

THE STATE OF NEW HAMPSHIRE

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EXECUTIVE DIRECTOR
Debra A. Howland



PUBLIC UTILITIES COMMISSION
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NHPUC 25MAR'16AM11:07

March 25, 2016

Debra A. Howland
Executive Director
New Hampshire Public Utilities Commission
21 S. Fruit St., Suite 10
Concord, New Hampshire 03301

Re: DW 16-220, Pennichuck Water Works, Inc.
Water Infrastructure and Conservation Adjustment (WICA)
2016 Surcharge and 2016-18 Capital Projects
Recommendation for Approval

Dear Ms. Howland:

On February 2, 2016, Pennichuck Water Works, Inc. (PWW), filed a petition for certain approvals under its current WICA tariff provision. PWW's WICA is a pilot program originally authorized by Order 25,230 (June 9, 2011), in Docket No. DW 10-091. PWW's petition seeks: (1) approval of a WICA surcharge of 3.04%, based on completed, in-service, 2013, 2014, and 2015 projects; (2) approval of its proposed 2016 WICA projects; and (3) preliminary approval of PWW's 2017 WICA projects. A WICA project list for construction in 2018 was also provided for informational purposes. Accompanying the petition was the testimony of Donald L. Ware, Chief Operating Officer of PWW. After review of the petition and discovery, Staff recommends approval of a 2016 surcharge of 3.03%, and a 2016 project list totaling an estimated \$5.02 million. Staff also recommends preliminary approval of the 2017 project list estimated to total \$5.31 million.

Following the company's filing, Staff proposed an informal procedural schedule for review of the filing. The Office of the Consumer Advocate did not participate in this docket. Staff submitted discovery requests to PWW as necessary, and the responses are attached. Staff also engaged the services of Douglas W. Brogan, an engineering consultant, to review the technical and engineering aspects of the filing. Mr. Brogan asserts that the 2015 projects were completed in a prudent manner, and that PWW's proposed 2016-2018 WICA projects appear reasonable. Mr. Brogan's memorandum summarizing his review and findings is attached to this letter.

In addition, the Commission Audit Staff audited the actual costs of the completed 2015 projects, and that report is attached. Mr. Jayson Laflamme, Senior Analyst in the Commission's Gas and Water Division reviewed the financial aspects of the filing, including the calculation of the proposed 2016 surcharge, and the bill impacts of the proposed WICA surcharge. He points out that the small difference in the recommended WICA surcharge from that requested in the filing results from certain corrections that were required as a result of Staff's discovery. In addition, Mr. Laflamme explains that inclusion of the completed 2015 WICA projects into the surcharge represents an increase of about \$0.57 per month to an average residential customer. Mr. Laflamme's memorandum, summarizing his review and providing explanation of the recommended 2016 surcharge of 3.03%, is attached to this letter.

Consistent with its tariff and the Commission's approval in Docket No. DW 15-043, PWW requests the 2016 WICA surcharge be effective on a bills-rendered basis as of June 1, 2016. This billing format eliminates the need for proration of the WICA surcharge.

In summary, Staff recommends that the Commission approve a WICA surcharge of 3.03%, to be applied to all customer bills on a bills-rendered basis as of June 1, 2016, representing recovery of 2013, 2014, and 2015 WICA projects. Staff also recommends approval of the 2016 WICA project list and preliminary approval of the 2017 projects.

If the Commission requires additional information, please so advise.

Sincerely,



Mark A. Naylor
Director, Gas & Water Division

Attachments:

February 9, 2016 Revised Attachments to Ware Testimony
PWW Responses to Staff Discovery, Sets 1 and 2
March 21, 2016 Memo from D. Brogan
March 22, 2016 Memo from J. Laflamme
March 9, 2016 Audit Report of B. Nelson

cc: Docket-Related Service List

SERVICE LIST - EMAIL ADDRESSES - DOCKET RELATED

Pursuant to N.H. Admin Rule Puc 203.11 (a) (1): Serve an electronic copy on each person identified on the service list.

Executive.Director@puc.nh.gov
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thomas.getz@mclane.com

Docket #: 16-220-1 Printed: March 25, 2016

FILING INSTRUCTIONS:

- a) Pursuant to N.H. Admin Rule Puc 203.02 (a), with the exception of Discovery, file 7 copies, as well as an electronic copy, of all documents including cover letter with:
- DEBRA A HOWLAND
EXECUTIVE DIRECTOR
NHPUC
21 S. FRUIT ST, SUITE 10
CONCORD NH 03301-2429
- b) Serve an electronic copy with each person identified on the Commission's service list and with the Office of Consumer Advocate.
- c) Serve a written copy on each person on the service list not able to receive electronic mail.

