

Knepper Applicable PHMSA Training Completed			
	Online Computer Based Training	Status	Date
1	PHMSA-PL1DIMP Introduction of Distribution Integrity Management Program WBT	Successful	5/3/2011
2	PHMSA-PL1GLAW Introduction to Gas Laws WBT	Successful	8/11/2014
3	PHMSA-PL1HCA High Consequence Areas WBT	Successful	7/4/2005
4	PHMSA-PL1ICDA Internal Corrosion Direct Assessment WBT	Successful	4/1/2011
5	PHMSA-PL1IPROC Integrity Management Processes WBT	Successful	7/6/2005
6	PHMSA-PL1ODOR Natural Gas Odorization WBT	Successful	4/4/2011
7	PHMSA-PL1PRESS Fundamentals of Gas Pressure Regulators WBT	Successful	2/26/2007
8	PHMSA-PL1IRA Introduction to Risk Assessment Methods WBT	Successful	4/25/2015
9	PHMSA-PL2FLMEC - Fundamentals of Fluid Mechanics WBT	Successful	4/24/2015
10	PHMSA-PL2P195 Introduction to Part 195 WBT	Successful	4/14/2015
11	PHMSA-PL3CP Fundamentals of Pipeline Corrosion and Cathodic Protection WBT	Successful	8/14/2007
12	PHMSA-PL3ECDA External Corrosion Direct Assessment WBT	Successful	4/1/2011
13	PHMSA-PL3ELEC Fundamentals of Basic DC Electricity WBT	Successful	8/18/2007
14	PHMSA-PL3OQ Operator Qualification WBT Course	Successful	1/31/2006
15	PHMSA-PL3PIG Fundamentals of Launching and Receiving Maintenance Pigs WBT	Successful	6/8/2010
16	PHMSA-PL3PP Fundamentals of Plastic Pipe WBT	Successful	4/12/2007
17	PHMSA-PL3REG Regulatory Overview WBT	Successful	4/8/2015
18	PHMSA-PL3SCADA Fundamentals of SCADA Systems WBT	Successful	3/14/2011
19	PHMSA-PL3SCCDA Stress Corrosion Cracking Direct Assessment WBT	Successful	8/23/2006
20	PHMSA-PL3WELD Introduction to Pipeline Welding WBT	Successful	6/1/2007
21	PHMSA-PL4LNG Fundamentals of Liquefied Natural Gas (LNG) WBT	Successful	6/15/2005
21	PHMSA-PL3IC - Investigating and Managing Internal Corrosion of Pipelines WBT	Successful	10/6/2016
22	PHMSA-PL3DA Drug and Alcohol Testing for the Pipeline Industry WBT	Successful	10/8/2016
	COURSES	Status	Date
1	PHMSA-PL1297 Gas Integrity Management (IM) Protocol Course	Successful	5/5/2005
2	PHMSA-PL4253 Liquefied Natural Gas (LNG) Safety Technology and Inspection Course	Successful	7/29/2005
3	PHMSA-PL1250 Safety Evaluation of Gas Pipeline Systems Course	Successful	12/15/2005
4	PHMSA-PL2284 (HAZWOPER) Refresher for Pipeline Safety Representatives	Successful	1/9/2007
5	PHMSA-PL3322 Evaluation of Operator Qualification (OQ) Programs Course	Successful	1/21/2016
6	PHMSA-PL3256 Pipeline Failure Investigation Techniques Course	Successful	2/9/2007
7	PHMSA-PL1255 Gas Pressure Regulation and Overpressure Protection Course	Successful	4/12/2007
8	PHMSA-PL1310 Plastic and Composite Materials Course	Successful	6/15/2007
9	PHMSA-PL3242 Welding and Welding Inspection of Pipeline Materials Course	Successful	6/15/2007
10	PHMSA-PL3254 Joining of Pipeline Materials Course	Successful	6/15/2007
11	PHMSA-PL3257 Pipeline Safety Regulation Application and Compliance Procedures Course	Successful	8/17/2007
12	PHMSA-PL3600 Root Cause/Incident Investigation Course	Successful	8/21/2009
13	PHMSA-PL3292 Safety Evaluation of Inline Inspection (ILI)/Pigging Programs Course	Successful	6/11/2010
14	PHMSA-PL3293 Corrosion Control of Pipeline Systems Course	Successful	6/25/2010
15	PHMSA-PL3291 Fundamentals of (SCADA) System Technology and Operation Course	Successful	4/1/2011
16	PHMSA-PL3355 Safety Evaluation of Control Room Management Programs	Successful	8/29/2014
17	PHMSA-PL1245 Safety Evaluation of Distribution Integrity Management Programs (DIMP) Course	Successful	4/23/2015
18	PHMSA-PL2258 Safety Evaluation of Hazardous Liquid Pipeline Systems Course	Successful	5/15/2015
19	PHMSA-PL3267 Fundamentals of Integrity Management Course	Successful	7/31/2015
20	PHMSA-PL3306 External Corrosion Direct Assessment (ECDA) Field Course	Successful	8/14/2015
21	PHMSA-PL2294 Safety Evaluation of Hazardous Liquid Pipeline (IM) Programs Course	Successful	4/28/2017

(20) Cast Iron Bare Steel Replacement Program:

A cast iron/bare steel replacement program (“CIBS Program”) shall be implemented that will be based on a construction year (April through December). By no later than January 15 of each year, EnergyNorth shall provide a copy of its CIBS Plan, defined below, to Staff for review and comment. EnergyNorth shall meet with Staff in technical sessions to discuss the plan to be implemented for the subsequent construction year. After review by Staff, EnergyNorth will take all reasonable steps to carry out and implement the plan, taking into account Staff comments.

The CIBS plan, which will cover cast iron and bare steel pipe replacements, will describe each replacement project, itemizing the proposed projects by general category, along with the targeted amount of investment to be made during the following construction year, which budget shall not be less than the CIBS base amount for capital expenditures described in paragraph e below (“CIBS Plan”). The CIBS Plan will prioritize cast iron and bare steel pipe replacements based on factors including leakage, material condition, age and other components affecting pipe integrity. The CIBS Plan will not address replacement of cast iron and bare steel pipes required in public works projects and/or carried out pursuant to the Cast Iron Encroachment Policy referenced in Condition 12 above.

EnergyNorth agrees to engage in an annual evaluation and selection process to identify and target investments to be proposed in the CIBS Plan, as follows:

- a. It will undertake an annual review of the performance of its distribution system as it relates to the integrity of its cast iron and bare steel pipelines. This review will provide: (1) a detailed analysis of leak activity over the preceding ten years on the bare steel and cast iron gas mains, and (2) an evaluation of which main segments represent the highest priority segments for replacement. Consideration will be given to the age of the main, the date the leak(s) occurred, leak classification, type of leak, number of clamps used in leak repair, condition of main when repaired, specific leak location, building types in the area of the main segment and quantity of bare steel services attached to the potential segment to be replaced.
- b. Adjustments in the priority of main segment replacement could be made due to planned paving projects, public relations, or identification of new main segments by operating personnel in the field that were not captured through EnergyNorth’s data systems.
- c. Using the process identified in (a) and (b) above, EnergyNorth shall rank and prioritize those mains to be replaced in the associated construction year and provide its plans to the Commission.
- d. Categories of spending will include the following:

- 1.1 unprotected bare steel main replacement, as determined by the evaluation and selection process;
- 1.2. cast iron main replacement as determined by the evaluation and selection process;
- 1.3. cast iron or bare steel main replacement candidates requested by field operating personnel; and
- 1.4. bare steel services replaced as a result of a segment of bare steel main or cast iron main that is selected.

