations	0	repairs	0	repairs	+0	N/A
	Other	20	repairs	5	repairs	+15	300.0%
	TOTAL SVC LEAKS	**586**	**repairs**	**654**	**repairs**	**-68**	**-10.4%**
Service Leaks Including Above Ground Leaks	Corrosion	333	repairs	460	repairs	-127	-27.6%
	Natural Forces	3	repairs	2	repairs	+1	50.0%
	Excavation	88	repairs	101	repairs	-13	-12.9%
	Other Outside Force	7	repairs	13	repairs	-6	-46.2%
	Material or Welds	2	repairs	2	repairs	+0	0.0%
	Equipment	135	repairs	74	repairs	+61	82.4%
	Operations	0	repairs	0	repairs	+0	N/A
	Other	20	repairs	5	repairs	+15	300.0%
	TOTAL SVC LEAKS	**588**	**repairs**	**657**	**repairs**	**-69**	**-10.5%**
Total Leak Repairs (Main & Service) Excluding Above Ground Leak		1,613	repairs	1,523	repairs	+90	5.9%
Total Leak Repairs (Main & Service) Including Above Ground Leak		1,615	repairs	1,526	repairs	+89	5.8%
Workable Backlog As of 12/31		169	leaks	74	leaks	+95	128.4%
UFG (Net)		2.5%		2.2%		0.30%	13.6%
Average Service Length (Ft)		66.5	ft	66.5	ft	+0	0.0%

Data Shown Includes Filed Revisions

2018 SYSTEM INTEGRITY REPORT

NATIONAL GRID-US
2018 GAS DISTRIBUTION SYSTEM STATISTICS

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2018 SYSTEM INTEGRITY REPORT

2018 GAS DISTRIBUTION SYSTEM STATISTICS

STATE	LEGACY	2018 PIPELINE / CUSTOMER / SENDOUT STATISTICS									
		Miles of Main	# of Services	Avg Service Length (ft/svc)	Miles of Services	TOTAL Distribution Pipeline	Residential Customers	Commercial and Industrial Customers	TOTAL Customers	Sendout (MDT)	Sendout (MDT)/ HDD
	NYC	4,156	569,988	45	4,858	9,014	1,194,771	73,018	1,267,789	206,995	59
	LI	8,253	550,950	65	6,783	15,036	540,268	62,489	602,757	108,941	31
	UPSTATE	8,820	566,339	73	7,819	16,639	576,024	47,688	623,712	173,868	38
ALL NEW YORK STATE		***21,229***	***1,687,277***	***60.9***	***19,460***	***40,689***	***2,311,063***	***183,195***	***2,494,258***	***489,804***	***42***
	BGC/EGC	7,240	563,962	49.0	5,232	12,472	655,202	59,871	715,073	126,715	33
	CCC/CLW	3,890	197,420	73.9	2,765	6,655	191,725	19,336	211,061	27,389	7
	RI	3,201	197,147	66.5	2,483	5,684	246,215	25,576	271,791	43,889	12
NEW ENGLAND		***14,331***	***958,529***	***57.7***	***10,480***	***24,811***	***1,093,141***	***104,784***	***1,197,925***	***197,993***	***17***
TOTAL NGRID-US		**35,560**	**2,645,806**	**59.7**	**29,939**	**65,499**	**3,404,205**	**287,978**	**3,692,183**	**687,797**	**30**

CAUTION:

This chart is for comparative-illustrative purposes only. The data is not audited & many assumption have been made.

Inventory data is from the Annual DOT/PHMSA Distribution Reports.
Customer data is from the Gas Customer Data base- Active Gas Accounts
Sendout data is from the sendouts for the 12-month period used to calculate UFG for the DOT Reports.

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2018 SYSTEM INTEGRITY REPORT

2018 GAS DISTRIBUTION SYSTEM STATISTICS

STATE	LEGACY	PERCENTAGES OF NGRID-US SYSTEM					ASSET RATIOS			GAS CONSUMPTION RATIOS			
		% of Main	% of Services	% of Distrib-ution Pipeline	% of Custo-mers	% of Sendout	Service Density (Svcs / Mile Main)	Meter Density (Custo-mers / Service)	Customer Density (Customers / Mile Total Pipeline)	Main Capacities Used (Sendout MDT / Mile Main)	Service Capacities Used (Sendout MDT/ Service)	Pipeline Capacities Used (Sendout MDT / Mile Total Pipe)	Customer Usage (Sendout MDT / Customer)
	NYC	11.7%	21.5%	13.8%	34.3%	30.1%	137	2.2	140.6	49.81	0.36	22.96	0.163
	LI	23.2%	20.8%	23.0%	16.3%	15.8%	67	1.1	40.1	13.20	0.20	7.25	0.181
	UPSTATE	24.8%	21.4%	25.4%	16.9%	25.3%	64	1.1	37.5	19.71	0.31	10.45	0.279
ALL NEW YORK STATE		***59.7%***	***63.8%***	***62.1%***	***67.6%***	***71.2%***	***79***	***1.5***	***61.3***	***23.07***	***0.29***	***12.04***	***0.196***
	BGC/EGC	20.4%	21.3%	19.0%	19.4%	18.4%	78	1.3	57.3	17.50	0.22	10.16	0.177
	CCC/CLW	10.9%	7.5%	10.2%	5.7%	4.0%	51	1.1	31.7	7.04	0.14	4.12	0.130
	RI	9.0%	7.5%	8.7%	7.4%	6.4%	62	1.4	47.8	13.71	0.22	7.72	0.161
NEW ENGLAND		***40.3%***	***36.2%***	***37.9%***	***32.4%***	***28.8%***	***67***	***1.2***	***48.3***	***13.82***	***0.21***	***7.98***	***0.165***
TOTAL NGRID-US		**100%**	**100%**	**100%**	**100%**	**100%**	**74**	**1.4**	**56.4**	**19.34**	**0.26**	**10.50**	**0.186**

2018 SYSTEM INTEGRITY REPORT

SEPARATE LEAK-PRONE PIPE ANALYSIS

STATE	LEGACY	2018 LEAK-PRONE PIPE INVENTORY						LEAK-PRONE PIPE %'s		
		Leak - Prone Main (miles)	% of TOTAL Main	Leak - Prone Services (#)	% of TOTAL Services	Miles of Leak - Prone Services	TOTAL Leak - Prone Pipe (in miles)	% of NG-US Leak - Prone Main (miles)	% of NG-US Leak - Prone Services (#)	% of NG-US TOTAL Leak - Prone Pipe
	NYC	1,565	37.7%	129,761	22.8%	1,106	2,671	16.7%	25.6%	17.8%
	LI	3,075	37.3%	79,730	14.5%	982	4,057	32.8%	15.7%	27.0%
	UPSTATE	566	6.4%	136,519	24.1%	1,885	2,451	6.0%	26.9%	16.3%
ALL NEW YORK STATE		***5,206***	***24.5%***	***346,010***	***20.5%***	***3,972***	***9,178***	***55.5%***	***68.3%***	***61.1%***
	BGC/EGC	2,896	40.0%	110,902	19.7%	1,029	3,925	30.8%	21.9%	26.1%
	CCC/CLW	186	4.8%	7,787	3.9%	109	295	2.0%	1.5%	2.0%
	RI	1,100	34.4%	42,121	21.4%	531	1,631	11.7%	8.3%	10.8%
NEW ENGLAND		***4,182***	***29.2%***	***160,810***	***16.8%***	***1,669***	***5,851***	***44.5%***	***31.7%***	***38.9%***
TOTAL NGRID-US		**9,388**	**26.4%**	**506,820**	**19.2%**	**5,641**	**15,029**	**100%**	**100%**	**100%**

NOTES:

Leak-Prone Main includes Cast Iron/Wrought Iron, Unprotected Steel , Aldyl-A and Other Material.
Leak-Prone Service includes Cast Iron/Wrought Iron, Copper and Unprotected Steel.

2018 SYSTEM INTEGRITY REPORT

LEAK AND REPAIR ANALYSIS

STATE	LEGACY	2018 LEAK DATA				LEAK RATE RATIOS					
		TOTAL Leak Receipts (Main & Service)	TOTAL Leak Repairs (Main & Service)	Year-End Workable Leak Backlog	TOTAL Repairs + Workable Leaks	TOTAL Leak Receipts / Mile TOTAL Pipe	TOTAL Leak Receipts / Mile Leak-Prone Pipe	TOTAL Leak Repairs / Mile TOTAL Pipe	TOTAL Leak Repairs / Mile Leak-Prone Pipe	Repairs + Workables / Mile TOTAL Pipe	Repairs + Workable / Mile Leak-Prone Pipe
	NYC	4,171	4,813	10	4,823	0.5	1.6	0.5	1.8	0.5	1.8
	LI	3,452	3,214	-	3,214	0.2	0.9	0.2	0.8	0.2	0.8
	UPSTATE	1,549	1,355	-	1,355	0.1	0.6	0.1	0.6	0.1	0.6
ALL NEW YORK STATE		***9,172***	***9,382***	***10***	***9,392***	***0.2***	***1.0***	***0.2***	***1.0***	***0.2***	***1.0***
	BGC/EGC	6,951	6,645	1,397	8,042	0.6	1.8	0.5	1.7	0.6	2.0
	CCC/CLW	707	869	17	886	0.1	2.4	0.1	2.9	0.1	3.0
	RI	1,989	1,466	169	1,635	0.3	1.2	0.3	0.9	0.3	1.0
NEW ENGLAND		***9,647***	***8,980***	***1,583***	***10,563***	***0.4***	***1.6***	***0.4***	***1.5***	***0.4***	***1.8***
TOTAL NGRID-US		**18,819**	**18,362**	**1,593**	**19,955**	**0.3**	**1.3**	**0.3**	**1.2**	**0.3**	**1.3**

NOTES:

TOTAL Leak Receipts (Main & Service) data excludes Excavation Leaks.
TOTAL Leak Repairs (Main & Service) data includes Excavation Leaks.
TOTAL Leak Repairs (Main & Service) data excludes Above Ground Leaks.

2018 SYSTEM INTEGRITY REPORT ANALYSIS (FINDINGS AND EXPLANATIONS)

2018 SYSTEM INTEGRITY REPORT

ANALYSIS OF FINDINGS AND EXPLANATIONS

FINDING 2:

RI

Total leak receipts have increased by 3% (65) in 2018 compared to 2017.

MAIN – Leak repairs have increased by 7% (63) in 2018 compared to 2017. Total Cast Iron Joint leaks comprise 74% of all main leaks.

SERVICE – Leak repairs have decreased by 18% (120) compared to 2017. Corrosion leaks comprise 44% of all service leaks.

TOTAL – Gas leak repairs decreased by 3% (53) in 2018.

2018 SYSTEM INTEGRITY REPORT
LPP Replacement Projection

NE - Leak Prone Pipe Replacement														
		CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22	CY23	CY24	CY25
RI	All Programs	54.3	44.0	28.8	56.0	62.7	63.3	67.0	55	55	70	70	70	70	70
	Proactive	50.0	39.9	23.0	50.3	51.0	48.3	51.2	42	42	49	49	53	54	59

Cast Iron/Unprotected Steel Ratio

NE - Cast Iron / Unprotected Steel					
Calendar Years		2015	2016	2017	2018
RI	Cast Iron	29.4	19.8	24.7	28.3
	Unp. Steel	39.5	41.0	28.5	39.2

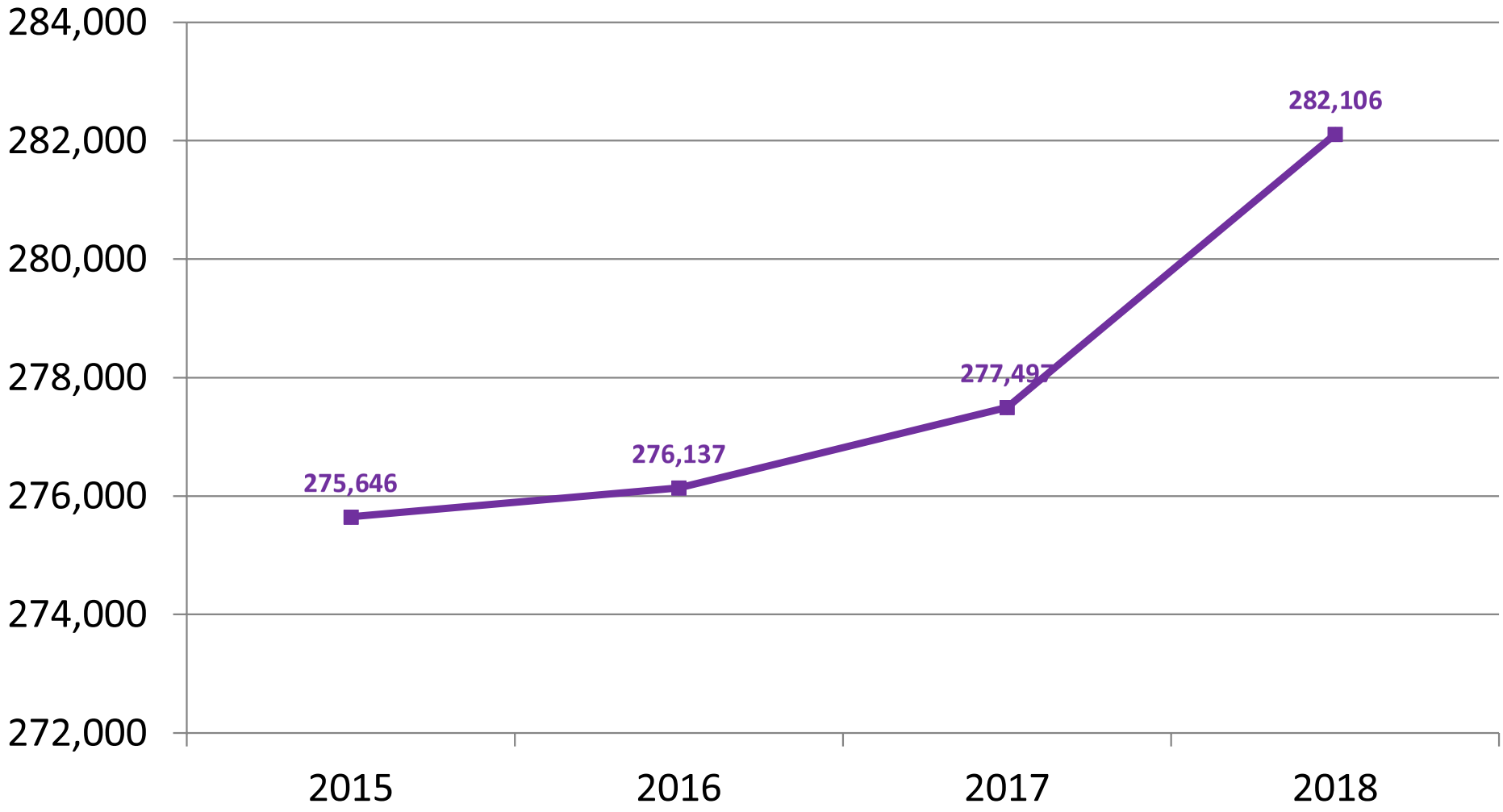
2018 SYSTEM INTEGRITY REPORT

2018 METER STATISTICS

2018 SYSTEM INTEGRITY REPORT

RI

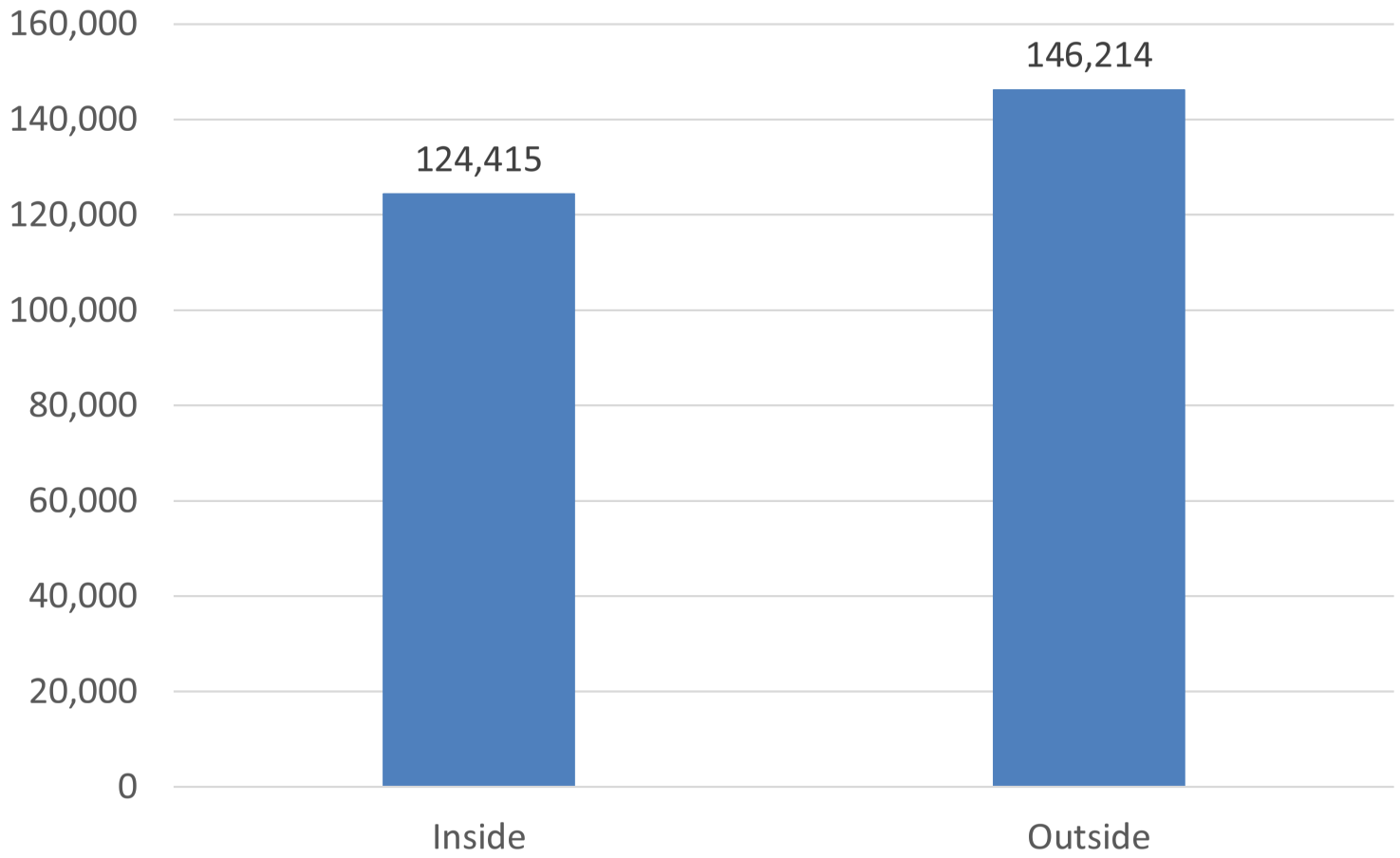
Meter Population



2018 SYSTEM INTEGRITY REPORT

RI

Meter Population Inside VS Outside



Note: Based upon readily available exports in July 2019.

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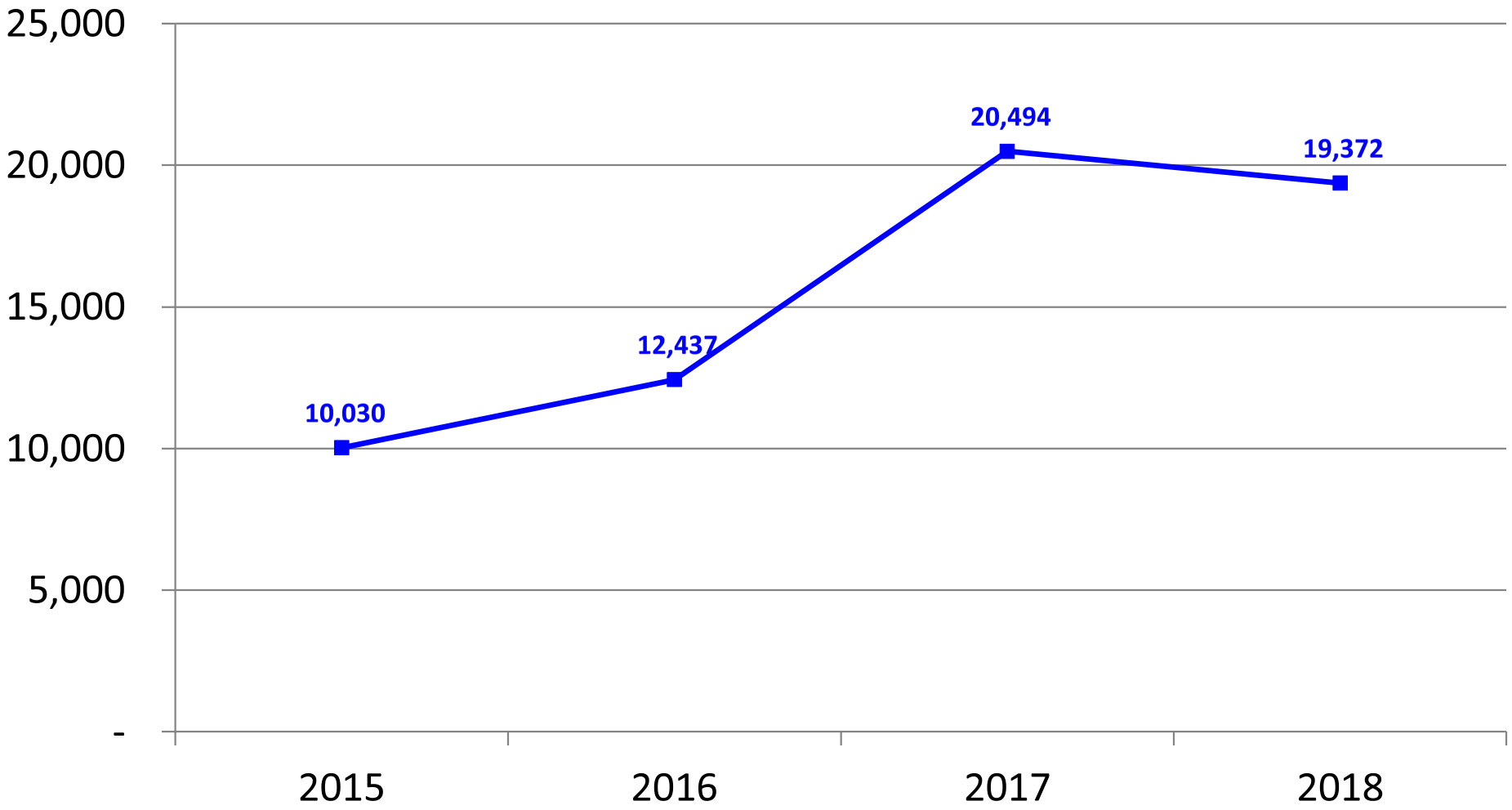
2018 SYSTEM INTEGRITY REPORT

RI

Meter Changes



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Section 2
Gas Capital Investment

Section 2

Gas Capital Investment Plan
FY 2021 Proposal

Gas Capital Investment Plan
FY 2021 Proposal

Background

The Company developed its proposed capital investment plan to meet its obligation to provide safe, reliable, and efficient gas distribution service for customers at reasonable costs.[7] The Gas ISR Plan includes capital investment spending needed to meet state and federal regulatory requirements applicable to the Company's gas system and to maintain its distribution infrastructure in a safe and reliable condition. To address the replacement of leak-prone pipe, the Plan includes infrastructure, safety, and reliability work for cast-iron and non-cathodically protected steel mains. The Plan also contains capital spending related to safety and reliability for public works projects, mandated programs, and gas reliability, including gas expansion in Southern Rhode Island. Additionally, the plan includes O&M spending to begin assessing capital investment options for heat decarbonization.

Consistent with the goals of the Revenue Decoupling Law, in order to continue to provide safe and reliable gas delivery service to Rhode Island customers, it is critical that the Company remain vigilant with respect to investing in its infrastructure and have appropriate and timely cost recovery. To that end, the Company's proposed Plan identifies the capital spending investment that it expects to complete in FY 2021. At the end of this section, Table 1 contains a description of the proposed budget for the FY 2021 Plan; Table 2 contains a proposed five-year

[7] The Company delivers natural gas to approximately 272,000 Rhode Island residential and commercial and industrial customers in 32 cities and towns in Rhode Island. To provide this service, the Company owns and maintains approximately 3,200 miles of gas mains and approximately 197,000 gas services.

spending forecast for FY 2021 through FY 2025; and Table 3 contains actual spending based on the prior five-year period, FY 2015 through FY 2019. In FY 2021, the Company proposes to invest a total of $199.61 million of ISR investments[8] to be included in the FY 2021 Gas ISR recovery mechanism. This amount includes the following: $39.30 million for Non-Discretionary capital expenditures; $144.79 million for Discretionary capital expenditures, which includes $40.46 million for the Southern RI Gas Expansion Project; $1.52 million for PE Stamps; $13.01 million for incremental curb to curb paving costs estimated in accordance with the new RI paving law; and $1.00 million of O&M spending to begin assessing capital investment options for heat decarbonization. The incremental paving costs include $2.61 million for incremental paving specific to the Southern RI Gas Expansion Project.

As set forth in Table 1 at the end of this section, the Company proposes the following levels of spending for each category of programs contained in the $199.61 million that the Company proposes in the FY 2021 Gas ISR Plan:

Non-Discretionary:

- $17.37 million net investment for Public Works programs, including $18.77 million in capital spend and $1.40 million in reimbursements;
- $21.68 million for Mandated Programs (i.e., Corrosion, Purchase Meter Replacements, Reactive Leaks (Cast Iron Joint Encapsulation/Service Replacement), Service Replacement (Reactive) – Non-Leak/Other, Main Replacement (Reactive) – Maintenance (including Water Intrusion), Transmission Station Integrity; and
- $0.25 million for Damage/Failure programs.

[8] For FY 2021, the Company plans to spend $232.84 million of total capital investment. Of that total amount, $33.23 million is associated with projected growth and other non-ISR spending, which is not included for recovery in the FY 2020 Gas ISR Plan.

Discretionary:

- $67.73 million for the Proactive Main Replacement program (i.e., Proactive Main Replacement, Large Diameter, and Atwells Avenue project);
- $0.35 million for the new Proactive Service Replacement program;
- $40.40 million for Gas System Reliability, including work relative to Gas System Control, System Automation, Heater Program, Pressure Regulating Facilities, Allens Avenue Multi Station Rebuild, Valve Installation Replacement, Take Station Refurbishment, Gas System Reliability Enhancement, Instrumentation and Regulation – Reactive, Distribution Station Over Pressure Protection, Liquefied Natural Gas (LNG) facilities, Replace Pipe on Bridges, Access Protection Remediation, and Tools and Equipment; and
- $40.46 million for the Southern Rhode Island Gas Expansion Project (Southern RI Gas Expansion).

Incremental Costs:

- $1.52 million for PE Stamps.
- $13.01 million for Incremental Curb to Curb Paving Costs, including Southern RI Gas Expansion and All Other ISR Work.

Operation and Maintenance Expenses:

- $1.00 million for Heat Decarbonization Assessment

Incremental Costs: Curb to Curb Paving

The Rhode Island Utility Fair Share Roadway Repair Act was enacted into state law on July 15, 2019. The Act require public utilities or utility facilities to repave and repair roadways which have been altered or excavated by the Utility from curb line to curb line or as required in accordance with the state or municipal utility permit requirements. The new law is immediately applicable to all work on state roadways, and within municipalities as they see fit to adopt within

their permits. To date, 5 of the 38 municipalities in Rhode Island[9] have adopted curb to curb restoration requirements. The Company anticipates that most municipalities will adopt the requirements before the start of the Company's FY 2021 construction season in April 2020. The new curb to curb paving restoration requirement will significantly impact the costs of gas capital construction projects and gas maintenance work in RI.

The Company has estimated the cost of complying with the law for all work other than the Southern RI project using the following assumptions and assuming the incremental paving will be required for 100% of miles installed and for 50% of patch restorations associated with ISR work. After subtracting the average cost of prior paving requirements, the Company estimates incremental costs of $5.60 million associated with restoring approximately 42.3[10] miles of trenches following main work, $4.80 million associated with restoring 3,429 patches associated with ISR work, and $2.61 million associated with road restoration for the Southern RI project.