MCLANE
MIDDLETON

THOMAS B. GETZ
Direct Dial: 603.230.4403
Email: thomas.getz@mclane.com
Admitted in NH
11 South Main Street, Suite 500
Concord, NH 03301
T 603.226.0400
F 603.230.4448

February 9, 2016

NH-PUC 10FEB'16AM9:48

**VIA ELECTRONIC MAIL AND
HAND DELIVERY**

Debra A. Howland
Executive Director & Secretary
New Hampshire Public Utilities Commission
21 S. Fruit Street, Suite 10
Concord, NH 03301

**Re: DW 16-220; Pennichuck Water Works, Inc. – Petition for Approval of Water
Infrastructure and Conservation Adjustment (WICA) Proposed Projects**

Dear Ms. Howland:

Enclosed for filing pursuant to Puc 203.02 (a) (1) please find an original and six copies of substitute versions of Attachment A and Attachment B to the testimony of Donald L. Ware in the above-captioned proceeding. The Attachments were revised to label schedules more clearly and re-number pages accordingly. In addition, a column deleted in one schedule during production was re-inserted. An electronic copy has also been filed with the Commission and the Office of Consumer Advocate as required by Puc 203.02 (a) (2) and (4).

Sincerely,



Thomas B. Getz

TBG:slb

Enclosures

cc: Office of Consumer Advocate

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
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8		(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
9																	
10																	
11		2013 ¹															
12																	
13																	
14																	
15																	
16																	
17		Mains		\$ 1,563,037		\$ (156,234)		\$ 1,406,803		\$ (14,422)		\$ 1,392,381		1.60%		\$ 22,278	
18		Contingency		-		-		-		-		-		1.60%		-	
19		Paving		28,395		(2,839)		25,556		-		25,556		1.57%		401	
20		Hydrants		59,164		(5,063)		54,101		(2,293)		51,808		2.24%		1,160	
21		Services		241,199		(22,980)		218,219		(6,924)		211,295		2.34%		4,944	
22		Valves		69,084		(6,908)		62,176		(2,174)		60,002		1.60%		960	
23		Total		\$ 1,960,879		\$ (194,024)		\$ 1,766,855		\$ (25,813)		\$ 1,741,042				\$ 29,744	
24																	
25																	
26																	
27																	
28		2014 ²															
29																	
30																	
31																	
32																	
33																	
34		Mains		\$ 2,744,191		(273,203)		\$ 2,470,988		\$ -		\$ 2,470,988		1.60%		\$ 39,536	
35		Contingency		-		-		-		-		-		1.60%		-	
36		Paving		-		-		-		-		-		1.57%		-	
37		Hydrants		35,249		(3,525)		31,724		(215)		31,509		2.24%		706	
38		Services		82,444		(8,244)		74,200		(1)		74,199		2.34%		1,736	
39		Valves		10,031		(1,003)		9,028		(538)		8,490		1.60%		136	
40		Total		\$ 2,871,915		\$ (285,975)		\$ 2,585,940		\$ (754)		\$ 2,585,186				\$ 42,114	
41																	
42																	
43																	
44																	
45		2015 ³															
46																	
47																	
48																	
49																	
50																	
51		Mains		\$ 3,089,415		\$ (308,941)		\$ 2,780,473		\$ 38,121		\$ 2,818,594		1.60%		\$ 45,098	
52		Contingency		-		-		-		-		-		1.60%		-	
53		Paving		44,436		(4,444)		\$ 39,993		-		39,993		1.57%		\$ 628	
54		Hydrants		76,976		(7,698)		\$ 69,278		9,516		78,795		2.24%		\$ 1,765	
55		Services		76,496		(7,650)		\$ 68,846		2,627		71,473		2.34%		\$ 1,672	
56		Valves		10,558		(1,056)		\$ 9,502		2,995		12,497		1.60%		\$ 200	
57		Total		\$ 3,297,881		\$ (329,788)		\$ 2,968,093		\$ 53,259		\$ 3,021,352				\$ 49,363	
58																	
59																	
60																	

