

**Fiscal Year 2011 (April 1, 2010 –
March 31, 2011) Cast Iron/Bare
Steel Replacement Program
Results Filing**

DG 11-_____

May 13, 2011

**Submitted to:
New Hampshire
Public Utilities Commission**

**Submitted by:
National Grid NH**

TABLE OF CONTENTS

INTRODUCTION 1

SECTION 1: ACTUAL CAPITAL EXPENDITURES 1

SECTION 2: CALCULATION OF INCREMENTAL REVENUE REQUIREMENT..... 3

SECTION 3: DIFFERNCES BETWEEN PLANNED AND ACTUAL EXPENDITURES 3

**SECTION 4 STATUS OF THE PENDING LITIGATION BETWEEN NATIONAL GRID AND THE
CITIES OF MANCHESTER AND CONCORD 4**

Introduction

Pursuant to the settlement agreement approved by the New Hampshire Public Utilities Commission (the “Commission”) as part of the National Grid plc/KeySpan Corporation merger proceeding in Docket DG 06-107¹ (“Settlement Agreement”), EnergyNorth Natural Gas, Inc. d/b/a National Grid NH (“National Grid” or “Company”) is submitting the results of the Cast Iron Bare Steel Replacement Program (“CIBS”) for fiscal year 2011 (April 1, 2010-March 31, 2011). As required by the Settlement Agreement, this report contains the following information: (1) A report detailing the actual amount of capital investments made in accordance with implementing the CIBS program during fiscal year 2011 ; (2) A calculation of the incremental revenue requirement associated with placing the capital investments into rate base above a base spending level of \$500,000; (3) An explanation for deviations between actual results and the original plan, and; (4) A request for a permanent increase in base distribution delivery rates in the amount of \$521,590 effective for usage on and after July 1, 2011. In addition, Section 4 provides a status of the road degradation fee litigation between National Grid NH and the cities of Concord and Manchester.

Section 1: Actual Capital Expenditures

Actual capital expenditures incurred during implementation of the CIBS for fiscal year 2011 are detailed in Attachment A. Through a series of technical sessions that began in 2008, Commission Staff and the Company have agreed that the capital investments amounts to be

¹ See Order No. 24,777 (July 12, 2007).

included for recovery under CIBS may include all prudently incurred direct and indirect² costs associated with: (i) replacement or abandonment³ of cast iron and bare steel mains, including replacement of existing pipe with replacement pipe of the same size⁴, with recovery for the costs of “upsizing” the pipe allowed only when specifically justified,⁵ (ii) replacement or abandonment of cast iron or bare steel service lines directly connected to bare steel or cast iron main replacement projects, and (iii) tie over of connected service lines not replaced or abandoned as part of a cast iron bare steel main replacement project.

Categories of costs that may not be included for recovery under CIBS include: (i) replacement or abandonment of plastic main, (ii) replacement or abandonment of coated steel main, regardless of vintage, (iii) replacement or abandonment of plastic or coated steel services connected to cast iron or bare steel main replacement projects, (iv) the differential in cost to replace existing cast iron or bare steel mains with pipe of a diameter that is greater than the existing main and the cost to replace that main with a pipe that is larger than the existing main, unless specifically justified, (v) relocation of customer meters from inside to out and (vi) random cast iron or bare steel service replacements not connected to a cast iron or bare steel main replacement project.

Prior to submitting this fiscal year 2011 report to the Commission, the Company met with Commission Staff, to review the CIBS results for fiscal year 2011 against the agreed upon scope of the program. No costs were removed as being beyond the scope of the agreed

² Indirect costs mean overheads such as pension, OPEB's and other fringe benefits, payroll taxes, material handling costs and other general & administrative expenses that are loaded on all labor and material transactions. Categories of costs that may not be included for recovery under the plan include costs related to CIBS planning (other than normal engineering and project planning), reporting and filing.

³ For purposes of ii and iii, abandonments such as mains that are not servicing a customer via a service will not be allowed. Other abandonments will be considered by Staff on a case by case basis.

⁴ 3-inch pipes, which are no longer standard size, will be routinely replaced with 4-inch pipes.

⁵ See, Order No. 25,127 dated June 30, 2010 at 6-7.

upon plan as a result of that meeting. Line 24 column L of Attachment A shows actual expenditures of \$4,059,700. After removing the CIBS base amount of \$500,000 in accordance with the terms of the merger settlement⁶ from the actual expenditures, the total incremental expenditures to be included in rate base amounts to \$3,559,700. Attachment D to this report is the New Hampshire Condition Bare Steel Main Replacement Program – Sample Analysis Report for fiscal year 2011. This report contains photographs and descriptions of various pipe segments removed and catalogued as part of the fiscal 2011 CIBS program.

Section 2: Calculation of Incremental revenue Requirement

In this filing, National Grid is seeking recovery of the incremental revenue requirement associated with \$3,559,700 of CIBS capital investments in rates. As set forth in Attachment B, the revenue requirement associated with fiscal year 2011 capital expenditures of \$3,559,700 is \$521,590. Consistent with prior delivery rate increases for the CIBS program, the Company proposes to apply the increase pro rata across all customer classes. Attachment B also indicates the annual bill impacts for a typical residential customer and commercial customers in rate classes G-41, G-42 and G-52. Attachment C is a computation of the cumulative revenue requirement associated with the CIBS program since its inception in fiscal year 2009.

Section 3: Differences between planned and actual expenditures

The Company's proposed CIBS program for fiscal year 2011, which was submitted to the Commission Staff on April 30, 2010, provided for the replacement of 2.79 miles of cast iron and bare steel pipe at an estimated cost of \$4,106,680. As shown on Attachment A, the Company actually completed 3.04 miles of replacement at a cost of \$4,059,700, which includes \$280,630 of cost incurred in fiscal year 2011 for final street restoration on three

⁶ See, Order No. 24,777

projects that were part of the fiscal year 2010 program. Details of the differences between estimated and actual costs by project are shown in Attachment A column B.

Section 4: Status of the pending litigation between National Grid and the cities of Manchester and Concord.

On June 15, 2010, National Grid filed an action in Hillsborough Superior court against the City of Manchester seeking an injunction against enforcement of recently adopted regulations concerning street opening permit fees, as well as a request for a declaratory judgment invalidating such fees. The matter was docketed as NO 216-2010-EQ 001722. On May 6, 2011, the Company filed a motion for summary judgment. The matter remains pending with the court.

Similarly, on June 29, 2010, National Grid filed an action in Merrimack Superior Court against the City of Concord seeking an injunction against enforcement of recently adopted regulations concerning street opening permit fees, as well as a request for a declaratory judgment invalidating such fees. The matter was docketed as NO 217-2010-CV-00402. On April 6, 2011 the Company filed a motion for summary judgment. On May 6, 2011, the City of Concord objected and filed a cross motion for summary judgment. The matter remains pending with the court.