[9] 32 municipalities have gas services.
[10] Approximately 14% of final restoration is already included in the average restoration costs, so the incremental restoration mileage is effectively approximately 36.5 miles.

A summary of the total estimate for the FY 2021 Gas ISR Incremental Curb to Curb Paving Costs is presented in the table below.

FY 2021
Incremental Curb to Curb Paving Costs
Main Installation, Patches, and Southern RI Gas Expansion Project

Planned Main Installation Paving Miles	42.3

*Note that minus the ~14% which is already paved curb to curb, this number is effectively approximately 36.5 miles

Main Installation Paving	Sq Yards/ Mile	Cost/ Sq Yd	Added Costs %*	Cost/Mile	Total Cost for 42.92 Miles	Budget
Minimum 8ft Restoration	4,693	$ 12.50		$ 58,663	$ 2,480,837	
Average 10.28ft Restoration	6,033	$ 12.50		$ 75,410	$ 3,189,089	
Curb to Curb 26 ft Restoration	15,253	$ 12.50	20%	$ 228,800	$ 9,675,952	
Curb to Curb minus Average = Incremental Cost/mile				$ 153,390	$ 6,486,863	
Deduct ~14% for roads already paved curb to curb					$ 890,889	
Total Incremental Cost for curb to curb main installation paving					$ 5,595,974	**$ 5,596,000**

*Added Costs for paving curb to curb such as driveway aprons, striping, drainage, sewer, intersection sensors, etc.

Planned ISR Patches	3,429

Patching Paving Costs	Average Cost/Patch	Total Cost for 3,429 Patches	Budget
Standard	$ 1,400	$ 4,800,600	
Mix of curb to curb and curb to center @ 50% adoption rate	$ 2,800	$ 9,601,200	
"Curb to Curb" minus Standard = Incremental Cost/Patch	$ 1,400	$ 4,800,600	**$ 4,801,000**

Southern RI Gas Expansion Incremental Paving Costs	Incremental Paving Cost	Budget
Main Installation*	$ 2,565,078	$ 2,565,000
Other Investment - MOP Increase from 150 to 200 psi	$ 49,000	$ 49,000
Total Incremental Southern RI Gas Expansion Paving Costs	$ 2,614,078	**$ 2,614,000**

*Cost also includes impact of new RIDOT concrete restoration guidelines

FY 2021 Gas ISR Incremental Paving Costs by Category	Incremental Paving Cost	Budget
Main Installation - 44.43 miles	$ 5,595,974	$ 5,596,000
Patches - 3,429 @ 50% (mix curb to curb and curb to center)	$ 4,800,600	$ 4,801,000
Southern RI Gas Expansion	$ 2,614,078	$ 2,614,000
Total FY 2021 ISR Incremental Paving Costs	**$ 13,010,652**	**$ 13,011,000**

Description of Programs and Projects

The Non-Discretionary and Discretionary programs are described in detail below.

Non-Discretionary Work:

A. Public Works

The purpose of the Public Works program is to address existing gas infrastructure conflicts, as appropriate, and to improve the safety and reliability of the Company's natural gas distribution system in conjunction with municipal reconstruction and water and sewer projects, which provide significant incremental benefits to customers and communities. Municipal and water and sewer work affords the Company an opportunity to replace additional leak-prone pipe and reduce paving costs by coordinating the Company's gas main replacement work with planned third-party construction projects, while also benefitting customers and communities by improving service delivery and minimizing construction impacts and inconvenience. The Company has an ongoing plan to replace targeted gas mains on a risk-based approach. Coordinating the Company's Integrity programs with planned municipal and water and sewer projects has yielded increased system reliability, system integrity, and optimized capital spending. Although one of the primary purposes of Public Works spending is to address direct conflicts between planned third-party projects and existing gas infrastructure, Public Works spending provides the additional opportunity to coordinate other system improvement work, such as the replacement of leak-prone pipe, system reliability upgrades, elimination of redundant main, and regulator station upgrades.

The Company will manage multiple projects to address the dynamic nature of the Public Works process through effective liaison activity. Although municipal schedules and plans

change largely due to funding, other factors also contribute to the scheduling of these projects (e.g., political demand and maintenance). Changes in municipal projects can and do create additional work in developing and coordinating the Company's planning and budgeting processes. Using the Company's five-year work planning process, the Company can provide some flexibility in scheduling, coordinating, and engineering projects in concert with municipal public works initiatives. For FY 2021, the Plan includes $17.37 million in spending under the Public Works category, which includes $18.77 million in capital spend and $1.40 million that is anticipated to be reimbursed under agreements with third parties. Overall, the Public Works budget provides for the installation of 13 miles of gas main, mainly resulting from the replacement and abandonment of 13 miles of leak-prone gas main, consisting of cast iron and unprotected steel main. Please note that the costs in this category do not include any incremental cost associated with complying with the new RI paving law. Please note that the Company's calculation of estimated incremental paving costs excludes public works miles since the municipality or the state is typically responsible for final paving restoration when the Company completes its work in conjunction with public works projects. Additionally, the costs in this category do not include the estimated incremental cost of $0.46 million associated with complying with the new PE Stamp statutory requirements. The PE Stamp costs will be tracked as a separate line item.

B. Mandated Programs

Spending for Mandated Programs falls into the following six categories: (1) Corrosion, (2) Purchase Meter Replacement, (3) Reactive Leaks (4) Reactive Service Replacement - Non-leak/Other, (5) Reactive Main Replacement-Maintenance, and (6) Transmission Station Integrity.

1. Corrosion

Cathodic protection effectively extends the service life of buried steel facilities (as compared to unprotected buried steel facilities) and can prolong replacement by 20 years or more. In 1971, the Code of Federal Regulations, Part 192, was amended to require the cathodic protection of all new buried steel gas facilities. Protection is accomplished in part through ensuring proper coating by establishing proper conditions on pipe segments through installation of rectifiers, anodes, insulators, and test stations. In addition, the Corrosion program includes control line work at existing regulator stations and cathodic protection upgrades. For FY 2021, the Company proposes to spend $1.17 million on this program. Please note that the costs in this category do not include the estimated incremental cost of $0.04 million associated with complying with the new PE Stamp statutory requirements. The PE Stamp costs will be tracked as a separate line item.

2. Purchase Meter Replacement

Capital costs for the Purchase Meter Replacement program are required for the procurement of replacement meters. For FY 2021, the Company proposes to purchase 22,000 meters. The meter replacements are part of a multi-year plan and 22,000 meters

represents approximately 7.8 percent of the existing meter population in Rhode Island, at a cost of $4.85 million.

3. Reactive Leaks

This category provides funding for the leak sealing of cast iron bell joints that are discovered during proactive leak surveys, public odor calls, or other activities. In addition, it provides funding for remediating leaking gas services through insertion, replacement, and/or abandonment of the services. For FY 2021, the Company proposes to spend $12.28 million for this work.

4. Reactive Service Replacement - Non-leak/Other

This program contains the capital costs for service relocations, meter protection, service abandonments, and the installation of curb valves. In FY 2021, the Company will continue the agreement with the Division to expand curb valve installations to properties inaccessible for inside inspection. Installation of curb valves provides additional public safety benefits and complements efforts in place aimed at improving collection and meter reading opportunities particularly in situations where the Company has encountered difficulty gaining access to meters. For FY 2021, the Company proposes to spend $2.10 million for this program.

5. Reactive Main Replacement – Maintenance

This category of work consists of emergency main replacements or modifications because of leaks or other unplanned events where main conditions dictate immediate replacement and/or gas facilities are subject to water intrusion or exposure and require remedy. Over the past several years, the Company has received minimal requests in this

category, primarily because the Company's increased Proactive Main Replacement program work has reduced the need for reactive work through construction of a more resilient system. The Company proposes to spend $0.68 million in this area.

6. <u>Transmission Station Integrity</u>

The Transmission Station Integrity program is a new ISR program for FY 2021 that is a continuation of a rate base- funded program[11], for $0.31 million per year. This program began several years ago and has primarily consisted of in-depth compliance records and documentation reviews of pressure regulating facilities. The primary purpose of the Transmission Station Integrity program is to meet the recent United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) code requirements, issued on October 1, 2019 and which will be effective on July 1, 2020. The PHSMA code requirements ensure that pipelines, including those associated with transmission stations, are safe, reliable, and fit for service. The next stage of this multi-year program includes retesting, and, where necessary, replacing equipment, prioritized by a standard risk-based evaluation that will not meet the incoming PHSMA documentation requirements. Of the 24 Transmission Stations on the Company's system, 12 are in scope for re-testing and/or replacing equipment. In FY 2021, the Company proposes to spend $0.61 million in this category, and the activities primarily consist of project development, engineering, and procuring long lead materials for the identified

[11] See RIPUC Docket No. 4770, November 27, 2017 Initial Filing, Book 4 at Bates Page 55, Line 17 and Bates Page 58, Line 8; August 16, 2018 Compliance Filing Book 2 on Bates Page 204, Line 3; and Compliance Attachment 2, Schedule 38, Page 6.

capital replacement projects. The Company expects that construction will begin in FY 2022.

Please note that the costs in the Mandated categories do not include the estimated incremental cost associated with complying with either the new RI paving law or the new PE Stamp statutory requirements, where applicable. Instead, these costs will be tracked as separate line items. In total, the Gas ISR Plan for FY 2021 contains $21.68 million for all categories of Mandated work.

C. Damage/Failure Program

The Company proposes to include funding for safety and reliability projects associated with remediation of damage or failure occurrences. Damage or failure projects are initiated in response to events outside the Company's control that require immediate action. The Company proposes a FY 2021 budget of $0.25 million for such work.

In total, for FY 2021, the Gas ISR Plan contains $39.30 million for Non-Discretionary work.

Discretionary Work:

A. Proactive Main Replacement Program

The value of and need for targeted spending on the replacement of leak-prone gas main is well-documented and has been accepted by the PUC and Division. For FY 2021, the Company forecasts spending $67.73 million on its Proactive Main Replacement and Rehabilitation programs, which will address approximately 49 miles of leak-prone gas main (approximately 48 miles of proactive main replacement including Atwells Avenue and approximately 1 mile of

rehabilitation work) and approximately 3,387 service relays, inserts, or tie-ins. Please note that the costs in this category do not include the estimated incremental cost associated with complying with the new RI paving law, with the exception of the Atwells Avenue project, which already assumed curb to curb paving in the cost estimates. The incremental paving costs incurred in the proactive main replacement program will be tracked as a separate line item. Additionally, the costs in this category do not include the estimated incremental cost of $0.80 million associated with complying with the new PE Stamp statutory requirements. The PE Stamp costs will be tracked as a separate line item.

1. **Proactive Main Replacement (<16-inch)**

   The Proactive Main Replacement (<16-inch) program consists of the installation of approximately 42.3 miles and the abandonment of approximately 47.4 miles of cast iron and unprotected steel main with a diameter of less than 16 inches, and the renewal, abandonment, or tie-over of existing services. The average installation cost per mile for work in rural locations is estimated to increase from $0.86 million in FY 2020 to $0.97 million in FY 2021. The average installation cost per mile for work in suburban locations is estimated to increase from $1.13 million in FY 2020 to $1.24 million in FY 2021. The average installation cost per mile for work in urban locations is estimated to decrease from $1.83 million in FY 2020 to $1.77 million in FY 2021 because the FY 2021 plan contains a slightly higher volume of replacements that are changing from low-pressure to high-pressure and calls for the installation of 2-inch and 4-inch main instead of 6-inch and 8-inch main which results in a cost savings per mile. The table below provides a

comparison of the Main Replacement – Leak Prone Pipe program between FY 2020 and FY 2021, including the estimated cost per mile for installed and abandoned main in urban, suburban, and rural areas. This table excludes the Large Diameter program and the costs for the Atwells Avenue Main Replacement program because the nature of those programs are not suitable for year-over-year comparison

FY 2020 (Plan as of 12/19/2018)				
	Installation Miles	Abandonment Miles	Installation Cost/Mile	Abandonment Cost/Mile
Rural	5.9	6.6	$0.86M	$0.76M
Suburban	18.4	20.1	$1.13M	$1.04M
Urban	17.1	20.3	$1.83M	$1.54M
Total	41.3	47.0	$1.38M	$1.22M
FY 2021 (Plan as of 12/18/2019)				
	Installation Miles	Abandonment Miles	Installation Cost/Mile	Abandonment Cost/Mile
Rural	4.0	4.6	$0.97M	$0.84M
Suburban	21.9	23.6	$1.24M	$1.15M
Urban	16.4	19.2	$1.77M	$1.51M
Total	42.3	47.4	$1.42M	$1.27M

The overall Proactive Main Replacement program costs have increased over the past several years, in part because the proportion of cast iron gas mains that the Company is replacing has increased. Moreover, the costs for replacement of cast iron main is typically greater than unprotected bare steel due to several key factors, including the following: (1) cast iron is predominant on low and intermediate pressure systems consisting of larger diameter mains; and (2) cast iron facilities are typically centralized in urban areas where costs are driven by higher customer density, greater underground congestion (e.g., excavation), and increased restoration and traffic control. In FY 2021,

the Company is increasing the cast iron abandonment percentage to 61 percent of total leak-prone pipe inventory, which is a 1 percent increase from the FY 2020 Plan. Cast iron represents 64 percent of the Company's total leak-prone main inventory in Rhode Island. The Company has analyzed historic costs and has developed budget projections based on project specific main replacement candidates identified for completion in the program. For FY 2021, the Company proposes to spend $59.25 million on the Proactive Main Replacement (<16-inch) program.

2. Proactive Large Diameter Program (>=16-inch)

The Company operates approximately 37 miles of large diameter (greater than or equal to 16-inches) leak-prone gas mains. The Proactive Large Diameter Program consists of rehabilitating large diameter leak-prone pipe through the implementation of a sealing and lining program. For FY 2021, the Company proposes to spend a total of $3.40 million on this program to address approximately one mile of large diameter leak-prone pipe. This includes lining 2,600 feet of cast iron main of 16-inches or more. In addition, the Company will seal 2,500 feet of 16-inch cast iron main. Lining and sealing are cost-effective alternatives for remediating large diameter leak-prone pipe. Additional benefits of this program include minimization of impact to customers and communities, a shortened construction period, and use of existing space in areas with significant underground utility congestion. All of this work is located in Providence.

3. Proactive - Atwells Avenue Main Replacement

In the 2017-2018 winter period, the Company experienced four main breaks on Atwells Avenue in Providence on 12-inch low pressure cast iron main installed in the 1870s. This main is located in one of the busiest streets in Providence, with a heavy concentration of restaurants. Upon completion of an integrity analysis, the Company concluded that it was necessary to abandon over one mile of cast iron main and replace it with over one mile (5,505 feet) of high-density polyethylene (HDPE) plastic pipe between FY 2020 and FY 2022. The project is broken into 4 segments; 1A – 1,565 feet; 1B – 1,565 feet; 2 – 965 feet; and 3 – 1,410 feet. In FY 2020, the Company is addressing the highest risk segment, Segment 2. In mid-September 2019, the City of Providence granted the Company a permit to begin that work. Due to the later than anticipated field work start date, the Company was unable to accelerate the Segment 1A work into FY 2020, and Segment 1A is now part of the FY 2021 workplan. The $5.08 million budget in FY 2021 includes the completion of Segments 1A and 1B (approximately 0.6 miles of installation and abandonment of leak-prone gas main) and the engineering and design work in preparation of Segment 3, which is scheduled to be completed in FY 2022. The Company anticipates that the final restoration work associated with Segment 2 will be completed in FY 2020. The final restoration work associated with Segments 1A and 1B, along with the field work for Segment 3, are scheduled to be completed as part of the estimated FY 2022 budget of $5.19 million. The total estimated cost for the Atwells Avenue main replacement project is approximately $11.63 million, although the estimate is subject to change.

B. Proactive Service Replacement Program

National Grid has identified 700 isolated leak prone services that will not be replaced as part of the Proactive Main Replacement Program because they are located on mains that are not leak prone. The Company will replace 100 services each year for the next seven years. The annual cost of the Proactive Service Replacement Program is $0.35 million. Please note that the costs in this category do not include the estimated incremental cost associated with complying with the new RI paving law. Those costs, explained above, will be tracked as a separate line item.

C. Reliability

Reliability spending includes 14 programs to address gas control and system automation, heating, pressure regulation, take stations, valve installation/replacement, gas network reliability and resiliency, distribution station over pressure protection, LNG facilities, replacement pipe on bridges, access protection remediation, and capital tools and equipment. The FY 2021 Gas ISR Plan contains $36.25 million in spending for Gas System Reliability. The costs in this category do not include any incremental cost associated with complying with the new RI paving law, and no costs have been built into the incremental paving cost estimate because the volume of paving associated with reliability work is limited. Any incremental paving costs incurred will be tracked as a separate line item in the Company's quarterly reports. Additionally, the costs in the Reliability categories do not include the estimated incremental cost of $0.23 million associated with complying with the new PE Stamp statutory requirements. The PE Stamp costs will be tracked as a separate line item. Of the $36.25 million budget, $20.66 million are costs specifically related to ensuring the Resiliency of the Company's gas distribution system. These

programs are designed to enhance the Company's ability to ensure the system is able to perform on the coldest days of the year or in the event of an incident that impacts delivery of gas supply to the Rhode Island system. Resiliency Programs are also designed to enhance the Company's ability to respond to emergencies and to minimize impacts to the system and our customers in the event of a supply interruption or other incidents that require interrupting gas service. A summary of each major program is provided below. Resiliency programs are identified in each category. The table below summarizes the programs that support Resiliency.

	FY 2021 Reliability Totals	**FY 2021 Resiliency Subcategory**	**Resiliency Sub-Categories**
Reliability Categories			
Gas System Control	$118		
System Automation	$1,252	$1,252	System Automation, Remote Operation from Gas Control
Heater Program	$2,961		
Pressure Regulating Facilities	$7,849	$7,849	Including second bypass valve installations
Allens Ave Multi Station Rebuild	$6,200		
Take Stations Rebuild	$995	$995	Take Station Refurbishments
Valve Installation/Replacement (incl Storm Hardening & Aquidneck Isl)	$676	$498	Valve Installation - Newport and Middletown
Gas System Reliability - Gas Planning	$2,371		
I&R - Reactive	$1,392		
Distribution Station Over Pressure Protection	$3,636	$3,636	Distribution Station Over Pressure Protection
LNG	$6,433	$6,433	Exeter, Cumberland, Support for Aquidneck Island
Replace Pipe on Bridges	$1,500		
Access Protection Remediation	$260		
Tools & Equipment	$603		
Reliability & Resiliency Totals	**$36,246**	**$20,663**	

1. Gas System Control

Under the Gas System Control – Training Simulator project, the Company's Gas Control and Critical Network Infrastructure personnel will use funding of $0.12 million to purchase, design and implement a real-time system modeled simulator for the training of new and in place Operators. Under the Federal Control Room Management Regulations CFR 192.631, pipeline operators are required to incorporate the use of either table-top

scenario or simulator based technology in the training of the Gas System Operators. Currently, the Company relies on paper based tabletop scenarios. The enhanced use of simulator based training for Operators will allow real time system based training to occur in response to normal, abnormal and emergency operating conditions and provide real time feedback in real world systems. This will allow Gas System Operators to recognize, react, and determine the correctness of their actions in real time to optimize gas system performance and to prevent real life emergency situations from occurring.

2. Valve Installation / Replacement

Valves are used to sectionalize portions of the gas network to support both planned and unplanned field activities. Replacement of inoperable valves is necessary to ensure the Company's continued ability to effectively isolate portions of the distribution system. New valve installations are also occasionally needed to provide the capability to reduce the size of an isolation area where existing valves would result in broader shutdown than desired. For FY 2021, the Company has budgeted $0.68 million for valve work, with approximately $0.50 million for valves in Newport and Middletown. The new valve installations in Newport and Middletown support Resiliency.

3. System Automation

The primary purpose of the System Automation program is to meet the United States Department of Transportation code requirements under 49 C.F.R. Part 192, Docket ID PHMSA 2007-27954, which were issued on December 3, 2009. These code provisions contain the following pipeline safety requirements: (a) control room management/human factors, (b) modernization of the Company's system data and telemetry recording, and (c)

increasing the level of system automation and control. The overall System Automation program will increase the safety, reliability, and efficiency of the gas system and, by extension, the level of service the Company provides to its customers.

The Company's ability to provide safe and reliable service is governed to a large extent by the Company's ability to maintain adequate pressure in its gas mains. To accomplish this task, the Company has approximately 196 gas pressure regulator stations disbursed throughout its Rhode Island gas service territory. Although a portion of these regulator stations have full system telemetry and control capability, additional stations require the installation of new telemetry equipment and FY 2021 will be a continuation of the process to equip more stations. In addition to monitoring and controlling the regulator stations, the Company must also monitor system end points to ensure that adequate system pressures are being maintained in remote areas under a variety of operating conditions. For FY 2021, the Company is proposing to spend $1.25 million for its System Automation program, all of which supports Resiliency. The Company's FY 2021 work will provide alternating current power, telemetry, and/or remote control to approximately 25 locations.

4. Heater Program

The Heater installation program provides for the installation and replacement of gas system heaters, which are operated to ensure proper conditioning and control of gas temperatures at key Company facilities. Work for the project identified in this program began in FY 2018, materials are being purchased in FY 2020, and the Company plans to

commence construction of the new heaters at the Company's Cranston gate station during FY 2021, which was deferred from FY 2020 due in part to higher than anticipated contractor bids. The Company will spend $2.96 million for the construction phase of this work, along with smaller heater upgrades at other locations, during FY 2021.

5. Pressure Regulating Facilities

The Company's pressure regulating facilities have been designed to reliably control gas distribution system pressures and maintain continuity of supply during normal and critical gas demand periods. Each regulator station has specific requirements for flows and pressures based on the anticipated needs of the station. A facility includes both pressure-regulating piping and equipment and control lines, but it may also include a heater or a scrubber. The Company has instituted a program that provides for condition-based assessments of all regulator stations. Accepted engineering guidelines provide for design, planning, and operation of these gas distribution facilities. Applicable state and federal codes are followed to help ensure safe and continuous supply of natural gas to the Company's customers and the communities it serves. The FY 2021 Plan includes enhancements in response to regulator station work prioritized through condition-based assessments, which include, in part, station accessibility, pipe condition (i.e., corrosion), water intrusion, redundancy, station isolation, and common mode failure. In FY 2021, work is planned at eight regulator stations, which includes locations in East Providence, Providence, Newport, Pawtucket, Warwick, and West Warwick. Additionally, work will be done to install a second bypass valve at nine stations to prevent a failure of a single

bypass valve resulting in over pressurization, of which, three stations are located in Middletown and four stations are located in Newport. The Company plans to spend $7.85 million for this category during FY 2021, all of which support Resiliency.

6. <u>Allens Avenue Multi Station Rebuild Project</u>

The Allens Avenue Multi Station Rebuild project is a multi-year project designed to replace or retire eight existing pressure regulating facilities at the Company's major gas interchange in Providence. Four of the existing regulator stations that feed the 99 pounds per square inch gauge (psig) distribution system will be replaced by, and consolidated into, a single new station, with that portion of work scheduled to begin in October 2019 and completed by the end of FY 2021. An additional three regulator stations feeding various distribution systems at other pressures will be relocated off-property, which will help enable abandonment of additional leak-prone pipe and is planned to begin in FY 2021. An eighth station will be retired by integrating the downstream system with an existing distribution network during the project. The new facilities on the site are designed with storm hardening protections to ensure safe and continued operation in the event of adverse weather impacts and flooding. The scope of work also includes the abandonment and/or removal of obsolete pipe and equipment in support of the safety and reliability of the Company's distribution system at this location. A component of the Allens Avenue Project is an LNG send-out line with an estimated cost of $1.30 million. This work was originally scheduled to be completed in FY 2021, will now be moved up to FY 2020. Advancing this work will help accelerate the project timeline and reduce the

FY 2021 budget requirement. Incorporating that change, in FY 2021, the Company plans to spend $6.20 million to relocate and commission three regulator stations and complete additional pipework associated with the new 99 psig regulator station.

7. Take Station Refurbishments

The Take Station Refurbishment program will address required modifications to the Company's custody transfer stations. Projects include installation of third layer of over pressure protection with remote operation capability at multiple stations, design costs for future station construction, and control line replacement work. The remote operated valves will be installed at high pressure connection points and will support the ability to shorten response time in the event of a major gas release. The Company plans to spend $1.00 million for this program during FY 2021. Take station refurbishments are designed to support Resiliency.

8. Gas System Reliability – Gas Planning Program

The Gas Planning program identifies projects that support system reliability through standardization and simplification of system operations (e.g., system up-ratings and de-ratings and regulator elimination), integration of systems (e.g., tie-ins), and new supply sources (e.g., take stations). The FY 2021 budget includes funding for the initial phase of a multi-year project designed to eliminate a single-feed system and engineering costs to address enhancements to the Cumberland Take Station on Scott Road. Funding is also included for the project closeout costs for the Wood at Woodlawn regulator station in

Bristol, which is being completed to move a regulator station out of flood plain area. For FY 2021, the Company proposes to spend approximately $2.37 million for this program.

9. Instrumentation and Regulation (I&R) Reactive Program

The I&R Reactive program is established to address capital project requirements over and above the Pressure Regulation capital budget. Projects range from instrumentation replacement due to failure; replacement of obsolete/unreliable equipment, such as regulators, pilots, boilers, heat exchangers, odorant equipment, and station valves; and replacement of building roofs or doors due to deterioration. New additions to the program for FY 2021 include the installation of override pilots to protect the system in case of control line damage or failure, as was the case recently with a gas system outside of Rhode Island. For FY 2021, the Company proposes to spend $1.39 million for this program.

10. Distribution Station Over Pressure Protection

The Distribution Station Over Pressure Protection program is new for FY 2021 and has been implemented to address risks for over pressurization incidents at pressure regulating facilities throughout the system. Actions planned for this program include work to relocate and provide additional protections for regulator sensing and control lines to protect from third-party damage, installation of additional control equipment to ensure safe and reliable regulator operation in the event of control line damage, and installation of new relief valves on the system to ensure that potential abnormal operating conditions

at regulator stations do not result in over pressurization scenarios. For FY 2021, the Company proposes to spend $3.64 million for this program which supports Resiliency.

11. LNG

The LNG program is established to address specific and blanket capital project requirements to support the Company's LNG operations. This program includes $5.42 million of funding for specific projects associated with the Exeter LNG facility, including the purchase of, and preparation for the installation of, two new boil-off compressors which will replace two compressors that were originally commissioned in the early 1970's, installation of an automated emergency shutdown system and associated upgrades to the fire alarm system, preparation for the installation of a high expansion foam system, and the purchase of critical spares for items that aren't readily available (i.e. long lead times). Additional funding of $0.57 million is associated with the blanket program for the Exeter LNG plant, which is aligned with recent historical experience for this facility. Funding also includes $0.25 million for engineering and infrastructure costs associated with peak shaving requirements for Aquidneck Island. Finally, funding also includes $0.20 for a Cumberland Tank Replacement feasibility study. For FY 2021, the Company plans to spend $6.43 million for the LNG program, all of which supports Resiliency.

12. Replace Pipe on Bridges

In FY 2021, the Company expects to spend $1.50 million for project planning, engineering, and long-lead materials in preparation for the replacement of main on the

Goat Island bridge in Newport. The Rhode Island Department is Transportation (RIDOT) is currently planning a project to repair or replace the bridge, with construction anticipated to begin in FY 2022.

13. Access Protection Remediation

The Access Protection Remediation program is designed to reduce the risk of public injury by restricting and/or deterring public access to the Company's elevated gas facilities. In FY 2021, the Company expects to spend $0.26 million for the identification and execution of projects for this program.

14. Capital Tools and Equipment

This category includes tools and equipment required to support the performance of work contained in the Gas ISR Plan and to provide for the safety and reliability of the gas distribution system. The Company will spend $0.60 million on capital tools and equipment during FY 2021.