Investmt summary - Attach A

	A	B	C	D	E	F	G	H	I
1	DW 16-xxx								
2	PENNICHUCK WATER WORKS, INC.								
3	PROJECTED CALCULATION OF 2016 WICA SURCHARGE								
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015								
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	A	B	C	D	E	F	G	H	I	J	K
1	DW 16-xxx										
2	PENNICHUCK WATER WORKS, INC.										
3	PROJECTED CALCULATION OF 2017 WICA SURCHARGE										
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015										
5	and PROJECTED CONSTRUCTION YEAR 2016										
6											
7											
8											
9											
10											
11	Plant in Service:										
12	Gross Plant Investment (Att A; Sch 1; Col (2))	\$	1,960,879	\$	2,871,915	\$	3,297,881	\$	5,018,743	\$	13,149,418
13	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(1,311,662)
14	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		26,692
15	Net Plant Investment		1,741,042		2,585,186		3,021,352		4,516,869		11,864,449
16											
17	Accumulated Depreciation										
18	Depreciation Expense ¹ (Att A; Sch 1; Col (8)):										
19	2013 Net Plant Investment		14,872		29,744		29,744		29,744		104,104
20	2014 Net Plant Investment		-		21,057		42,114		42,114		105,284
21	2015 Net Plant Investment		-		-		24,681		49,363		74,044
22	2016 Net Plant Investment		-		-		-		36,426		36,426
23	Total Depreciation Expense		14,872		50,801		96,539		157,647		319,859
24	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(1,311,662)
25	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		26,692
26	Net Accumulated Depreciation		(204,965)		(235,928)		(179,989)		(344,228)		(965,110)
27											
28	Net Plant in Service	\$	1,946,007	\$	2,821,114	\$	3,201,342	\$	4,861,096	\$	12,829,559
29	Pre-tax Rate of Return ²								x		6.17%
30	Return on Investment									\$	791,365
31											
32	Property Tax Expense ³	@	\$28.59	per	\$1,000						366,797
33											
34	Annual Depreciation Expense (Att A; Sch 1; Col (8)):										
35	2013 Net Plant Investment										29,744
36	2014 Net Plant Investment										42,114
37	2015 Net Plant Investment										49,363
38	2016 Net Plant Investment										72,852
39	Total Annual Depreciation Expense										194,073
40											
41	2017 Cumulative Revenue Requirement									\$	1,352,235
42	Less: 2016 Cumulative Revenue Requirement ⁴										(840,557)
43	2017 Revenue Requirement									\$	511,678
44											
45	Water Revenues per DW 13-130 ⁵									\$	27,689,214
46											
47											
48	2017 Revenue Surcharge %										1.85%
49	2017 Cumulative Revenue Surcharge %										4.88%
50											
51											
52	Customer Impact										
53	5/8 Inch Meter Monthly Charge									\$	20.34
54	Volumetric Charge									\$	3.30
55	Average Single Family Residential Usage (CCF)										7.88
56	Average Monthly Usage Charge									\$	26.00
57	Total Average Monthly Charge									\$	46.34
58											
59	Average Monthly \$ Impact per Customer of 2017 Surcharge									\$	0.86
60	Average Monthly \$ Impact per Customer of 2017 Cumulative Surcharge									\$	2.26
61											
62	Notes:										
63	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation										
64	expense is recorded in the first and last year of an asset's service life.										
65	² Calculation of Pre-Tax Rate of Return (Based on PW's Rate Filing in DW 13-130)										
66											
67	Debt		Weighted Cost		Tax Multiplier		Pre Tax Cost				
68	Equity		5.59%		1.000		5.59%				
69			0.35%		1.656		0.58%				
70			5.94%				6.17%				
71	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.										
72	⁴ Attachment A; Schedule 2b										
73	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).										