As noted in column B of Attachment A the increased costs associated with the recently adopted Manchester and Concord regulations regarding street opening permit fees are included for recovery in the CIBS program. To the extent that the pending litigation is resolved in the Company's favor, the Company will refund any savings to which customers

may be entitled as part of its next annual CIBS recovery filing following the resolution of the court actions.

Completed FY10-11 NH CIBS Program

Work Order	Location	Comments	Status	Actual Completion Date	Actual Install Footage	Actual Abandon Footage	Total Spend YTD-3/31/2011	Avg. Cost/Ft. based on Actuals	Estimate Ftg. vs. Actual Footage (over/under)	Estimated Cost vs. Actual Cost (over/under)	Costs to be Removed from Program	Costs to be Recovered	Degradation Fee's (Accrued)	Projected Carry Over Costs - FY12	Actual Overhead Rate %	Service Relay/Insert	Service Reconnects	Priority	Town Code	Int Street 1	Int Street 2
709972	23-51 LAUREL ST, CCD	\$12,287 degradation fee paid under protest. Additional costs due to additional sheathing at tie-ins than estimated, as well as higher than estimated overhead rate.	CASBUILT	08/18/2010	933	933	\$256,801	\$275	2	(\$49,302)	\$3,223	\$253,579	\$0	\$0	67%	1 (PL)	20 (PL)	1	CCD	GROVE ST	SOUTH ST
628738	125-166 RUMFORD ST, CCD, & WYMAN ST	\$7,569 degradation fee paid under protest. Completed late in season, final restoration in FY12 - Approx. \$65,672. Actual cost less than estimate due to deferred final restoration.	CASBUILT	12/10/2010	765	765	\$177,905	\$233	35	\$60,813	\$4,041	\$173,864	\$0	\$65,672	104%	9 (BS), 1 (CS)	1 (PL)	2	CCD	ALBIN ST	CHURCH ST
628864	29-132 LANCASTER AV, MNC	\$32,960 degradation fee on hold. Additional costs due to paving.	CASBUILT	08/06/2010	952	952	\$226,155	\$238	(22)	(\$17,201)	\$12,730	\$213,425	\$32,960	\$0	50%	7 (BS), 3 (CS)	4 (PL)	3	MNC	CALEF RD	PLAINFIELD ST
642277	209-284 PUTNAM ST, MNC, BARTLETT ST & THORNTON ST	\$46,520 degradation fee on hold. All final restoration completed, no carry over spend.	CASBUILT	11/09/2010	1,178	1,348	\$332,793	\$283	27	\$5,405	\$36,859	\$295,934	\$46,520	\$0	51%	14 (BS), 8 (PL), 1 (CS)	1 (PL)	4	MNC	WHIPPLE ST	SULLIVAN ST
642281	116-150 S TAYLOR ST, MNC, & 365-457 VINTON ST	\$39,400 degradation fee on hold. Additional footage required at tie-in locations.	CASBUILT	09/17/2010	1,154	1,200	\$262,351	\$227	(119)	(\$1,058)	\$16,513	\$245,837	\$39,400	\$0	43%	2 (BS), 2 (CS), 2 (PL)	4 (PL)	5	MNC	HOLLY AV	BRUNELLE AV
705386	20-34 SCHOOL ST, HUD	Final restoration and sheathing over estimated. Field conditions did not require additional sheathing.	CASBUILT	07/16/2010	180	800	\$47,692	\$265	20	\$23,417	\$0	\$47,692	\$0	\$0	57%	1 (BS)	0	6	HUD	LIBRARY ST	FIRST ST
705327	1-19 PERKINS ST, CCD, & 41-46 BRADLEY ST	Majority of facility installed outside of pavement, which significantly reduced restoration costs as well as the degradation fees required by the city of Concord.	CASBUILT	09/20/2010	855	993	\$133,655	\$156	(30)	\$58,005	\$8,757	\$124,899	\$0	\$0	81%	2 (PL), 8 (BS)	1 (PL)	7	CCD	WALKER ST	RUMFORD ST
659111	370-532 CILLEY RD, MNC, & 15-65 S HALL ST	\$68,830 degradation fee on hold. Mapping system footage varied from field footage. Project completed per plan. Reduction in footage translated into cost savings against estimate.	CASBUILT	07/16/2010	1,761	1,975	\$585,563	\$333	214	\$28,871	\$28,368	\$557,195	\$68,830	\$0	72%	8 (BS), 4(CS), 1 (PL)	0	8	MNC	MOREY ST	TAYLOR ST
709918	116-130 BOWERS ST, NAS	Additional 125' to relay 2" CS main in the middle segment. Cost of Additional footage removed. This actually reduced the overall cost of the project, as we eliminated 2 sheathed tie-in locations.	CASBUILT	07/27/2010	510	510	\$172,112	\$337	(125)	\$22,225	\$42,184	\$129,928	\$0	\$0	59%	5 (BS)	4 (PL)	9	NAS	ARLINGTON ST	
709977	183-228 ASH ST, MNC, & PROSPECT ST	\$25,445 degradation fee on hold. Additional footage at tie-in locations. Trench boxes were utilized at all tie-ins.	CASBUILT	10/14/2010	1,098	1,098	\$345,753	\$315	(188)	(\$72,992)	\$4,099	\$341,655	\$25,445	\$0	60%	4 (BS), 1 (PL)	6 (PL)	10	MNC	BEECH ST	BROOK ST
710173	461-522 HANOVER ST, MNC	\$13,970 degradation fee on hold. Additional footage on Milton Street to eliminate service on Milton Street branch service.	CASBUILT	09/16/2010	1,453	1,453	\$391,646	\$270	(393)	(\$7,721)	\$0	\$391,646	\$13,970	\$0	53%	11 (BS)	5 (PL)	11	MNC	HALL ST	BEACON ST
429634	59-85 BROADWAY, CCD	Broadway overlaid by City, no degradation fee required. Had to extend gas main down Stone St. extension, to replace 1-1/4" BS LP main not previously identified.	CASBUILT	07/13/2010	893	959	\$361,342	\$405	(218)	(\$133,916)	\$9,679	\$351,662	\$0	\$0	95%	15 (BS), 2 (PL)	3 (PL)	12	CCD	PILLSBURY ST	STONE ST
642225	1250-1287 CHESTNUT ST, MNC, RIDGE RD & N BAY CT	\$47,110 degradation fee on hold. Additional main had to be installed on N. Bay Street to eliminate extended service to 600 N. Bay Ct.	CASBUILT	11/19/2010	1,370	1,370	\$313,043	\$228	(210)	(\$40,071)	\$42,362	\$270,681	\$47,110	\$0	45%	7 (BS)	9 (PL)	13	MNC	PINECREST RD	ELM ST
705341	2-18 FAXON ST, NAS, & 1-7 FAXON AV	Field conditions didn't require as much sheathing as estimated. Actual service replacement costs were significantly less than estimated.	CASBUILT	06/15/2010	679	679	\$194,945	\$287	(44)	\$32,782	\$8,094	\$186,851	\$0	\$0	71%	9 (BS), 1 (CS), 1 (PL)	3 (PL)	14	NAS	MAIN ST	NUTT ST
642267	370-452 MANCHESTER ST, MNC	\$800 degradation fee on hold. Project advanced schedule due to city paving. Installed 655' out of 1,100' due to city paving in area. New work order proposed for remaining in FY12 prior to paving. Approx. \$17,000 in FY12 for restoration of intersection outside of paving limits. Actual overhead rate significantly higher than estimated.	CASBUILT	12/17/2010	695	695	\$190,446	\$274	415	(\$8,073)	\$37,810	\$152,636	\$800	\$17,000	109%	10 (CS)	9 (PL), 1 (CS)	15	MNC	LINCOLN ST	HALL ST
752176	CHESTER ST, NAS, to 59 BERKELEY ST	Field request - 2" bare steel keeps filling with water, causing chronic customer outage. Moved into FY11 program. Completed late in season, tied over existing services, which will be relaid in FY12 with final restoration. Approx \$42,873 in FY12.	CASBUILT	12/22/2010	330	300	\$41,585	\$126	(10)	\$60,991	\$0	\$41,585	\$0	\$42,873	86%	0	3 (BS)	16	NAS	BEASOM ST	