D. Gas Expansion – Southern Rhode Island Project

As was detailed in the FY 2020 Gas ISR, the Company has identified a need and has begun to build in increased capacity in the Southern Rhode Island service territory. The more than 30,000 customers in the Company's Southern Rhode Island service territory are served by almost 600 miles of distribution infrastructure, including approximately 77 miles of distribution main operating at pressures of 99 psig and above (the Southern Rhode Island Distribution Mains). As of 2018, growth forecasts indicated the maximum vaporization capacity at the Exeter

LNG facility would be exceeded by calendar year 2019. This could have resulted in approximately 3,750 customers with below minimum pressures and them being at risk of losing service. In addition, several regulator station inlet pressures are predicted to fall below the minimum threshold, which would cause problems on the downstream pressure systems if the regulator stations cannot maintain their outlet set pressure. Increasing capacity in Southern Rhode Island mitigates the risk of customers in the region losing service in the event of an outage at the Exeter LNG facility. Moreover, many commercial customers seeking to expand existing and new operations in the Southern Rhode Island region, such as in and around Quonset Point, cannot be served without this project. Without this project, the Company may have needed to impose a moratorium on all new gas service requests, as well as requests for expansion of existing gas service, to prevent service interruptions to existing customers.

To address these capacity issues, in FY 2020, the Company began construction on a project to reinforce the Southern Rhode Island Distribution Mains by installing approximately five miles of new 20-inch steel distribution main parallel to the existing 12-inch distribution main located beneath Route 2 (a Rhode Island Department of Transportation right-of-way) through the towns of Warwick, West Warwick, and East Greenwich. The parallel distribution main is being constructed to be in-line inspected, initially operated at 99 psig, and designed for a maximum allowable operating pressure (MAOP) of 200 psig to meet future demand. The new distribution main will be placed in-service in phases between FY 2020 and FY 2022, with normal operation at 99 psig and the potential to operate at 200 psig after a district regulator station is installed in the future near South Road in East Greenwich. This project will also

require work on existing regulator and take stations from FY 2021 through FY 2023. Based on current forecasts, each segment will add immediate growth capacity. Once all of the segments are completed, the Company expects that approximately 1,100 dekatherms per hour of additional capacity will be available. The installation of a second distribution main will also improve the reliability of the Company's gas distribution system in the area by decreasing the Company's dependence on pressure support from the Exeter LNG facility and by introducing redundancy that reduces the risk associated with a distribution main being out of service.

Between FY 2020 and FY 2024, the Company estimates that it will spend a total of $125.53 million for the Southern Rhode Island Project, which includes $3.54 million for incremental curb to curb paving along with costs associated with new RIDOT concrete base restoration guidelines. The work is comprised of main installation, regulation station investment, and other upgrades and investment. For the main installation portion of the Southern Rhode Island Project, the Company plans to install a total of 5 miles (26,625 feet) of new 20-inch steel distribution main. Between FY 2020 and FY 2023, the total estimated cost for the main installation work is currently $96.79 million, based on a completed design and an 80 percent level of confidence based on identified risks and future unknown risks, which includes incremental paving costs of $3.49 million. Factors contributing to the 80 percent project confidence level include the known increase of contractor pricing for the awarded phase 2 & 3 contracts versus the original estimates, assumptions around the increased presence of ledge based on phase 1 field conditions, changes to the RI paving law, new RIDOT concrete base restoration guidelines, permitting and work hour restrictions, requirements for night work, and handling of contaminated soil and ground water. For FY 2021, the Company

expects to spend a total of $41.36 million for the main installation work, which includes incremental paving costs of $2.57 million.

In FY 2021, the Company plans to continue preparation work, such as planning, engineering, and site planning, for regulator stations associated with the Southern Rhode Island Project. Between FY 2021 and FY 2023, the Company plans to upgrade the Cranston Take Station and the Cowesett Regulator Station. The total estimated cost for the FY 2020 through FY 2024 regulator station work is currently $17.58 million. Funding of $5.79 million is included for a planned new regulator station located at the southern end of the main installation to reduce the system pressure from a MAOP of 200 psig to 99 psig before feeding back into the distribution system, with the majority of construction planned for FY 2023.

Other upgrades and investment for the Southern Rhode Island Project include the installation of a launcher and receiver to support in-line inspections of the 200 psig main, material testing to support the maximum operating pressure (MOP) increase from 150 psig to 200 psig for 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick, and the installation of a remote operating valve (ROV). The total estimated cost for the FY 2020 through FY 2023 other upgrades and investment work is currently $11.16 million, which includes incremental paving costs of $0.05 million related roadway patches for the MOP increase. For FY 2020, the Company estimates it will spend $3.55 million for the material testing. For FY 2021, the Company estimates it will spend $0.98 million to complete the remainder of the material testing, which includes incremental paving costs of $0.05 million. All other work in this category is planned to occur in FY 2022 and FY 2023. The estimates related to the FY 2022 and FY 2023 work are considered preliminary and will be updated as part of the Company's FY 2022 Gas ISR Plan.

A summary of the total estimate for the Southern Rhode Island Project is presented in the table below.

Southern RI Gas Expansion Spending Forecast

Description	Units	FY 2020 Forecast	FY 2021	FY 2022	FY 2023	FY 2024	Total in FY21 ISR
Main Installation:							
Phase 1	12,625	$ 39,922,433					$ 39,922,433
Phase 2	11,050		$ 38,798,000				$ 38,798,000
Phase 3	2,950			$ 13,982,000			$ 13,982,000
Project Closeout					$ 600,000	$ -	$ 600,000
Subtotal Main Installation	26,625	$ 39,922,433	$ 38,798,000	$ 13,982,000	$ 600,000	$ -	$ 93,302,433
Incremental curb to curb paving*		$ -	$ 2,565,000	$ 926,000	$ -	$ -	$ 3,491,000
Total Main Installation	**26,625**	**$ 39,922,433**	**$ 41,363,000**	**$ 14,908,000**	**$ 600,000**	**$ -**	**$ 96,793,433**
*Cost also includes impact of new RIDOT concrete restoration guidelines							
Regulator Station Investment:							
Cranston Take Station Upgrades		$ 75,000	$ 175,000	$ 9,754,000	$ 100,000	$ -	$ 10,104,000
Cowesett Regulator Station Upgrades		$ 75,000	$ 175,000	$ 1,337,000	$ 100,000	$ -	$ 1,687,000
New Regulator Station		$ 50,000	$ 380,000	$ 100,000	$ 5,205,000	$ 50,000	$ 5,785,000
Total - Regulator Station Investment		**$ 200,000**	**$ 730,000**	**$ 11,191,000**	**$ 5,405,000**	**$ 50,000**	**$ 17,576,000**
Other Upgrades/Investment:							
Launcher/Receiver		$ -	$ -	$ -	$ 5,698,000	$ -	$ 5,698,000
MOP Increase from 150 to 200 psi		$ 3,554,654	$ 932,000	$ 50,000	$ -	$ -	$ 4,536,654
Installation of ROV				$ 873,000	$ -	$ -	$ 873,000
Subtotal - Other Investment		$ 3,554,654	$ 932,000	$ 923,000	$ 5,698,000		$ 11,107,654
Incremental curb to curb paving		$ -	$ 49,000	$ -	$ -	$ -	$ 49,000
Total - Other Investment		**$ 3,554,654**	**$ 981,000**	**$ 923,000**	**$ 5,698,000**	**$ -**	**$ 11,156,654**
Subtotal Southern RI Gas Expansion Project (Excluding Incremental Curb to Curb Paving)		$ 43,677,087	$ 40,460,000	$ 26,096,000	$ 11,703,000	$ 50,000	$ 121,986,087
Total Incremental curb to curb paving		$ -	$ 2,614,000	$ 926,000	$ -	$ -	$ 3,540,000
Total Southern RI Gas Expansion Project		**$ 43,677,087**	**$ 43,074,000**	**$ 27,022,000**	**$ 11,703,000**	**$ 50,000**	**$ 125,526,087**

For FY 2021, the Company estimates it will spend a total of $43.07 million for the Southern Rhode Island Project. This includes $41.36 million for the installation of 2.1 miles (11,050 feet) of gas main, $0.73 million related to regulator stations, and $0.98 million to complete the final portion of the material testing required to increase the maximum operating pressure from 150 psig to 200 psig for the 5.2 miles (27,578 feet) of existing main in Cranston and West Warwick.

Excluding the Gas Expansion category, the proposed Gas ISR Plan contains $104.33 million in spending for Discretionary work in FY 2021. Including the Gas Expansion category, the proposed Plan contains a total of $144.79 million in spending for Discretionary work.

O&M Expenses:

A. Heat Decarbonization

National Grid recognizes and supports Rhode Island's need to ensure energy reliability and facilitate the transition towards a low-carbon future and away from the high-carbon, delivered fuels that currently supply roughly 40% of the State's heading needs. The Company believes that the best approach for Rhode Island is a technology-neutral approach, and that a balanced mix of strategic electrification, decarbonized gas, and energy efficiency will play a material role in achieving these objectives. National Grid can help identify and provide greater insights into the actions Rhode Island can take over the next decade to address heating sector reliability and emissions and which types of actions should be undertaken at pilot versus commercial scale.

For instance, geothermal heat pumps are highly efficient and can meet whole-home heating and cooling needs. For delivered fuel customers outside of the natural gas network, geothermal is an opportunity to convert to a cleaner heating system. However, the high cost of these systems a lack of public awareness has stifled widescale adoption of this technology. The Company believes that utility involvement can help address both barriers and encourage geothermal heat pump adoption growth.

The Company is proposing a top-down technical and market feasibility analysis of ground source heat pumps, evaluating inclusion of the heating loop in rate base. A two-phased assessment, as it is envisioned, will focus on utility applications at the edge of the gas network (i.e., communities currently seeking gas connections) and how the customer interacts with the technology from a business perspective. This assessment will help inform the Company's future geothermal capital plans.

Phase 1 aims to provide:

- A high-level, techno-economic assessment of geothermal with ground source heat pumps,
- An evaluation of land availability and limitations on the use thereof, and
- Identification of site selection criteria.

Phase 1 will be used to understand the potential for geothermal heat pumps to contribute to heating sector emissions reductions in Rhode Island and inform supporting strategy. It is anticipated the Company will perform the assessment in-house. Phase 2 will focus on identifying suitable sites for utility owned geothermal heat pump systems. This will be accomplished through a market analysis that identifies specific candidate sites, utility business models, and customer offerings, as well as assesses scalability. Due to limited internal resources, the Company anticipates retaining consulting services to assist with Phase 2.

For those customers for whom electrification is impracticable due to economic and / or technical constraints, the Company sees the opportunity to drive the decarbonization of the gas network through renewable natural gas (RNG) and potentially hydrogen blending. RNG

presents an extraordinary opportunity to decarbonize the heating sector and leverage existing assets for a more affordable outcome. Integrating RNG converts the existing gas network into a clean energy distribution system that delivers low- or zero-carbon fuel to customers. We believe that decarbonizing the gas and electric networks in parallel can reduce the cost of achieving deep decarbonization goals. Integrating RNG will allow customers to reduce their carbon footprint, without having to replace equipment or undertake deep renovations, minimizing disruption and upfront capital costs for our customers.

The objective of this project is to understand the potential near-and long-term gas demand in Rhode Island that can be served by RNG. To accomplish this, the Company proposes a bottom-up RNG (including hydrogen) economic potential assessment. Specifically, the Company proposes estimating the potential amount of near and long-term non-electric gas demand in Rhode Island that can be served by RNG based on available feedstocks, load forecasts, and expected renewable generation buildout and dedicated RNG / hydrogen project-specific renewables projects. The most granular, site-specific assessment will be focused on landfill gas given facilities have been operating at scale worldwide for decades. Emerging sources and technologies used to produce RNG (municipal solid waste, food waste) and hydrogen (via electrolyzers) will also be evaluated for near-, mid-, and long-term feasibility. This insight will be used to identify opportunities for utility-led capital programs and projects that provide or integrate low-carbon energy supply, such as:

- Identify and evaluate specific locations for RNG interconnections and potential partners to develop RNG facilities.

- Evaluate locations for future use as a closed-loop hydrogen injection site. The Company would determine if hydrogen can safely be introduced into our system in subsequent years.
- Evaluating locations for use as a future RNG injection site. Engineering work will allow us to ascertain an appropriate and beneficial location to build a hydrogen injection site in the State. The work will provide the Company with a more complete understanding of the application of hydrogen technology in our system. The money requested could be utilized to develop a building site plan for a future electrolyzer, potentially aimed at meeting supply constraints in a specific area, and which could blend 2-3% hydrogen into the system (further allowing us to address potential leak and pipe embrittlement concerns).

Five-Year Gas ISR Investment Plan

As of December 31, 2018, approximately 1,150 miles, or 36 percent, of the 3,201 miles in the Company's gas distribution system in Rhode Island is made up of leak-prone pipe. The 1,150 miles of leak-prone pipe are comprised of 386 miles of unprotected steel, 715 miles of cast iron and wrought iron gas main, and 50 miles of vintage Aldyl-A and Polybutylene plastic. The Company plans to eliminate or rehabilitate all leak-prone pipe within the next 16 years.

The Company's proposed five-year Gas ISR investment plan is provided in Table 2 below. Table 2 contains the approved FY 2020 Plan spending, along with spending projected within each of the primary categories for the period FY 2020 through FY 2024.

The Company's prior five-year Gas ISR investment plan actual spend is provided in Table 3 below.

Table 1
Narragansett Gas
FY 2021
($000)

Categories	Budget	Leak-Prone Pipe Abandonment Miles	Main Replacement Installation Miles
NON-DISCRETIONARY			
Public Works			
CSC/Public Works - Non-Reimbursable	$17,368		
CSC/Public Works - Reimbursable	$1,403		
CSC/Public Works - Reimbursements	($1,403)		
Public Works Total	**$17,368**	**13.0**	**13.0**
Mandated Programs			
Corrosion	$1,166		
Purchase Meters (Replacements)	$4,852		
Reactive Leaks (CI Joint Encapsulation/Service Replacement)	$12,280		
Service Replacements (Reactive) - Non-Leaks/Other	$2,096		
Main Replacement (Reactive) - Maintenance (incl Water Intrusion)	$680		
Transmission Station Integrity	$610		
Mandated Total	**$21,684**		
Damage / Failure (Reactive)			
Damage / Failure (Reactive)	**$249**		
NON-DISCRETIONARY TOTAL	**$39,301**		
DISCRETIONARY			
Proactive Main Replacement			
Main Replacement (Proactive) - Leak Prone Pipe	$59,250	47.4	42.3
Main Replacement (Proactive) - Large Diameter LPCI Program	$3,398		
Atwells Avenue	$5,081	0.6	0.6
Proactive Main Replacement Total	**$67,729**	**48.0**	**42.9**
Proactive Service Replacement			
Proactive Service Replacement Total	**$350**		
Reliability			
Gas System Control	$118		
System Automation	$1,252		
Heater Installation Program	$2,961		
Pressure Regulating Facilities	$7,849		
Allens Ave Multi Station Rebuild	$6,200		
Take Station Refurbishment	$995		
Valve Installation/Replacement (incl Storm Hardening & Middletown/Newport)	$676		
Gas System Reliability	$2,371		
I&R - Reactive	$1,392		
Distribution Station Over Pressure Protection	$3,636		
LNG	$6,433		
Replace Pipe on Bridges	$1,500		
Access Protection Remediation	$260		
Tools & Equipment	$603		
Reliability Total	**$36,246**		
SUBTOTAL DISCRETIONARY (Without Gas Expansion)	**$104,325**		
Southern RI Gas Expansion Project	$40,460		
DISCRETIONARY TOTAL (With Gas Expansion)	**$144,785**		
CAPITAL ISR TOTAL (Base Capital - Without Gas Expansion)	**$143,626**		
CAPITAL ISR TOTAL (With Gas Expansion) Amount does not include incremental paving associated with new RI Paving Law, PE Stamps, or O&M	**$184,086**	**61.0**	**55.9**
Incremental Costs			
PE Stamps	$1,515		
Incremental Paving - Main Installation	$5,596		
Incremental Paving - Patches	$4,801		
Incremental Paving - Southern RI Gas Expansion	$2,614		
Incremental Costs Total	**$14,526**		
CAPITAL ISR TOTAL **(with Gas Expansion, PE Stamps, and Incremental Paving)**	**$198,612**		
O&M - Heat Decarbonization			
O&M - Heat Decarbonization Total	**$1,000**		
ISR GRAND TOTAL **(with Gas Expansion, PE Stamps, Incremental Paving, and O&M)**	**$199,612**	**61.0**	**55.9**

*Total miles of abandonment will be 62 miles. 1 mile will come from Reinforcement work.

Table 2
RI Gas ISR Spending Forecast
($000)

Investment Categories	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
NON-DISCRETIONARY					
Public Works	$17,368	$17,851	$18,172	$18,815	$20,624
Mandated Programs	$21,684	$27,218	$27,477	$36,431	$40,915
Damage / Failure (Reactive)	$249	$248	$245	$247	$285
Special Projects	$0	$0	$0	$0	$0
NON-DISCRETIONARY TOTAL	**$39,301**	**$45,318**	**$45,894**	**$55,493**	**$61,824**
DISCRETIONARY					
Proactive Main Replacement	$67,729	$74,149	$69,780	$76,185	$76,286
Proactive Service Replacement	$350	$350	$350	$350	$350
Reliability	$36,246	$36,514	$75,774	$73,783	$42,352
SUBTOTAL DISCRETIONARY (Without Gas Expansion)	**$104,325**	**$111,013**	**$145,904**	**$150,318**	**$118,988**
Southern RI Gas Expansion Project	$40,460	$26,096	$11,703	$50	$0
DISCRETIONARY TOTAL (With Gas Expansion)	**$144,785**	**$137,109**	**$157,607**	**$150,368**	**$118,988**
CAPITAL ISR TOTAL (Base Capital - Without Gas Expansion)	**$143,626**	**$156,330**	**$191,798**	**$205,811**	**$180,811**
CAPITAL ISR TOTAL (With Gas Expansion) Amount does not include incremental paving costs associated with new RI Paving Law, PE Stamps, or O&M	**$184,086**	**$182,426**	**$203,501**	**$205,861**	**$180,811**
INCREMENTAL COSTS					
PE Stamps	$1,515	$1,560	$1,607	$1,655	$1,705
Incremental Paving - Main Installation	$5,596	$5,764	$5,937	$6,115	$6,298
Incremental Paving - Patches	$4,801	$4,945	$5,093	$5,246	$5,404
Incremental Paving - Southern RI Gas Expansion	$2,614	$926	$0	$0	$0
INCREMENTAL COSTS TOTAL	$14,526	$13,195	$12,637	$13,017	$13,407
CAPITAL ISR Total (With Gas Expansion, PE Stamps, and Incremental Paving)	**$198,612**	**$195,622**	**$216,139**	**$218,878**	**$194,218**
O&M - HEAT DECARBONIZATION*					
O&M - Heat Decarbonization Total	**$1,000**	**$0**	**$0**	**$0**	**$0**
ISR GRAND TOTAL (with Gas Expansion, PE Stamps, and Incremental Paving)	**$199,612**	**$195,622**	**$216,139**	**$218,878**	**$194,218**

*Heat Decarbonization FY22-25: Future years are TBD and will be proposed in the FY22 ISR based on outcomes of feasibility studies in FY21.

Table 3

RI Gas ISR Historical Spend
($000)

Investment Categories	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
	Actual	**Actual**	**Actual**	**Actual**	**Actual**
NON-DISCRETIONARY					
Public Works	$ 7,207	$ 7,732	$ 8,597	$ 14,590	$ 13,575
Mandated Programs	$ 15,415	$ 16,861	$ 16,370	$ 22,110	$ 18,868
Damage / Failure (Reactive)	$ -	$ -	$ -	$ 1,610	$ -
Special Projects	$ -	$ -	$ 5,020	$ 1,780	$ 8,486
NON-DISCRETIONARY TOTAL	**$ 22,622**	**$ 24,592**	**$ 29,987**	**$ 40,080**	**$ 40,928**
DISCRETIONARY					
Proactive Main Replacement	$ 40,904	$ 58,386	$ 48,872	$ 51,210	$ 52,629
Proactice Main Replacement - Large Diameter LPCI Program	$ -	$ -	$ -	$ 1,180	$ -
Atwells Avenue	$ -	$ -	$ -	$ -	$ -
Service Replacement - Proactive	$ 1,121	$ 1,789	$ -	$ -	$ -
Reliability	$ 8,968	$ 7,914	$ 8,403	$ 13,950	$ 10,290
Special Projects	$ 3,728	$ 1,188	$ -	$ -	$ -
DISCRETIONARY TOTAL	**$ 54,721**	**$ 69,277**	**$ 57,275**	**$ 66,330**	**$ 62,918**
Base ISR Capital Total (Excluding Growth)	**$ 77,343**	**$ 93,869**	**$ 87,262**	**$ 106,410**	**$ 103,846**
O&M Total	$ 503	$ 464	$ 488	$ 560	$ 179
GAS ISR TOTAL	**$ 77,846**	**$ 94,333**	**$ 87,750**	**$ 106,970**	**$ 104,025**

Section 3
Revenue Requirement

Section 3

Revenue Requirement
FY 2021 Proposal

Revenue Requirement
FY 2021 Proposal

The attached proposed revenue requirement calculation reflects the revenue requirement related to the Company's proposed investment in its Gas ISR Plan for the fiscal year ended March 31, 2021.

As shown on Attachment 1, Page 1, Column (b), the Company's FY 2021 Gas ISR Plan cumulative revenue requirement totals $22,354,740. The revenue requirement consists of the following elements: (1) operation and maintenance (O&M) expenses of $1,000,000 associated with heat decarbonization; (2) the revenue requirement of $7,636,309 on FY 2021 proposed non-growth ISR capital investment of $198,612,000, as calculated on Attachment 1, Page 12; (3) the FY 2021 revenue requirement on incremental non-growth ISR capital investment for FY 2018 through FY 2020 totaling $9,007,264, as summarized on Attachment 1, Page 1; and (4) property tax expenses of $4,711,167, as shown on Attachment 1, Page 20, in accordance with the property tax recovery mechanism included in the Amended Settlement Agreement in Docket No. 4323 and continued under the Amended Settlement Agreement in Docket No. 4770. Importantly, the incremental capital investment for the FY 2021 ISR revenue requirement excludes capital investment embedded in base rates in Docket No. 4770 for FY 2018 through FY 2021. Incremental non-growth capital investment for this purpose is intended to represent the net change in net plant for non-growth infrastructure investments during the relevant fiscal year and is defined as capital additions plus cost of removal, less annual depreciation expense ultimately embedded in the Company's base rates (excluding depreciation expense attributable to general plant, which is not eligible for inclusion in the Gas ISR Plan).

For illustration purposes only, Attachment 1, Page 1, Column (c) provides the FY 2022 revenue requirement for the respective vintage year capital investments. Notably, these amounts will be trued up to actual investment activity after the conclusion of the fiscal year, with rate adjustments for the revenue requirement differences incorporated in future ISR filings.

Operation and Maintenance Expenses

As previously noted, the Company's FY 2021 Gas ISR Plan revenue requirement includes $1,000,000 of operation and maintenance expenses as shown on Page 1, Line 1, associated with heat decarbonization. These proposed operation and maintenance expenses are discussed in Section 2 of this Plan.

Gas Infrastructure Investment

Incremental Capital Investment

As noted above, Attachment 1, Page 12 calculates the revenue requirement of incremental capital investment associated with the Company's FY 2021 Gas ISR Plan, that is, gas infrastructure investment (net of general plant) incremental to the amounts embedded in the Company's base distribution rates. The proposed capital investment, including cost of removal, was obtained from Table 1 in Section 2 of the Plan. The FY 2021 revenue requirement also includes the incremental capital investment associated with the Company's actual ISR capital investments from FY 2018 through FY 2019 and FY 2020 ISR Plan, excluding investments reflected in rate base in Docket No. 4770.

Attachment 1, Page 15 calculates the incremental FY 2018 through FY 2021 ISR capital investment and the related incremental cost of removal, incremental retirements, and incremental net operating loss (NOL) position for the FY 2021 ISR revenue requirement. The calculations on Page 15 compare ISR-eligible capital investment, cost of removal, retirements, and net NOL position for FY 2018 through FY 2021 to the corresponding amounts reflected in rate base in Docket No. 4770.

Incremental Capital Investment Calculation

The ISR mechanism was established to allow the Company to recover outside of base rates its costs associated with plant additions incurred to expand its gas infrastructure and improve the reliability and safety of its gas facilities. When new base rates are implemented, as was the case in Docket No. 4770, the Company no longer recovers costs for pre-rate case ISR plant additions through a separate ISR factor. Instead, such costs are recovered through base rates, and the underlying ISR plant additions become a component of base distribution rate base from that point forward. The forecast used to develop rate base in the distribution rate case included ISR plant additions levels for FY 2018, FY 2019, and five months of FY 2020 (using the level of plant additions approved in the FY 2018 Gas ISR Plan as a proxy for FY 2019 and FY 2020). The effective date of new rates in Docket No. 4770 was September 1, 2018. Therefore, recovery of the approved FY 2012 through FY 2017 ISR revenue requirement through the ISR factor ended on August 31, 2018, and all future recovery of those ISR plant additions will be through the Company's base rates.

As a result of the implementation of new base rates pursuant to Docket No. 4770 effective September 1, 2018, the cumulative amount of forecasted ISR plant additions were

rolled into base rates effective at that date. The FY 2021 revenue requirement for incremental FY 2018, FY 2019, and FY 2020 ISR investments reflect a full year of revenue requirement because none of these incremental investments are included in the Company's rate base in Docket 4770. These incremental fiscal year vintage amounts must remain in the ISR recovery mechanism as provided for in the terms of the approved Amended Settlement Agreement in Docket No. 4770. The current filing is based on the actual ISR investment made during the Company's fiscal years ended March 31, 2018 and 2019 and estimated ISR investment levels for the Company's fiscal years ended March 31, 2020 and 2021, and which are incremental to the levels reflected in rate base in the Company's last base rate case (Docket No. 4770).

Gas Infrastructure Revenue Requirement

The revenue requirement calculation on incremental gas infrastructure investment for vintage year FY 2021 is shown on Attachment 1, Page 12. The revenue requirement calculation incorporates the incremental Gas ISR Plan capital investment, cost of removal, and retirements, which are the basis for determining the two components of the revenue requirement: (1) the return on investment (i.e., average Plan rate base at the weighted average cost of capital) and (2) depreciation expense. The calculation on Page 12 begins with the determination of the depreciable net incremental capital that will be included in the Plan rate base. Because depreciation expense is affected by plant retirements, retirements have been deducted from the total allowed capital included in the Plan rate base in determining depreciation expense. Retirements, however, do not affect rate base, as both plant-in-service and the depreciation reserve are reduced by the installed value of the plant being retired and, therefore, have no

impact on net plant. Incremental book depreciation expense on Line 12 is computed based on the net depreciable additions from Line 3 at the 2.99 percent composite depreciation rate approved in Docket No. 4770, and as shown on Line 9. The Company has assumed a half-year convention for the year of installation. Unlike retirements, cost of removal affects rate base, but not depreciation expense. Consequently, the cost of removal, as shown on Line 7, is combined with the incremental depreciable amount from Line 6 (vintage year ISR Plan allowable capital additions, less non-general plant depreciation expense included in base distribution rates) to arrive at the incremental investment on Line 8 to be included in the rate base upon which the return component of the annual revenue requirement is calculated.

The rate base calculation incorporates net plant from Line 8 and accumulated depreciation on current vintage year investment and accumulated deferred tax reserves as shown on Lines 13 and 18, respectively. The deferred tax amount arising from the capital investment, as calculated on Lines 14 through 18, equals the difference between book depreciation and tax depreciation on the capital investment, multiplied by the effective tax rate, net of any tax net operating loss (NOL) or NOL utilization. The calculation of tax depreciation is described below. The average rate base before deferred tax proration adjustment is shown on Line 23. This amount then nets with the deferred tax proration adjustment on Line 24 to derive the average ISR rate base on Line 25. This average rate base is multiplied by the pre-tax rate of return approved by the PUC in Docket No. 4770, as shown on Line 26, to compute the return and tax portion of the incremental revenue requirement, as shown on Line 27. Incremental depreciation expense is added to this amount on Line 28. The sum of these amounts reflects the annual revenue requirement associated with the capital investment portion of the Plan on Line 29, which is

carried forward to Page 1 as part of the total Plan revenue requirement. Similar revenue requirement calculations for the vintage FY 2018 through FY 2020 incremental Plan capital investment are shown on Pages 2, 5 and 8, respectively. These capital investment revenue requirement amounts are added to the total property tax recovery on Page 1, Line 8 and the operation and maintenance expense on Page 1, Line 1 to derive the total FY 2021 Gas ISR Plan revenue requirement of $22,354,740, as shown on Page 1, Line 10.