Categories of spending that are not included in the CIBS:

- 2.1. costs of moving inside meters to outside;
- 2.2. costs of reconnecting existing plastic services or existing coated steel services from cast iron mains or bare steel mains to the newly installed replacement main;
- 2.3. costs of any mains replaced made of polyethelene or steel that have a protective coating;
- 2.4. costs of any mains that are abandoned;
- 2.5. costs of coated steel mains that “act as bare steel mains” such as poorly coated steel mains or disbonded steel mains, unless approved by the Safety Division;
- 2.6. incremental costs of upsizing with the exception of (n) below; and
- 2.7 carryover costs in aggregate exceeding 5% of the approved estimated total expenditures under the CIBS program for the construction year, unless approved by the Safety Division. Such carryover costs include items such as restoration costs not incurred during the construction year.
- 2.8 Replacements made under the Cast Iron Encroachment Policy are not eligible for accelerated rate recovery in the Cast Iron/Bare Steel Program unless a special circumstance is approved by the Safety Division.

e) EnergyNorth shall bear the initial \$500,000 of capital expenditures under the CIBS program (“the CIBS Base Amount”) (in accordance with the Handy Whitman index). The CIBS Base Amount excludes replacement projects required by public works projects and/or carried out pursuant to the Cast Iron Encroachment Policy referenced in Condition 12. Provided that investments were made in accordance with the approved CIBS plan, EnergyNorth will be allowed a permanent increase in its base distribution delivery rates to recover the annual revenue requirement for those investments that are found to be reasonable and prudent made in the preceding construction year and in excess of the CIBS Base Amount. The permanent capital investment recovery allowance will not take effect until the actual costs of the

previous construction year are approved by the Commission. Petitions for cost recovery will be submitted annually thereafter not later than May 1, for an effective date of July 1.

f) After Staff completes the review of the CIBS Plan for a given construction year, EnergyNorth shall track all capital investments made in accordance with the approved CIBS Plan. EnergyNorth will reconcile actual capital expenditures with the CIBS Plan targets at the conclusion of the CIBS Plan period.

g) EnergyNorth agrees that it will file a report with the Commission on May 15 of each year detailing the actual amount of capital investments made in accordance with implementing the CIBS Plan during the prior construction year (“CIBS Report”). The report will include a calculation of the incremental revenue requirement associated with the capital investments in rate base that exceeds the CIBS Base Amount, using the Commission-approved imputed or actual capital structure and cost of capital determined using the Commission-approved return on equity and cost of debt. If the Commission has not made a final determination in the first rate case by the time the first adjustment is to be calculated, a reasonable proxy will be used for the rate calculation and an adjustment will be made to the revenue requirement to reconcile to the approved cost of capital rates when the rates from the first rate case go into effect.

h) EnergyNorth agrees to file its annual CIBS Report on the prior construction year’s activities at the time it makes its rate adjustment filing on May 15. The Settling Parties and Staff understand that, in implementing the CIBS Plan, the circumstances encountered during the year may require reasonable deviations from the original plan. In such cases, EnergyNorth shall include an explanation of any deviations in the report. For cost recovery purposes, EnergyNorth shall have the burden to show that any deviations were due to circumstances out of its reasonable control or, if within its control, were reasonable and prudent. The CIBS Report shall include a breakdown of footage replaced by municipal projects that involve Cast Iron /Bare Steel as well the footage replaced under the Cast Iron Encroachment Policy. Samples of reporting that Staff has reviewed previously are included in Attachment A.

i) The CIBS Program will remain in place through and beyond EnergyNorth’s future rate cases until terminated by the Commission or by mutual agreement at the end of a given construction year, with a final capital allowance pertaining to the final year.

j) EnergyNorth can elect to not finalize its CIBS Plan until after the winter frost patrol ends in early April. By May 1, EnergyNorth shall finalize actual projects and provide a copy of the final CIBS Plan to Staff. In addition, the priority rankings of main segments for replacement will be subject to change over the course of the year due to new information. In such case, if EnergyNorth believes it is prudent to change

the rankings from the approved CIBS Plan, it will notify Staff, stating the reasons for the change prior to construction. If Staff does not believe that particular components of the revised plans are reasonable and the matter is not resolved between EnergyNorth and Staff, Staff may object and the matter may be referred to the Commission for resolution.

k) EnergyNorth acknowledges that Staff review will not relieve EnergyNorth of its obligation to operate its business and maintain safe, reliable service through expenditures and other capital investments in the ordinary course of business that are not set forth in the CIBS Plan, nor will it bind Staff to a particular position regarding the adequacy and/or effectiveness of the plan.

l) However, EnergyNorth will be authorized to include in its CIBS Plan the replacement of cast iron and bare steel pipe located in the vicinity of public works projects, where replacement is not required as a part of the project, but permitted for convenience or other reasons, as determined by the Safety Division.

m) EnergyNorth shall provide GIS Mapping or other electronic means that shows the project scope with each submittal of the CIBS Plan.

n) No upsizing of pipe diameter shall be allowed for cost recovery within the CIBS Program on 60 psig systems. For low pressure systems (12 inches water column and below) no upsizing shall be allowed for cost recovery within the CIBS Program except for 3" nominal diameter low pressure pipe replaced with 4" nominal diameter pipe and other special circumstances as approved by the Safety Division.

o) EnergyNorth shall provide the Commission Staff with actual cutouts of the worst section within any bare steel main segment replaced prior to reconciling any cost adjustments for associated construction season. Cutouts shall be approximately 12 inches to 24 inches in length.

p) EnergyNorth shall provide a written report accompanying the actual cutouts in section 20(o) above that includes: photographs the replaced bare steel segment; a general description of the condition of the pipe; the street address from which it was taken; age of material; original wall thickness; measured depth of deepest pit of the cutout; operating pressure of replaced pipe; pH of soil condition of cutout surrounds; results of testing for microbiological acid producing bacteria (APB) and sulfate reducing bacteria (colonies per ML); and identification of the threshold of high bacteria counts.

II. Additional Granite State Electrical Safety Conditions (Electrical Underground Facility Protection)

Underground Damage Prevention Program Enhancement

1. Granite State Electric Company (Granite State) will institute a new Locating/Mark-Out Policy within the existing Underground Damage Prevention Program. The Locating/Mark-Out Policy will provide enhanced public safety by increasing the commitments and responsibilities associated with locating and marking private underground residential facilities within Granite State's franchise territory. Notwithstanding the exemption contained in RSA 374:53 concerning facilities not owned by the operator, Granite State accepts the additional responsibility of locating privately owned, residential underground electrical facilities pursuant to excavation notifications, and agrees to establish the Locating/Mark-Out Policy ("Policy") described below.