Footage Mileage 14,806 2.80 16,030 3.04 \$4,033,788 \$272 (646) (\$37,826) \$254,719 \$3,779,070 \$275,035 \$125,545 140 69

Final Restoration on FY09-10 projects:

642294	2-4 FOURTH ST, NAS	Final Restoration has been completed and no additional restoration. Additional carry-over invoice for trench paving on top of cut back.	CASBUILT	09/15/2009			\$39,551			(\$14,441)	\$0	\$39,551	\$0	\$0	114%			17	NAS	LEDGE ST	N GROTON ST
642255	25-174 CONCORD ST, MNC	Final Restoration has been completed and no additional restoration. Trench cut back was not originally included in carry-over estimate.	CASBUILT	12/02/2009			\$202,874			(\$161,892)	\$0	\$202,874	\$0	\$0	98%			8	MNC	ELM ST	UNION ST
695905	1-4 ALMONT ST, NAS	Final Restoration has been completed and no additional restoration. Actual overhead rate lower than estimated.	CASBUILT	12/22/2009			\$38,205			\$6,421	\$0	\$38,205	\$0	\$0	18%			26	NAS	LAKE ST	

\$4,314,419 (\$207,739) \$254,719 \$4,059,700 \$275,035 \$125,545

Deferred Projects:

710944	17-58 NORTH ST, LAC, & 124-155 SCHOOL ST	Deferred construction to allow 642267 - Manchester Street, MNC to be performed due to paving in 2010.	WAPPR				\$0												LAC	SHERIDAN ST	BELVIDERE ST
--------	--	---	-------	--	--	--	-----	--	--	--	--	--	--	--	--	--	--	--	-----	-------------	--------------

Completed FY10-11 NH CIBS Program

Work Order	Location	Address Range	Exst Diameter	Exst Material	YOI	System Pressure	Relay Diameter	Relay Footage	Aband Footage	Total Footage	# of Services	Estimated Direct Main Cost	Estimated Direct Service Cost	Total Estimated Direct Cost	Total Estimated Loaded Cost	Estimated Overhead Rate %	Avg Dcost/ Foot	Avg Lcost/ Foot	Original Replacement Comments			
709972	23-51 LAUREL ST, CCD	23-51	3 & 4	Cast Iron	1898/1924	LP	4	935	0	935	23	\$107,046	\$29,900	\$136,946	\$207,499	52%	\$146	\$222	Two main breaks on segment.			
628738	125-166 RUMFORD ST, CCD, & WYMAN ST	125-166	8	Cast Iron	1967	LP	4, 6 & 8	800	0	800	14	\$136,342	\$18,200	\$154,542	\$238,718	54%	\$193	\$298	Two main breaks on segment.			
628864	29-132 LANCASTER AV, MNC	29-132	4	Cast Iron	1927	LP	6	930	0	930	21	\$111,855	\$27,300	\$139,155	\$208,954	50%	\$150	\$225	Two main breaks on segment.			
642277	209-284 PUTNAM ST, MNC, BARTLETT ST & THORNTON ST	209-284	4 & 6	Cast Iron	1909/1929	LP, LP to 60	2 & 4	1,205	0	1,205	30	\$182,560	\$39,000	\$221,560	\$338,198	53%	\$184	\$281	Three main breaks on segment, deep pitting on 1.			
642281	116-150 S TAYLOR ST, MNC, & 365-457 VINTON ST	116-150	4	Cast Iron	1936/1950	LP	6	1,035	0	1,035	15	\$155,508	\$19,500	\$175,008	\$261,293	49%	\$169	\$252	Two main breaks on segment.			
705386	20-34 SCHOOL ST, HUD	20-34	3 & 4	Bare Steel	1947	LP	4	200	590	790	1	\$40,561	\$1,300	\$41,861	\$71,109	70%	\$53	\$90	3 corrosion repairs within 300 feet.			
705327	1-19 PERKINS ST, CCD, & 41-46 BRADLEY ST	1-19	1.5	Bare Steel	1955	LP to HP	2	825	0	825	18	\$101,723	\$23,400	\$125,123	\$191,660	53%	\$152	\$232	2 corrosion repairs within 200 feet.			
659111	370-532 CILLEY RD, MNC, & 15-65 S HALL ST	370-532	4 & 6	Cast Iron	1912/1926/1938	LP	6 & 8	1,975	0	1,975	34	\$357,807	\$44,200	\$402,007	\$614,434	53%	\$204	\$311	Deep pitting noted on 4 inch cast iron main break.			
709918	116-130 BOWERS ST, NAS	116-130	2	Bare Steel	1913/1950	LP	4	385	0	385	3	\$111,144	\$3,900	\$115,044	\$194,337	69%	\$299	\$505	Deep pitting noted on 2 inch steel repair, school.			
709977	183-228 ASH ST, MNC, & PROSPECT ST	183-228	3 & 4	Cast Iron	1899/1928	LP	6	910	0	910	15	\$165,177	\$19,500	\$184,677	\$272,761	48%	\$203	\$300	Deep pitting noted on 3 inch cast iron main break.			
710173	461-522 HANOVER ST, MNC	461-522	3	Cast Iron	1933/1938	LP	6	1,060	0	1,060	15	\$228,887	\$19,500	\$248,387	\$383,925	55%	\$234	\$362	Deep pitting noted on 3 inch cast iron main break.			
709974	59-85 BROADWAY, CCD	59-85	6	Cast Iron	1898	LP	6	675	0	675	17	\$123,762	\$22,100	\$145,862	\$227,426	56%	\$216	\$337	Deep pitting noted on 6 inch cast iron main break.			
642225	1250-1287 CHESTNUT ST, MNC, RIDGE RD & N BAY CT	1250-1287	4	Cast Iron	1940/1947/1954	LP	6	1,160	0	1,160	13	\$163,869	\$16,900	\$180,769	\$272,972	51%	\$156	\$235	2 main breaks, one notes main should be replaced.			
705341	2-18 FAXON ST, NAS, & 1-7 FAXON AV	2-18	2	Bare Steel	1910	LP	4 & 6	635	0	635	21	\$107,915	\$27,300	\$135,215	\$227,727	68%	\$213	\$359	Deep pitting noted on 2 inch steel repair.			
642267	370-452 MANCHESTER ST, MNC	370-452	4	Cast Iron	1912	LP	6	1,110	0	1,110	39	\$117,660.00	\$0.00	\$117,660	\$182,373	55%	\$106	\$164	Exposed notes - main should be replaced. Moved into 2010 to accommodate City's paving schedule. Started on 11/9/2010.			
752176	CHESTER ST, NAS, to 59 BERKELEY ST	49-59	2	Bare Steel	1947	LP	4	320	0	320	3	\$57,178	\$3,348	\$60,526	\$102,576	69%	\$189	\$321	Field Request - 2" bare steel keeps filling with water, causing cronic customer outage. Main in poor condition. Moved into FY10-11 program.			
										Footage	14,160	590	14,750	282	\$2,268,994	\$315,348	\$2,584,342	\$3,995,962	\$175	\$271		
										Mileage	2.68	0.11	2.79									
Final Restoration on FY09-10 projects:																						
642294	2-4 FOURTH ST, NAS	2-4	2	Bare Steel								\$16,200	\$0	\$16,200	\$25,110	55%			Final Restoration per Nashua. Completely Paid.			
642255	25-174 CONCORD ST, MNC	25-174	6	Cast Iron								\$26,440	\$0	\$26,440	\$40,982	55%			Final paving completed and paid.			
695905	1-4 ALMONT ST, NAS	1-4	3.5	Bare Steel								\$28,791	\$0	\$28,791	\$44,626	55%			Final paving completed and paid.			
											\$2,340,425	\$315,348	\$2,655,773	\$4,106,680								
Deferred Projects:																						
710944	17-58 NORTH ST, LAC, & 124-155 SCHOOL ST	17-58	3	Cast Iron	1900	LP to HP	2	1,065	0	1,065	9	\$115,892	\$11,700	\$127,592	\$190,459	49%	\$120	\$179	Last segment of 3 inch cast iron in LAC.			