Tax Depreciation Calculation

The tax depreciation calculation for FY 2021 is provided on Attachment 1, Page 13. The tax depreciation amount assumes that a portion of the capital investment, as shown on Lines 1 through 3, will be eligible for immediate deduction on the Company's fiscal year federal income tax return. This immediate deductibility is referred to as the capital repairs deduction.[1] In addition, plant additions not subject to the capital repairs deduction may be subject to bonus depreciation, as shown on Page 13, Lines 4 through 12 for FY 2021. During 2010, Congress passed the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (the 2010 Tax Act), which provided for an extension of bonus depreciation. Specifically, the

[1] In 2009, the Internal Revenue Service (IRS) issued additional guidance, under Internal Revenue Code Section 162, related to certain work considered to be repair and maintenance expense, and eligible for immediate tax deduction for income tax purposes, but capitalized by the Company for book purposes. As a result of this additional guidance, the Company recorded a one-time tax expense for repair and maintenance costs in its FY 2009 federal income tax return filed on December 11, 2009 by National Grid Holdings, Inc. Since that time, the Company has taken a capital repairs deduction on all subsequent fiscal year tax returns. This has formed the basis for the capital repairs deduction assumed in the Company's revenue requirement. This tax deduction has the effect of increasing deferred taxes and lowering the revenue requirement that customers will pay under the capital investment reconciliation mechanism. The Company's federal income tax returns are subject to audit by the IRS. If it is determined in the future that the Company's position on its tax returns on this matter was incorrect, the Company will reflect any related IRS disallowances, plus any associated interest assessed by the IRS, in a subsequent reconciliation filing under the Gas ISR Plan.

2010 Tax Act provided for the application of 100 percent bonus depreciation for investment constructed and placed into service after September 8, 2010 through December 31, 2011, and then 50 percent bonus depreciation for similar capital investment placed into service after December 31, 2011 through December 31, 2012. The 50 percent bonus depreciation rate was later extended through December 31, 2013, and then extended further through December 31, 2017 via the Protecting Americans From Tax Hikes (PATH) Act. As noted in the Company's previous Gas ISR filings, the Tax Cuts and Jobs Act of 2017 (the 2017 Tax Act) went into effect on December 22, 2017. The 2017 Tax Act has many elements, but two particular aspects have an impact on the Gas ISR revenue requirement. The first is the reduction of the federal income tax rate from 35 percent to 21 percent commencing January 1, 2018. The second 2017 Tax Act element affecting the Gas ISR revenue requirement is changes to the bonus depreciation rules eliminating bonus depreciation for certain capital investments, including ISR-eligible investments, effective September 28, 2017. However, property acquired prior to September 28, 2017 and placed in service in tax years beginning after December 31, 2017 is allowed bonus depreciation. The Company's original interpretation of the 2017 Tax Act was that no deduction for bonus depreciation would be allowed in FY 2019 and FY 2020. However, based on current industry practice, the Company has revised its estimate of FY 2019 and FY 2020 bonus depreciation. The Company's FY 2021 revenue requirement includes the impact of the 2017 Tax Act on vintage FY 2018 through FY 2021 investment.

Finally, the remaining plant additions not deducted as bonus depreciation are then subject to the IRS Modified Accelerated Cost-Recovery System, or MACRS, tax depreciation rate. Also, the IRS clarified its tangible property regulations, and, consequently, the Company submitted a

§481(a) election with the IRS to apply for a change in accounting method regarding the treatment of gains or losses on asset retirements, which are characterized as partial retirements for tax purposes. This election was submitted to the PUC, as required under IRS rules, on December 17, 2015. The late partial disposition election was made to protect the Company's deduction of cost of removal (COR). Otherwise, the Company would have been required to make a §481(a) adjustment to reverse all historical COR deductions, resulting in a substantial reduction in deferred tax liabilities. Because the Company made the election, COR remains 100% deductible. The vintage FY 2018 through FY 2021 tax depreciation calculations in this filing include an additional tax deduction related to this change in accounting issue. The total amount of tax depreciation equals the amount of capital repairs deduction plus the bonus depreciation deduction, MACRS depreciation, the tax loss on retirements, and cost of removal. These annual total tax depreciation amounts are carried forward to Line 10 of Page 12 and incorporated in the deferred tax calculation. Similar tax depreciation calculations are provided for FY 2018, FY 2019 and FY 2020 on Pages 3, 6 and 9, respectively.

The Company continues to monitor for new guidance pertaining to the 2017 Tax Act and any resulting impacts to its pending rate requests. The Company will file its FY 2019 tax return in December 2019. At that time, the Company will evaluate whether any revisions are required to its calculation of accumulated deferred income taxes included in rate base in the FY 2019, FY 2020, and FY 2021 vintage revenue requirement calculations in this docket. If so, the Company will supplement this filing with a revised FY 2021 revenue requirement calculation.

Federal Net Operating Loss

Tax NOLs are generated when the Company has tax deductions on its income tax returns that exceed its taxable income. Tax NOLs do not mean that the Company is suffering losses in its financial statements. Instead, the Company's tax NOLs are the result of the significant tax deductions that have been generated in recent years by the bonus depreciation and capital repairs tax deductions. In addition to first-year bonus tax depreciation, the Internal Revenue Code allows the Company to classify certain costs as repairs expense, which the Company takes as an immediate deduction on its income tax return. However, such costs are recorded as plant investment on the Company's books. These significant bonus depreciation and capital repairs tax deductions have exceeded the amount of taxable income reported in tax returns filed for FY 2009 to FY 2018, with the exception of FY 2011 and FY 2017. NOLs are recorded as non-cash assets on the Company's balance sheet and represent a benefit that the Company and customers will receive when the Company is able to realize actual cash savings and applies the NOLs against taxable income in the future.

As a result of the 2017 Tax Act, the Company originally did not expect to generate new NOLs in FY 2018 and anticipates it will begin to utilize prior years' NOLs in FY 2019. Estimated NOL utilization is included in base rates in Docket No. 4770. Therefore, the calculation of accumulated deferred income taxes in this filing includes only the incremental amount of forecasted NOL utilization in FY 2021, which is the fiscal year the benefit would be reflected in the Company's federal income tax return.

NOL utilization is an increase to the Company's accumulated deferred income taxes. Accumulated deferred income taxes, which equal the difference between book depreciation and

tax depreciation on ISR capital investment, multiplied by the effective tax rate, are included as a credit or reduction in the calculation of rate base.

Accumulated Deferred Income Tax Proration Adjustment

The Gas ISR Plan includes a proration calculation with respect to the accumulated deferred income tax (ADIT) balance included in rate base. The calculation fulfills requirements set out under IRS Regulation 26 C.F.R. §1.167(l)-1(h)(6). This regulation sets forth normalization requirements for regulated entities so that the benefits of accelerated depreciation are not passed back to customers too quickly. The penalty of a normalization violation is the loss of all federal income tax deductions for accelerated depreciation, including bonus depreciation. Any regulatory filing which includes capital expenditures, book depreciation expense, and ADIT related to those capital expenditures must follow the normalization requirements. When the regulatory filing is based on a future period, the deferred tax must be prorated to reflect the period of time that the ADIT balances are in rate base. This filing includes FY 2018, FY 2019, FY 2020, and FY 2021 proration calculations at Attachment 1, on Pages 4, 7, 10 and 14, respectively, the effects of which are included in each year's respective revenue requirement.

Property Tax Recovery Adjustment

The Property Tax Recovery Adjustment is set forth on Attachment 1, Pages 19 and 20. The method used to recover property tax expense under the Gas ISR Plan was modified by the Amended Settlement Agreement in Docket No. 4323 and continued by the Amended Settlement Agreement in Docket No. 4770. In determining the base on which property tax expense is calculated for purposes of the Plan revenue requirement, the Company includes an amount equal

to the base rate allowance for depreciation expense and depreciation expense on incremental Plan plant additions in the accumulated reserve for depreciation that is deducted from plant-in-service. The Property Tax Recovery Adjustment also includes the impact of any changes in the Company's effective property tax rates on base rate embedded property, plus cumulative Plan net additions. Property tax impacts associated with non-ISR plant additions are excluded from the property tax recovery formula. This provision of the Amended Settlement Agreement in Docket No. 4323 took effect for Plan property tax recovery periods subsequent to the end of the rate year for that docket, or January 31, 2014, and has been continued by the Amended Settlement Agreement in Docket No. 4770. The FY 2021 revenue requirement includes $4,711,167 for the Net Property Tax Recovery Adjustment.

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Annual Revenue Requirement Summary

Line No.		Approved Fiscal Year 2020 (a)	Fiscal Year 2021 (b)	Fiscal Year 2022 (c)
	Operation and Maintenance Expenses			
1	Forecasted Gas Infrastructure, Safety, and Reliability O&M Expenses	$0	$1,000,000	$0
	Capital Investment:			
2	Actual Revenue Requirement on FY 2018 Incremental Capital Included in ISR Rate Base	$663,731	$676,445	$690,881
3	Actual Revenue Requirement on FY 2019 Incremental Capital Included in ISR Rate Base	($666,404)	($1,002,387)	($1,003,034)
4	Forecasted Revenue Requirement on FY 2020 Capital Included in ISR Rate Base	$4,123,711	$9,333,206	$9,082,041
5	Forecasted Revenue Requirement on FY 2021 Capital Included in ISR Rate Base		$7,636,309	$15,098,354
6	Total Capital Investment Revenue Requirement	$4,121,038	$16,643,573	$23,868,242
7	FY 2020 Property Tax Recovery Adjustment	$2,353,682		
8	FY 2021 Property Tax Recovery Adjustment		$4,711,167	
9	Total Capital Investment Component of Revenue Requirement	**$6,474,720**	**$21,354,740**	**$23,868,242**
10	Total Fiscal Year Revenue Requirement	**$6,474,720**	**$22,354,740**	**$23,868,242**
11	Incremental Fiscal Year Rate Adjustment		**$15,880,020**	

Column Notes:
(a) RIPUC Docket No. 4916, Revised Section 3, Attachment 1R, Page 1 of 19

Line Notes for Columns (b) and (c):
1 Section 2, Table 1
2 Page 2 of 22, Line 30, Col. (d) and Col. (e)
3 Page 5 of 22, Line 29, Col. (c), and Col. (d)
4 Page 8 of 22, Line 29, Col. (b), and Col. (c)
5 Page 12 of 22, Line 29, Col. (a), and Col. (b)
6 Sum of Lines 2 through Line 5
8 Line 63, Column (k) × 1,000
9 Sum of Line 6 through Line 8
10 Line 1 + Line 9
11 Line 10 Col (b) - Line 10 Col (a)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2018 Actual Incremental Gas Capital Investment

Line No.				Fiscal Year 2018 (a)	Fiscal Year 2019 (b)	Fiscal Year 2020 (c)	Fiscal Year 2021 (d)	Fiscal Year 2022 (e)
	Depreciable Net Capital Included in ISR Rate Base							
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 15 of 22 , Line 3 ,Col (a)		$4,632,718	$0	$0	$0	$0
2	Retirements	Page 15 of 22 , Line 9 ,Col (a)		$12,059,428	$0	$0	$0	$0
3	Net Depreciable Capital Included in ISR Rate Base	Year 1 = Line 1 - Line 2; then = Prior Year Line		($7,426,710)	($7,426,710)	($7,426,710)	($7,426,710)	($7,426,710)
	Change in Net Capital Included in ISR Rate Base							
4	Capital Included in ISR Rate Base	Line 1		$4,632,718	$0	$0	$0	$0
5	Depreciation Expense			$0	$0	$0	$0	$0
6	Incremental Capital Amount	Year 1 = Line 4 - Line 5; then = Prior Year Line 6		$4,632,718	$4,632,718	$4,632,718	$4,632,718	$4,632,718
7	Cost of Removal	Page 15 of 22 , Line 6 ,Col (a)		$1,941,168	$1,941,168	$1,941,168	$1,941,168	$1,941,168
8	**Net Plant Amount**	**Line 6 + Line7**		**$6,573,886**	**$6,573,886**	**$6,573,886**	**$6,573,886**	**$6,573,886**
	Deferred Tax Calculation:							
9	Composite Book Depreciation Rate		1/	3.38%	3.15%	2.99%	2.99%	2.99%
10	Tax Depreciation	Year 1=Page 3 of 22, Line 24, Col (a); then = Page 3 of 22, Col (d)		$7,820,728	$21,720	$20,089	$18,585	$17,189
11	Cumulative Tax Depreciation	Year 1 = Line 10; then = Prior Year Line 11 + Current Year Line 10		$7,820,728	$7,842,448	$7,862,538	$7,881,123	$7,898,312
12	Book Depreciation	Year 1= Line 3 × Line 9 × 50%; then = Line 3 × Line 9		($125,511)	($234,127)	($222,059)	($222,059)	($222,059)
13	Cumulative Book Depreciation	Year 1 = Line 12; then = Prior Year Line 13 + Current Year Line 12		($125,511)	($359,638)	($581,697)	($803,756)	($1,025,814)
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$7,946,239	$8,202,087	$8,444,235	$8,684,878	$8,924,126
15	Effective Tax Rate		2/	21.00%	21.00%	21.00%	21.00%	21.00%
16	Deferred Tax Reserve	Line 14 × Line 15		$1,668,710	$1,722,438	$1,773,289	$1,823,824	$1,874,066
17	Less: FY 2018 Federal NOL	-Page 21 of 22, Line 10, Col (e)		($6,051,855)	($6,051,855)	($6,051,855)	($6,051,855)	($6,051,855)
18	Excess Deferred Tax	(Line 14 × 31.55% blended FY18 tax rate) - Line 16; then = Prior Year Line 18	3/	$838,328	$838,328	$838,328	$838,328	$838,328
19	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17 + Line 18		($3,544,817)	($3,491,089)	($3,440,238)	($3,389,703)	($3,339,461)
	ISR Rate Base Calculation:							
20	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$6,573,886	$6,573,886	$6,573,886	$6,573,886	$6,573,886
21	Accumulated Depreciation	- Line 13		$125,511	$359,638	$581,697	$803,756	$1,025,814
22	Deferred Tax Reserve	- Line 19		$3,544,817	$3,491,089	$3,440,238	$3,389,703	$3,339,461
23	Year End Rate Base before Deferred Tax Proration	Sum of Lines 20 through 22		$10,244,214	$10,424,613	$10,595,821	$10,767,344	$10,939,161
	Revenue Requirement Calculation:							
24	Average Rate Base before Deferred Tax Proration Adjustment	Year 1 = 0; then Average of (Prior + Current Year Line 23)					$10,681,583	$10,853,253
25	Proration Adjustment	Year 1 and 2 =0; then = Page 4 of 22, Line 41, Col (j), Col (k) and Col (l)					$2,169	$2,157
26	Average ISR Rate Base after Deferred Tax Proration	Line 24 + Line 25					$10,683,752	$10,855,409
27	Pre-Tax ROR	Page 22 of 22, Line 30, Column (e)					8.41%	8.41%
28	Return and Taxes	Line 26 × Line 27					$898,504	$912,940
29	Book Depreciation	Year 1 = N/A; then = Line 12					($222,059)	($222,059)
30	**Annual Revenue Requirement**	**Sum of Lines 28 through 29**		**N/A**	**N/A**	**N/A**	**$676,445**	**$690,881**

1/ 3.38%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4323, in effect until Aug 31, 2018
2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018
FY 19 Composite Book Depreciation Rate = 3.38% × 5 /12 + 2.99% × 7 / 12
2/ The Federal Income Tax rate changed from 35% to 21% on Janurary 1, 2018 per the Tax Cuts and Jobs Act of 2017

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2018 Incremental Capital Investment

Line No.				Fiscal Year 2018 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 2 of 22, Line 1		$4,632,718
2	Capital Repairs Deduction Rate	Per Tax Department	1/	85.43%
3	Capital Repairs Deduction	Line 1 × Line 2		$3,957,731
4	Bonus Depreciation			
5	Plant Additions	Line 1		$4,632,718
6	Less Capital Repairs Deduction	Line 3		$3,957,731
7	Plant Additions Net of Capital Repairs Deduction	Line 5 - Line 6		$674,987
8	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		100.00%
9	Plant Eligible for Bonus Depreciation	Line 7 × Line 8		$674,987
10	Bonus depreciation 100% category	100% × 15.86%	2/	15.86%
11	Bonus depreciation 50% category	50% × 58.05%	2/	29.03%
12	Bonus depreciation 40% category	40% × 26.35%	2/	10.54%
13	Bonus Depreciation Rate (October 2017 - March 2018)	1 × 50% × 0%	2/	0.00%
14	Total Bonus Depreciation Rate	Line 10 + Line 11 + Line 12 + Line 13		55.43%
15	Bonus Depreciation	Line 9 × Line 14		$374,112
	Remaining Tax Depreciation			
16	Plant Additions	Line 1		$4,632,718
17	Less Capital Repairs Deduction	Line 3		$3,957,731
18	Less Bonus Depreciation	Line 15		$374,112
19	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 16 - Line 17 - Line 18		$300,875
20	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.75%
21	Remaining Tax Depreciation	Line 19 × Line 20		$11,283
22	FY18 tax (gain)/loss on retirements	Per Tax Department	3/	$1,536,434
23	Cost of Removal	Page 2 of 22, Line 7		$1,941,168
24	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 15, 21, 22 & 23		$7,820,728

20 Year MACRS Depreciation

MACRS basis: $300,875

(b) Fiscal Year	(c)	(d) Annual	(e) Cumulative
2018	3.75%	$11,283	$7,820,728
2019	7.22%	$21,720	$7,842,448
2020	6.68%	$20,089	$7,862,538
2021	6.18%	$18,585	$7,881,123
2022	5.71%	$17,189	$7,898,312
2023	5.29%	$15,901	$7,914,213
2024	4.89%	$14,707	$7,928,920
2025	4.52%	$13,606	$7,942,525
2026	4.46%	$13,425	$7,955,950
2027	4.46%	$13,422	$7,969,372
2028	4.46%	$13,425	$7,982,797
2029	4.46%	$13,422	$7,996,219
2030	4.46%	$13,425	$8,009,644
2031	4.46%	$13,422	$8,023,066
2032	4.46%	$13,425	$8,036,491
2033	4.46%	$13,422	$8,049,913
2034	4.46%	$13,425	$8,063,338
2035	4.46%	$13,422	$8,076,761
2036	4.46%	$13,425	$8,090,186
2037	4.46%	$13,422	$8,103,608
2038	2.23%	$6,713	$8,110,320
	100.00%	$300,875	

1/ Capital Repairs percentage is based on the actual results of the FY 2018 tax return.
2/ Percent of Plant Eligible for Bonus Depreciation is the actual result of FY2018 tax return
3/ Actual Loss for FY2018

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on FY 2018 Incremental Capital Investment

Line No.	Deferred Tax Subject to Proration		(a) FY20	(b) FY21	(c) FY22
1	Book Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 4 Col (a); then = Page 2 of 22 , Line 12 ,Col (d) and Col (e)	($222,059)	($222,059)	($222,059)
2	Bonus Depreciation		$0	$0	$0
3	Remaining MACRS Tax Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 4 Col (a); then = -Page 3 of 22, Col (d)	($20,089)	($18,585)	($17,189)
4	FY18 tax (gain)/loss on retirements		$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($242,148)	($240,644)	($239,248)
6	Effective Tax Rate		21%	21%	21%
7	Deferred Tax Reserve	Line 5 × Line 6	($50,851)	($50,535)	($50,242)
	Deferred Tax Not Subject to Proration				
8	Capital Repairs Deduction				
9	Cost of Removal				
10	Book/Tax Depreciation Timing Difference at 3/31/2017				
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10			
12	Effective Tax Rate				
13	Deferred Tax Reserve	Line 11 × Line 12			
14	Total Deferred Tax Reserve	Line 7 + Line 13	($50,851)	($50,535)	($50,242)
15	Net Operating Loss		$0	$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	($50,851)	($50,535)	($50,242)
	Allocation of FY 2018 Estimated Federal NOL				
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	($242,148)	($240,644)	($239,248)
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($242,148)	($240,644)	($239,248)
20	Total FY 2018 Federal NOL		$0	$0	$0
21	Allocated FY 2018 Federal NOL Not Subject to Proration	(Line 18 ÷ Line 19) × Line 20	$0	$0	$0
22	Allocated FY 2018 Federal NOL Subject to Proration	(Line 17 ÷ Line 19) × Line 20	$0	$0	$0
23	Effective Tax Rate		21%	21%	21%
24	Deferred Tax Benefit subject to proration	Line 22 × Line 23	$0	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($50,851)	($50,535)	($50,242)

	Proration Calculation	(h) Number of Days in Month	(i) Proration Percentage	(j) FY20	(k) FY21	(l) FY22
26	April	30	91.78%	($3,889)	($3,865)	($3,843)
27	May	31	83.29%	($3,529)	($3,507)	($3,487)
28	June	30	75.07%	($3,181)	($3,161)	($3,143)
29	July	31	66.58%	($2,821)	($2,804)	($2,787)
30	August	31	58.08%	($2,461)	($2,446)	($2,432)
31	September	30	49.86%	($2,113)	($2,100)	($2,088)
32	October	31	41.37%	($1,753)	($1,742)	($1,732)
33	November	30	33.15%	($1,405)	($1,396)	($1,388)
34	December	31	24.66%	($1,045)	($1,038)	($1,032)
35	January	31	16.16%	($685)	($681)	($677)
36	February	28	8.49%	($360)	($358)	($356)
37	March	31	0.00%	$0	$0	$0
38	Total	365		($23,243)	($23,098)	($22,964)
39	Deferred Tax Without Proration	Line 25		($50,851)	($50,535)	($50,242)
40	Average Deferred Tax without Proration	Line 39 × 50%		($25,426)	($25,268)	($25,121)
41	Proration Adjustment	Line 38 - Line 40		$2,183	$2,169	$2,157

Column Notes:

(i) Sum of remaining days in the year (Col (h)) ÷ 365
(j) through (l) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2019 Actual Incremental Gas Capital Investment

Line No.				Fiscal Year 2019 (a)	Fiscal Year 2020 (b)	Fiscal Year 2021 (c)	Fiscal Year 2022 (d)
	Depreciable Net Capital Included in ISR Rate Base						
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 15 of 22 , Line 3 ,Col (b)		($914,000)	$0	$0	$0
2	Retirements	Page 15 of 22 , Line 9 ,Col (b)		($1,368,021)	$0	$0	$0
3	Net Depreciable Capital Included in ISR Rate Base	Year 1 = Line 1 - Line 2; then = Prior Year Line 3		$454,021	$454,021	$454,021	$454,021
	Change in Net Capital Included in ISR Rate Base						
4	Capital Included in ISR Rate Base	Line 1		($914,000)	$0	$0	$0
5	Depreciation Expense			$0	$0	$0	$0
6	Incremental Capital Amount	Year 1 = Line 4 - Line 5; then = Prior Year Line 6		($914,000)	($914,000)	($914,000)	($914,000)
7	Cost of Removal	Page 15 of 22 , Line 6 ,Col (b)		$5,626,564	$5,626,564	$5,626,564	$5,626,564
8	**Net Plant Amount**	**Line 6 + Line 7**		**$4,712,564**	**$4,712,564**	**$4,712,564**	**$4,712,564**
	Deferred Tax Calculation:						
9	Composite Book Depreciation Rate	As Approved in RIPUC Docket No. 4323 & 4770	1/	3.15%	2.99%	2.99%	2.99%
10	Tax Depreciation	Year 1 = Page 6 of 22, Line 21, Col (a); then = Page 6 of 22, Col (d)		$5,166,399	($16,141)	($14,929)	($13,811)
11	Cumulative Tax Depreciation	Year 1 = Line 10; then = Prior Year Line 11 + Current Year Line 10		$5,166,399	$5,150,257	$5,135,328	$5,121,517
12	Book Depreciation	Year 1 = Line 3 × Line 9 × 50%; then = Line 3 × Line 9		$7,157	$13,575	$13,575	$13,575
13	Cumulative Book Depreciation	Year 1 = Line 12; then = Prior Year Line 13 + Current Year Line 12		$7,157	$20,732	$34,307	$47,883
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$5,159,242	$5,129,525	$5,101,021	$5,073,634
15	Effective Tax Rate			21.00%	21.00%	21.00%	21.00%
16	Deferred Tax Reserve	Line 14 × Line 15		$1,083,441	$1,077,200	$1,071,214	$1,065,463
17	Add: FY 2019 Federal NOL incremental utilization	Page 15 of 22, Line 12, Col (b)		$15,690,984	$15,690,984	$15,690,984	$15,690,984
18	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17		$16,774,424	$16,768,184	$16,762,198	$16,756,447
	ISR Rate Base Calculation:						
19	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$4,712,564	$4,712,564	$4,712,564	$4,712,564
20	Accumulated Depreciation	- Line 13		($7,157)	($20,732)	($34,307)	($47,883)
21	Deferred Tax Reserve	- Line 18		($16,774,424)	($16,768,184)	($16,762,198)	($16,756,447)
22	Year End Rate Base before Deferred Tax Proration	Sum of Lines 19 through 21		($12,069,018)	($12,076,353)	($12,083,942)	($12,091,766)
	Revenue Requirement Calculation:						
23	Average Rate Base before Deferred Tax Proration Adjustment	Year 1 = Current Year Line 22 ÷ 2; then = (Prior Year Line 22 + Current Year Line 22) ÷ 2				($12,080,147)	($12,087,854)
24	Proration Adjustment	Year 1 =0; then = Page 7 of 22, Line 41, Col (j), Col (k) and Col (l)				($257)	($247)
25	Average ISR Rate Base after Deferred Tax Proration	Line 23 + Line 24				($12,080,404)	($12,088,101)
26	Pre-Tax ROR	Page 22 of 22, Line 30, Column (e)				8.41%	8.41%
27	Return and Taxes	Line 25 × Line 26				($1,015,962)	($1,016,609)
28	Book Depreciation	Line 12				$13,575	$13,575
29	**Annual Revenue Requirement**	**Sum of Lines 27 through 28**		**N/A**	**N/A**	**($1,002,387)**	**($1,003,034)**

1/ 3.38%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4323, in effect until Aug 31, 2018
2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018
FY 19 Composite Book Depreciation Rate = 3.38% × 5 /12 + 2.99% × 7 / 12

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2019 Incremental Capital Investment

Line No.				Fiscal Year 2019 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 5 of 22, Line 1		($914,000)
2	Capital Repairs Deduction Rate	Per Tax Department	1/	71.49%
3	Capital Repairs Deduction	Line 1 × Line 2		($653,419)
	Bonus Depreciation			
4	Plant Additions	Line 1		($914,000)
5	Less Capital Repairs Deduction	Line 3		($653,419)
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5		($260,581)
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		100.00%
8	Plant Eligible for Bonus Depreciation	Line 6 × Line 7		($260,581)
9	Bonus Depreciation Rate (30% Eligible)	1 × 30% × 11.65%		3.50%
10	Bonus Depreciation Rate (40% Eligible)	1 × 40% × 26.75%		10.70%
11	Total Bonus Depreciation Rate	Line 9 + Line 10		14.20%
12	Bonus Depreciation	Line 8 × Line 11		($36,989)
	Remaining Tax Depreciation			
13	Plant Additions	Line 1		($914,000)
14	Less Capital Repairs Deduction	Line 3		($653,419)
15	Less Bonus Depreciation	Line 12		($36,989)
16	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15		($223,592)
17	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.75%
18	Remaining Tax Depreciation	Line 16 × Line 17		($8,385)
19	FY19 tax (gain)/loss on retirements	Per Tax Department	2/	$238,628
20	Cost of Removal	Page 5 of 22, Line 7		$5,626,564
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19 & 20		$5,166,399