Policy Implementation and Potential Discontinuation

2. Locating/Mark-Out Policy will be implemented within 120 days of the Closing Date.
3. Granite State reserves the right to discontinue the Policy with Staff review and consent but without the necessity of obtaining formal Commission approval if the incremental costs of implementing the Policy, not including advertising and marketing costs or other non-field costs, exceed \$10,000 annually. In the event Granite State disagrees with Staff's decision not to consent, it may file a request for review with the Commission. Granite State will file written notification of any discontinuation of the Policy with the Commission.

Policy Requirements

4. Within Granite State's franchise territory, Granite State will mark privately owned, residential underground facilities up to the meter and including the service entrance upon receipt of notifications received via the One Call Notification System.
5. The electrical service includes primary service voltage levels as well as secondary voltage levels.
6. The electrical service also includes service from aerial distribution systems as well as underground systems.
7. Notifications received for underground excavation involving commercial properties are not included in the waiver or this Policy.
8. The location and marking of excavations involving underground electrical facilities beyond the meter, such as from a house to a barn, lamp post, pool, shed and other structures, are not included in this Policy.

9. Granite State's responsibility under the Policy shall not extend beyond marking out the facility, and does not include repairs to such facilities.
10. Field Markouts made under the Policy shall clearly indicate private electrical facilities that are not owned or operated by GSE.
11. During each year the Policy is in effect, Granite State shall maintain a level of accuracy for markouts made under the Policy that is commensurate with the level achieved for its own facilities. An audit or equivalent method may be used to determine the accuracy percentage of Policy markouts.
12. Granite State will not be required to mark such services defined in this Policy where the customer refuses Granite State access or denies such markout service.

Program Reporting

13. By January 31, 2013, Granite State shall submit an initial report to the Safety Division of the average accuracy level for markouts made of underground facilities pursuant to the One Call Notification System, and the derivation with sufficient detail supporting the determination of the average used to measure the accuracy level for the Policy. The initial report shall indicate the levels of markout accuracy obtained for Granite State facilities as well as privately owned, residential facilities. The report shall also contain the elements listed in item 14 below. Staff shall review and comment on the submittal, and Granite State shall incorporate Staff's comments into subsequent reports in following years.
14. Granite State shall keep track of costs expended and associated data, including but not limited to: number of notifications received, number of markouts made, address locations of markouts, quantity and locations of customer refusals, and dates of services performed. A summary report with subtotals by month shall be submitted to Staff annually, no later than January 31st for the previous calendar year's Policy.
15. The new Policy does not require Granite State to file a monthly E-26 report for markouts made under the Policy.

Liberty Utilities Cast Iron Bare Steel Program											
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Address	Concord St	2-7 Cornell St	20-34 School St	18-56 Ash St	5-19 Lemon St	1-34 Dickerman St	Pennichuck St & Caron Ave	48 NEWBURY ST, NAS (ON UNDERHILL ST)	22-50 Bridge St, NAS	5-67 Williams St NAS	1-132 Allids St
Town	Concord	Concord	Hudson	Nashua	Nashua	Nashua	Nashua	Nashua	Nashua	Nashua	Nashua
Pipe Size	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"
Install Date	1953	1955	1947	1928	1902/1925	1902/1925	1956/1960	1917 est	1904	1940	1940
Wall Thickness	0.166 in	Unknown	Unknown	Unknown	Unknown	0.154 in	0.143 in	0.188 in	0.188 in	0.154 in	0.154 in
Age	55	54	63	83	110	111	58	99 est	112	77	78
Pressure	12 in water column	60 psig	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column
Ground PH	7 to 8	7 to 8	7.5	6.5	6	7.5	6	6	6	7.5	6
Pipe Condition	Deep pitting/Significant wall loss	Good condition Coated steel	Deep Pitting/Fair to poor Condition	100% wall loss/Very poor Condition	100% wall loss/very poor condition	90% wall loss/poor condition	100% wall loss/Very poor condition	100% wall loss/Very poor condition	50% wall loss in pits/moderate condition	30% wall loss in pits	100% wall loss/Very poor condition
Address	Woodman St	83 Pleasant St	2-18 Faxon St & 1-7 Faxon Ave	55-100 W North St	2-13 Grove St	1-44 Revere St & Fernwood St	90 Dodge St	49 Summer St (on Salem St)	18 Howard St, NAS	14-38 Brook St, NAS	1-21 Fowell Ave
Town	Concord	Concord	Nashua	Manchester	Nashua	Nashua	Nashua	Nashua	Nashua	Nashua	Nashua
Pipe Size	1.5"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"
Install Date	1929	1900	1912	1960	1910	1902/1925	1959	1924	1912	1924	1924
Wall Thickness	0.130 in	Unknown	Unknown	Unknown	Unknown	0.188 in	0.160 in	0.218 in	0.188 in	0.154 in	0.154 in
Age	79	109	98	51	102	111	55	91	104	93	94
Pressure	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column	12 in water column
Ground PH	7 to 8	6	7.5	6	7	7	6	6	6	7	7
Pipe Condition	Deep pitting/Significant wall loss	some areas of pitting and wall loss	Multiple large holes/very poor condition	Deep Pitting/Poor Condition	Deep pitting/poor condition	37% wall loss/moderate condition	100% wall loss/very poor condition	100% wall loss/very poor condition	100% wall loss/very poor condition	25-50% wall loss pits	30-50% wall loss pits
Address	Connell St	25-28 Depot St	116-130 Bowers St			17-28 Sunset Dr	93 Walnut St		2-15 Columbia Ave, NAS	4-26 Nutt St NAS	171-185 Concord St
Town	Hudson	Franklin	Nashua			Belmont	Nashua		Nashua	Nashua	Nashua
Pipe Size	2"	2"	2"			2"	2"		2"	2"	2"
Install Date	1928	1931	1913			Unknown	1913		1915	1924	1954
Wall Thickness	0.139 in	unknown	Unknown			0.188 in	0.160 in		0.188 in	0.154 in	0.154 in
Age	80	78	97			Unknown	101		93	93	64
Pressure	12 in water column	60 psig	12 in water column			60 psig	12 in water column		12 in water column	12 in water column	12 in water column
Ground PH	6 to 7	6	7			6	6		6	6	7
Pipe Condition	Deep pitting/Significant wall loss	Good condition Coated steel	Heavy wall loss/poor condition			100% wall loss/very poor condition	100% wall loss/very poor condition		100% wall loss/very poor condition	100% wall loss/very poor condition	100% wall loss/very poor condition
Address	Gloria Ave	80-113 Blossom St	1-19 Perkins St & 41-46 Bradley St			8-18 Maple St	57 Spaulding St		31-70 McKean St, NAS	3-75 Blossom St, NAS	126-226 Pine St
Town	Hudson	Nashua	Concord			Nashua	Nashua		Nashua	Nashua	Hudson
Pipe Size	2"	2"	1.5"			2"	2"		2"	2"	2"
Install Date	1954	1908 & 1913	1955			1957	1956		1923	1915	1957
Wall Thickness	0.148 in	Unknown	Unknown			0.154 in	0.139 in		0.188 in	0.154 in	0.154 in
Age	54	101	55			56	58		93	102	61
Pressure	60 psig	12 in water column	12 in water column			12 in water column	12 in water column		12 in water column	12 in water column	12 in water column
Ground PH	7 to 8	5	7			6.5	6		6	7	6
Pipe Condition	Fair Condition	Extremely poor condition	Deep pitting/fair to poor condition			39% wall loss/moderate condition	100% wall loss/very poor condition		100% wall loss/very poor condition	100% wall loss in svc connect/mod corros	100% wall loss in pits/very poor condition
Address	Library St	5-11 Bristol St	Chester St -59 Berkeley St			3-25 Pratt St & Zellwood St	95 Shaker Rd		5-18 Edwin St, NAS	28-36 Ffield St, NAS	
Town	Hudson	Nashua	Nashua			Nashua	Concord		Nashua	Nashua	
Pipe Size	4"	4"	2"			2"	1"		2"	2"	
Install Date	1908	1947, 1951, 1954, 1957	1947			1894/1914	Unknown		1961	1959	
Wall Thickness	0.234 in	Unknown	Unknown			0.188 in	0.133 in		0.188 in	0.154 in	
Age	100	62	63			119	Unknown		55	58	
Pressure	12 in water column	12 in water column	12 in water column			60 psig	60 psig		12 in water column	12 in water column	
Ground PH	6	7	7			7	6		6	7	
Pipe Condition	Fair Condition	Moderate uniform pitting/Fair Condition	Visible holes/Very poor condition			100% wall loss/very poor condition	27% wall loss/fair condition		100% wall loss/very poor condition	30% wall loss in pits/gen corros pitting	
Address	Mulberry St	12-25 Buck St				5-21 Ridge St	249 Medford St		2-16 Stevens St, NAS	75-235 Lake St, NAS	
Town	Nashua	Nashua				Nashua	Manchester		Nashua	Nashua	
Pipe Size	2"	2"				2"	2"		2"	2"	
Install Date	1912	1901, 1903 & 1911				Unknown	1956/1960		1904	1900	
Wall Thickness	Unknown	Unknown				0.154 in	0.160 in		0.188 in	0.154 in	
Age	96	108				Unknown	58		112	117	
Pressure	12 in water column	12 in water column				12 in water column	60 psig		12 in water column	12 in water column	
Ground PH	7 to 8	6 to 7				6.5	6		7	7	
Pipe Condition	Concentrated deep pitting	Heavy Pitting/Poor Condition				39% wall loss/moderate condition	100% wall loss/very poor condition		100% wall loss/very poor condition	30% wall loss/gen scaling and pitting	
Address	Prescott St & Putnam St	2-4 Fourth St				1-6 Jewell Ln	348 Lincoln St			4-22 Peabody St TIL	
Town	Nashua	Nashua				Nashua	Manchester			Tilton	
Pipe Size	2"	2"				2"	3"			4"	
Install Date	1924	1926				1947	1954			1931	
Wall Thickness	Not Taken Due to Pipe Condition	Unknown				0.154 in	0.234 in			0.237 in	
Age	84	83				66	60			86	
Pressure	12 in water column	12 in water column				12 in water column	60 psig			60 psig	
Ground PH	6 to 7	6				7	6			7	
Pipe Condition	Pipe breakage and pit holes	Significant deep pitting/Poor Condition				32% wall loss/moderate condition	12% wall loss/fair condition			20% wall loss/light corros & pitting	
Address	Reed Court	31-39 Newbury St									
Town	Nashua	Nashua									
Pipe Size	2"	2"									
Install Date	1908	1898, 1910, 1928									
Wall Thickness	0.121 in	Unknown									
Age	100	111									
Pressure	12 in water column	12 in water column									
Ground PH	6	3 to 4									
Pipe Condition	Significan wall Loss	Significant wall loss/Poor condition									
Address		5-21 Winter St									
Town		Tilton									
Pipe Size		4"									
Install Date		1931									
Wall Thickness		Unknown									
Age		78									
Pressure		60 psig									
Ground PH		7									
Pipe Condition		Fair Condition									
59	8	9	5	2	2	7	7	2	6	7	4
Samples											