**Energy North
Cast Iron, Bare Steel Replacement Program
May 15, 2011**

Computation of Revenue Requirement	1
Vintage Year Book Depreciation Schedule	2
Municipal Taxes as a Percentage of Net Plant	3
Bill Impacts due to Cast Iron and Bare Steel Replacement Program	4

Energy North
Cast Iron, Bare Steel Replacement Program
Computation of Revenue Requirement

Annual Increase due to Cast Iron Bare Steel program

	(a)	(b)	(c)	(d)
	Actual FY09	July 1, 2009 thru March 31, 2010 9 Months FY10	Actual FY11	Estimate FY12
Defered Tax Calculation				
1 CIBS Program Actual Spend-Mains	1,736,153	4,049,995	3,391,069	
2 CIBS Program Actual Spend-Service	729,463	798,555	668,631	
3 CIBS Program Estimated Spend-Mains				2,608,764
4 CIBS Program Estimated Spend-Service				324,067
5 Base Spending Amount	500,000	482,110	500,000	500,000
6 Incremental Amount	1,965,616	4,366,440	3,559,700	2,432,831
7 Cumulative REP Program Spend Since July 1, 2009		4,366,440	7,926,140	10,358,971
8				
9				
10 Annual Tax Depreciation	1,031,948	4,366,440	3,559,700	2,432,831
11 Cumulative Tax Depreciation Since July 1, 2009		4,366,440	7,926,140	10,358,971
12				
13 Book Depreciation	49,836	98,794	179,335	231,746
14 Cumulative Book Depreciation Since July 1, 2009		98,794	278,129	509,875
15				
16 Book/Tax Timer	982,112	4,267,646	7,648,011	9,849,096
17 Effective Tax Rate	40.53%	40.53%	40.53%	40.53%
18				
19 Deferred Tax Reserve	398,001	1,729,677	3,099,739	3,991,839
20				
Rate Base Calculation				
21 Plant In Service	1,965,616	4,366,440	7,926,140	10,358,971
22 Accum Depr	(49,836)	(98,794)	(278,129)	(509,875)
23 Net Plant in Service	1,915,780	4,267,646	7,648,011	9,849,096
24 Def Tax Reserve	(398,001)	(1,729,677)	(3,099,739)	(3,991,839)
25 Year End Rate Base	1,517,779	2,537,969	4,548,272	5,857,258
26				
Revenue Requirement Calculation				
27 Year End Rate Base	1,517,779	2,537,969	4,548,272	5,857,258
28 Pre-Tax ROR	11.53%	11.53%	11.63%	11.63%
29 Return and Taxes	175,003	292,628	528,964	681,199
30 Book Depreciation	49,836	98,794	278,129	509,875
31 Property Taxes	37,347	88,340	194,259	250,167
32 Annual Revenue Requirement	262,185	479,762	1,001,352	1,441,241
33				
34 Prior Year Annual Revenue Requirement	-	-	479,762	1,001,352
35				
36 Incremental Annual Rate Adjustment Since July 1, 2009	262,185	479,762	521,590	439,889
37				
Imputed Capital Structure				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
	<u>100.00%</u>		<u>8.33%</u>	<u>11.63%</u>

4c Amounts are negative pending removal of disallowed costs included in line 2c.
33 Actual 2009 ratio of municipal tax expense to net plant in service.

col b In accordance with Exhibit EN-3 of the National Grid/KeySpan Merger Settlement Agreement (Docket No. DG 06-107), EnergyNorth is allowed to implement on July 1 of each year, a permanent increase in its base distribution delivery rates to recover the annual revenue requirement for those investments made in the preceding fiscal year ended March 31st in excess of the CIBS base amount. As shown on Attachment A of Exhibit EN-3, the revenue requirement in any year reflects deferred income tax reserves based on the cumulative book/tax timing difference of all prior year CIBS investments. However, on July 1, 2010, EnergyNorth implemented new temporary base distribution delivery rates as part of its rate case in Docket No. DG 10-017. These new rates were based on the historic test year ended June 30, 2009 which included three months of CIBS investment for the fiscal year ended March 31, 2010. As a consequence, the revenue requirement for the fiscal year ended March 31, 2010 reflected CIBS investment for only the 9 month period ended March 31, 2010. In addition, this revenue requirement did not reflect deferred income tax reserves based on cumulative book/tax timing differences on CIBS spending prior to June 30, 2009.