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		($223,592)	
		Annual	Cumulative
Fiscal Year			
2019	3.75%	($8,385)	$5,166,399
2020	7.22%	($16,141)	$5,150,257
2021	6.68%	($14,929)	$5,135,328
2022	6.18%	($13,811)	$5,121,517
2023	5.71%	($12,774)	$5,108,743
2024	5.29%	($11,817)	$5,096,926
2025	4.89%	($10,929)	$5,085,997
2026	4.52%	($10,111)	$5,075,886
2027	4.46%	($9,977)	$5,065,910
2028	4.46%	($9,974)	$5,055,935
2029	4.46%	($9,977)	$5,045,958
2030	4.46%	($9,974)	$5,035,984
2031	4.46%	($9,977)	$5,026,007
2032	4.46%	($9,974)	$5,016,033
2033	4.46%	($9,977)	$5,006,056
2034	4.46%	($9,974)	$4,996,082
2035	4.46%	($9,977)	$4,986,105
2036	4.46%	($9,974)	$4,976,131
2037	4.46%	($9,977)	$4,966,154
2038	4.46%	($9,974)	$4,956,180
2039	2.23%	($4,988)	$4,951,191
	100.00%	($223,592)	$0

1/ Capital Repairs percentage is based on a three-year average of FYs 2014, 2015 and 2016 capital repairs rates.
2/ Actual Loss for FY2019

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on FY 2019 Incremental Capital Investment

Line No.	Deferred Tax Subject to Proration		(a) FY20	(b) FY21	(c) FY22
1	Book Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 7 Col (a); then = Page 5 of 22 , Line 12 ,Col (c) and Col (d)	$162,791	$13,575	$13,575
2	Bonus Depreciation		$0	$0	$0
3	Remaining MACRS Tax Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 7 Col (a); then = - Page 6 of 22, Col (d)	($156,315)	$14,929	$13,811
4	FY19 tax (gain)/loss on retirements		$0	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	$6,476	$28,504	$27,386
6	Effective Tax Rate		21%	21%	21%
7	Deferred Tax Reserve	Line 5 × Line 6	$1,360	$5,986	$5,751
	Deferred Tax Not Subject to Proration				
8	Capital Repairs Deduction				
9	Cost of Removal				
10	Book/Tax Depreciation Timing Difference at 3/31/2019				
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	$0	$0	$0
12	Effective Tax Rate		21%	21%	21%
13	Deferred Tax Reserve	Line 11 × Line 12	$0	$0	$0
14	Total Deferred Tax Reserve	Line 7 + Line 13	$1,360	$5,986	$5,751
15	Net Operating Loss		$0	$0	$0
16	Net Deferred Tax Reserve	Line 14 + Line 15	$1,360	$5,986	$5,751
	Allocation of FY 2019 Estimated Federal NOL				
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	$6,476	$28,504	$27,386
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	$0	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	$6,476	$28,504	$27,386
20	Total FY 2019 Federal NOL		$0	$0	$0
21	Allocated FY 2019 Federal NOL Not Subject to Proration	(Line 18 ÷ Line 19) × Line 20	$0	$0	$0
22	Allocated FY 2019 Federal NOL Subject to Proration	(Line 17 ÷ Line 19) × Line 20	$0	$0	$0
23	Effective Tax Rate		21%	21%	21%
24	Deferred Tax Benefit subject to proration	Line 22 × Line 23	$0	$0	$0
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	$1,360	$5,986	$5,751

		(h) Number of Days	(i)	(j)	(k)	(l)
	Proration Calculation	in Month	Proration Percentage	FY20	FY21	FY22
26	April	30	91.78%	$104	$458	$440
27	May	31	83.29%	$94	$415	$399
28	June	30	75.07%	$85	$374	$360
29	July	31	66.58%	$75	$332	$319
30	August	31	58.08%	$66	$290	$278
31	September	30	49.86%	$57	$249	$239
32	October	31	41.37%	$47	$206	$198
33	November	30	33.15%	$38	$165	$159
34	December	31	24.66%	$28	$123	$118
35	January	31	16.16%	$18	$81	$77
36	February	28	8.49%	$10	$42	$41
37	March	31	0.00%	$0	$0	$0
38	Total	365		$622	$2,736	$2,629
39	Deferred Tax Without Proration	Line 25		$1,360	$5,986	$5,751
40	Average Deferred Tax without Proration	Line 39 × 50%		$680	$2,993	$2,876
41	Proration Adjustment	Line 38 - Line 40		($58)	($257)	($247)

lumn Notes:
(i) Sum of remaining days in the year (Col (h)) ÷ 365
(j) through (l) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2020 Forecasted Incremental Gas Capital Investment

Line No.				Fiscal Year 2020 (a)	Fiscal Year 2021 (b)	Fiscal Year 2022 (c)
	Depreciable Net Capital Included in ISR Rate Base					
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 15 of 22 , Line 3 ,Col (c)		$115,727,842	$0	$0
2	Retirements	Page 15 of 22 , Line 9 ,Col (c)	1/	$10,634,425	$0	$0
3	Net Depreciable Capital Included in ISR Rate Base	Year 1 = Line 1 - Line 2; then = Prior Year Line 3		$105,093,417	$105,093,417	$105,093,417
	Change in Net Capital Included in ISR Rate Base					
4	Capital Included in ISR Rate Base	Line 1		$115,727,842	$0	$0
5	Depreciation Expense	Page 18 of 22, Line 72(c)		$23,534,853	$0	$0
6	Incremental Capital Amount	Year 1 = Line 4 - Line 5; then = Prior Year Line 6		$92,192,989	$92,192,989	$92,192,989
7	Cost of Removal	Page 15 of 22 , Line 6 ,Col (c)		$4,804,530	$4,804,530	$4,804,530
8	**Net Plant Amount**	**Line 6 + Line 7**		**$96,997,519**	**$96,997,519**	**$96,997,519**
	Deferred Tax Calculation:					
9	Composite Book Depreciation Rate	Page 16 of 22, Line 86(e)	1/	2.99%	2.99%	2.99%
10	Tax Depreciation	Year 1 =Page 9 of 22, Line 21, Col (a); then =Page 9 of 22, Col (d)		$88,746,670	$2,485,973	$2,299,327
11	Cumulative Tax Depreciation	Year 1 = Line 10; then = Prior Year Line 11 + Current Year Line 10		$88,746,670	$91,232,643	$93,531,971
12	Book Depreciation	Year 1 = Line 3 × Line 9 × 50% ; then = Line 3 × Line 9		$1,571,147	$3,142,293	$3,142,293
13	Cumulative Book Depreciation	Year 1 = Line 12; then = Prior Year Line 13 + Current Year Line 12		$1,571,147	$4,713,440	$7,855,733
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$87,175,524	$86,519,204	$85,676,238
15	Effective Tax Rate			21.00%	21.00%	21.00%
16	Deferred Tax Reserve	Line 14 × Line 15		$18,306,860	$18,169,033	$17,992,010
17	Add: FY 2020 Federal NOL utilization	Page 15 of 22, Line 12, Col (c)		$1,997,796	$1,997,796	$1,997,796
18	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17		$20,304,656	$20,166,829	$19,989,806
	ISR Rate Base Calculation:					
19	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$96,997,519	$96,997,519	$96,997,519
20	Accumulated Depreciation	- Line 13		($1,571,147)	($4,713,440)	($7,855,733)
21	Deferred Tax Reserve	- Line 18		($20,304,656)	($20,166,829)	($19,989,806)
22	Year End Rate Base before Deferred Tax Proration	Sum of Lines 19 through 21		$75,121,716	$72,117,250	$69,151,980
	Revenue Requirement Calculation:					
23	Average Rate Base before Deferred Tax Proration Adjustment	Year 1 = Line 22 × Page 11 of 22, Line 16; then = Average of (Prior Year Line 22 + Current Year Line 22/2)			$73,619,483	$70,634,615
24	Proration Adjustment	Page 10 of 22, Line 41, Cols (j), (k) and (l)			($5,774)	($7,416)
25	Average ISR Rate Base after Deferred Tax Proration	Line 23 + Line 24			$73,613,709	$70,627,199
26	Pre-Tax ROR	Page 22 of 22, Line 30, Column (e)			8.41%	8.41%
27	Return and Taxes	Line 25 × Line 26			$6,190,913	$5,939,747
28	Book Depreciation	Line 12			$3,142,293	$3,142,293
29	**Annual Revenue Requirement**	**Sum of Lines 27 through 28**		**N/A**	**$9,333,206**	**$9,082,041**

1/ 2.99%, Composite Book Depreciation Rate of Distirbution Plant approved per RIPUC Docket No. 4770, effective on Sep 1, 2018

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2020 Incremental Capital Investments

Line No.				Fiscal Year 2020 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 8 of 22, Line 1		$115,727,842
2	Capital Repairs Deduction Rate	Per Tax Department	1/	68.90%
3	Capital Repairs Deduction	Line 1 × Line 2		$79,736,483
	Bonus Depreciation			
4	Plant Additions	Line 1		$115,727,842
5	Less Capital Repairs Deduction	Line 3		$79,736,483
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5		$35,991,359
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		100.00%
8	Plant Eligible for Bonus Depreciation	Line 6 × Line 7		$35,991,359
9	Bonus Depreciation Rate 30%	14.4% × 30%		4.32%
10	Bonus Depreciation Rate 0%			0.00%
11	Total Bonus Depreciation Rate	Line 9 + Line 10		4.32%
12	Bonus Depreciation	Line 8 × Line 11		$1,554,827
	Remaining Tax Depreciation			
13	Plant Additions	Line 1		$115,727,842
14	Less Capital Repairs Deduction	Line 3		$79,736,483
15	Less Bonus Depreciation	Line 12		$1,554,827
16	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15		$34,436,532
17	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.75%
18	Remaining Tax Depreciation	Line 16 × Line 17		$1,291,370
19	FY20 tax (gain)/loss on retirements	Per Tax Department	2/	$1,359,460
20	Cost of Removal	Page 8 of 22, Line 7		$4,804,530
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19 & 20		$88,746,670

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		$34,436,532	
		Annual	Cumulative
Fiscal Year			
2020	3.75%	$1,291,370	$88,746,670
2021	7.22%	$2,485,973	$91,232,643
2022	6.68%	$2,299,327	$93,531,971
2023	6.18%	$2,127,145	$95,659,115
2024	5.71%	$1,967,359	$97,626,474
2025	5.29%	$1,819,971	$99,446,445
2026	4.89%	$1,683,258	$101,129,703
2027	4.52%	$1,557,220	$102,686,923
2028	4.46%	$1,536,558	$104,223,481
2029	4.46%	$1,536,214	$105,759,694
2030	4.46%	$1,536,558	$107,296,252
2031	4.46%	$1,536,214	$108,832,466
2032	4.46%	$1,536,558	$110,369,024
2033	4.46%	$1,536,214	$111,905,238
2034	4.46%	$1,536,558	$113,441,796
2035	4.46%	$1,536,214	$114,978,010
2036	4.46%	$1,536,558	$116,514,568
2037	4.46%	$1,536,214	$118,050,781
2038	4.46%	$1,536,558	$119,587,339
2039	4.46%	$1,536,214	$121,123,553
2040	2.23%	$768,279	$121,891,832
	100.00%	$34,436,532	

1/ FY 2020 estimated capital repair deduction is based on FY 2018 estimate
2/ FY 2020 estimated tax loss on retirements is based on FY 2018 estimate

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on FY 2020 Incremental Capital Investments

Line No.				(a) FY20	(b) FY21	(c) FY22
	Deferred Tax Subject to Proration					
1	Book Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = Page 8 of 22 , Line 12 Col (b) and Col (c)		$1,571,147	$3,142,293	$3,142,293
2	Bonus Depreciation			$0	$0	$0
3	Remaining MACRS Tax Depreciation	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = Page 9 of 22, Col (d)		($1,349,676)	($2,485,973)	($2,299,327)
4	FY20 tax (gain)/loss on retirements	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = 0		($1,359,460)	$0	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4		($1,137,989)	$656,320	$842,966
6	Effective Tax Rate			21%	21%	21%
7	Deferred Tax Reserve	Line 5 × Line 6		($238,978)	$137,827	$177,023
	Deferred Tax Not Subject to Proration					
8	Capital Repairs Deduction	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = 0		($79,736,483)		
9	Cost of Removal	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = 0		($4,804,530)		
10	Book/Tax Depreciation Timing Difference at 3/31/2020					
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10		($84,541,013)		
12	Effective Tax Rate			21%		
13	Deferred Tax Reserve	Line 11 × Line 12		($17,753,613)		
14	Total Deferred Tax Reserve	Line 7 + Line 13		($17,992,590)	$137,827	$177,023
15	Net Operating Loss					
16	Net Deferred Tax Reserve	Line 14 + Line 15		($17,992,590)	$137,827	$177,023
	Allocation of FY 2018 Estimated Federal NOL					
17	Cumulative Book/Tax Timer Subject to Proration	Line 5		($1,137,989)	$656,320	$842,966
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11		($84,541,013)	$0	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18		($85,679,002)	$656,320	$842,966
20	Total FY 2020 Federal NOL	Year 1 = Docket no. 4916, R.S. 3, Att. 1R, page 10 Col (a); then = 0		($9,513,316)		
21	Allocated FY 2020 Federal NOL Not Subject to Proration	(Line 18 ÷ Line 19) × Line 20		($9,386,960)		
22	Allocated FY 2020 Federal NOL Subject to Proration	(Line 17 ÷ Line 19) × Line 20		($126,356)		
23	Effective Tax Rate			21%		
24	Deferred Tax Benefit subject to proration	Line 22 × Line 23		($26,535)		
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24		($265,512)	$137,827	$177,023
		(h)	(i)	(j)	(k)	(l)
	Proration Calculation	Number of Days in Month	Proration Percentage	FY20	FY21	FY22
26	April	30	91.80%	($10,772)	$10,544	$13,543
27	May	31	83.33%	($9,779)	$9,571	$12,293
28	June	30	75.14%	($8,817)	$8,630	$11,084
29	July	31	66.67%	($7,823)	$7,657	$9,835
30	August	31	58.20%	($6,829)	$6,684	$8,585
31	September	30	50.00%	($14,774)	$5,743	$7,376
32	October	31	41.53%	($12,272)	$4,770	$6,126
33	November	30	33.33%	($9,850)	$3,829	$4,917
34	December	31	24.86%	($7,347)	$2,856	$3,668
35	January	31	16.39%	($4,844)	$1,883	$2,418
36	February	29	8.47%	($2,503)	$973	$1,249
37	March	31	0.00%	$0	$0	$0
38	Total	366		($95,609)	$63,139	$81,095
39	Deferred Tax Without Proration	Line 25		($265,512)	$137,827	$177,023
40	Average Deferred Tax without Proration	Year 1: Line 39 × Page 11 of 22, Line 16; then = Line 39 × 0.5		($106,789)	$68,914	$88,511
41	Proration Adjustment	Line 38 - Line 40		$11,181	($5,774)	($7,416)

Column Notes:
(i) Sum of remaining days in the year (Col (h)) divided by 365
(j) Current Year Line 25 × Page 11 of 22, Col (f) × Current Month Col (i)
(k) & (l) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
ISR Additions April through August 2020

Line No.	Month No.	Month	FY 2020 ISR Additions (a)	In Rates (b)	Not In Rates (c) = (a) - (b)	Weight for Days (d)	Weighted Average (e) = (d) × (c)	Weight for Investment (f)=(c)÷Total(c)
1								
2	1	Apr-19	$12,879,299	$7,764,750	$5,114,549	0.958	$4,901,443	4.42%
3	2	May-19	$12,879,299	$7,764,750	$5,114,549	0.875	$4,475,231	4.42%
4	3	Jun-19	$12,879,299	$7,764,750	$5,114,549	0.792	$4,049,018	4.42%
5	4	Jul-19	$12,879,299	$7,764,750	$5,114,549	0.708	$3,622,806	4.42%
6	5	Aug-19	$12,879,299	$7,764,750	$5,114,549	0.625	$3,196,593	4.42%
7	6	Sep-19	$12,879,299	$0	$12,879,299	0.542	$6,976,287	11.13%
8	7	Oct-19	$12,879,299	$0	$12,879,299	0.458	$5,903,012	11.13%
9	8	Nov-19	$12,879,299	$0	$12,879,299	0.375	$4,829,737	11.13%
10	9	Dec-19	$12,879,299	$0	$12,879,299	0.292	$3,756,462	11.13%
11	10	Jan-20	$12,879,299	$0	$12,879,299	0.208	$2,683,187	11.13%
12	11	Feb-20	$12,879,299	$0	$12,879,299	0.125	$1,609,912	11.13%
13	12	Mar-20	$12,879,299	$0	$12,879,299	0.042	$536,637	11.13%
14		Total	$154,551,592	$38,823,750	$115,727,842		$46,540,327	100.00%
15	**Total Additions September 2019 through March 2020**				**$90,155,095**			
16	**FY 2020 Weighted Average Incremental Rate Base Percentage**						**40.22%**	

Column (a)=Page 15 of 22 , Line 1 ,Col (c)
Column (b)=Page 15 of 22 , Line 2 ,Col (c)
Column (d) = (12.5 - Month No.) ÷ 12
Line 15 = Sum of Lines 7(c) through 13(c)
Line 16 = Line 14(e)/Line 14(c)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Computation of Revenue Requirement on FY 2021 Forecasted Incremental Gas Capital Investment

Line No.				Fiscal Year 2021 (a)	Fiscal Year 2022 (b)
	Depreciable Net Capital Included in ISR Rate Base				
1	Total Allowed Capital Included in ISR Rate Base in Current Year	Page 15 of 22 , Line 3 ,Col (d)		$179,664,487	$0
2	Retirements	Page 15 of 22 , Line 9 ,Col (d)	1/	$23,555,235	$0
3	Net Depreciable Capital Included in ISR Rate Base	Year 1 = Line 1 - Line 2; then = Prior Year Line 3		$156,109,252	$156,109,252
	Change in Net Capital Included in ISR Rate Base				
4	Capital Included in ISR Rate Base	Line 1		$179,664,487	$0
5	Depreciation Expense	Page 18 of 22, Line 78(c)		$40,700,587	$0
6	Incremental Capital Amount	Year 1 = Line 4 - Line 5; then = Prior Year Line 6		$138,963,900	$138,963,900
7	Cost of Removal	Page 15 of 22 , Line 6 ,Col (d)		$17,833,998	$17,833,998
8	**Net Plant Amount**	**Line 6 + Line 7**		**$156,797,898**	**$156,797,898**
	Deferred Tax Calculation:				
9	Composite Book Depreciation Rate	Page 16 of 22, Line 86(e)	1/	2.99%	2.99%
10	Tax Depreciation	Year 1 =Page 13 of 22, Line 21, Col (a); then = Page 13 of 22, Col (d)		$173,600,482	$1,909,181
11	Cumulative Tax Depreciation	Year 1 = Line 10; then = Prior Year Line 11 + Current Year Line 10		$173,600,482	$175,509,663
12	Book Depreciation	Year 1 = Line 3 × Line 9 × 50% ; then = Line 3 × Line 9		$2,333,833	$4,667,667
13	Cumulative Book Depreciation	Year 1 = Line 12; then = Prior Year Line 13 + Current Year Line 12		$2,333,833	$7,001,500
14	Cumulative Book / Tax Timer	Line 11 - Line 13		$171,266,649	$168,508,163
15	Effective Tax Rate			21.00%	21.00%
16	Deferred Tax Reserve	Line 14 × Line 15		$35,965,996	$35,386,714
17	Add: FY 2021 Federal NOL utilization	Page 15 of 22 , Line 12 ,Col (d)		($7,598,182)	($7,598,182)
18	Net Deferred Tax Reserve before Proration Adjustment	Line 16 + Line 17		$28,367,814	$27,788,532
	ISR Rate Base Calculation:				
19	Cumulative Incremental Capital Included in ISR Rate Base	Line 8		$156,797,898	$156,797,898
20	Accumulated Depreciation	- Line 13		($2,333,833)	($7,001,500)
21	Deferred Tax Reserve	- Line 18		($28,367,814)	($27,788,532)
22	Year End Rate Base before Deferred Tax Proration	Sum of Lines 19 through 21		$126,096,251	$122,007,866
	Revenue Requirement Calculation:				
23	Average Rate Base befor Deferred Tax Proration Adjustment	Year 1 = Current Year Line 22 ÷ 2; then = (Prior Year Line 22 + Current Year Line 22) ÷ 2		$63,048,125	$124,052,059
24	Proration Adjustment	Page 14 of 22, Line 41, Col (j) and Col (k)		$1,527	($24,864)
25	Average ISR Rate Base after Deferred Tax Proration	Line 23 + Line 24		$63,049,652	$124,027,195
26	Pre-Tax ROR	Page 22 of 22, Line 30, Column (e)		8.41%	8.41%
27	Return and Taxes	Line 25 × Line 26		$5,302,476	$10,430,687
28	Book Depreciation	Line 12		$2,333,833	$4,667,667
29	**Annual Revenue Requirement**	**Sum of Lines 27 through 28**		**$7,636,309**	**$15,098,354**

1/ 2.99%, Composite Book Depreciation Rate approved per RIPUC Docket No. 4770, effective on Sep 1, 2018

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Tax Depreciation and Repairs Deduction on FY 2021 Incremental Capital Investments

Line No.				Fiscal Year 2021 (a)
	Capital Repairs Deduction			
1	Plant Additions	Page 12 of 22, Line 1		$179,664,487
2	Capital Repairs Deduction Rate	Per Tax Department	1/	85.28%
3	Capital Repairs Deduction	Line 1 × Line 2		$153,217,875
	Bonus Depreciation			
4	Plant Additions	Line 1		$179,664,487
5	Less Capital Repairs Deduction	Line 3		$153,217,875
6	Plant Additions Net of Capital Repairs Deduction	Line 4 - Line 5		$26,446,612
7	Percent of Plant Eligible for Bonus Depreciation	Per Tax Department		0.00%
8	Plant Eligible for Bonus Depreciation	Line 6 × Line 7		$0
9	Bonus Depreciation Rate ()	Per Tax Department		0.00%
10	Bonus Depreciation Rate ()	Per Tax Department		0.00%
11	Total Bonus Depreciation Rate	Line 9 + Line 10		0.00%
12	Bonus Depreciation	Line 8 × Line 11		$0
	Remaining Tax Depreciation			
13	Plant Additions	Line 1		$179,664,487
14	Less Capital Repairs Deduction	Line 3		$153,217,875
15	Less Bonus Depreciation	Line 12		$0
16	Remaining Plant Additions Subject to 20 YR MACRS Tax Depreciation	Line 13 - Line 14 - Line 15		$26,446,612
17	20 YR MACRS Tax Depreciation Rates	IRS Publication 946		3.75%
18	Remaining Tax Depreciation	Line 16 × Line 17		$991,748
19	FY21 tax (gain)/loss on retirements	Per Tax Department	2/	1,556,861
20	Cost of Removal	Page 12 of 22, Line 7		$17,833,998
21	Total Tax Depreciation and Repairs Deduction	Sum of Lines 3, 12, 18, 19 & 20		$173,600,482

(b)	(c)	(d)	(e)
20 Year MACRS Depreciation			
MACRS basis:		$26,446,612	
		Annual	Cumulative
Fiscal Year			
2021	3.75%	$991,748	$173,600,482
2022	7.22%	$1,909,181	$175,509,663
2023	6.68%	$1,765,840	$177,275,503
2024	6.18%	$1,633,607	$178,909,110
2025	5.71%	$1,510,895	$180,420,005
2026	5.29%	$1,397,703	$181,817,709
2027	4.89%	$1,292,710	$183,110,419
2028	4.52%	$1,195,916	$184,306,335
2029	4.46%	$1,180,048	$185,486,383
2030	4.46%	$1,179,783	$186,666,166
2031	4.46%	$1,180,048	$187,846,214
2032	4.46%	$1,179,783	$189,025,997
2033	4.46%	$1,180,048	$190,206,045
2034	4.46%	$1,179,783	$191,385,828
2035	4.46%	$1,180,048	$192,565,876
2036	4.46%	$1,179,783	$193,745,660
2037	4.46%	$1,180,048	$194,925,707
2038	4.46%	$1,179,783	$196,105,491
2039	4.46%	$1,180,048	$197,285,539
2040	4.46%	$1,179,783	$198,465,322
2041	2.23%	$590,024	$199,055,346
	100.00%	$26,446,612	

1/ Capital Repairs percentage is based on a three-year average of FYs 2017, 2018 and 2019 capital repairs rates.
2/ FY 2021 estimated tax loss on retirements is tax department estimate

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Net Deferred Tax Reserve Proration on FY 2021 Incremental Capital Investments

Line No.			(a) FY21	(b) FY22
	Deferred Tax Subject to Proration			
1	Book Depreciation	Page 12 of 22 , Line 12 ,Col (a), Col (b) and Col	$2,333,833	$4,667,667
2	Bonus Depreciation	Page 13 of 22 , Line 12 ,Col (a)	$0	$0
3	Remaining MACRS Tax Depreciation	Year 1= - Page 13 of 22, Line 18, Col (a); then = - Page 13 of 22, Col (d)	($991,748)	($1,909,181)
4	FY21 tax (gain)/loss on retirements	Page 13 of 22 , Line 19 ,Col (a)	($1,556,861)	$0
5	Cumulative Book / Tax Timer	Sum of Lines 1 through 4	($214,776)	$2,758,486
6	Effective Tax Rate		21%	21%
7	Deferred Tax Reserve	Line 5 × Line 6	($45,103)	$579,282
	Deferred Tax Not Subject to Proration			
8	Capital Repairs Deduction	Page 13 of 22 , Line 3 ,Col (a)	($153,217,875)	
9	Cost of Removal	Page 12 of 22 , Line 7 ,Col (a)	($17,833,998)	
10	Book/Tax Depreciation Timing Difference at 3/31/2021			
11	Cumulative Book / Tax Timer	Line 8 + Line 9 + Line 10	($171,051,873)	
12	Effective Tax Rate		21%	
13	Deferred Tax Reserve	Line 11 × Line 12	($35,920,893)	
14	Total Deferred Tax Reserve	Line 7 + Line 13	($35,965,996)	$579,282
15	Net Operating Loss	- Page 12 of 22 , Line 17 ,Col (a)	$7,598,182	
16	Net Deferred Tax Reserve	Line 14 + Line 15	($28,367,814)	$579,282
	Allocation of FY 2021 Estimated Federal NOL			
17	Cumulative Book/Tax Timer Subject to Proration	Line 5	($214,776)	$2,758,486
18	Cumulative Book/Tax Timer Not Subject to Proration	Line 11	($171,051,873)	$0
19	Total Cumulative Book/Tax Timer	Line 17 + Line 18	($171,266,649)	$2,758,486
20	Total FY 2021 Federal NOL	- Page 12 of 22 , Line 17 ,Col (a)÷21%	$36,181,820	
21	Allocated FY 2021 Federal NOL Not Subject to Proration	(Line 18 ÷ Line 19) × Line 20	$36,136,447	
22	Allocated FY 2021 Federal NOL Subject to Proration	(Line 17 ÷ Line 19) × Line 20	$45,374	
23	Effective Tax Rate		21%	
24	Deferred Tax Benefit subject to proration	Line 22 × Line 23	$9,528	
25	Net Deferred Tax Reserve subject to proration	Line 7 + Line 24	($35,574)	$579,282

		(h) Number of Days in Month	(i) Proration Percentage	(j) FY21	(k) FY22
	Proration Calculation				
26	April	30	91.78%	($2,721)	$44,306
27	May	31	83.29%	($2,469)	$40,206
28	June	30	75.07%	($2,225)	$36,238
29	July	31	66.58%	($1,974)	$32,138
30	August	31	58.08%	($1,722)	$28,038
31	September	30	49.86%	($1,478)	$24,071
32	October	31	41.37%	($1,226)	$19,971
33	November	30	33.15%	($983)	$16,003
34	December	31	24.66%	($731)	$11,903
35	January	31	16.16%	($479)	$7,803
36	February	28	8.49%	($252)	$4,100
37	March	31	0.00%	$0	$0
38	Total	365		($16,260)	$264,777
39	Deferred Tax Without Proration	Line 25		($35,574)	$579,282
40	Average Deferred Tax without Proration	Line 39 × 0.5		($17,787)	$289,641
41	Proration Adjustment	Line 38 - Line 40		$1,527	($24,864)

Column Notes:
(i) Sum of remaining days in the year (Col (h)) divided by 365
(j) & (k) Current Year Line 25 ÷ 12 × Current Month Col (i)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
FY 2018 - FY 2021 Incremental Capital Investment Summary

Line No.			Actual Fiscal Year 2018 (a)	Actual Fiscal Year 2019 (b)	Plan Fiscal Year 2020 (c)	Plan Fiscal Year 2021 (d)
	Capital Investment					
1	ISR-eligible Capital Investment	Col (a)=Docket No. 4678 FY18 Reconciliation Filing; Col (b)=Docket No. 4781 FY19 Reconciliation Filing; Col (c)=Docket No. 4916 FY20 Plan Filing; Col(d)=Section 2, Table 1	$97,809,718	$92,263,000	$154,551,592	$179,664,487
2	ISR-eligible Capital Additions included in Rate Base per RIPUC Docket No. 4770	Docket No. 4770 Schedule MAL-11-Gas Page 5, Col (a)=Lines 1(a) + 1(b); Col(b)=Lines 1(c) + 1(d); Col(c)= Line 1(e)	$93,177,000	$93,177,000	$38,823,750	$0
3	Incremental ISR Capital Investment	Line 1 - Line 2	$4,632,718	($914,000)	$115,727,842	$179,664,487
	Cost of Removal					
4	ISR-eligible Cost of Removal	Col (a) Docket No. 4678 FY 2018 ISR Reconciliation Filing; Col (b) Docket No. 4781 FY 2019 ISR Reconciliation Filing; Col (c) Docket No. 4916 FY20 Plan Filing; Col(d)=Section 2, Table 1	$8,603,224	$11,583,085	$7,910,408	$18,947,513
5	ISR-eligible Cost of Removal in Rate Base per RIPUC Docket No. 4770	Schedule 6-GAS, Docket No. 4770: Col(a)=[P1]L23+L42×7÷12+Docket 4678 Page 2, Line 7x3÷12; Col(b)=[P1]L42×5÷12+[P2]L18×7÷12; Col (c)=[P2]L18×5÷12+L39×7÷12; Col (d) = [P2] L39×5÷12+L60×7÷12	$6,662,056	$5,956,522	$3,105,878	$1,113,515
6	Incremental Cost of Removal	Line 4 - Line 5	$1,941,168	$5,626,564	$4,804,530	$17,833,998
	Retirements					
7	ISR-eligible Retirements	Col (a) Docket No. 4678 FY 2018 ISR Reconciliation Filing; Col (b) Docket No. 4781 FY 2019 ISR Reconciliation Filing; Col (c) Docket No. 4916 FY20 Plan Filing; Col(d)=FY21 Planned Investment x 3-year average actual retirement rate FY17 - FY19	$24,056,661	$6,531,844	$14,753,610	$25,032,040
8	ISR-eligible Retirements per RIPUC Docket No. 4770	Schedule 6-GAS, Docket No. 4770: Col(a)=[P1]L24+L43×7÷12+ Docket 4678 Page 2, Line 2x3÷12; Col(b)=[P1]L43×5÷12+[P2]L19×7÷12 Col (c)=[P2]L19×5÷12+L40×7÷12; Col (d) = [P2]L40×5÷12+L61×7÷12	$11,997,233	$7,899,865	$4,119,186	$1,476,805
9	Incremental Retirements	Line 7 - Line 8	$12,059,428	($1,368,021)	$10,634,425	$23,555,235
	(NOL)/ NOL Utilitization					
10	ISR (NOL)/NOL Utilization Per ISR	Page 21 of 22, Line 10	($6,051,855)	$16,495,753	$5,060,855	$0
11	ISR NOL Utilization Per Docket 4770	Schedule 11-Gas Page 11, Docket No. 4770: Col (a)= L40×5÷12; Col (b) = L40×5÷12+L48×7÷12; Col (c) = P11,L48×5÷12+P12,L39×7÷12; Col (d) = P12,L39×5÷12+P12,L49×7÷12	$0	$804,769	$3,063,059	$7,598,182
12	Incremental (NOL)/NOL Utilization	Line 10 - Line 11	($6,051,855)	$15,690,984	$1,997,796	($7,598,182)

Note: The FY21 non-growth ISR capital investment of $198,612,000 is the sum of Line 1 and Line 4.