FY	Age	
2009-1	55	
2009-2	79	
2009-3	80	
2009-4	54	
2009-5	100	
2009-6	96	
2009-7	84	
2009-8	100	
2010-1	54	
2010-2	109	
2010-3	78	
2010-4	101	
2010-5	62	
2010-6	108	
2010-7	83	
2010-8	111	
2010-9	78	
2011-1	63	
2011-2	98	
2011-3	97	
2011-4	55	
2011-5	63	
2012-1	83	
2012-2	51	
2013-1	110	
2013-2	102	
2014-1	111	
2014-2	111	
2014-3		
2014-4	56	
2014-5	119	
2014-6		
2014-7	66	
2015-1	58	
2015-2	55	
2015-3	101	
2015-4	58	
2015-5		
2015-6	58	
2015-7	60	
2016-1	99 est	
2016-2	91	
2017-1	112	
2017-2	104	
2017-3	101	
2017-4	93	
2017-5	55	
2017-6	112	
2018-1	77	
2018-2	93	
2018-3	93	
2018-4	102	
2018-5	58	
2018-6	117	
2018-7	86	
2019-1	78	
2019-2	94	
2019-3	64	74.25
2019-4	61	
Sum	59	83.9

LIBERTY UTILITIES BARE STEEL REPLACEMENT PROGRAM

2009-2019

Prepared by the New Hampshire Public Utilities Commission
Safety Division



2019 Bare Steel Replacement Reports



FY 2019

Address	1-132 Allds St Mulvaney St sample
Town	Nashua
Pipe Size	2"
Install Date	1940
Wall Thickness	0.154"
Age	78
Pressure	12 in water column
Ground PH	6
Pipe Condition	100 % wall loss in areas



FY 2019

Address	1-21 Fowell Ave
Town	Nashua
Pipe Size	2"
Install Date	1924
Wall Thickness	0.154"
Age	94
Pressure	12 in water column
Ground PH	7
Pipe Condition	30-50% wall loss in pits



FY 2019

Address	171-185 Concord St Damon Ave sample
Town	Nashua
Pipe Size	2"
Install Date	1954
Wall Thickness	0.154"
Age	64
Pressure	12 in water column
Ground PH	7
Pipe Condition	100% wall loss in pits



FY 2019

Address	126-226 Pine St Lovell St sample
Town	Nashua
Pipe Size	2"
Install Date	1957
Wall Thickness	0.154"
Age	61
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% wall loss in pits



2018 Bare Steel Replacement Reports



FY 2018

Address	5-67 Williams St
Town	Nashua
Pipe Size	2"
Install Date	1940
Wall Thickness	0.154"
Age	77
Pressure	12 in water column
Ground PH	7.5
Pipe Condition	30% wall loss in pits



FY 2018

Address	14-38 Brook St
Town	Nashua
Pipe Size	2"
Install Date	1924
Wall Thickness	0.154"
Age	93
Pressure	12 in water column
Ground PH	7
Pipe Condition	25-50% wall loss in pits



FY 2018

Address	4-26 Nutt St
Town	Nashua
Pipe Size	2"
Install Date	1924
Wall Thickness	0.154"
Age	93
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% wall loss in pits Heavy Corrosion