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	DW 16-xxx												
2	PENNICHUCK WATER WORKS, INC.												
3	PROJECTED CALCULATION OF 2018 WICA SURCHARGE												
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015												
5	and PROJECTED CONSTRUCTION YEARS 2016 - 2017												
6													
7													
8													
9													
10													
11	Plant Investment:												
12	Gross Plant Investment (Att A; Sch 1; Col (2))	\$	1,960,879	\$	2,871,915	\$	3,297,881	\$	5,018,743	\$	5,311,913	\$	18,461,331
13	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(531,191)		(1,842,853)
14	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		-		26,692
15	Net Plant Investment		<u>1,741,042</u>		<u>2,585,186</u>		<u>3,021,352</u>		<u>4,516,869</u>		<u>4,780,722</u>		<u>16,645,170</u>
16													
17	Accumulated Depreciation:												
18	Depreciation Expense ¹ (Att A; Sch 1; Col (8)):												
19	2013 Net Plant Investment		14,872		29,744		29,744		29,744		29,744		133,849
20	2014 Net Plant Investment		-		21,057		42,114		42,114		42,114		147,398
21	2015 Net Plant Investment		-		-		24,681		49,363		49,363		123,407
22	2016 Net Plant Investment		-		-		-		36,426		72,852		109,279
23	2017 Net Plant Investment		-		-		-		-		38,543		38,543
24	Total Depreciation Expense		<u>14,872</u>		<u>50,801</u>		<u>96,539</u>		<u>157,647</u>		<u>232,616</u>		<u>552,475</u>
25	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(531,191)		(1,842,853)
26	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		-		26,692
27	Net Accumulated Depreciation		<u>(204,965)</u>		<u>(235,928)</u>		<u>(179,989)</u>		<u>(344,227)</u>		<u>(298,575)</u>		<u>(1,263,686)</u>
28													
29	Net Plant in Service	\$	<u>1,946,007</u>	\$	<u>2,821,114</u>	\$	<u>3,201,342</u>	\$	<u>4,861,096</u>	\$	<u>5,079,297</u>	\$	<u>17,908,856</u>
30	Pre-tax Rate of Return ²											x	6.17%
31	Return on Investment												\$ 1,104,671
32													
33	Property Tax Expense ³	@		\$28.59	per	\$1,000							512,014
34													
35	Annual Depreciation Expense (Att A; Sch 1; Col (8)):												
36	2013 Net Plant Investment												29,744
37	2014 Net Plant Investment												42,114
38	2015 Net Plant Investment												49,363
39	2016 Net Plant Investment												72,852
40	2017 Net Plant Investment												77,086
41	Total Annual Depreciation Expense												<u>271,159</u>
42													
43	2018 Cumulative Revenue Requirement												\$ 1,887,843
44	Less: 2017 Cumulative Revenue Requirement ⁴												<u>(1,352,235)</u>
45	2018 Revenue Requirement												<u>\$ 535,608</u>
46													
47	Water Revenues per DW 13-130 ⁵												<u>\$ 27,689,214</u>
48													
49													
50	2018 Revenue Surcharge %												1.93%
51	2018 Cumulative Revenue Surcharge %												<u>6.82%</u>
52													
53													
54	Customer Impact:												
55	5/8 Inch Meter Monthly Charge											\$	20.34
56	Volumetric Charge											\$	3.30
57	Average Single Family Residential Usage (CCF)												7.88
58	Average Monthly Usage Charge											\$	26.00
59	Total Average Monthly Charge											\$	<u>46.34</u>
60													
61	Average Monthly \$ Impact per Customer of 2018 Surcharge											\$	0.90
62	Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge											\$	<u>3.16</u>
63													
64	Notes:												
65	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation												
66	expense is recorded in the first and last year of an asset's service life.												
67	² Calculation of Pre-Tax Rate of Return (Based on PW's Rate Filing in DW 13-130)												
68													
69	Debt			Weighted Cost		Tax Multiplier		Pre Tax Cost					
70	Equity			5.59%		1.000		5.59%					
71				0.35%		1.656		0.58%					
72				5.94%				6.17%					
73	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.												
74	⁴ Attachment A; Schedule 2c												
75	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).												