Energy North
Cast Iron, Bare Steel Replacement Program
Vintage Year Book Depreciation Schedule

		(a)	(b)	(c)	(d)
		Actual	July 1, 2009 thru March 31, 2010 9 Months FY10	Actual FY11	Estimate FY12
Book Depreciation Schedule-Mains					
1	Actual CIBS spending	1,736,153	4,049,995	3,391,069	2,608,764
2	Base spending	(352,073)	(402,707)	(417,650)	(450,000)
3	Incremental CIBS spending	1,384,080	3,647,288	2,973,419	2,158,764
4					
5	Book Depreciation Rate:				
6	Year 1 (1)	2.54%	35,065		
7	Year 1 beginning in FY10	1.92%		70,028	57,090
8	Year 2	1.92%		70,028	57,090
9	Year 3	1.92%			70,028
10	Year 4	1.92%			
11	Year 5	1.92%			
12	Year 6	1.92%			
13	Year 7	1.92%			
14	Year 8	1.92%			
15	Year 9	1.92%			
16	Year 10	1.92%			
17	Year 11	1.92%			
18	Year 12	1.92%			
19	Year 13	1.92%			
20	Year 14	1.92%			
21	Year 15	1.92%			
22	Year 16	1.92%			
23					
24	Book Depreciation Expense--Mains	35,065	70,028	127,118	168,566
25					
26	Accumulated Depreciation--Beginning of Year	-	-	70,028	197,146
27	Accumulated Depreciation--End of Year	35,065	70,028	197,146	365,712
6(a) FY09 filing used the composite depreciation rate for both mains and services					
6(b) See footnote regarding column (b) on page 1 of 4.					
Book Depreciation Schedule-Services					
		Actual FY09	9 Months FY10	Estimate FY11	Estimate FY12
1	Actual CIBS spending	729,463	798,555	668,631	324,067
2	Base spending	(147,927)	(79,403)	(82,350)	(50,000)
3	Incremental CIBS spending	581,536	719,152	586,281	274,067
4					
5	Book Depreciation Rate:				
6	Year 1 (1)	2.54%	14,771		
7	Year 1 beginning in FY10	4.00%		28,766	23,451
8	Year 2	4.00%		28,766	23,451
9	Year 3	4.00%			28,766
10	Year 4	4.00%			
11	Year 5	4.00%			
12	Year 6	4.00%			
13	Year 7	4.00%			
14	Year 8	4.00%			
15	Year 9	4.00%			
16	Year 10	4.00%			
17	Year 11	4.00%			
18	Year 12	4.00%			
19	Year 13	4.00%			
20	Year 14	4.00%			
21	Year 15	4.00%			
22	Year 16	4.00%			
23					
24	Book Depreciation Expense--Services	14,771	28,766	52,217	63,180
25					
26	Accumulated Depreciation--Beginning of Year	-	-	28,766	80,983
27	Accumulated Depreciation--End of Year	14,771	28,766	80,983	144,163
28					
29					
30					
31	Total Mains & Services Depreciation Expense	49,836	98,794	179,335	231,746
32					
33	Total Mains & Services Accumulated Depreciation	49,836	98,794	278,129	509,875

6(a) FY09 filing used the composite depreciation rate for both mains and services
col. (b) See footnote regarding column (b) on page 1 of 4.

Energy North
Cast Iron, Bare Steel Replacement Program
Municipal Taxes as a Percentage of Net Plant

	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010
1 Plant in Service (page 100 table 10)	258,573	272,678	289,379	305,221	319,737	332,049
2 Depreciation and Amortization Reserve (page 101 table 10)	(82,363)	(88,564)	(94,562)	(102,587)	(108,270)	(114,294)
3 Net Plant	176,209	184,114	194,817	202,634	211,467	217,756
4						
5 Average Net Plant						
6 Plant in Service		265,625	281,028	297,300	312,479	325,893
7 Depreciation Reserve		(85,463)	(91,563)	(98,575)	(105,429)	(111,282)
8 Net Plant		180,162	189,465	198,726	207,051	214,611
9						
10 Municipal Taxes (page 112 table 33)		3,534	3,641	3,771	4,294	5,459
11						
12 % Municipal Taxes to Net Plant		1.96%	1.92%	1.90%	2.07%	2.54%

Note: Source of above data is the December 31 PUC Annual Report to be consistent with data previously provided to the Commission.

Energy North
Cast Iron, Bare Steel Replacement Program
Bill Impacts due to Cast Iron and Bare Steel Replacement Program

	(a)	(b)	(c)	(d)
	FY2009	FY2010	FY2011	Estimate FY2012
1 Annual Increase due to Cast Iron Bare Steel program	262,185	479,762	521,590	439,889
2				
3 Annual Throughput (based on Nov 10 COG/LDAF filing)	154,702,063	150,828,182	154,648,622	154,648,622
4				
5 Increase Factor	\$0.0017	\$0.0032	\$0.0034	\$0.0028
6				
7 Annual Actual Revenues 2010	\$176,520,000	\$151,224,178	\$132,475,941	\$132,475,941
8				
9 Annual percent increase	0.15%	0.32%	0.39%	0.33%
10				
11 Miles of Main Replaced Annually	2.96	3.98	2.79	2.46
12 Cumulative Miles of Main Replaced	2.96	3.98	6.77	9.23
13 Miles of Cast Iron/Bare Steel Main Remaining				
14				
15 Services Replaced Annually	101	127	282	63
16 Cumulative Number of Services Replaced	101	127	409	472
17				
18 Typical Residential bill (Based on Pk 10-11 and OffPeak 10 COG)	\$1,757	\$1,591	\$1,555	\$1,555
19				
20 Typical Usage	1,250	1,250	1,250	1,250
21				
22 Annual Increase for Residential Heating customer	\$2.12	\$3.98	\$4.22	\$3.56
23				
24 Percent bill increase	0.12%	0.25%	0.27%	0.23%
25				
26				
27 Typical G-41 (Based on Pk 10-11 and OffPeak 10 COG)	\$2,944	\$2,662	\$2,628	\$2,628
28				
29 Typical Usage	2,000	2,000	2,000	2,000
30				
31 Annual Increase for G-41 customer	\$3.39	\$6.36	\$6.75	\$5.69
32				
33 Percent bill increase	0.12%	0.24%	0.26%	0.22%
34				
35				
36 Typical G-42 (Based on Pk 10-11 and OffPeak 10 COG)	\$28,260	\$25,188	\$23,828	\$23,828
37				
38 Typical Usage	21,023	21,023	21,023	21,023
39				
40 Annual Increase for G-42 customer	\$35.63	\$66.87	\$70.91	\$59.80
41				
42 Percent bill increase	0.13%	0.27%	0.30%	0.25%
43				
44				
45 Typical G-52 (Based on Pk 10-11 and OffPeak 10 COG)	\$23,840	\$21,185	\$20,620	\$20,620
46				
47 Typical Usage	20,489	20,489	20,489	20,489
48				
49 Annual Increase for G-52 customer	\$34.72	\$65.17	\$69.10	\$58.28
50				
51 Percent bill increase	0.15%	0.31%	0.34%	0.28%