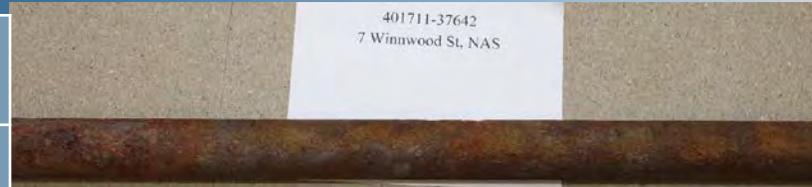
FY 2018

Address	3-75 Blossom St
Town	Nashua
Pipe Size	2"
Install Date	1915
Wall Thickness	0.154"
Age	102
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% wall loss in pits Very Poor Condition



FY 2018

Address	28-36 Fifield St & Winnwood St
Town	Nashua
Pipe Size	2"
Install Date	1959
Wall Thickness	0.154"
Age	58
Pressure	12 in water column
Ground PH	7
Pipe Condition	30% wall loss in pits General Corrosion/Pitting



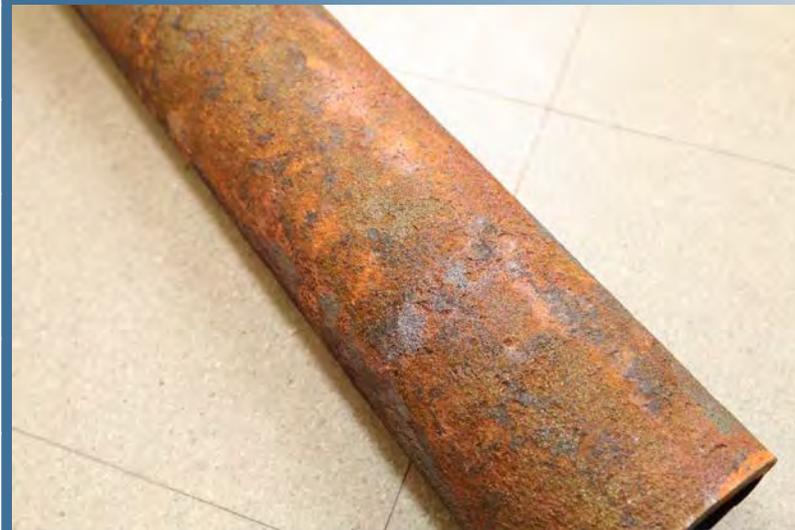
FY 2018

Address	75-235 Lake St
Town	Nashua
Pipe Size	2"
Install Date	1900
Wall Thickness	0.154"
Age	117
Pressure	12 in water column
Ground PH	7
Pipe Condition	30% wall loss in pits General Scaling/Pitting



FY 2018

Address	4-22 Peabody St
Town	Tilton
Pipe Size	4"
Install Date	1931
Wall Thickness	0.237"
Age	86
Pressure	60 psig
Ground PH	7
Pipe Condition	20% wall loss in pits Light Corrosion/Pitting

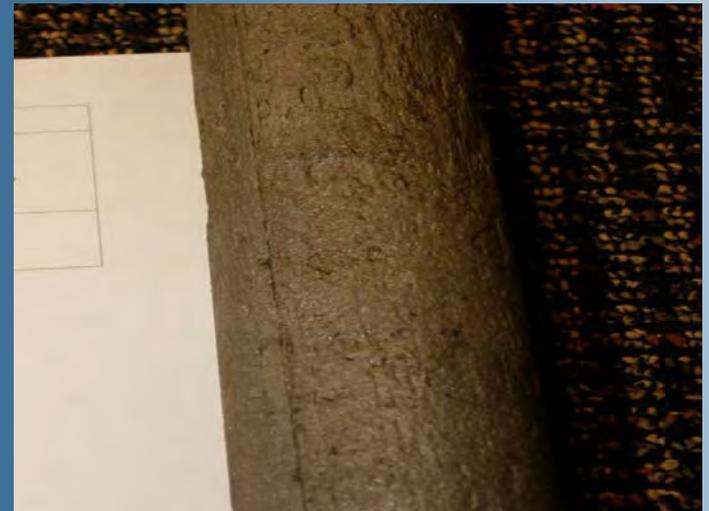
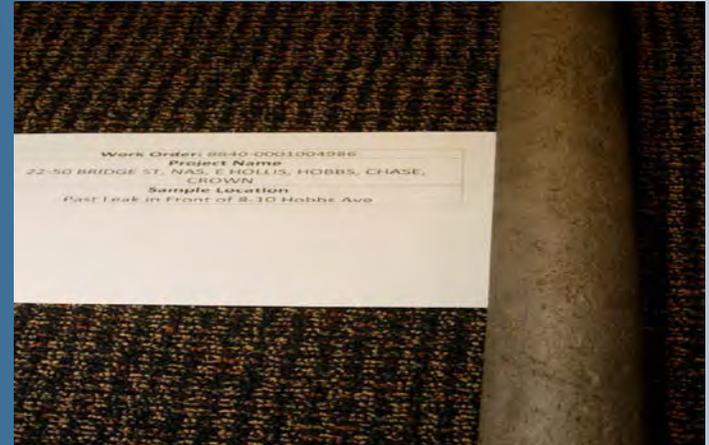


2017 Bare Steel Replacement Reports



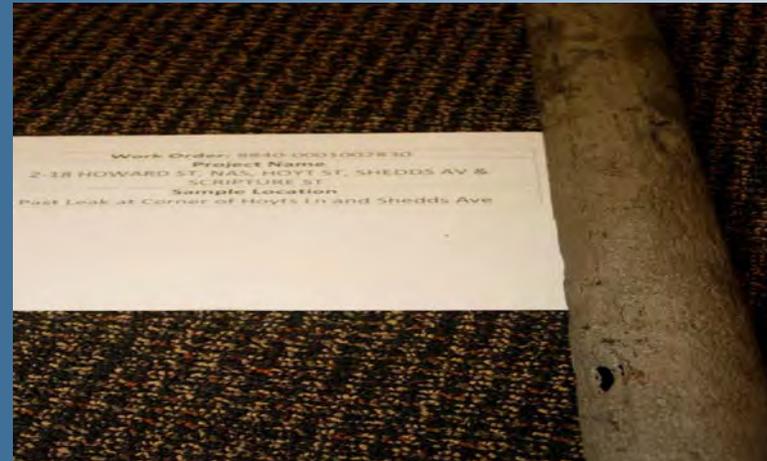
FY 2017

Address	22-50 Bridge St
Town	Nashua
Pipe Size	2"
Install Date	1904
Wall Thickness	0.188 in
Age	112
Pressure	12 in water column
Ground PH	6
Pipe Condition	50% Wall Loss/ Poor Condition



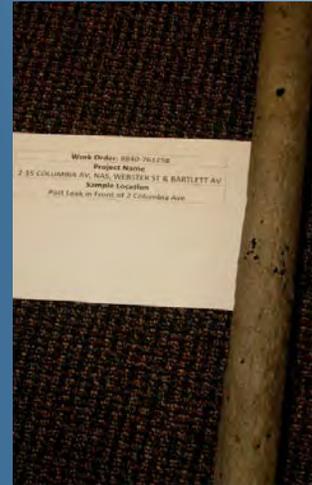
FY 2017

Address	18 Howard St
Town	Nashua
Pipe Size	2"
Install Date	1912
Wall Thickness	0.188 in
Age	104
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