The Narragansett Electric Company
d/b/a National Grid
ISR Depreciation Expense per Rate Case RIPUC Docket No. 4770

	Account No.	Account Title	Test Year June 30, 2017 (a)	1/ ARO Adjustment (b)	Adjustments June 30, 2017 (c)	Adjusted Balance (d) = (a) + (b) + (c)	Proposed Rate (e)	Depreciation Expense (f) = (d) x (e)
		Intangible Plant						
1	302.00	Franchises And Consents	$213,499	$0	$0	$213,499	0.00%	$0
2	303.00	Misc. Intangible Plant	$25,427	$0	$0	$25,427	0.00%	$0
3	303.01	Misc. Int Cap Software	$19,833,570	$0	$9,991,374	$29,824,944	0.00%	$0
4								
5		Total Intangible Plant	$20,072,496	$0	$9,991,374	$30,063,870		$0
6								
7		Production Plant						
8								
9	304.00	Production Land Land Rights	$364,912	$0	$0	$364,912	0.00%	$0
10	305.00	Prod. Structures & Improvements	$2,693,397	$0	$0	$2,693,397	15.05%	$405,356
11	307.00	Production Other Power	$46,159	$0	$0	$46,159	7.16%	$3,305
12	311.00	Production LNG Equipme	$3,167,445	$0	$0	$3,167,445	11.40%	$361,089
13	320.00	Prod. Other Equipment	$1,106,368	$0	$0	$1,106,368	6.69%	$74,016
14								
15		Total Production Plant	$7,378,281	$0	$0	$7,378,281		$843,766
16								
17		Storage Plant						
18								
19	360.00	Stor Land & Land Rights	$261,151	$0	$0	$261,151	0.00%	$0
20	361.03	Storage Structures Improvements	$3,385,049	$0	$0	$3,385,049	0.99%	$33,512
21	362.04	Storage Gas Holders	$4,606,338	$0	$0	$4,606,338	0.04%	$1,843
22	363.00	Stor. Purification Equipment	$13,891,210	$0	$0	$13,891,210	3.37%	$468,134
23								
24		Total Storage Plant	$22,143,748	$0	$0	$22,143,748		$503,488
25								
26		Distribution Plant						
27								
28	374.00	Dist. Land & Land Rights	$956,717	$0	$0	$956,717	0.00%	$0
29	375.00	Gas Dist Station Structure	$10,642,632	$0	$0	$10,642,632	1.15%	$122,390
30	376.00	Distribution Mains	$46,080,760	$0	$0	$46,080,760	3.61%	$1,663,515
31	376.03	Dist. River Crossing Main	$695,165	$0	$0	$695,165	3.61%	$25,095
32	376.04	Mains - Steel And Other - Sl	$4,190	$0	$0	$4,190	0.00%	$0
33	376.06	Dist. District Regulator	$14,213,837	$0	$0	$14,213,837	3.61%	$513,120
34	376.11	Gas Mains Steel	$57,759,572	$0	$0	$57,759,572	3.31%	$1,908,954
35	376.12	Gas Mains Plastic	$382,797,443	$0	$0	$382,797,443	2.70%	$10,316,391
36	376.13	Gas Mains Cast Iron	$5,556,209	$0	$0	$5,556,209	8.39%	$465,888
37	376.14	Gas Mains Valves	$222,104	$0	$0	$222,104	3.61%	$8,018
38	376.15	Propane Lines	$0	$0	$0	$0	3.61%	$0
39	376.16	Dist. Cathodic Protect	$1,569,576	$0	$0	$1,569,576	3.61%	$56,662
40	376.17	Dist. Joint Seals	$63,067,055	$0	$0	$63,067,055	4.63%	$2,920,005
41	377.00	T&D Compressor Sta Equipment	$248,656	$0	$0	$248,656	1.07%	$2,661
42	377.62	1/ 5360-Tanks ARO	$299	($299)	$0	$0	0.00%	$0
43	378.10	Gas Measur & Reg Sta Equipment	$19,586,255	$0	$0	$19,586,255	2.08%	$407,394
44	378.55	Gas M&Reg Sta Eqp RTU	$372,772	$0	$0	$372,772	6.35%	$23,671
45	379.00	Dist. Measur. Reg. Gs	$11,033,164	$0	$0	$11,033,164	2.22%	$244,936
46	379.01	Dist. Meas. Reg. Gs Eq	$1,399,586	$0	$0	$1,399,586	0.00%	$0
47	380.00	Gas Services All Sizes	$331,205,854	$0	$0	$331,205,854	3.05%	$10,101,779
48	381.10	Sml Meter& Reg Bare Co	$26,829,565	$0	$0	$26,829,565	1.76%	$472,200
49	381.30	Lrg Meter& Reg Bare Co	$15,779,214	$0	$0	$15,779,214	1.76%	$277,714
50	381.40	Meters	$9,332,227	$0	$0	$9,332,227	0.96%	$89,589
51	382.00	Meter Installations	$675,201	$0	$0	$675,201	3.66%	$24,712
52	382.20	Sml Meter& Reg Installation	$43,145,998	$0	$0	$43,145,998	3.66%	$1,579,144
53	382.30	Lrg Meter&Reg Installation	$2,524,025	$0	$0	$2,524,025	3.66%	$92,379
54	383.00	Dist. House Regulators	$937,222	$0	$0	$937,222	0.67%	$6,279
55	384.00	T&D Gas Reg Installs	$1,216,551	$0	$0	$1,216,551	1.56%	$18,978
56	385.00	Industrial Measuring And Regulating Station Equipment	$540,187	$0	$0	$540,187	4.18%	$22,580
57	385.01	Industrial Measuring And Regulating Station Equipment	$255,921	$0	$0	$255,921	0.00%	$0
58	386.00	Other Property On Customer Premises	$271,765	$0	$0	$271,765	0.23%	$625
59	386.02	Dist. Consumer Prem Equipment	$110,131	$0	$0	$110,131	0.00%	$0
60	387.00	Dist. Other Equipment	$930,079	$0	$0	$930,079	2.15%	$19,997
61	388.00	1/ ARO	$5,736,827	($5,736,827)	$0	$0	0.00%	$0
62								
63		Total Distribution Plant	$1,055,696,761	($5,737,126)	$0	$1,049,959,635	2.99%	$31,384,677
64								
65		General Plant						
66								
67	389.01	General Plant Land Lan	$285,357	$0	$0	$285,357	0.00%	$0
68	390.00	Structures And Improvements	$7,094,532	$0	$0	$7,094,532	3.12%	$221,349
69	391.01	Gas Office Furniture & Fixture	$274,719	$0	$0	$274,719	6.67%	$18,324
70	394.00	General Plant Tools Shop (Fully Dep)	$26,487	$0	$0	$26,487	0.00%	$0
71	394.00	General Plant Tools Shop	$5,513,613	$0	$0	$5,513,613	5.00%	$275,681
72	395.00	General Plant Laboratory	$221,565	$0	$0	$221,565	6.67%	$14,778
73	397.30	Communication Radio Site Specific	$387,650	$0	$0	$387,650	5.00%	$19,383
74	397.42	Communication Equip Tel Site	$63,481	$0	$0	$63,481	20.00%	$12,696
75	398.10	Miscellaneous Equipment (Fully Dep)	$1,341,386	$0	$0	$1,341,386	0.00%	$0
76	398.10	Miscellaneous Equipment	$2,789,499	$0	$0	$2,789,499	6.67%	$186,060
77	399.10	1/ ARO	$342,146	($342,146)	$0	$0	0.00%	$0
78								
79		Total General Plant	$18,340,436	($342,146)	$0	$17,998,289	4.16%	$748,271
80								
81		Grand Total - All Categories	$1,123,631,722	($6,079,273)	$9,991,374	$1,127,543,823	3.05%	$33,480,202
82							2.97%	
83		Other Utility Plant Assets						
84			Line 63		Total Distribution Plant	$1,049,959,635	2.99%	$31,384,677
85			Line 73 + Line 74		Communication Equipment	$451,132	7.11%	$32,079
86					Total ISR Tangible Plant	$1,050,410,767	2.99%	$31,416,756
					Non ISR Assets	$77,133,057		

Lines 1 through 81 - per RIPUC Docket No. 4770 Compliance filing dated August 16, 2018 , Compliance Attachment 2, Schedule 6-GAS, Pages 3 & 4

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC Docket Nos. 4770/4780
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The Narragansett Electric Company d/b/a National Grid
Depreciation Expense - Gas
For the Test Year Ended June 30, 2017 and the Rate Year Ending August 31, 2019

The Narragansett Electric Company
d/b/a National Grid
Gas ISR Depreciation Expense

Line No	Description		Reference	Amount	Less non-ISR eligible Plant	ISR Amount
				(a)	(b)	(c)
1	Total Company Rate Year Depreciation		Sum of Page 2, Line 16 and Line 17	$39,136,909		
2	Total Company Test Year Depreciation		Per Company Books	$33,311,851		
3	Less: Reserve adjustments		Page 4, Line 29, Col (b) + Col (c)	($15,649)		
4	Adjusted Total Company Test Year Depreciation Expense		Line 2 + Line 3	$33,296,202		
5	Depreciation Expense Adjustmen		Line 1 - Line 4	$5,840,707		
6						
7				Per Book		
8	Test Year Depreciation Expense 12 Months Ended 06/30/17:			Amount		
9	Total Gas Utility Plant 06/30/17		Page 4, Line 27, Col (d)	$1,405,994,678	($77,133,057)	$1,328,861,622
10	Less Non Depreciable Plant		Sum of Page 3, Line 5, Col (d) and Page 4, Line 25, Col (e)	($308,514,725)		($308,514,725)
11	Depreciable Utility Plant 06/30/17		Line 9 + Line 10	$1,097,479,953	($77,133,057)	$1,020,346,897
12						
13	Plus: Added Plant 2 Mos Ended 08/31/17		Schedule 11-GAS, Page 3, Line 4	$19,592,266		$19,592,266
14	Less: Retired Plant 2 Months Ended 08/31/17	1/	Line 13 x Retirement Rate	($1,345,989)		($1,345,989)
15	Depreciable Utility Plant 08/31/17		Line 11 + Line 13 + Line 14	$1,115,726,231	($77,133,057)	$1,020,346,897
16						
17	Average Depreciable Plant for Year Ended 08/31/17		(Line 11 + Line 15)/2	$1,106,603,092		$1,106,603,092
18						
19	Composite Book Rate %		As Approved in RIPUC Docket No. 4323	3.38%		
20						
21	Book Depreciation Reserve 06/30/17		Page 5, Line 72, Col (d)	$357,576,825		$357,576,825
22	Plus: Book Depreciation Expense		Line 17 x Line 19	$6,233,864		$6,233,864
23	Less: Net Cost of Removal/(Salvage)	2/	Line 13 x Cost of Removal Rate	($1,014,879)		($1,014,879)
24	Less: Retired Plant		Line 14	($1,345,989)		($1,345,989)
25	Book Depreciation Reserve 08/31/17		Sum of Line 21 through Line 24	$361,449,821		
26						
27	Depreciation Expense 12 Months Ended 08/31/18					
28	Total Utility Plant 08/31/17		Line 9 + Line 13 + Line 14	$1,424,240,956	($77,133,057)	$1,347,107,900
29	Less Non Depreciable Plant		Line 10	($308,514,725)		($308,514,725)
30	Depreciable Utility Plant 08/31/17		Line 28 + Line 29	$1,115,726,231		$1,038,593,175
31						
32	Plus: Plant Added in 12 Months Ended 08/31/18		Schedule 11-GAS, Page 3, Line 11	$115,710,016		$115,710,016
33	Less: Plant Retired in 12 Months Ended 08/31/18		Line 32 x Retirement rate	($7,949,278)		($7,949,278)
34	Depreciable Utility Plant 08/31/18		Sum of Line 30 through Line 33	$1,223,486,969		$1,146,353,912
35						
36	Average Depreciable Plant for 12 Months Ended 08/31/18		(Line 30 + Line 34)/2	$1,169,606,600		$1,092,473,543
37						
38	Composite Book Rate %		As Approved in RIPUC Docket No. 4323	3.38%		3.38%
39						
40	Book Depreciation Reserve 08/31/17		Line 25	$361,449,821		
41	Plus: Book Depreciation 08/31/18		Line 36 x Line 38	$39,532,703		$36,925,606
42	Less: Net Cost of Removal/(Salvage)		Line 32 x Cost of Removal Rate	($5,993,779)		
43	Less: Retired Plant		Line 33	($7,949,278)		
44	Book Depreciation Reserve 08/31/18		Sum of Line 40 through Line 43	$387,039,467		

1/ 3 year average retirement over plant addition in service FY 15 ~ FY17 — 6.87% Retirements
2/ 3 year average Cost of Removal over plant addition in service FY 15 ~ FY17 — 5.18% COR

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC Docket Nos. 4770/4780
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The Narragansett Electric Company d/b/a National Grid
Depreciation Expense - Gas
For the Test Year Ended June 30, 2017 and the Rate Year Ending August 31, 2021

The Narragansett Electric Company
d/b/a National Grid
Gas ISR Depreciation Expense

Line No	Description		Reference		Amount	Less non-ISR eligible Plant	ISR Amount
					(a)	(b)	(c)
1	Rate Year Depreciation Expense 12 Months Ended 08/31/19:						
2	Total Utility Plant 08/31/18		Page 1, Line 28 + Line 32 + Line 33		$1,532,001,694	($77,133,057)	$1,454,868,637
3	Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
4	Depreciable Utility Plant 08/31/18		Line 2 + Line 3		$1,223,486,969		$1,146,353,912
5							
6	Plus: Added Plant 12 Months Ended 08/31/19		Schedule 11-GAS, Page 3, Line 35		$114,477,000	($1,348,000)	$113,129,000
7	Less: Depreciable Retired Plant	1/	Line 6 x Retirement rate		($7,864,570)	$92,608	($7,771,962)
8							
9	Depreciable Utility Plant 08/31/19		Sum of Line 4 through Line 7		$1,330,099,399	($78,388,449)	$1,251,710,950
10							
11	Average Depreciable Plant for Rate Year Ended 08/31/19		(Line 4 + Line 9)/2		$1,276,793,184		$1,199,032,431
12							
13	Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
14							
15	Book Depreciation Reserve 08/31/18		Page 1, Line 44		$387,039,467		$0
16	Plus: Book Depreciation Expense		Line 11 x Line 13		$38,950,409		$35,851,070
17	Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
18	Less: Net Cost of Removal/(Salvage)	2/	Line 6 x Cost of Removal Rate		($5,929,909)		$0
19	Less: Retired Plant		Line 7		($7,864,570)		$0
20	Book Depreciation Reserve 08/31/19		Sum of Line 15 through Line 19		$412,381,898		$36,037,570
21							
22	Rate Year Depreciation Expense 12 Months Ended 08/31/20:						
23	Total Utility Plant 08/31/19		Line 2 + Line 6 + Line 7		$1,638,614,124	($78,388,449)	$1,560,225,675
24	Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
25	Depreciable Utility Plant 08/31/19		Line 23 + Line 24		$1,330,099,399		$1,251,710,950
26							
27	Plus: Added Plant 12 Months Ended 08/31/20		Schedule 11-GAS, Page 5, Line 11(i)		$21,017,630	($750,000)	$20,267,630
28	Less: Depreciable Retired Plant	1/	Line 27 x Retirement rate		($1,443,911)	$51,525	($1,392,386)
29							$0
30	Depreciable Utility Plant 08/31/20		Sum of Line 25 through Line 28		$1,349,673,118	($79,086,924)	$1,270,586,194
31							
32	Average Depreciable Plant for Rate Year Ended 08/31/20		(Line 25 + Line 30)/2		$1,339,886,258		$1,261,148,572
33							
34	Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
35							
36	Book Depreciation Reserve 08/31/20		Line 20		$412,381,898		$0
37	Plus: Book Depreciation Expense		Line 32 x Line 34		$40,875,154		$37,708,342
38	Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
39	Less: Net Cost of Removal/(Salvage)	2/	Line 27 x Cost of Removal Rate		($1,088,713)		$0
40	Less: Retired Plant		Line 28		($1,443,911)		$0
41	Book Depreciation Reserve 08/31/20		Sum of Line 36 through Line 40		$450,910,927		$37,894,842
42							
43	Rate Year Depreciation Expense 12 Months Ended 08/31/21:						
44	Total Utility Plant 08/31/20		Line 23 + Line 27 + Line 28		$1,658,187,843	($79,086,924)	$1,579,100,919
45	Less Non-Depreciable Plant		Page 1, Line 10		($308,514,725)		($308,514,725)
46	Depreciable Utility Plant 08/31/20		Line 44 + Line 45		$1,349,673,118		$1,270,586,194
47							
48	Plus: Added Plant 12 Months Ended 08/31/21		Schedule 11-GAS, Page 5, Line 11(l)		$21,838,436	($750,000)	$21,088,436
49	Less: Depreciable Retired Plant	1/	Line 48 x Retirement rate		($1,500,301)	$51,525	($1,448,776)
50							
51	Depreciable Utility Plant 08/31/21		Sum of Line 46 through Line 49		$1,370,011,253	($79,785,399)	$1,290,225,854
52							
53	Average Depreciable Plant for Rate Year Ended 08/31/21		(Line 46 + Line 51)/2		$1,359,842,185		$1,280,406,024
54							
55	Proposed Composite Rate %		Page 4, Line 17, Col (e)		3.05%		2.99%
56							
57	Book Depreciation Reserve 08/31/20		Line 41		$450,910,927		$0
58	Plus: Book Depreciation Expense		Line 53 x Line 55		$41,483,938		$38,284,140
59	Plus: Unrecovered Reserve Adjustment		Schedule NWA-1-GAS, Part VI, Page 6		$186,500		$186,500
60	Less: Net Cost of Removal/(Salvage)	2/	Line 48 x Cost of Removal Rate		($1,131,231)		$0
61	Less: Retired Plant		Line 49		($1,500,301)		$0
62	Book Depreciation Reserve 08/31/21		Sum of Line 57 through Line 61		$489,949,834		$38,470,640
63							
64	1/ 3 year average retirement over plant addition in service FY 15 ~ FY17			0.0687	Retirements		
65	2/ 3 year average Cost of Removal over plant addition in service FY 15 ~ FY17			0.0518	COR		
66							
67	Book Depreciation RY2		Line 37 (a) + Line 38 (b)				$41,061,654
68	Less: General Plant Depreciation (assuming add=retirement)		Page 10, Line 79(f)				($748,271)
69	Plus: Comm Equipment Depreciation		Page 10, Line 73 + Line 74				$32,079
70	Total						$40,345,462
71	7 Months						x7/12
72	FY 2020 Depreciation Expense						$23,534,853
73							
74	Book Depreciation RY3		Line 58 (a) + Line 59 (b)				$41,670,438
75	Less: General Plant Depreciation		Page 10, Line 79(f)				($748,271)
76	Plus: Comm Equipment Depreciation		Page 10, Line 73 + Line 74				$32,079
77	Total						$40,954,247
78	FY 2021 Depreciation Expense		5 Months of RY 2 and 7 Months of RY 3				$40,700,587

The Narragansett Electric Company
d/b/a National Grid
FY 2021 ISR Property Tax Recovery Adjustment
(000s)

Line		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
		End of FY 2018	**ISR Additions**	**Non-ISR Add's**	**Total Add's**	**Bk Depr (1)**	**Retirements**	**COR**	**End of FY 2019**
1	Plant In Service	$1,195,705	$92,263	$24,845	$117,108		($6,844)		$1,305,969
2	Accumulated Depr	$414,713				$40,858	($6,844)	($6,123)	$442,604
3	Net Plant	$780,992							$863,364
4	Property Tax Expense	$22,678							$23,283
5	Effective Prop tax Rate	2.90%							2.70%
		End of FY 2019	**ISR Additions**	**Non-ISR Add's**	**Total Add's**	**Bk Depr (1)**	**Retirements**	**COR**	**End of FY 2020**
6	Plant In Service	$1,305,969	$154,552	$19,341	$173,893		($14,754)		$1,465,108
7	Accumulated Depr	$442,604				$41,650	($14,754)	($7,910)	$461,590
8	Net Plant	$863,364							$1,003,518
9	Property Tax Expense	$23,283							$28,640
10	Effective Prop tax Rate	2.70%							2.85%
		End of FY 2020	**ISR Additions**	**Non-ISR Add's**	**Total Add's**	**Bk Depr (1)**	**Retirements**	**COR**	**End of FY 2021**
11	Plant In Service	$1,465,108	$179,664	$24,845	$204,509		($25,032)		$1,644,585
12	Accumulated Depr	$461,590				$46,790	($25,032)	($18,948)	$464,401
13	Net Plant	$1,003,518							$1,180,184
14	Property Tax Expense	$28,640							$31,827
15	Effective Prop tax Rate	2.85%							2.70%

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
		Cumulative Increm. ISR Prop. Tax for FY2018					**Cumulative Increm. ISR Prop. Tax for FY2019 1st 5 month**					
16	Incremental ISR Additions		$97,810				$92,263					
17	Book Depreciation: base allowance on ISR eligible plant		($24,356)				($24,356)					
18	Book Depreciation: current year ISR additions		($1,246)				($1,449)					
19	COR		$8,603				$11,583					
20	Net Plant Additions		$80,811				$78,041					
21	RY Effective Tax Rate		3.06%				3.06%					
22	ISR Property Tax Recovery on FY 2014 vintage investment			$194		5 month	1.27%	$76				
23	ISR Property Tax Recovery on FY 2015 vintage investment			$1,311				$508				
24	ISR Property Tax Recovery on FY 2016 vintage investment			$1,819				$709				
25	ISR Property Tax Recovery on FY 2017 vintage investment			$1,799				$714				
26	ISR Property Tax Recovery on FY 2018 vintage investment			$2,469				$989				
27	ISR Property Tax Recovery on FY 2019 vintage investment							$993				
28	Total Property Tax due to ISR			$7,592				$3,989				
29	ISR Year Effective Tax Rate	2.90%				2.70%						
30	RY Effective Tax Rate	3.06%	-0.15%			3.06%	-0.36%					
31	RY Effective Tax Rate 5 mos for FY 2019		-0.15%			5 month	-0.15%					
32	RY Net Plant times 5 m/7 month	$458,057	* -0.15%	($694)		$458,057	* -0.15%	($684)				
33	FY 2014 Net Adds time 7 month	$6,343	* -0.15%	($10)		$5,950	* -0.15%	($9)				
34	FY 2015 Net Adds time 7 month	$42,913	* -0.15%	($65)		$39,920	* -0.15%	($60)				
35	FY 2016 Net Adds times ISR Year Effective Tax	$59,527	* -0.15%	($90)		$55,693	* -0.15%	($83)				
36	FY 2017 Net Adds times ISR Year Effective Tax	$58,883	* -0.15%	($89)		$56,076	* -0.15%	($84)				
37	FY 2018 Net Adds times ISR Year Effective Tax	$80,810	* -0.15%	($122)		$77,664	* -0.15%	($116)				
38	FY 2019 Net Adds times ISR Year Effective Tax rate					$78,041	* -0.15%	($117)				
39	Total Property Tax due to rate differential			($1,071)				($1,152)				
40	Total ISR Property Tax Recovery			$6,521				$2,837				

The Narragansett Electric Company
d/b/a National Grid
FY 2021 ISR Property Tax Recovery Adjustment

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
		Cumulative Increm. ISR Prop. Tax for FY2019		7 months		Cumulative Increm. ISR Prop. Tax for FY2020				Cumulative Increm. ISR Prop. Tax for FY2021		
41	Incremental ISR Additions			($914)			$115,728				$179,664	
42	Book Depreciation: base allowance on ISR eligible plant			$0			$0				$0	
43	Book Depreciation: current year ISR additions			($7)			($1,571)				($2,334)	
44	COR			$5,627			$4,805				$17,834	
45	Net Plant Additions			$4,705			$118,961				$195,165	
46												
47	RY Effective Tax Rate			2.92%			2.96%				3.02%	
48	Property Tax Recovery on Growth and non-ISR 7 mos			1.70%	$0			($604)				($1,249)
49	ISR Property Tax Recovery on FY 2018 Net Incremental				$118			$212				$223
50	ISR Property Tax Recovery on FY 2019 Net Incremental				$80			$139				$141
51	ISR Property Tax Recovery on FY 2020 Net Incremental							$3,518				$3,499
52	ISR Property Tax Recovery on FY 2021 vintage investment											$5,896
53	ISR Year Effective Tax Rate		2.70%				2.85%				2.70%	
54	RY Effective Tax Rate		2.92%				2.96%				3.02%	
55	RY Effective Tax Rate 7 mos for FY 2019			-0.13% 7 mos				-0.10%				-0.32%
56	RY Net Plant times Rate 7 month		$919,892	* -0.13%	($1,203)		$908,586	* -0.1%	($939)		$889,353	* -0.32%
57	Growth and non-ISR Incremental times rate difference				$0		($20,407)	* -0.1%	$21		($41,336)	* -0.32%
58	FY 2018 Net Incremental times rate difference		$6,934	* -0.13%	($9)		$7,156	* -0.1%	($7)		$7,378	* -0.32%
59	FY 2019 Net Incremental times rate difference		$4,705	* -0.13%	($6)		$4,692	* -0.1%	($5)		$4,678	* -0.32%
60	FY 2020 Net Incremental times rate difference						$118,961	* -0.1%	($123)		$115,819	* -0.32%
61	FY 2021 Net Adds times rate difference										$195,165	* -0.32%
62	Total Property Tax due to rate differential				($1,218)				($1,053)			($3,800)
63	Total ISR Property Tax Recovery				($1,138)				$2,212			$4,711