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	DW 16-xxx														
2	PENNICHUCK WATER WORKS, INC.														
3	PROJECTED CALCULATION OF 2019 WICA SURCHARGE														
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015														
5	and PROJECTED CONSTRUCTION YEARS 2016 - 2018														
6															
7															
8															
9															
10															
11	Plant Investment:														
12	Gross Plant Investment (Att A; Sch 1; Col (2))	\$	1,960,879	\$	2,871,915	\$	3,297,881	\$	5,018,743	\$	5,311,913	\$	6,408,613	\$	24,869,944
13	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(531,191)		(640,861)		(2,483,714)
14	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		-		-		26,692
15	Net Plant Investment		1,741,042		2,585,186		3,021,352		4,516,869		4,780,722		5,767,752		22,412,922
16															
17	Accumulated Depreciation:														
18	Depreciation Expense ¹ (Att A; Sch 1; Col (8)):														
19	2013 Net Plant Investment		14,872		29,744		29,744		29,744		29,744		29,744		163,593
20	2014 Net Plant Investment		-		21,057		42,114		42,114		42,114		42,114		189,512
21	2015 Net Plant Investment		-		-		24,681		49,363		49,363		49,363		172,770
22	2016 Net Plant Investment		-		-		-		36,426		72,852		72,852		182,131
23	2017 Net Plant Investment		-		-		-		-		38,543		77,086		115,628
24	2018 Net Plant Investment		-		-		-		-		-		46,439		46,439
25	Total Depreciation Expense		14,872		50,801		96,539		157,647		232,616		271,159		823,634
26	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(329,788)		(501,874)		(531,191)		(640,861)		(2,483,714)
27	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		53,259		-		-		-		26,692
28	Net Accumulated Depreciation		(204,965)		(235,928)		(179,989)		(344,227)		(298,575)		(369,703)		(1,633,388)
29															
30	Net Plant in Service	\$	1,946,007	\$	2,821,114	\$	3,201,342	\$	4,861,096	\$	5,079,297	\$	6,137,454	\$	24,046,310
31	Pre-tax Rate of Return ²													x	6.17%
32	Return on Investment														\$ 1,483,247
33															
34	Property Tax Expense ³	@	\$28.59 per \$1,000												687,484
35															
36	Annual Depreciation Expense (Att A; Sch 1; Col (8)):														
37	2013 Net Plant Investment														29,744
38	2014 Net Plant Investment														42,114
39	2015 Net Plant Investment														49,363
40	2016 Net Plant Investment														72,852
41	2017 Net Plant Investment														77,086
42	2018 Net Plant Investment														92,878
43	Total Annual Depreciation Expense														271,159
44															
45	2018 Cumulative Revenue Requirement														\$ 2,441,889
46	Less: 2017 Cumulative Revenue Requirement ⁴														(1,887,843)
47	2018 Revenue Requirement														\$ 554,046
48															
49	Water Revenues per DW 13-130 ⁵														\$ 27,689,214
50															
51															
52	2018 Revenue Surcharge %														2.00%
53	2018 Cumulative Revenue Surcharge %														8.82%
54															
55															
56	Customer Impact:														
57	5/8 Inch Meter Monthly Charge													\$	20.34
58	Volumetric Charge													\$	3.30
59	Average Single Family Residential Usage (CCF)														7.88
60	Average Monthly Usage Charge													\$	26.00
61	Total Average Monthly Charge													\$	46.34
62															
63	Average Monthly \$ Impact per Customer of 2018 Surcharge													\$	0.93
64	Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge													\$	4.09
65															
66	Notes:														
67	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation														
68	expense is recorded in the first and last year of an asset's service life.														
69	² Calculation of Pre-Tax Rate of Return (Based on PWW's Rate Filing in DW 13-130)														
70															
71	Debt														
72	Equity														
73															
74	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.														
75	⁴ Attachment A; Schedule 2c														
76	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).														

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DW 16-xxx													
2	PENNICHUCK WATER WORKS, INC.													
3	SUMMARY OF WICA SURCHARGE CALCULATIONS													
4	FOR APPROVED 2015 WICA SURCHARGE, PROPOSED 2016 WICA SURCHARGE													
5	and PROJECTED 2017 - 2018 WICA SURCHARGES													
6														
7														
8														
9														
10														
11														
12	SUMMARY OF CALCULATIONS (Att A; Sch's 2):													
13														
14	Annual Revenue Requirement													
15	Cumulative Revenue Requirement													
16														
17														
18	Annual Revenue Surcharge %													
19	Cumulative Revenue Surcharge %													
20														
21														
22	Annual Average Monthly \$ Impact per Customer													
23	Cumulative Average Monthly \$ Impact per Customer													
24														
25														
26														
27	PER MOST RECENT APPROVED RATE FILING DW15-043													
28														
29	Annual Revenue Requirement													
30	Cumulative Revenue Requirement													
31														
32														
33	Annual Revenue Surcharge %													
34	Cumulative Revenue Surcharge %													
35														
36														
37	Annual Average Monthly \$ Impact per Customer													
38	Cumulative Average Monthly \$ Impact per Customer													
39														

2016-2018 Projects Attach B

2016-2018 Projects Attach B

MCLANE MIDDLETON

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February 29, 2016

Via Electronic Mail

Rorie E. Patterson, Esq.
Staff Attorney
New Hampshire Public Utilities Commission
21 South Fruit Street
Concord, NH 03301-2429

**Re: DW 16 -220; Pennichuck Water Works, Inc.
Responses to Staff's First Set of Data Requests**

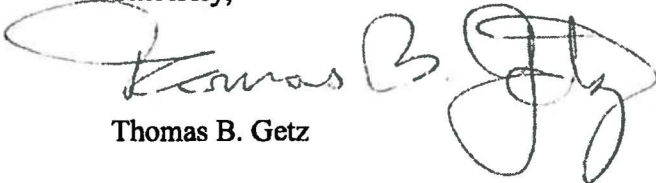
Dear Rorie:

In connection with the above-referenced matter, I enclose Pennichuck Water Works, Inc.'s responses to Staff's First Set of Data Requests.