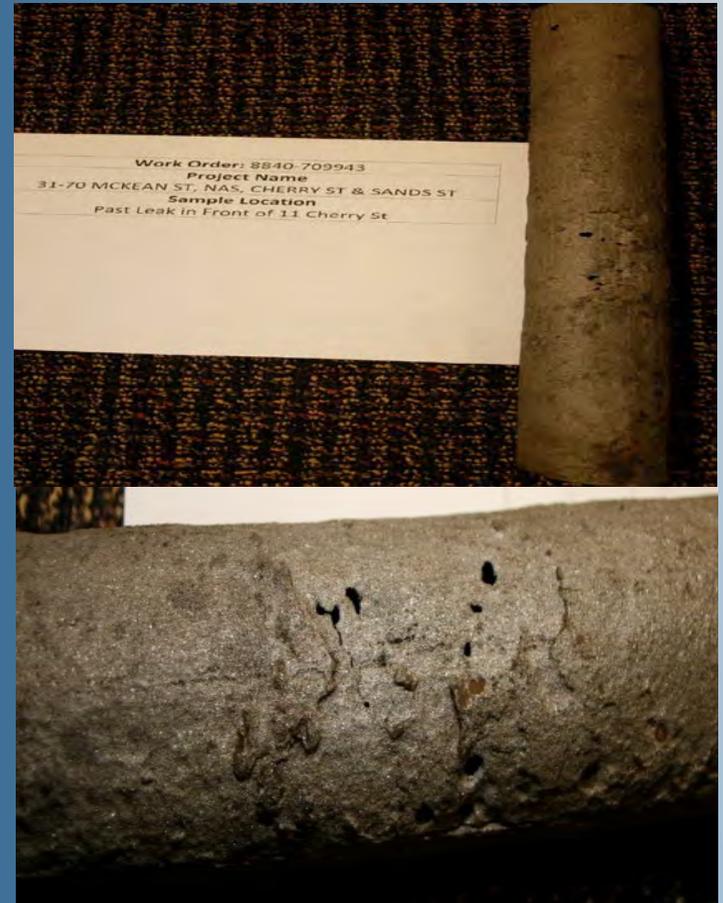
FY 2017

Address	2-15 Columbia Ave
Town	Nashua
Pipe Size	2"
Install Date	1915
Wall Thickness	0.188 in
Age	101
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



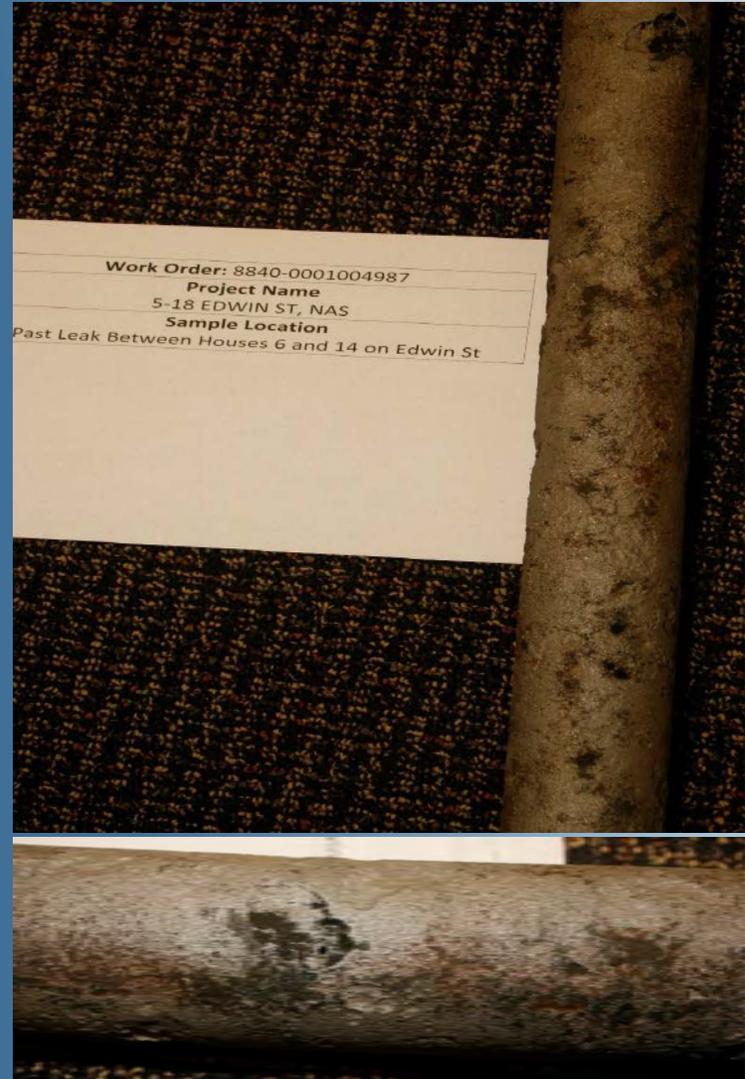
FY 2017

Address	31-70 McKean St
Town	Nashua
Pipe Size	2"
Install Date	1923
Wall Thickness	0.188 in
Age	93
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



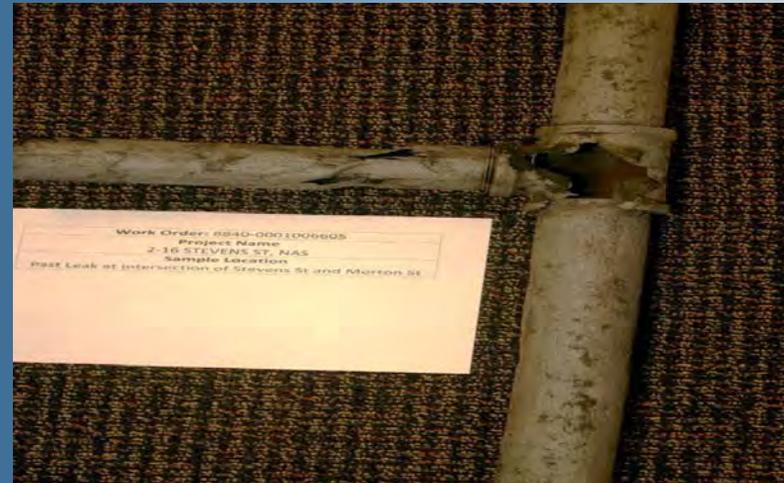
FY 2017

Address	5-18 Edwin St
Town	Nashua
Pipe Size	2"
Install Date	1961
Wall Thickness	0.188 in
Age	55
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2017

Address	2-16 Stevens St
Town	Nashua
Pipe Size	2"
Install Date	1904
Wall Thickness	0.188 in
Age	112
Pressure	12 in water column
Ground PH	7
Pipe Condition	100% Wall Loss/ Very Poor Condition



2016 Bare Steel Replacement Reports



FY 2016

Address	48 Newbury St NAS (On Underhill St)
Town	Nashua
Pipe Size	2"
Install Date	Unknown
Wall Thickness	0.188 in
Age	Unknown
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2016

Address	49 Summer St (On Salem St)
Town	Nashua
Pipe Size	2"
Install Date	1924
Wall Thickness	0.218 in
Age	91
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition

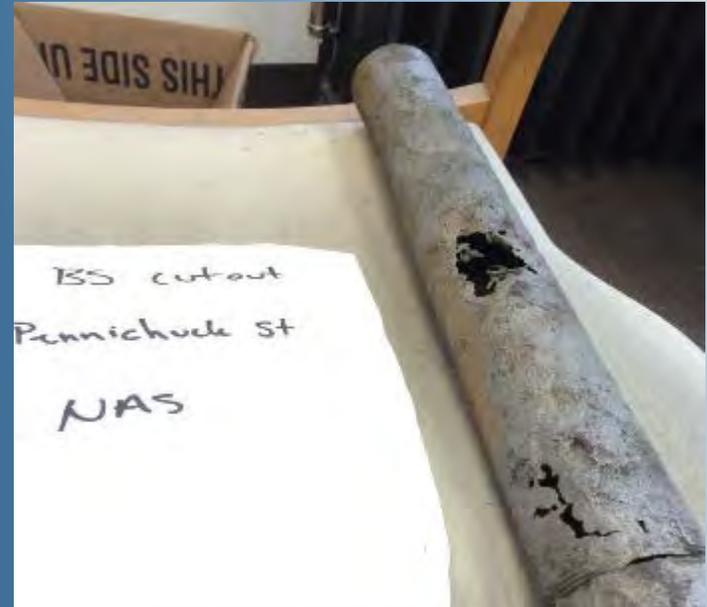


2015 Bare Steel Replacement Reports



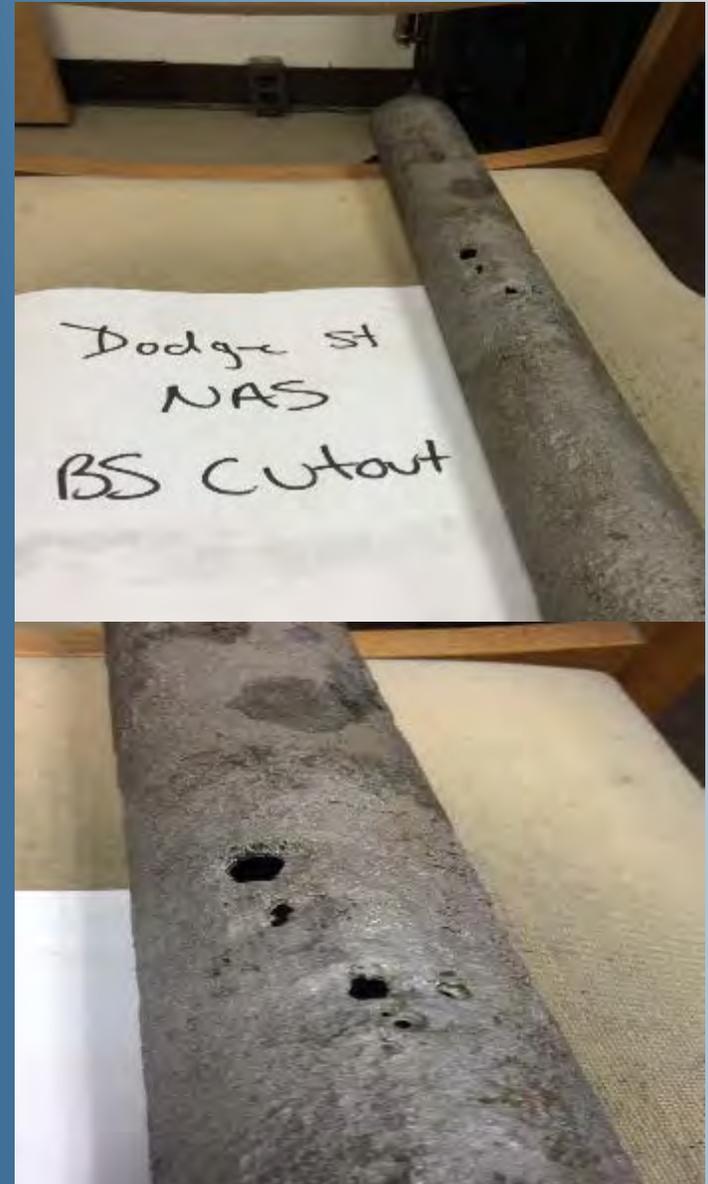
FY 2015

Address	Pennichuck St & Caron Ave
Town	Nashua
Pipe Size	2"
Install Date	1956/1960
Wall Thickness	0.143 in
Age	58
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2015

Address	90 Dodge St
Town	Nashua
Pipe Size	2"
Install Date	1959
Wall Thickness	0.160 in
Age	55
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2015

Address	93 Walnut St
Town	Nashua
Pipe Size	2"
Install Date	1913
Wall Thickness	0.160 in
Age	101
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2015

Address	57 Spaulding St
Town	Nashua
Pipe Size	2"
Install Date	1956
Wall Thickness	0.139 in
Age	58
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2015

Address	95 Shaker Road (Shaker Rd School)
Town	Concord
Pipe Size	1"
Install Date	Unknown
Wall Thickness	0.133 in
Age	Unknown
Pressure	60 psig
Ground PH	6
Pipe Condition	27% Wall Loss/ Fair Condition



FY 2015

Address	249 Medford St
Town	Manchester
Pipe Size	2"
Install Date	1956/1960
Wall Thickness	0.160 in
Age	58
Pressure	60 psig
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2015

Address	348 Lincoln St
Town	Manchester
Pipe Size	3"
Install Date	1954
Wall Thickness	0.234 in
Age	60
Pressure	60 psig
Ground PH	6
Pipe Condition	12% Wall Loss/ Fair Condition



2014 Bare Steel Replacement Reports



FY 2014

Address	1-34 Dickerman St
Town	Nashua
Pipe Size	2"
Install Date	1902/1925
Wall Thickness	0.154 in
Age	111
Pressure	12 in water column
Ground PH	7.5
Pipe Condition	90% Wall Loss/ Poor Condition



FY 2014

Address	1-44 Revere St & Fernwood St
Town	Nashua
Pipe Size	2"
Install Date	1902/1925
Wall Thickness	0.188 in
Age	111
Pressure	12 in water column
Ground PH	7
Pipe Condition	37% Wall Loss/ Moderate Condition



FY 2014

Address	17-28 Sunset Dr
Town	Belmont
Pipe Size	2"
Install Date	Unknown
Wall Thickness	0.188 in
Age	Unknown
Pressure	60 psig
Ground PH	6
Pipe Condition	100% Wall Loss/Very Poor Condition



FY 2014

Address	8-18 Maple St
Town	Nashua
Pipe Size	2"
Install Date	1957
Wall Thickness	0.154 in
Age	56
Pressure	12 in water column
Ground PH	6.5
Pipe Condition	39% Wall Loss/Moderate Condition



FY 2014

Address	3-25 Pratt St & Zellwood St
Town	Nashua
Pipe Size	2"
Install Date	1894/1914
Wall Thickness	0.188 in
Age	119
Pressure	60 psig
Ground PH	7
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2014

Address	5-21 Ridge St
Town	Nashua
Pipe Size	2"
Install Date	Unknown
Wall Thickness	0.154 in
Age	119
Pressure	12 in water column
Ground PH	6.5
Pipe Condition	39% Wall Loss/ Moderate Condition



FY 2014

Address	1-6 Jewell Lane
Town	Nashua
Pipe Size	2"
Install Date	1947
Wall Thickness	0.154 in
Age	66
Pressure	12 in water column
Ground PH	7
Pipe Condition	32% Wall Loss/ Moderate Condition