1(b)-16(b) Amounts are cumulative from July 1, 2009

**Energy North
Cast Iron, Bare Steel Replacement Program
May 15, 2011**

Computation of Revenue Requirement From Inception	1
Vintage Year Book Depreciation Schedule From Inception	2
Municipal Taxes as a Percentage of Net Plant From Inception	3
Bill Impacts due to Cast Iron and Bare Steel Replacement Program From Inception	4

Energy North
Cast Iron, Bare Steel Replacement Program
Computation of Revenue Requirement From Inception

RESTATED AS IF RATE CASE WAS NOT FILED. FOR INFORMATIONAL PURPOSES ONLY

	(a)	(b)	(c)	(d)
	Actual FY09	12 Months FY10	Actual FY11	Estimate FY12
Deferred Tax Calculation				
1 CIBS Program Actual Spend-Mains	1,736,153	4,206,295	3,391,069	
2 CIBS Program Actual Spend-Service	729,463	822,173	668,631	
3 CIBS Program Estimated Spend-Mains			-	2,608,764
4 CIBS Program Estimated Spend-Service			-	324,067
5 Base Spending Amount	500,000	500,000	500,000	500,000
6 Incremental Amount	1,965,616	4,528,468	3,559,700	2,432,831
7 Cumulative REP Program Spend	1,965,616	6,494,084	10,053,784	12,486,615
8				
9				
10 Annual Tax Depreciation	1,031,948	5,462,136	3,559,700	2,432,831
11 Cumulative Tax Depreciation	1,031,948	6,494,084	10,053,784	12,486,615
12				
13 Book Depreciation	49,836	152,184	232,725	285,135
14 Cumulative Book Depreciation	49,836	202,019	434,744	719,879
15				
16 Book/Tax Timer	982,112	5,309,953	8,636,928	10,784,624
17 Effective Tax Rate	40.53%	40.53%	40.53%	40.53%
18				
19 Deferred Tax Reserve	398,001	2,152,124	3,500,547	4,371,008
20				
Rate Base Calculation				
21				
22 Plant In Service	1,965,616	6,494,084	10,053,784	12,486,615
23 Accum Depr	(49,836)	(202,019)	(434,744)	(719,879)
24 Net Plant in Service	1,915,780	6,292,065	9,619,040	11,766,736
25 Def Tax Reserve	(398,001)	(2,152,124)	(3,500,547)	(4,371,008)
26 Year End Rate Base	1,517,779	4,139,941	6,118,493	7,395,728
27				
Revenue Requirement Calculation				
28				
29 Year End Rate Base	1,517,779	4,139,941	6,118,493	7,395,728
30 Pre-Tax ROR	11.53%	11.53%	11.63%	11.63%
31 Return and Taxes	175,003	477,335	711,581	860,123
32 Book Depreciation	49,836	202,019	434,744	719,879
33 Property Taxes	37,347	88,340	244,324	298,875
34 Annual Revenue Requirement	262,185	767,694	1,390,649	1,878,877
35				
36 Prior Year Annual Revenue Requirement	-	262,185	767,694	1,390,649
37				
38 Incremental Annual Rate Adjustment	262,185	505,509	622,955	488,228
39				
40				
Imputed Capital Structure				
41				
42				
43 Long Term Debt	Ratio	Rate	Weighted	Pre Tax
44 Short Term Debt	50.00%	6.99%	3.50%	3.50%
45 Common Equity	0.00%	0.00%	0.00%	0.00%
46	50.00%	2.67%	4.84%	8.13%
47	100.00%		8.33%	11.63%

4c Amounts are negative pending removal of disallowed costs included in line 2c.
33 Actual 2009 ratio of municipal tax expense to net plant in service.
col b Amounts are as if rate case was never filed in 2009.
11b Includes repairs tax catch up for FY 2009

Energy North
Cast Iron, Bare Steel Replacement Program
Vintage Year Book Depreciation Schedule From Inception

RESTATED AS IF RATE CASE WAS NOT FILED. FOR INFORMATIONAL PURPOSES ONLY

		(a)	(b)	(c)	(d)
Book Depreciation Schedule-Mains		Actual FY09	12 Months FY10	Actual FY11	Estimate FY12
1	Actual CIBS spending	1,736,153	4,206,295	3,391,069	2,608,764
2	Base spending	(352,073)	(418,248)	(417,650)	(450,000)
3	Incremental CIBS spending	1,384,080	3,788,047	2,973,419	2,158,764
4					
5	Book Depreciation Rate:				
6	Year 1 (1)	2.54%	35,065	35,065	35,065
7	Year 1 beginning in FY10	1.92%	72,731	57,090	41,448
8	Year 2	1.92%		72,731	57,090
9	Year 3	1.92%			72,731
10	Year 4	1.92%			
11	Year 5	1.92%			
12	Year 6	1.92%			
13	Year 7	1.92%			
14	Year 8	1.92%			
15	Year 9	1.92%			
16	Year 10	1.92%			
17	Year 11	1.92%			
18	Year 12	1.92%			
19	Year 13	1.92%			
20	Year 14	1.92%			
21	Year 15	1.92%			
22	Year 16	1.92%			
23					
24	Book Depreciation Expense--Mains	35,065	107,796	164,886	206,333
25					
26	Accumulated Depreciation--Beginning of Year	-	35,065	142,860	307,746
27	Accumulated Depreciation--End of Year	35,065	142,860	307,746	514,079
28					
29					
30					
31	Total Mains & Services Depreciation Expense	49,836	152,184	232,725	285,135
32					
33	Total Mains & Services Accumulated Depreciation	49,836	202,019	434,744	719,879

2(d) FY12 estimate split 85% Mains 15% Services
6(a) FY09 filing used the composite depreciation rate for both mains and services
6(b) See footnote regarding column (b) on page 1 of 4.

Book Depreciation Schedule-Services		Actual FY09	12 Months FY10	Estimate FY11	Estimate FY12
1	Actual CIBS spending	729,463	822,173	668,631	324,067
2	Base spending	(147,927)	(81,752)	(82,350)	(50,000)
3	Incremental CIBS spending	581,536	740,421	586,281	274,067
4					
5	Book Depreciation Rate:				
6	Year 1 (1)	2.54%	14,771	14,771	14,771
7	Year 1 beginning in FY10	4.00%		29,617	10,963
8	Year 2	4.00%		29,617	23,451
9	Year 3	4.00%			29,617
10	Year 4	4.00%			
11	Year 5	4.00%			
12	Year 6	4.00%			
13	Year 7	4.00%			
14	Year 8	4.00%			
15	Year 9	4.00%			
16	Year 10	4.00%			
17	Year 11	4.00%			
18	Year 12	4.00%			
19	Year 13	4.00%			
20	Year 14	4.00%			
21	Year 15	4.00%			
22	Year 16	4.00%			
23					
24	Book Depreciation Expense--Services	14,771	44,388	67,839	78,802
25					
26	Accumulated Depreciation--Beginning of Year	-	14,771	59,159	126,998
27	Accumulated Depreciation--End of Year	14,771	59,159	126,998	205,800
28					
29					
30					
31	Total Mains & Services Depreciation Expense	49,836	152,184	232,725	285,135
32					
33	Total Mains & Services Accumulated Depreciation	49,836	202,019	434,744	719,879

6(a) FY09 filing used the composite depreciation rate for both mains and services
col. (b) See footnote regarding column (b) on page 1 of 4.