Line Notes		Line Notes	
1(a) - 5(h)	Docket No. 4781 Attachment MAL-2, Page 10 of 13, 1(a) to 5(h)	15(h)	Line 10(a) - Estimated based on FY2019 actual property rate
6(a) - 10(a)	Per Line 1(h) – 5(h)	16(a) - 40(g)	Docket No. 4781 Attachment MAL-1, Page 29 of 55, 82(e) to 107(k)
6(b)	Page 15 of 22 , Line 1 ,Col (e)÷1000	41(a) - 63(e)	Docket No. 4781 Attachment MAL-2, Page 11 of 13, 31(a) to 50(e)
6(c)	Docket No. 4916, Revised Section 3, Att. 1R, P. 15, L. 7(c)	41(f)	Page 8 of 22, Line 4(a)÷1000
6(d)	Line 6(b) + Line 6(c)	42(f)	FY20 depreciation is reflected in the NBV at 56(e)
6(f)	Page 15 of 22 , Line 7 ,Col (e)÷1000	43(f)	- Page 8 of 22, Line 12(a)÷1000
6(h)	Line 6(a) + (d) + (f)	44(f)	Page 8 of 22, Line 7(a)÷1000
7(e)	Page 18 of 22 ,(Line 16 + Line 17 ,Col (a))×5÷12 + Page 18 of 22 ,(Line 37 + Line 38 ,Col (a))×7÷12 + (Page 2 of 22 , Line 3, Col (a) + Page 5 of 22 , Line 3, Col (a))÷1000 * 3.05% + Page 8 of 22 , Line 3, Col (a)×0.5×3.05%÷1000	45(f)	Sum of Lines 41(f) through 44(f)
		47(f)	=Rate Case, Docket 4770, Compliance, Revised Rebuttal. Att. 1, Sch 1-G, P2, L15, Col (c) ÷ 56(e)
7(f)	=6(f)	48(g)	Line 47(f) x Line 57(e)
7(g)	Page 15 of 22, Line 4 ,Col (e)÷1000	49(g)	Line 47(f) x Line 58(e)
7(h)	Line 7(a) + (e) + (f) + (g)	50(g)	Line 47(f) × 59(e)
8(h)	Line 6(b) - 7(h)	51(g)	Line 47(f) × 60(e)
9(h)	Docket No. 4916, Revised Section 3, Att. 1R, P. 15, L.10(h)	53(e)	=10(h)
10(h)	Line 9(h) – 8(h)	54(e)	=47(f)
11(a) - 15(a)	Per Line 6(h) – 10(h)	54(f)	53(e)-54(e)
11(b)	Page 15 of 22 , Line 1 ,Col (d)÷1000	55(f)	=54(f)
11(c)	Line 1(e) - Estimated based on FY2019 actual non-ISR addition	56(e)	=Rate Case, Docket 4770, Compliance, Revised Rebuttal. Att. 1: 56(a) × 5÷12 + (Sch 6-G, P2, L30 - L41 + P3, L5(d) - P5, L4(d) - Sch 5-G, P1, L1(e) - L1(g)) × 7÷12000
11(d)	Line 11(b) + Line 11(c)	56(g)	56(e) ×55(f)
11(f)	Page 15 of 22, Line 7 ,Col (d)÷1000	57(e)	= - Rate Case, Docket 4770, Compliance, Revised Rebuttal. Att. 1: Sch 11-G, P5, L3(e)+L3(g)+L7(e)+L7(g)
11(h)	Line 11(a) + (d) + (f)	57(g)	57(e) ×55(f)
12(e)	Page 18 of 22 ,(Line 37 + Line 38 ,Col (a))×5÷12 + Page 18 of 22 ,(Line 58 + Line 59 ,Col (a))×7÷12 + (Page 2 of 22 , Line 3, Col (a) + Page 5 of 22 , Line 3, Col (a))+ Page 8 of 22 , Line 3, Col (a))÷1000 * 3.05% + Page 12 of 22 , Line 3, Col (a)×0.5×3.05%÷1000	58(e)	Line 58(a) - Page 2 of 22, Line 12(e)÷1000
		58(g)	=58(e) ×55(f)
12(f)	=11(f)	59(e)	Line 59(a) - Page 5 of 22, Line 12(b)÷1000
12(g)	- Page 15 of 22 , Line 4 ,Col (d)÷1000	59(g)	=59(e) ×55(f)
12(h)	Line 12(a) + (e) + (f) + (g)	60(e)	=45(f)
13(h)	Line 11(h) - 12(h)	60(g)	=60(e) ×55(f)
14(h)	Line 13(h) x 15(h)	62(g)	sum of 56(g) through 61(g)
		63(g)	sum of 48(g) through 51(g) + 62(g)

Line Notes	
41(f)	
42(f)	Page 12 of 22, Line 4(a) ÷1000
43(f)	FY21 depreciation is reflected in the NBV at 56(f)
44(f)	- Page 12 of 22, Line 12(a) ÷1000
45(f)	Page 12 of 22, Line 7(a) ÷1000
47(f)	Sum of Lines 41(f) through 44(f)
48(k)	=Rate Case, Docket 4770, Compliance, Revised Rebuttal. Att. 1, Sch 1-G, P2, L15, Col (e) ÷ 56(f)
49(k)	Page 12 of 22, Line 7(a) ÷1000
50(k)	Line 47(f) x Line 58(f)
51(k)	Line 47(f) x Line 59(f)
52(k)	Line 47(f) x Line 60(f)
53(f)	Line 47(f) x Line 61(f)
54(f)	=15(h)
55(f)	=47(f)
	53(f)-54(f)
	=54(f)
	=Rate Case, Docket 4770, Compliance, Revised Rebuttal. Att.1, Sch 6-G: (P2, L30 - L41 + P3, L5(d) - P5, L4(d) - Sch 5-G, P1, L1(e) - L1(g)) × 5÷12000+(P2, L51 - L62 + P3, L5(d) - P5, L4(d) - Sch 5-G, P1, L1(e) - L1(g)- L1(i)) × 7÷12000
56(f)	56(i)-55(i)
56(k)	
57(f)	=- Rate Case, Docket 4770, Compliance. Revised Rebuttal. Att. 1: Sch 11-G, P5, L3(h)+L3(j)+L7(h)+L7(j)
57(k)	57(i)×55(i)
58(f)	Line 58(e) - Page 2 of 22, Line 12(d)÷1000
58(k)	=58(i)×55(i)
59(f)	Line 59(e) - Page 5 of 22, Line 12(e)÷1000
59(k)	=59(i)×55(i)
60(f)	Line 60(e) - Page 8 of 22, Line 5(a)÷1000
60(k)	=60(i)×55(i)
61(f)	45(i)
61(k)	=61(i)×55(i)
62(k)	sum of 56(k) through 61(k)
63(k)	sum of 48(k) through 52(k) + 62(k)

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Deferred Income Tax ("DIT") Provisions and Net Operating Losses ("NOL")

		(a)	(b) Test Year July 2016 - June 2017	(c)	(d)	(e) Jul & Aug 2017	(f) 12 Mths Aug 31 2018	(g) 12 Mths Aug 31 2019	(h) 12 Mths Aug 31 2020
1	Total Base Rate Plant DIT Provision		$29,439,421			$5,223,437	$20,453,237	$16,078,372	$5,085,206
2	Excess DIT amortization					$0	$0	($1,470,238)	($1,470,238)
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2018	FY 2019	FY 2020	FY 2021
3	Total Base Rate Plant DIT Provision					$24,514,347	$17,043,594	$8,195,454	$5,167,632
4	Incremental FY 18	$2,507,039	$2,560,766	$1,773,289	$1,823,824	$2,507,039	$53,728	($787,477)	$50,535
5	Incremental FY 19	$0	$1,083,441	$1,077,200	$1,071,214	$0	$1,083,441	($6,240)	($5,986)
6	Incremental FY 20	$0	$0	$18,306,860	$18,169,033	$0	$0	$18,306,860	($137,827)
7	Incremental FY 21				$35,965,996				$35,965,996
8	TOTAL Plant DIT Provision	$2,507,039	$3,644,207	$21,157,350	$57,030,068	$27,021,386	$18,180,762	$25,708,596	$41,040,350
9	NOL (Utilization)					$6,051,855	($16,495,753)	($5,060,855)	$0
10	Lesser of NOL or DIT Provision					$6,051,855	($16,495,753)	($5,060,855)	$0

Line Notes:

1(e) RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 11 of 23, Line 3 plus Line 4
1(f) RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 11 of 23, Line 7
1(g) RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 11 of 23, Line 50
1(h) RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 12 of 23, Line 41
1 RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 12 of 23, Line 51
2 RIPUC Docket Nos. 4770/4780, Compliance, Revised Rebuttal Attachment 1, Schedule 11-GAS, Page 12 of 23, Line 52

3 Col (e) = Line 1(b) × 25% + Line 1(e) + Line 1(f) × 7/12; Col (f) = Line 1(f) × 5/12 + Line 1(g) × 7/12 + Line (2(f) x 5/12 + Line 2(g) × 7/12;

4(a)-7(d) Cumulative DIT plus Deferred Income Tax (Page 2, Line 16 + Line 18; Page 5, Line 16; Page 8, Line 16; Page 12, Line 16)
4(e)-7(h) Year over year change in cumulative DIT shown in Cols (a) through (d)
8 Sum of Lines 3 through 7
9 Col (e)(f) = Docket No. 4781 FY19 ISR Rec, Att. MAL-2, P.6, L.10; Col (g)= Docket no. 4916, R.S. 3, Att. 1R, P.11, L.10(c); Col(h) = Per Tax Department
10 Lesser of Line 8 or Line 9

The Narragansett Electric Company
d/b/a National Grid
FY 2021 Gas ISR Plan Revenue Requirement
Calculation of Weighted Average Cost of Capital

Line No.

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4323 at 35% income tax rate effective April 1, 2013

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	49.95%	5.70%	2.85%		2.85%
Short Term Debt	0.76%	0.80%	0.01%		0.01%
Preferred Stock	0.15%	4.50%	0.01%		0.01%
Common Equity	49.14%	9.50%	4.67%	2.51%	7.18%
	100.00%		7.54%	2.51%	10.05%

(d) - Column (c) x 35% divided by (1 - 35%)

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4323 at 21% income tax rate effective January 1, 2018

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	49.95%	5.70%	2.85%		2.85%
Short Term Debt	0.76%	0.80%	0.01%		0.01%
Preferred Stock	0.15%	4.50%	0.01%		0.01%
Common Equity	49.14%	9.50%	4.67%	1.24%	5.91%
	100.00%		7.54%	1.24%	8.78%

(d) - Column (c) x 21% divided by (1 - 21%)

Weighted Average Cost of Capital as approved in RIPUC Docket No. 4770 effective September 1, 2018

	(a)	(b)	(c)	(d)	(e)
			Weighted		
	Ratio	Rate	Rate	Taxes	Return
Long Term Debt	48.35%	4.98%	2.41%		2.41%
Short Term Debt	0.60%	1.76%	0.01%		0.01%
Preferred Stock	0.10%	4.50%	0.00%		0.00%
Common Equity	50.95%	9.28%	4.73%	1.26%	5.99%
	100.00%		7.15%	1.26%	8.41%

(d) - Column (c) x 21% divided by (1 - 21%)

FY18 Blended Rate	Line 8(e) × 75% + Line 20(e) × 25%		9.73%
FY19 Blended Rate	Line 20 x 5 ÷ 12 + Line 30 x 7 ÷ 12		8.56%

Section 4
Rate Design &
Bill Impacts

Section 4

Rate Design and Bill Impacts
FY 2021 Proposal

Rate Design and Bill Impacts
FY 2021 Proposal

Like the revenue requirement, the proposed Gas ISR Plan rate design for FY 2021 is designed to recover incremental capital investment in excess of capital investment that has been reflected in the rate base in the Company's last general rate case in Docket No. 4770, as well as incremental O&M described in Section 2 and the property tax described in Section 3. For purposes of rate design, the revenue requirement associated with cumulative capital investment and property tax recovery is allocated to rate classes based upon a rate base allocator derived from the approved Allocated Cost of Service Study (ACOSS) included in the Amended Settlement Agreement in Docket No. 4770. The incremental O&M expense associated with the Heat Decarbonization Assessment has been allocated to all rate classes on a per-unit basis.

The throughput for the April 2020 through March 2021 period is from the Company's most recent forecast filed in the Company's Gas Cost Recovery filing in Docket No. 4963. Attachment 1 of this section provides the proposed ISR factors by rate class. Attachment 2 of this section provides the Plan's bill impacts[1] associated with the rate design in Attachment 1 by rate class. For the average Residential Heating customer using 845 therms per year, the cumulative impact of the FY 2021 Gas ISR Plan will represent an annual increase of $44.08, or 3.7 percent, from last year's bills.

[1] Bill impacts are provided using rates approved and currently in effect as of November 1, 2019.

	FY 2021 Revenue Requirement	Rate Class	Rate Base Allocator (%)	Allocation to Rate Class ($)	Throughput (dth)	CapEx Factor (dth)	CapEx Factor (therm)	O&M Allocation (therm)	Total ISR Factor (therm)	Uncollectible %	ISR Factor (therm)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
(1)	$21,354,740										
(2)	$1,000,000										
(3)		Res-NH	2.55%	$544,546	355,432	$1.5320	$0.1532	$0.0023	$0.1555	1.91%	$0.1585
(4)		Res-H	64.04%	$13,675,576	20,002,161	$0.6837	$0.0683	$0.0023	$0.0706	1.91%	$0.0719
(5)		Small	8.04%	$1,716,921	2,595,305	$0.6615	$0.0661	$0.0023	$0.0684	1.91%	$0.0697
(6)		Medium	12.23%	$2,611,685	6,151,694	$0.4245	$0.0424	$0.0023	$0.0447	1.91%	$0.0455
(7)		Large LL	5.57%	$1,189,459	2,930,300	$0.4059	$0.0405	$0.0023	$0.0428	1.91%	$0.0436
(8)		Large HL	2.25%	$480,482	1,564,868	$0.3070	$0.0307	$0.0023	$0.0330	1.91%	$0.0336
(9)		XL-LL	0.97%	$207,141	1,399,020	$0.1480	$0.0148	$0.0023	$0.0171	1.91%	$0.0174
(10)		XL-HL	4.35%	$928,931	6,711,586	$0.1384	$0.0138	$0.0023	$0.0161	1.91%	$0.0164
(11)		Total	100.00%	$21,354,740	41,710,367						

(a) Line 1: Proposed Capital Revenue Requirement & Forecasted Annual Property Tax Recovery Mechanism (Section 3, Attachment 1, Page 1, Line 10)
(a) Line 2: Proposed O&M (Section 3, Attachment 1, Page 1, Line 1)
(c) Docket 4770, RI 2017 Rate Case, Compliance Attachment 14, Schedule 2, Page 1 & 2, Line 15 (Rate Class divided by Total Company)
(d) Column (a) Line 1 * Column (c)
(e) Page 2, Column (m), Line 9
(f) Column (d) / Column (e), truncated to 4 decimal places
(g) Column (d) / (Column (e)*10), truncated to 4 decimal places
(h) Column (a) Line 2 / (Column (e) Line 11 * 10)
(i) Column (g) + Column (h)
(j) Docket 4770, RI 2017 Rate Case, Compliance Attachment 2, Schedule 22, Page 7, Line 15
(k) Column (i) / (1- Column (j)), truncated to 4 decimal places

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4996
Gas Infrastructure, Safety, and Reliability Plan FY 2021
Section 4: Attachment 1
Page 1 of 2

Forecasted Throughput April 2020 - March 2021

		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Total
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
(1)	Res-NH	38,776	23,141	16,991	13,192	12,870	12,955	17,210	29,318	41,316	50,599	54,760	44,305	355,432
(2)	Res-H	2,286,040	846,216	583,887	459,638	438,537	451,733	606,383	1,449,079	2,589,846	3,492,100	3,909,276	2,889,426	20,002,161
(3)	Small	322,732	146,582	69,771	51,967	51,719	54,435	46,321	164,007	327,130	443,028	543,243	374,371	2,595,305
(4)	Medium	695,442	386,939	274,477	199,940	188,417	185,696	221,094	460,376	722,500	931,426	1,071,317	814,070	6,151,694
(5)	Large LL	357,960	172,909	80,276	52,887	43,431	45,226	95,592	247,043	377,861	498,681	524,468	433,965	2,930,300
(6)	Large HL	141,189	111,789	106,220	91,875	91,003	103,985	106,623	127,141	161,974	178,099	195,202	149,769	1,564,868
(7)	X-Large LL	148,254	54,282	35,290	28,734	25,089	29,879	83,202	153,666	176,075	238,687	214,498	211,365	1,399,020
(8)	X-Large HL	532,906	493,776	501,198	491,138	501,539	535,334	555,401	580,109	622,822	677,322	653,010	567,030	6,711,586
(9)		4,523,300	2,235,634	1,668,110	1,389,371	1,352,605	1,419,243	1,731,827	3,210,737	5,019,522	6,509,942	7,165,776	5,484,300	41,710,367

Source: Company Forecast

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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

Residential Heating:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
548	$872.94	$844.37	$28.57	3.4%	$0.00	$0.00	$27.71	$0.00	$0.00	$0.86
608	$948.53	$916.82	$31.71	3.5%	$0.00	$0.00	$30.76	$0.00	$0.00	$0.95
667	$1,022.80	$988.00	$34.79	3.5%	$0.00	$0.00	$33.75	$0.00	$0.00	$1.04
726	$1,097.10	$1,059.22	$37.88	3.6%	$0.00	$0.00	$36.74	$0.00	$0.00	$1.14
785	$1,171.34	$1,130.37	$40.97	3.6%	$0.00	$0.00	$39.74	$0.00	$0.00	$1.23
845	$1,246.89	$1,202.81	$44.08	3.7%	$0.00	$0.00	$42.76	$0.00	$0.00	$1.32
905	$1,322.45	$1,275.24	$47.22	3.7%	$0.00	$0.00	$45.80	$0.00	$0.00	$1.42
964	$1,396.64	$1,346.37	$50.27	3.7%	$0.00	$0.00	$48.76	$0.00	$0.00	$1.51
1,023	$1,470.93	$1,417.57	$53.36	3.8%	$0.00	$0.00	$51.76	$0.00	$0.00	$1.60
1,082	$1,545.25	$1,488.80	$56.45	3.8%	$0.00	$0.00	$54.76	$0.00	$0.00	$1.69
1,142	$1,620.83	$1,561.25	$59.58	3.8%	$0.00	$0.00	$57.79	$0.00	$0.00	$1.79

Residential Heating Low Income:

						Difference due to:						
								DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Low Income Discount	Base DAC	ISR	EE	LIHEAP	GET
548	$648.78	$627.36	$21.43	3.4%	$0.00	($6.93)	$0.00	$27.71	$0.00	$0.00	$0.64
608	$704.82	$681.03	$23.78	3.5%	$0.00	($7.69)	$0.00	$30.76	$0.00	$0.00	$0.71
667	$759.88	$733.78	$26.10	3.6%	$0.00	($8.44)	$0.00	$33.75	$0.00	$0.00	$0.78
726	$814.96	$786.55	$28.41	3.6%	$0.00	($9.18)	$0.00	$36.74	$0.00	$0.00	$0.85
785	$870.00	$839.28	$30.73	3.7%	$0.00	($9.94)	$0.00	$39.74	$0.00	$0.00	$0.92
845	$926.02	$892.95	$33.06	3.7%	$0.00	($10.69)	$0.00	$42.76	$0.00	$0.00	$0.99
905	$982.04	$946.63	$35.41	3.7%	$0.00	($11.45)	$0.00	$45.80	$0.00	$0.00	$1.06
964	$1,037.03	$999.33	$37.70	3.8%	$0.00	($12.19)	$0.00	$48.76	$0.00	$0.00	$1.13
1,023	$1,092.10	$1,052.08	$40.02	3.8%	$0.00	($12.94)	$0.00	$51.76	$0.00	$0.00	$1.20
1,082	$1,147.22	$1,104.88	$42.34	3.8%	$0.00	($13.69)	$0.00	$54.76	$0.00	$0.00	$1.27
1,142	$1,203.26	$1,158.58	$44.68	3.9%	$0.00	($14.45)	$0.00	$57.79	$0.00	$0.00	$1.34

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2019

The Narragansett Electric Company
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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

Residential Non-Heating:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
144	$378.01	$362.07	$15.94	4.4%	$0.00	$0.00	$15.46	$0.00	$0.00	$0.48
158	$396.94	$379.46	$17.48	4.6%	$0.00	$0.00	$16.96	$0.00	$0.00	$0.52
172	$415.93	$396.86	$19.06	4.8%	$0.00	$0.00	$18.49	$0.00	$0.00	$0.57
189	$438.96	$418.00	$20.96	5.0%	$0.00	$0.00	$20.33	$0.00	$0.00	$0.63
202	$456.53	$434.16	$22.37	5.2%	$0.00	$0.00	$21.70	$0.00	$0.00	$0.67
220	$480.88	$456.50	$24.38	5.3%	$0.00	$0.00	$23.65	$0.00	$0.00	$0.73
238	$505.31	$478.92	$26.39	5.5%	$0.00	$0.00	$25.60	$0.00	$0.00	$0.79
251	$522.92	$495.09	$27.82	5.6%	$0.00	$0.00	$26.99	$0.00	$0.00	$0.83
268	$545.85	$516.15	$29.70	5.8%	$0.00	$0.00	$28.81	$0.00	$0.00	$0.89
282	$564.82	$533.56	$31.26	5.9%	$0.00	$0.00	$30.32	$0.00	$0.00	$0.94
297	$585.13	$552.21	$32.92	6.0%	$0.00	$0.00	$31.93	$0.00	$0.00	$0.99

Residential Non-Heating Low Income:

						Difference due to:						
								DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Low Income Discount	Base DAC	ISR	EE	LIHEAP	GET
144	$281.96	$270.00	$11.95	4.4%	$0.00	($3.86)	$0.00	$15.46	$0.00	$0.00	$0.36
158	$296.02	$282.90	$13.11	4.6%	$0.00	($4.24)	$0.00	$16.96	$0.00	$0.00	$0.39
172	$310.09	$295.79	$14.30	4.8%	$0.00	($4.62)	$0.00	$18.49	$0.00	$0.00	$0.43
189	$327.17	$311.45	$15.72	5.0%	$0.00	($5.08)	$0.00	$20.33	$0.00	$0.00	$0.47
202	$340.21	$323.43	$16.78	5.2%	$0.00	($5.43)	$0.00	$21.70	$0.00	$0.00	$0.50
220	$358.29	$340.00	$18.29	5.4%	$0.00	($5.91)	$0.00	$23.65	$0.00	$0.00	$0.55
238	$376.40	$356.61	$19.79	5.6%	$0.00	($6.40)	$0.00	$25.60	$0.00	$0.00	$0.59
251	$389.47	$368.60	$20.87	5.7%	$0.00	($6.75)	$0.00	$26.99	$0.00	$0.00	$0.63
268	$406.50	$384.22	$22.28	5.8%	$0.00	($7.20)	$0.00	$28.81	$0.00	$0.00	$0.67
282	$420.58	$397.14	$23.44	5.9%	$0.00	($7.58)	$0.00	$30.32	$0.00	$0.00	$0.70
297	$435.64	$410.95	$24.69	6.0%	$0.00	($7.98)	$0.00	$31.93	$0.00	$0.00	$0.74

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2019

The Narragansett Electric Company
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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

C & I Small:

						Difference due to:					
	Annual	Proposed	Current				DAC				
Consumption (Therms)		Rates	Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
830		$1,278.57	$1,236.91	$41.66	3.4%	$0.00	$0.00	$40.41	$0.00	$0.00	$1.25
919		$1,381.36	$1,335.24	$46.12	3.5%	$0.00	$0.00	$44.74	$0.00	$0.00	$1.38
1,010		$1,486.57	$1,435.89	$50.68	3.5%	$0.00	$0.00	$49.16	$0.00	$0.00	$1.52
1,099		$1,589.41	$1,534.28	$55.13	3.6%	$0.00	$0.00	$53.48	$0.00	$0.00	$1.65
1,187		$1,691.17	$1,631.59	$59.59	3.7%	$0.00	$0.00	$57.80	$0.00	$0.00	$1.79
1,277		$1,795.21	$1,731.10	$64.10	3.7%	$0.00	$0.00	$62.18	$0.00	$0.00	$1.92
1,367		$1,899.22	$1,830.62	$68.60	3.7%	$0.00	$0.00	$66.54	$0.00	$0.00	$2.06
1,456		$2,002.09	$1,929.01	$73.08	3.8%	$0.00	$0.00	$70.89	$0.00	$0.00	$2.19
1,544		$2,103.86	$2,026.37	$77.49	3.8%	$0.00	$0.00	$75.17	$0.00	$0.00	$2.32
1,635		$2,209.06	$2,126.98	$82.08	3.9%	$0.00	$0.00	$79.62	$0.00	$0.00	$2.46
1,725		$2,313.02	$2,226.44	$86.58	3.9%	$0.00	$0.00	$83.98	$0.00	$0.00	$2.60

C & I Medium:

						Difference due to:					
	Annual	Proposed	Current				DAC				
Consumption (Therms)		Rates	Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
6,907		$7,811.84	$7,586.12	$225.72	3.0%	$0.00	$0.00	$218.95	$0.00	$0.00	$6.77
7,650		$8,538.12	$8,288.09	$250.03	3.0%	$0.00	$0.00	$242.53	$0.00	$0.00	$7.50
8,391		$9,262.02	$8,987.78	$274.24	3.1%	$0.00	$0.00	$266.01	$0.00	$0.00	$8.23
9,136		$9,990.10	$9,691.48	$298.62	3.1%	$0.00	$0.00	$289.66	$0.00	$0.00	$8.96
9,880		$10,717.26	$10,394.38	$322.88	3.1%	$0.00	$0.00	$313.19	$0.00	$0.00	$9.69
10,623		$11,443.56	$11,096.39	$347.16	3.1%	$0.00	$0.00	$336.75	$0.00	$0.00	$10.41
11,366		$12,169.85	$11,798.42	$371.43	3.1%	$0.00	$0.00	$360.29	$0.00	$0.00	$11.14
12,111		$12,897.89	$12,502.07	$395.81	3.2%	$0.00	$0.00	$383.94	$0.00	$0.00	$11.87
12,855		$13,625.10	$13,205.00	$420.10	3.2%	$0.00	$0.00	$407.50	$0.00	$0.00	$12.60
13,596		$14,348.99	$13,904.68	$444.31	3.2%	$0.00	$0.00	$430.98	$0.00	$0.00	$13.33
14,340		$15,076.17	$14,607.54	$468.63	3.2%	$0.00	$0.00	$454.57	$0.00	$0.00	$14.06

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2019

The Narragansett Electric Company
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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