2013 Bare Steel Replacement Reports



FY 2013

Address	5-19 Lemon St
Town	Nashua
Pipe Size	2"
Install Date	1902/1925
Wall Thickness	Unknown
Age	110
Pressure	12 in water column
Ground PH	6
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2013

Address	2-13 Grove St
Town	Nashua
Pipe Size	2"
Install Date	1910
Wall Thickness	Unknown
Age	102
Pressure	12 in water column
Ground PH	7
Pipe Condition	Deep Pitting/ Poor Condition



2012 Bare Steel Replacement Reports



FY 2012

Address	18-56 Ash St
Town	Nashua
Pipe Size	2"
Install Date	1928
Wall Thickness	Unknown
Age	83
Pressure	12 in water column
Ground PH	6.5
Pipe Condition	100% Wall Loss/ Very Poor Condition



FY 2012

Address	55-100 W North St
Town	Manchester
Pipe Size	8"
Install Date	1960
Wall Thickness	Unknown
Age	51
Pressure	12 in water column
Ground PH	6
Pipe Condition	Deep Pitting/ Poor Condition



2011 Bare Steel Replacement Reports



FY 2011

Address	20-34 School St
Town	Hudson
Pipe Size	2"
Install Date	1947
Wall Thickness	Unknown
Age	63
Pressure	12 in water column
Ground PH	7.5
Pipe Condition	Deep Pitting/ Fair to Poor Condition



FY 2011

Address	2-18 Faxon St & 1-7 Faxon Ave
Town	Nashua
Pipe Size	2"
Install Date	1912
Wall Thickness	Unknown
Age	98
Pressure	12 in water column
Ground PH	7.5
Pipe Condition	Multiple Large Holes/ Very Poor Condition



FY 2011

Address	116-130 Bowers St
Town	Nashua
Pipe Size	2"
Install Date	1913
Wall Thickness	Unknown
Age	97
Pressure	12 in water column
Ground PH	7
Pipe Condition	Heavy Wall Loss/ Poor Condition



FY 2011

Address	1-19 Perkins St & 41-46 Bradley St
Town	Concord
Pipe Size	1.5"
Install Date	1955
Wall Thickness	Unknown
Age	55
Pressure	12 in water column
Ground PH	7
Pipe Condition	Deep Pitting/ Fair to Poor Condition



FY 2011

Address	Chester St-59 Berkeley St
Town	Nashua
Pipe Size	2"
Install Date	1947
Wall Thickness	Unknown
Age	63
Pressure	12 in water column
Ground PH	7
Pipe Condition	Visible Holes/ Very Poor Condition



2010 Bare Steel Replacement Reports



FY 2010

Address	2-7 Cornell St
Town	Concord
Pipe Size	2"
Install Date	1955
Wall Thickness	Unknown
Age	54
Pressure	60 psig
Ground PH	7 to 8
Pipe Condition	Good Condition
	Coated Steel



FY 2010

Address	83 Pleasant St
Town	Concord
Pipe Size	2"
Install Date	1900
Wall Thickness	Unknown
Age	109
Pressure	12 in water column
Ground PH	6
Pipe Condition	Some Areas of Pitting and Wall Loss



FY 2010

Address	25-28 Depot St
Town	Franklin
Pipe Size	2"
Install Date	1931
Wall Thickness	Unknown
Age	78
Pressure	60 psig
Ground PH	6
Pipe Condition	Good Condition
	Coated Steel



FY 2010

Address	80-113 Blossom St
Town	Nashua
Pipe Size	2"
Install Date	1908 & 1913
Wall Thickness	Unknown
Age	101
Pressure	12 in water column
Ground PH	5
Pipe Condition	Extremely Poor Condition



FY 2010

Address	5-11 Bristol St
Town	Nashua
Pipe Size	4"
Install Date	1947, 1951, 1954, 195?
Wall Thickness	Unknown
Age	62
Pressure	12 in water column
Ground PH	7
Pipe Condition	Moderate Uniform Pitting/ Fair Condition



FY 2010

Address	12-25 Buck St
Town	Nashua
Pipe Size	2"
Install Date	1901, 1903 & 1911
Wall Thickness	Unknown
Age	108
Pressure	12 in water column
Ground PH	6 to 7
Pipe Condition	Heavy Pitting/ Poor Condition



FY 2010

Address	2-4 Fourth St
Town	Nashua
Pipe Size	2"
Install Date	1926
Wall Thickness	Unknown
Age	83
Pressure	12 in water column
Ground PH	6
Pipe Condition	Significant Deep Pitting/ Poor Condition



FY 2010

Address	31-39 Newbury St
Town	Nashua
Pipe Size	2"
Install Date	1898, 1910, 1928
Wall Thickness	Unknown
Age	111
Pressure	12 in water column
Ground PH	3 to 4
Pipe Condition	Significant Wall Loss/ Poor Condition



FY 2010

Address	5-21 Winter St
Town	Tilton
Pipe Size	4"
Install Date	1931
Wall Thickness	Unknown
Age	78
Pressure	60 psig
Ground PH	7
Pipe Condition	Fair Condition



2009 Bare Steel Replacement Reports



FY 2009

Address	Concord St
Town	Concord
Pipe Size	2"
Install Date	1953
Wall Thickness	0.166 in
Age	55
Pressure	12 in water column
Ground PH	7 to 8
Pipe Condition	Deep pitting/Significant wall loss



FY 2009

Address	2 Woodman St
Town	Concord
Pipe Size	1.5"
Install Date	1929
Wall Thickness	0.130 in
Age	79
Pressure	12 in water column
Ground PH	7 to 8
Pipe Condition	Deep pitting/Significant wall loss



FY 2009

Address	Connell St
Town	Hudson
Pipe Size	2"
Install Date	1928
Wall Thickness	0.139 in
Age	80
Pressure	12 in water column
Ground PH	6 to 7
Pipe Condition	Deep pitting/Significant wall loss



FY 2009

Address	Gloria Avenue
Town	Hudson
Pipe Size	2"
Install Date	1954
Wall Thickness	0.148 in
Age	54
Pressure	60 psig
Ground PH	7 to 8
Pipe Condition	Fair Condition



FY 2009

Address	Library St
Town	Hudson
Pipe Size	4"
Install Date	1908
Wall Thickness	0.234 in
Age	100
Pressure	12 in water column
Ground PH	6
Pipe Condition	Fair Condition



FY 2009

Address	Mulberry St
Town	Nashua
Pipe Size	2"
Install Date	1912
Wall Thickness	0.124 in
Age	96
Pressure	12 in water column
Ground PH	7 to 8
Pipe Condition	Concentrated Deep Pitting



FY 2009

Address	Prescott St & Putnam St
Town	Nashua
Pipe Size	2"
Install Date	1924
Wall Thickness	Not Taken Due to Poor Condition
Age	84
Pressure	12 in water column
Ground PH	6 to 7
Pipe Condition	Pipe Breakage and Pit Holes



FY 2009

Address	Reed Ct
Town	Nashua
Pipe Size	2"
Install Date	1908
Wall Thickness	0.121 in
Age	100
Pressure	12 in water column
Ground PH	6
Pipe Condition	Significant Wall Loss