Energy North
Cast Iron, Bare Steel Replacement Program
Municipal Taxes as a Percentage of Net Plant From Inception

	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010
1 Plant in Service (page 100 table 10)	258,573	272,678	289,379	305,221	319,737	332,049
2 Depreciation and Amortization Reserve (page 101 table 10)	(82,363)	(88,564)	(94,562)	(102,587)	(108,270)	(114,294)
3 Net Plant	176,209	184,114	194,817	202,634	211,467	217,756
4						
5 Average Net Plant						
6 Plant in Service		265,625	281,028	297,300	312,479	325,893
7 Depreciation Reserve		(85,463)	(91,563)	(98,575)	(105,429)	(111,282)
8 Net Plant		180,162	189,465	198,726	207,051	214,611
9						
10 Municipal Taxes (page 112 table 33)		3,534	3,641	3,771	4,294	5,459
11						
12 % Municipal Taxes to Net Plant		1.96%	1.92%	1.90%	2.07%	2.54%

Note: Source of above data is the December 31 PUC Annual Report to be consistent with data previously provided to the Commission.

Energy North
Cast Iron, Bare Steel Replacement Program
Bill Impacts due to Cast Iron and Bare Steel Replacement Program From Inception

RESTATED AS IF RATE CASE WAS NOT FILED. FOR INFORMATIONAL PURPOSES ONLY

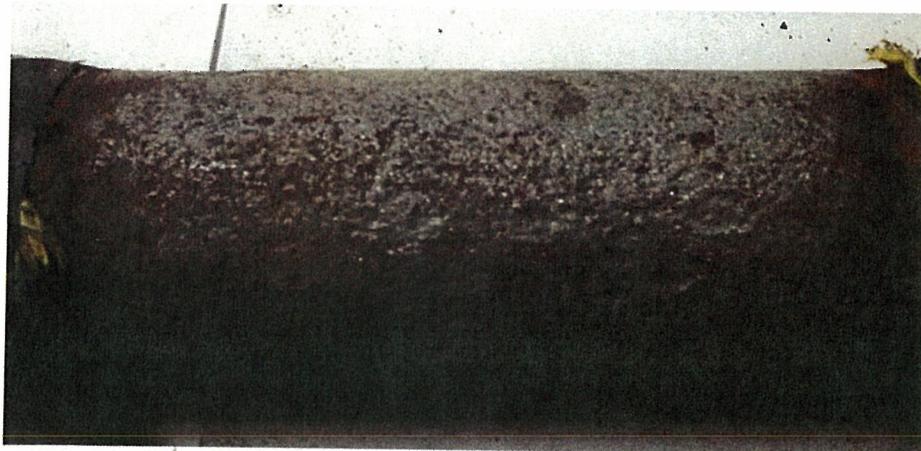
	FY2009	FY2010	FY2011	Estimate FY2012
1 Annual Increase due to Cast Iron Bare Steel program (cumulative)	262,185	767,694	1,390,649	1,878,877
2				
3 Annual Throughput (based on Nov 10 COG/LDAF filing)	154,702,063	150,828,182	154,828,182	154,828,182
4				
5 Increase Factor	\$0.0017	\$0.0051	\$0.0090	\$0.0121
6				
7 Annual Actual Revenues 2010	\$176,520,000	\$151,224,178	\$132,475,941	\$132,475,941
8				
9 Annual percent increase (cumulative)	0.15%	0.51%	1.05%	1.42%
10				
11 Miles of Main Replaced Annually	2.96	3.98	2.79	2.46
12 Cumulative Miles of Main Replaced	2.96	6.94	9.73	12.19
13 Miles of Cast Iron/Bare Steel Main Remaining				
14				
15 Services Replaced Annually	101	127	282	63
16 Cumulative Number of Services Replaced	101	228	510	573
17				
18 Typical Residential bill (Based on Pk 10-11 and OffPeak 10 COG)	\$1,757	\$1,591	\$1,555	\$1,555
19				
20 Typical Usage	1,250	1,250	1,250	1,250
21				
22 Annual Increase for Residential Heating customer	\$2.12	\$6.36	\$11.23	\$15.17
23				
24 Percent bill increase	0.12%	0.40%	0.72%	0.98%
25				
26				
27 Typical G-41 (Based on Pk 10-11 and OffPeak 10 COG)	\$2,944	\$2,662	\$2,628	\$2,628
28				
29 Typical Usage	2,000	2,000	2,000	2,000
30				
31 Annual Increase for G-41 customer	\$3.39	\$10.18	\$17.96	\$24.27
32				
33 Percent bill increase	0.12%	0.38%	0.68%	0.92%
34				
35				
36 Typical G-42 (Based on Pk 10-11 and OffPeak 10 COG)	\$28,260	\$25,188	\$23,828	\$23,828
37				
38 Typical Usage	21,023	21,023	21,023	21,023
39				
40 Annual Increase for G-42 customer	\$35.63	\$107.00	\$188.83	\$255.12
41				
42 Percent bill increase	0.13%	0.42%	0.79%	1.07%
43				
44				
45 Typical G-52 (Based on Pk 10-11 and OffPeak 10 COG)	\$23,840	\$21,185	\$20,620	\$20,620
46				
47 Typical Usage	20,489	20,489	20,489	20,489
48				
49 Annual Increase for G-52 customer	\$34.72	\$104.29	\$184.03	\$248.64
50				
51 Percent bill increase	0.15%	0.49%	0.89%	1.21%

2010 New Hampshire Condition Bare Steel Main Replacement Program – Sample Analysis

Over the course of the 2010 construction season, steel pipe and soil samples were collected from the CIBS main replacement program projects completed in New Hampshire. These samples were taken with the intention of using the analysis conclusions as a tool to assist in the selection of candidates for future CIBS replacement programs. Each sample was treated so that approximately half of the pipe would be in the 'as found' condition when exposed, while the other half was sand blasted to clean the exposed pipe down to the bare metal. Soil samples were taken as close to the pipe samples as possible in an effort to retrieve 'native' soil.