C & I LLF Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
37,587	$41,006.17	$39,828.18	$1,177.99	3.0%	$0.00	$0.00	$1,142.65	$0.00	$0.00	$35.34
41,634	$45,153.51	$43,848.69	$1,304.81	3.0%	$0.00	$0.00	$1,265.67	$0.00	$0.00	$39.14
45,683	$49,303.33	$47,871.63	$1,431.70	3.0%	$0.00	$0.00	$1,388.75	$0.00	$0.00	$42.95
49,731	$53,452.23	$51,893.64	$1,558.59	3.0%	$0.00	$0.00	$1,511.83	$0.00	$0.00	$46.76
53,777	$57,598.64	$55,913.25	$1,685.39	3.0%	$0.00	$0.00	$1,634.83	$0.00	$0.00	$50.56
57,825	$61,747.53	$59,935.28	$1,812.25	3.0%	$0.00	$0.00	$1,757.88	$0.00	$0.00	$54.37
61,873	$65,896.44	$63,957.34	$1,939.10	3.0%	$0.00	$0.00	$1,880.93	$0.00	$0.00	$58.17
65,920	$70,043.76	$67,977.83	$2,065.93	3.0%	$0.00	$0.00	$2,003.95	$0.00	$0.00	$61.98
69,967	$74,191.72	$71,998.95	$2,192.77	3.0%	$0.00	$0.00	$2,126.99	$0.00	$0.00	$65.78
74,016	$78,341.57	$76,021.91	$2,319.66	3.1%	$0.00	$0.00	$2,250.07	$0.00	$0.00	$69.59
78,063	$82,488.90	$80,042.40	$2,446.49	3.1%	$0.00	$0.00	$2,373.10	$0.00	$0.00	$73.39

C & I HLF Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
41,956	$37,503.56	$36,599.56	$904.00	2.5%	$0.00	$0.00	$876.88	$0.00	$0.00	$27.12
46,471	$41,272.26	$40,270.98	$1,001.28	2.5%	$0.00	$0.00	$971.24	$0.00	$0.00	$30.04
50,991	$45,044.67	$43,946.01	$1,098.66	2.5%	$0.00	$0.00	$1,065.70	$0.00	$0.00	$32.96
55,507	$48,814.17	$47,618.20	$1,195.97	2.5%	$0.00	$0.00	$1,160.09	$0.00	$0.00	$35.88
60,028	$52,587.30	$51,293.91	$1,293.39	2.5%	$0.00	$0.00	$1,254.59	$0.00	$0.00	$38.80
64,545	$56,357.48	$54,966.78	$1,390.70	2.5%	$0.00	$0.00	$1,348.98	$0.00	$0.00	$41.72
69,062	$60,127.68	$58,639.63	$1,488.05	2.5%	$0.00	$0.00	$1,443.41	$0.00	$0.00	$44.64
73,583	$63,900.84	$62,315.37	$1,585.46	2.5%	$0.00	$0.00	$1,537.90	$0.00	$0.00	$47.56
78,099	$67,670.30	$65,987.53	$1,682.77	2.6%	$0.00	$0.00	$1,632.29	$0.00	$0.00	$50.48
82,619	$71,442.70	$69,662.55	$1,780.15	2.6%	$0.00	$0.00	$1,726.75	$0.00	$0.00	$53.40
87,137	$75,214.53	$73,337.06	$1,877.47	2.6%	$0.00	$0.00	$1,821.15	$0.00	$0.00	$56.32

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2019

The Narragansett Electric Company
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National Grid - RI Gas
Infrastructure, Safety, and Reliability (ISR) Filing
Bill Impact Analysis with Various Levels of Consumption:

C & I LLF Extra-Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
233,835	$187,007.42	$184,042.28	$2,965.13	1.6%	$0.00	$0.00	$2,876.18	$0.00	$0.00	$88.95
259,019	$206,480.60	$203,196.14	$3,284.45	1.6%	$0.00	$0.00	$3,185.92	$0.00	$0.00	$98.53
284,197	$225,949.76	$222,346.03	$3,603.73	1.6%	$0.00	$0.00	$3,495.62	$0.00	$0.00	$108.11
309,381	$245,422.89	$241,499.81	$3,923.08	1.6%	$0.00	$0.00	$3,805.39	$0.00	$0.00	$117.69
334,562	$264,894.11	$260,651.73	$4,242.38	1.6%	$0.00	$0.00	$4,115.11	$0.00	$0.00	$127.27
359,745	$284,366.65	$279,804.92	$4,561.73	1.6%	$0.00	$0.00	$4,424.88	$0.00	$0.00	$136.85
384,928	$303,839.12	$298,958.07	$4,881.05	1.6%	$0.00	$0.00	$4,734.62	$0.00	$0.00	$146.43
410,110	$323,310.94	$318,110.56	$5,200.37	1.6%	$0.00	$0.00	$5,044.36	$0.00	$0.00	$156.01
435,293	$342,783.46	$337,263.77	$5,519.69	1.6%	$0.00	$0.00	$5,354.10	$0.00	$0.00	$165.59
460,471	$362,252.58	$356,413.62	$5,838.96	1.6%	$0.00	$0.00	$5,663.79	$0.00	$0.00	$175.17
485,655	$381,725.76	$375,567.46	$6,158.30	1.6%	$0.00	$0.00	$5,973.55	$0.00	$0.00	$184.75

C & I HLF Extra-Large:

						Difference due to:					
							DAC				
Annual Consumption (Therms)	Proposed Rates	Current Rates	Difference	% Chg	GCR	Base DAC	ISR	EE	LIHEAP	GET
486,528	$334,216.43	$328,197.51	$6,018.92	1.8%	$0.00	$0.00	$5,838.35	$0.00	$0.00	$180.57
538,924	$369,542.49	$362,875.41	$6,667.08	1.8%	$0.00	$0.00	$6,467.07	$0.00	$0.00	$200.01
591,320	$404,867.74	$397,552.44	$7,315.30	1.8%	$0.00	$0.00	$7,095.84	$0.00	$0.00	$219.46
643,718	$440,195.02	$432,231.46	$7,963.56	1.8%	$0.00	$0.00	$7,724.65	$0.00	$0.00	$238.91
696,109	$475,517.27	$466,905.58	$8,611.69	1.8%	$0.00	$0.00	$8,353.34	$0.00	$0.00	$258.35
748,506	$510,843.92	$501,584.08	$9,259.85	1.8%	$0.00	$0.00	$8,982.05	$0.00	$0.00	$277.80
800,903	$546,170.56	$536,262.47	$9,908.09	1.8%	$0.00	$0.00	$9,610.85	$0.00	$0.00	$297.24
853,294	$581,492.85	$570,936.62	$10,556.23	1.8%	$0.00	$0.00	$10,239.54	$0.00	$0.00	$316.69
905,692	$616,820.13	$605,615.69	$11,204.44	1.9%	$0.00	$0.00	$10,868.31	$0.00	$0.00	$336.13
958,088	$652,145.37	$640,292.73	$11,852.64	1.9%	$0.00	$0.00	$11,497.06	$0.00	$0.00	$355.58
1,010,485	$687,472.01	$674,971.15	$12,500.86	1.9%	$0.00	$0.00	$12,125.83	$0.00	$0.00	$375.03

Note: Bill Impacts are based on rates approved and currently in effect as of November 1, 2019

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4996
Gas Infrastructure, Safety, and Reliability Plan FY 2021
Section 4: Attachment 2
Page 5 of 5

Testimony of
Lee Gresham

DIRECT TESTIMONY

OF

LEE GRESHAM, JD, PhD

December 20, 2019

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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Lee Gresham. My business address is 40 Sylvan Road, Waltham, MA 02451.

Q. By whom are you employed and in what capacity?

A. I am employed by National Grid USA Service Company, Inc. as a Lead Analyst in Regulatory and Customer Strategy. I am the Rhode Island jurisdictional lead for heat decarbonization matters for the gas division of The Narragansett Electric Company d/b/a National Grid (Company), including those related to the Company's capital investment strategy. In my role, I work closely with the Rhode Island Jurisdictional President and jurisdictional staff on all local issues related to the Company's Rhode Island heat decarbonization efforts. My responsibilities also include working with Rhode Island regulators on issues related to decarbonizing the gas system, developing strategies to support Company objectives regarding decarbonization-related investments in the gas system and providing testimony regarding capital investments that enable National Grid to decarbonize its gas distribution network.

Q. Please describe your educational background and professional experience.

A. I graduated from the College of the Holy Cross with a Bachelor of Arts degree in

Psychology and concentration in Pre-Medicine in 1999. In 2007, I graduated from Vermont Law School with a Juris Doctorate degree. And in 2010, I received a Doctor of Philosophy degree in Engineering and Public Policy from Carnegie Mellon University.

From 2010 to 2011, I was a Post-Doctoral Fellow with the Carbon Capture and Sequestration Regulatory Institute. I worked as a Senior Consultant at SAIC's Energy, Environment, and Infrastructure division from 2011 to 2012. From 2012 to 2018, I held roles of increasing responsibility as an Associate with The Brattle Group in the firm's utility practice.

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC)?

A. No.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the Company's proposed Heat Decarbonization Assessment (or Assessment) filed as part of the FY 2021 Gas

Infrastructure, Safety, and Reliability Plan (Gas ISR Plan or Plan).[1] Through my testimony, I present the Company's Gas ISR Heat Decarbonization Assessment, which details the work the Company expects to complete and the anticipated capital investments associated with that work. Company Witness Melissa A. Little is providing testimony on the calculation of the revenue requirement associated with the Company's Plan, and Company Witness Ryan M. Scheib is providing testimony relative to (1) how the Company calculated the rate design for the ISR mechanism; (2) the calculation of the ISR factors; and (3) the customer bill impacts of the proposed ISR factors.

III. OVERVIEW

Q. How did the Company prepare the Gas ISR Heat Decarbonization Assessment proposal?

A. The Company prepared the Gas ISR Heat Decarbonization Assessment and submitted it to the Rhode Island Division of Public Utilities and Carriers (Division) for review on September 29, 2019.[2] On October 7, 2019, the Company met with the Division regarding the proposal and subsequently responded to discovery requests from the Division about

[1] The Company is required by statute to annually file an infrastructure, safety, and reliability spending plan with the PUC for review and approval. *See* R.I. Gen. Laws § 39-1-27.7.1(d). In addition to budgeted spending, the annual Gas ISR Plan must contain a reconcilable allowance for the Company's anticipated capital investments and other spending for the upcoming fiscal year. *See* R.I. Gen. Laws § 39-1-27.7.1(c)(2). For FY 2021, the Company's fiscal year is for the period of April 1, 2020 through March 31, 2021, so the Plan would be effective April 1, 2020.

[2] R.I. Gen. Laws § 39-1-27.7.1(d) requires that the Company and the Division work together over the course of 60 days in an attempt to reach an agreement on a proposed plan, which is then submitted to the PUC for review and approval within 90 days.

various components of the Assessment. The Company and the Division continued to collaborate regarding the proposed Assessment, including a discussion on December 6, 2019. The Division has indicated general concurrence with the proposal, including the analyses and projects outlined therein, and will continue to review the Assessment and its costs after filing, consistent with prior Gas ISR Plan filings. Overall, the Heat Decarbonization Assessment will enable the Company to meet state and federal safety and reliability requirements and maintain its gas distribution system in a safe and reliable condition, all while pursuing deep greenhouse gas emissions reductions. The proposed Assessment has been developed to address decarbonization as well as safety and reliability improvements of the Company's gas system for the immediate and long-term benefit of Rhode Island customers. Addressing heating sector emissions in Rhode Island is fundamental to achieving the state's climate targets. Decarbonizing heat will require transformative changes to energy supply and customer energy use.

Q. What is the Gas ISR Plan's Heat Decarbonization Assessment designed to accomplish?

A. The objective for the Heat Decarbonization Assessment is to evaluate the potential to continue to safely and reliably operate and maintain Rhode Island gas pipeline infrastructure while taking meaningful steps towards decarbonizing the gas network and

providing customers with clean and affordable heating solutions. This assessment will help inform the Company's future geothermal and renewable natural gas (RNG) capital plans.

Q. Are you sponsoring any exhibits through your testimony?

A. Yes. The proposed Gas ISR Plan is attached as Exhibit 1 to my testimony. The Plan is organized as follows:

Section 2 – Heat Decarbonization

Section 3 – Revenue Requirement Calculation

Section 4 – Rate Design and Bill Impacts

My testimony focuses on Section 2 of the Proposal. As noted earlier, Melissa A. Little is sponsoring the revenue requirement calculation included in Section 3 of the Proposal, and Ryan M. Scheib is sponsoring the rate design and bill impacts included in Section 4 of the Proposal.

Q. Please describe the proposed Geothermal Assessment and Objectives.

A. Geothermal (or ground source) heat pumps are highly efficient and can meet whole-home heating and cooling needs. For delivered fuel customers outside of the natural gas network, geothermal is an opportunity to convert to a cleaner heating system. However, the high cost of these systems and a lack of public awareness has stifled widescale

adoption of this technology. The Company believes that utility involvement can help address both barriers and encourage geothermal heat pump adoption growth.

The Company is proposing a top-down technical and market feasibility analysis of ground source heat pumps, evaluating inclusion of the heating loop in rate base. A heating loop is the below-ground portion of a geothermal system used to extract or dissipate heat. A two-phased assessment, as it is envisioned, will focus on utility applications at the edge of the gas network (i.e., communities currently seeking gas connections) and how the customer interacts with the technology from a business perspective. This assessment will help inform the Company's future geothermal capital plans.

Phase 1 aims to provide:

- A high-level, techno-economic assessment of geothermal with ground source heat pumps;
- An evaluation of land availability and limitations on the use thereof; and
- Identification of site selection criteria.

Phase 1 will be used to understand the potential for geothermal heat pumps to contribute to heating sector emissions reductions in Rhode Island and inform supporting strategy. The Company anticipates that it will perform the assessment in-house. Phase 2 will focus on identifying suitable sites for utility-owned geothermal heat pump systems. This will be

accomplished through a market analysis that identifies specific candidate sites, utility business models, and customer offerings, as well as assesses scalability. Due to limited internal resources, the Company anticipates retaining consulting services to assist with Phase 2.

Q. How will the results of the assessment be used or applied?

A. If a site or sites are found to be viable, the results will be used to inform a future ISR request for investment in a geothermal capital program.

Q. Please describe what specifically you are referring to with respect to the term "Renewable Natural Gas."

A. RNG is a term generally used to describe pipeline compatible gaseous fuel derived from biomass or other renewable sources that has lower lifecycle CO2e emissions than geological natural gas. RNG feedstocks include manure, food waste, wastewater treatment plants, or other biomass sources, often using an anaerobic digester. With recent advancements to lower the cost of gasification technology, feedstocks with lower moisture content can also be used to produce RNG (e.g., municipal solid waste or agricultural residues). Furthermore, with new technological innovations, production of RNG is moving beyond biomass to include renewable electricity, often referred to as power-to-gas or P2G. This concept includes either adding hydrogen to the existing gas system (i.e., hydrogen blending) or producing synthetic methane by combining hydrogen

and carbon dioxide. Collectively, RNG offers new ways to decarbonize the gas network by reducing the carbon footprint of the fuel supply in a manner similar to the way solar and wind technology reduce the carbon footprint of electricity.

Q. Please describe the proposed Renewable Natural Gas Assessment and Objectives.

A. Renewable natural gas (RNG) presents an extraordinary opportunity to decarbonize the heating sector and leverage existing assets for a more affordable outcome. Integrating RNG converts the existing gas network into a clean energy distribution system that delivers low- or zero-carbon fuel to customers. We believe that decarbonizing the gas and electric networks in parallel can reduce the cost of achieving deep decarbonization goals. Integrating RNG will allow customers to reduce their carbon footprint, without having to replace end-use equipment or undertake deep renovations, minimizing disruption and upfront capital costs for our customers.

The objective of this project is to understand the potential near-and long-term gas demand in Rhode Island that can be served by RNG. To accomplish this, the Company proposes a bottom-up RNG (including Hydrogen) economic potential assessment. Specifically, the Company proposes estimating the potential amount of near- and long-term non-electric gas demand in Rhode Island that can be served by RNG based on available feedstocks, load forecasts, and expected renewable generation buildout and dedicated RNG / Hydrogen project-specific renewables projects. The most granular, site-

specific assessment will be focused on landfill gas given facilities have been operating at scale worldwide for decades including the Staten Island Landfill facility that has been injecting into National Grid's gas network since the 1980's.3 Emerging sources and technologies used to produce RNG (municipal solid waste, food waste) and Hydrogen (via electrolyzers) will also be evaluated for near-, mid-, and long-term feasibility. This insight will be used to identify opportunities for utility-led capital programs and projects that provide or integrate low-carbon energy supply, such as:

- Identify and evaluate specific locations for traditional RNG interconnections, such as landfill gas-based, and potential partners to develop RNG facilities.
- Evaluating locations for use as a future hydrogen injection site. Engineering work will allow us to ascertain an appropriate and beneficial location to build a hydrogen injection site in the State. The work will provide the Company with a more complete understanding of the application of hydrogen technology in our system. The money requested could be utilized to develop a building site plan for a future electrolyzer, potentially aimed at meeting supply constraints in a specific area, and which could blend 2-3% hydrogen into the system (further allowing us to address potential leak and pipe embrittlement concerns). Along with the work supported by the RNG Assessment the Company will simultaneously outline how to safely blend hydrogen into the gas network in a separate, but related effort.

3 https://www.epa.gov/lmop/lmop-national-map

Q. How does the Company plan to involve the Division, Office of Energy Resources, and other stakeholders and keep them apprised of progress while the assessments are being conducted?

A. The Company will work collaboratively with Rhode Island stakeholders while conducting the assessment. Incorporating the perspective of the Division, the Office of Energy Resources, and other stakeholders will be critical to performing an accurate and actionable assessment. The Company also proposes to develop an Advisory Committee to provide technical and policy expertise and guidance with respect to the assessments. The Advisory Committee will meet at regular intervals throughout the project to review assumptions, results, and deliverables.

IV. CAPITAL INVESTMENT PLAN

Q. What levels of spending are proposed in the Gas ISR Plan's Heat Decarbonization Proposal?

A. For FY 2021, the Company proposes to invest a total of $1 million in Heat Decarbonization assessments, allocated equally between the Geothermal and RNG proposals.

V. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

Testimony of
Melissa A. Little

DIRECT TESTIMONY

OF

MELISSA A. LITTLE

December 20, 2019

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I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is Melissa A. Little, and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. Please state your position at National Grid and your responsibilities within that position.

A. I am a Director for New England Revenue Requirements in the Regulation and Pricing department of National Grid USA Service Company, Inc. (Service Company). The Service Company provides engineering, financial, administrative, and other technical support to subsidiary companies of National Grid USA (National Grid). My current duties include revenue requirement responsibilities for National Grid's gas and electric distribution activities in New England, including the gas operations of The Narragansett Electric Company d/b/a National Grid (Narragansett or the Company).

Q. Please describe your education and professional experience.

A. In 2000, I received a Bachelor of Science degree in Accounting Information Systems from Bentley College (now Bentley University). In September 2000, I joined PricewaterhouseCoopers LLP in Boston, Massachusetts, where I worked as an associate in the Assurance practice. In November 2004, I joined National Grid in the Service Company as an Analyst in the General Accounting group. After the merger of National

Grid and KeySpan in 2007, I joined the Regulation and Pricing department as a Senior Analyst in the Regulatory Accounting function, also supporting the Niagara Mohawk Power Corporation Revenue Requirement team. I was promoted to Lead Specialist in July 2011 and moved to the New England Revenue Requirement team. In August 2017, I was promoted to my current position.

Q. Have you previously filed testimony or testified before the Rhode Island Public Utilities Commission (PUC)?

A. Yes. Among other testimony, I testified in support of the Company's revenue requirement (1) for Narragansett, in the 2017 general rate case filing in Docket No. 4770; (2) for Narragansett Gas, in the Gas ISR Plan and reconciliation filings for FY 2016 in Docket No. 4540, FY 2017 in Docket No. 4590, and FY 2018 in Docket No. 4678, and FY 2019 in Docket No. 4781, and the Gas ISR Plan filing for FY 2020 in Docket No. 4916; and (3) for Narragansett Electric, in the Fiscal Year (FY) 2018 Electric Infrastructure, Safety, and Reliability (ISR) Plan and reconciliation filing in Docket No. 4682, and FY 2019 in Docket No. 4783, and the Electric ISR Plan filing for FY 2020 in Docket No. 4915.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to sponsor Section 3 of the FY 2021 Gas ISR Plan (Gas ISR Plan or Plan), which describes the calculation of the Company's revenue requirement

for FY 2021 in Attachment 1 of that section. The revenue requirement is based on the FY 2021 Gas ISR Plan capital investment described in the testimony of Company Witness Amy Smith.

II. GAS ISR PLAN REVENUE REQUIREMENT

Q. Please summarize the revenue requirement for the Company's FY 2021 Gas ISR Plan.

A. As demonstrated in Attachment 1, Page 1, Column (b), the Company's FY 2021 Gas ISR Plan revenue requirement amounts to $22,354,740, or an incremental $15,880,020 over the amount currently being billed for the Gas ISR Plan. The Plan's revenue requirement consists of the following elements: (1) operation and maintenance (O&M) expenses of $1,000,000 associated with heat decarbonization; (2) the revenue requirement of $7,636,309 comprised of the Company's return, taxes, and depreciation expense associated with FY 2021 proposed non-growth ISR incremental capital investment in gas utility infrastructure of $198,612,000, as calculated on Attachment 1, Page 12; (3) the FY 2021 revenue requirement on incremental non-growth ISR capital investment for FY 2018 through FY 2020 totaling $9,007,264; and (4) FY 2021 property tax expense of $4,711,167, as shown on Attachment 1 at Page 20, in accordance with the property tax recovery mechanism included in the Amended Settlement Agreement in Docket No. 4323 and continued under the Amended Settlement Agreement in Docket No. 4770. Importantly, the incremental capital investment for the FY 2021 ISR revenue requirement

excludes capital investment embedded in base rates in Docket No. 4770 for FY 2012 through FY 2021. Incremental non-growth capital investment for this purpose is intended to represent the net change in net plant for non-growth infrastructure investments during the relevant fiscal year and is defined as capital additions plus cost of removal, less annual depreciation expense ultimately embedded in the Company's base rates (excluding depreciation expense attributable to general plant, which is not eligible for inclusion in the Gas ISR Plan).

The FY 2021 Gas ISR Plan includes Operation & Maintenance (O&M) expense of $1,000,000 associated with heat decarbonization assessments as described in the testimony of Company Witness Lee Gresham.

For illustration purposes only, Attachment 1, Page 1, Column (c) provides the FY 2022 revenue requirement for the respective vintage year capital investments. Notably, these amounts will be trued up to actual investment activity after the conclusion of the fiscal year, with rate adjustments for the revenue requirement differences incorporated in future ISR filings. A detailed description of the calculation of the Company's revenue requirement for FY 2021 is provided in Section 3 of the Gas ISR Plan.

Q. Did the Company calculate the FY 2021 Gas ISR Plan revenue requirement in the same fashion as calculated in the previous ISR factor submissions?

A. Yes, with the exception of the bonus depreciation assumptions used in the calculation of tax depreciation on FY 2019 and FY 2020 capital investment. As stated in Section 3 of the Plan, the Company's original interpretation of the 2017 Tax Cut and Jobs Act (2017 Tax Act) was that no federal tax deduction for bonus depreciation would be allowed in FY 2019 and FY 2020. However, based on current industry practice, the Company has revised its estimate of FY 2019 and FY 2020 bonus depreciation. The Company's FY 2021 revenue requirement includes the impact of the 2017 Tax Act on vintage FY 2018 through FY 2021 investment.

Q. Does the Company plan to update the FY 2021 Gas ISR Plan revenue requirement calculation subsequent to the date of this filing?

A. Yes. The Company will file its FY 2019 federal income tax return in December 2019, coincident with the submission of this filing. The Company will compare the results of the actual FY 2019 federal tax return with the FY 2019 tax assumptions used to calculate deferred federal income taxes included in incremental rate base in the FY 2019, FY 2020 and FY 2021 vintage revenue requirement calculations and assess any impact to the FY 2021 Gas ISR Plan revenue requirement. The Company will then file a revised FY 2021 Gas ISR Plan revenue requirement prior to the hearing in this docket, which will quantify

the impact of any revisions to accumulated deferred income taxes on the FY 2021 Gas ISR Plan revenue requirement, including any further implications of the Tax Act.

III. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

Testimony of
Ryan M. Scheib

THE NARRAGANSETT ELECTRIC COMPANY
d/b/a NATIONAL GRID
RIPUC DOCKET NO. 4996
RE: FY 2021 GAS INFRASTRUCTURE,
SAFETY, AND RELIABILITY PLAN
WITNESS: RYAN M. SCHEIB

DIRECT TESTIMONY

OF

RYAN M. SCHEIB

December 20, 2019

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I. INTRODUCTION

Q. Please state your names and business address.

A. My name is Ryan M. Scheib and my business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am an Analyst in the New England Gas Pricing group employed by National Grid USA Service Company, Inc. In this position, I am responsible for the preparing and submitting various regulatory filings with the Rhode Island Public Utilities Commission (PUC) on behalf of The Narragansett Electric Company d/b/a National Grid (the Company).

Q. Please provide your educational background and professional experience.

I received a Bachelor of Science in Finance from the University of Delaware in 2016.

In 2016, I joined National Grid as an Associate Analyst in the New England Gas Pricing group. In 2018, I was promoted to Analyst supporting the Company.

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC) or any other regulatory commissions?

A. Yes, I have testified before the PUC in the Company's Distribution Adjustment Charge filing in October 2019, RIPUC Docket No. 4955.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to sponsor Section 4 of the Fiscal Year (FY) 2021 Gas Infrastructure, Safety, and Reliability (ISR) Plan (Gas ISR Plan or Plan), which describes the calculation of the proposed FY 2021 ISR factors and the customer bill impacts of the proposed ISR factors.

II. RATE DESIGN

Q. Please summarize the rate design used to develop the ISR factors presented as part of this filing.

A. Like the revenue requirement, the proposed Gas ISR Plan rate design for FY 2021 is based on the revenue requirement of incremental capital investment in excess of capital investment that has been reflected in rate base in the Company's most recent general rate case in Docket No. 4770, as well as incremental Operations and Maintenance (O&M) expense associated with the Heat Decarbonization Assessment as described in Section 2 of the ISR Plan and a property tax expense as described in Section 3 of the ISR Plan. The Company has allocated the revenue requirement associated with the capital investment to each rate class based on the rate base allocator approved by the PUC in the Amended Settlement Agreement in Docket No. 4770. However, to recover the proposed incremental O&M expense associated with the Heat Decarbonization Assessment, the Company calculated a uniform per-unit factor for each rate class. The Company also utilized the most recently available forecasted throughput for the period April 2020

through March 2021 that had been developed for the Company's 2019-20 Gas Cost Recovery filing in Docket No. 4963. That data was compiled by rate class and summarized as set forth in Section 4, Attachment 1, Page 2 of the proposed Gas ISR Plan. As shown in Section 4, Attachment 1, Page 1, the Company divided the allocated rate class revenue requirement, as multiplied by the rate base allocation, by the forecasted throughput for each rate class to develop separate ISR capital factors per rate class on a per-therm basis. Finally, the Company divided the total incremental O&M expense of $1,000,000 by the total forecasted throughput for all rate classes to derive the O&M factor for all rate classes on a per therm basis. The Company then adjusted each rate class' ISR factor (capital and O&M factors) to reflect the 1.91 percent uncollectible factor from the Amended Settlement Agreement in Docket No. 4770.

III. ISR FACTORS

Q. What are the ISR factors proposed by the Company?

A. The ISR factors proposed by the Company are shown in the table below and in the Gas ISR Plan at Section 4, Attachment 1.

Table 3-1 FY 2021 ISR Factors Per Rate Class

Rate Class	ISR Rate ($/therm)
Res-Non-Heating	$0.1585
Res-Heating	$0.0719
Small C&I	$0.0697
Medium C&I	$0.0455
Large LL	$0.0436
Large HL	$0.0336
XL-LL	$0.0174
XL-HL	$0.0164

*Rates include uncollectible allowance.

The same factors noted above for Residential Heating and Residential Non-Heating customers would also apply to each of the Low-Income rate classes.

IV. BILL IMPACTS

Q. What is the impact of the proposed ISR factors on customers' bills?

A. For the average Residential Heating customer using 845 therms annually, the proposed FY 2021 ISR factors will result in an annual bill increase of $44.08, or 3.7 percent,[1] as shown in the proposed Gas ISR Plan at Section 4, Attachment 2. The annual impact of the proposed ISR factors for all rate classes is set forth in Section 4 (Rate Design and Bill Impacts) of the Plan.

[1] Please note that the bill impact includes the Rhode Island Gross Earnings Tax of three percent.

Q. Does this conclude your testimony?

A. Yes.