Samples were taken at the following locations:

- (1) **20-34 School St, Hudson– wo#705386** – 2 inch, low pressure - installed in 1947
 - A soil sample was taken and analyzed. The pH was measured to be 7.5, slightly alkaline to neutral. Testing for chlorides was negative. Testing for microbiological acid producing (APB) and sulfate reducing bacteria (SRB) were performed. The APB testing produced a reading of 10,000 bacteria colonies per ML. The testing for SRB produced a reading of 100 bacteria colonies per ML. The soil was observed to be a normal color and odorless.
 - The pipe sample was observed to be in fair to poor condition. Some deep pitting was observed on the exposed steel. Pit depths were not measured as the samples are available for continued visible review. Exposure of this main should result in a scheduled replacement work order.
 - The following pictures were taken:



- (2) 2-18 Faxon St & 1-7 Faxon Av, Nashua – wo#705341 – 2 inch, low pressure, installed in 1912
- A soil sample was taken and analyzed. The pH was measured to be approximately 7.5, slightly alkaline to neutral. Testing for chlorides was negative. Testing for microbiological acid producing (APB) and sulfate reducing bacteria (SRB) were performed. The APB testing produced a reading of 100,000 bacteria colonies per ML. The testing for SRB produced a reading of 100 bacteria colonies per ML. The soil was observed to be a normal color and odorless.
 - The pipe sample was observed to be in very poor condition with multiple large holes observed in the pipe wall. Exposure of this main should result in a priority recommendation for replacement. Pit depths were not measured as the samples are available for continued visible review.
 - The following pictures were taken:

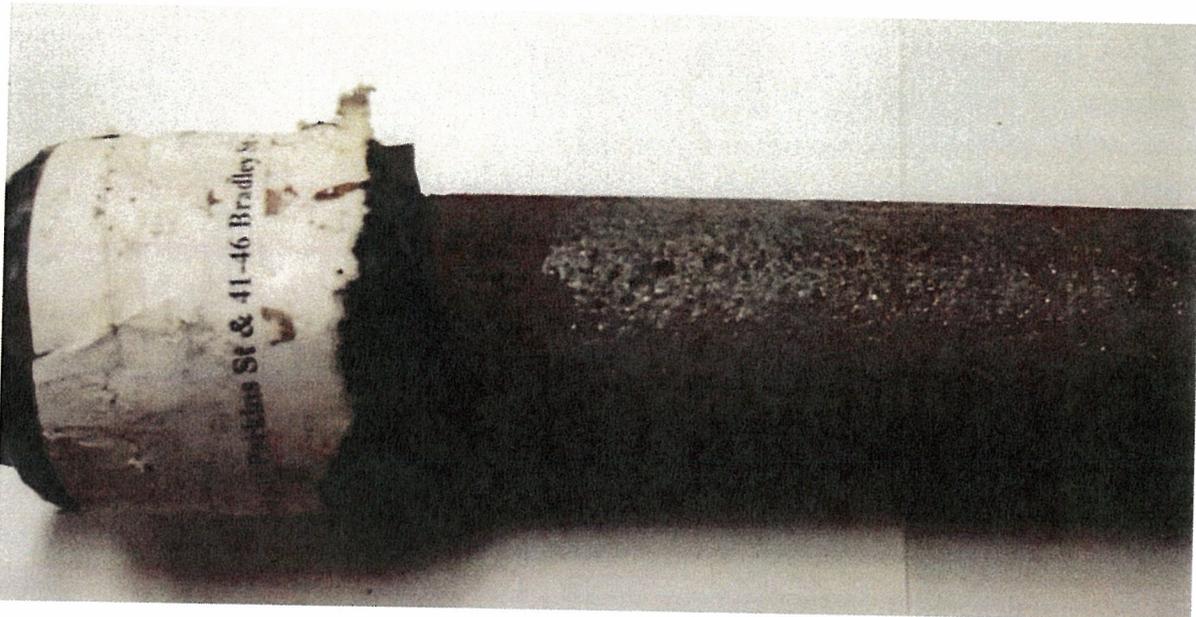


(3) **116-130 Bowers St, Nashua- wo#709918** – 2 inch, low pressure, installed in 1913

- A soil sample was taken and analyzed. The pH was measured to be approximately 7, or neutral. Testing for chlorides was negative. Testing for microbiological acid producing (APB) and sulfate reducing bacteria (SRB) were performed. The APB testing produced a reading of 1,000 bacteria colonies per ML. The testing for SRB produced a reading of 1,000 bacteria colonies per ML. The soil was observed to be a normal color and odorless.
- The pipe sample was observed to be in poor condition with heavy wall loss and a large dent in the pipe, possibly from the sample removal process. Exposure of this main segment should result in a recommendation for replacement based on condition. Pit depths were not measured as the samples are available for continued visible review.
- The following pictures were taken:



- (4) **1-19 Perkins St, CCD, & 41-46 Bradley St Concord – wo#705327** – 1.5 inch, low pressure, installed in 1955
- A soil sample was taken and analyzed. The pH was measured to be approximately 7, or neutral. Testing for chlorides was negative. Testing for microbiological acid producing (APB) and sulfate reducing bacteria (SRB) were performed. The APB testing produced a reading of 10,000 bacteria colonies per ML. The testing for SRB produced a reading of 10,000 bacteria colonies per ML. The soil was observed to be a normal color and odorless.
 - The pipe sample was observed to be in fair to poor condition. A concentrated amount of deep pitting was observed and a longitudinal seam was visible. Pit depths were not measured as the samples are available for continued visible review. Exposure of this main should result in a recommendation for replacement based on condition.
 - The following pictures were taken:



(5) Chester St, NAS, to 59 Berkeley St, Nashua – wo#752176 – 2 inch, low pressure, installed in 1947

- A soil sample was taken and analyzed. The pH was measured to be approximately 7, or neutral. Testing for chlorides was negative. Testing for microbiological acid producing (APB) and sulfate reducing bacteria (SRB) were performed. The APB testing produced a reading of 10,000 bacteria colonies per ML. The testing for SRB produced a reading of 1,000 bacteria colonies per ML. The soil was observed to be a normal color and odorless.
- The pipe sample was observed to be in very poor condition. Deep pitting was observed with visible holes in the pipe wall. The service tee on the sample was heavily corroded. This segment was specifically noted by field personnel for priority replacement. Pit depths were not measured as the samples are available for continued visible review. Exposure of this segment should result in a recommendation for a priority replacement based on condition.
- The following pictures were taken:





Conclusions/Recommendations:

- (1) Samples should continue to be taken as close to the area of leak activity as possible.
- (2) Crews taking the samples should specify the 12 o'clock position of the pipe taken.
- (3) Integrity Engineering should continue to be contacted prior to each removal of the sample pipe. An engineering representative should be on site to verify that the pipe sample is acceptable and that the soil taken is valid for analysis.
- (4) The criteria used for the segment selection process should continue to include exposed main reports indicating poor condition, as this data has proven to be useful and indicative of pipe in need of replacement.
- (5) Special attention should be paid to locations where the pH is highly acidic or highly alkaline.
- (6) Special attention should be paid to locations where the presence of chlorides is observed.
- (7) Special attention should be paid to locations where high levels of bacteria are recorded.
- (8) Segments for replacement should not be approved based on attributes alone. Segments of coated steel main that were previously thought to be bare have been included in the replacement program in past years.