The Revised Attachments A and B also reflect changes in Attachment B "End of Year 2015 Costs (Column P)" resulting from errors identified subsequent to the original filing, which are separate from those identified in the Data Requests. The revised amounts are highlighted in yellow and include footnotes detailing each change. There are three projects with revised End of Year 2015 Costs. The changes in Attachment B will also flow through to Attachment A – Investment Summary and Surcharge Worksheets.

Please call me with any questions or concerns.

Sincerely,



Thomas B. Getz

TBG:slb

Enclosures

cc: Discovery List

McLane Middleton, Professional Association
Manchester, Concord, Portsmouth, NH | Woburn, MA

McLane.com

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-1**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 1; Page 1 of 7 (Substitute); Lines 51-L through 57-L; Net Investment – 2015 (Column 6): It would appear that the amounts reported in this column should be the result of subtracting Retirements (Column 5) from Book Cost (Column 4) instead of adding them as is presently indicated. Therefore, should not the amounts reported for Net Investment – 2015 (Column 6) be as follows:

	<u>Net Investment</u>
Mains	\$2,742,352
Contingency	-
Paving	39,993
Hydrants	59,762
Services	66,219
Valves	<u>6,507</u>
Total	\$2,914,833

Please confirm. If yes, it would appear that this would impact Depreciation Expense – 2015 (Column 8) as well as all other subsequent schedules in Attachment A (Substitute). Please confirm.

RESPONSE:

We agree. The Retirements in Column 5 were added instead of subtracted from Book Cost in Column 4. See Revised Attachment A included with this response.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-2

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment A; Schedule 1; Page 2 of 7 (Substitute); Footnote 8: Should not this footnote read, "The Cost of Removal for 2014 Mains is from Page 4 of the Final Audit Report in DW 15-043 dated 3/19/15. All other Cost of Removal amounts in 2015 – 2018 are based upon 10.00% of the Gross Investment." (Please note emphasis) If no, please explain.

RESPONSE:

We agree and have changed Footnote 8. See Revised Attachment A.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-3**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 2a; Page 3 of 7 (Substitute); Line 15-G; Net Plant Investment – 2015: It would appear that this amount should be derived by subtracting Plant Retirements (Line 14-G) from Gross Plant Investment (Line 12-G) rather than adding it to such. Please confirm. If yes, it would appear that this would also impact all other subsequent schedules in Attachment A (Substitute). Please confirm.

RESPONSE:

We agree. The Plant Retirements should have been subtracted from Gross Plant Investment rather than added. The change has been made in Revised Attachment A. The 2015 Net Plant Investment amount has been revised to \$2,918,465 from the original incorrect amount of \$3,021,352. This change will also flow through to other areas of Schedule A on each of the subsequent Surcharge worksheets.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-4**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 2a; Page 3 of 7 (Substitute); Line 25-G; Net Accumulated Depreciation – 2015: It would appear that this amount should be derived by subtracting Plant Retirements (Line 24-G) from Total Depreciation Expense (Line 22-G) rather than adding it to such. Please confirm. If yes, it would appear that this would also impact all other subsequent schedules in Attachment A (Substitute). Please confirm.

RESPONSE:

We agree. The Plant Retirements should have been subtracted from Total Depreciation Expense rather than added to it. The change has been made in Revised Attachment A. The Net Accumulated Depreciation amount has been revised to \$287,815 from the original incorrect amount of \$179,989. This change will also flow through to other areas of Schedule A on each of the subsequent Surcharge worksheets.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-5

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment A; Schedule 2a; Page 3 of 7 (Substitute); Footnote 4: Staff suggests the following for Footnote 4 in place of what is indicated: "WICA Revenue Requirement approved in DW 15-043 by Commission Order No. 25,784 (4/30/15)." Does the Company concur?

RESPONSE:

We agree with the change and have replaced the previously stated information with that indicated in the Request. See Revised Attachment A; Schedule 2a, Page 3 of 7.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-6**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 2b; Page 4 of 7 (Substitute); Footnote 4: Staff believes that the reference indicated in Footnote 4 should be as follows: "Attachment A; Schedule 2a". (Please note emphasis) Does the Company concur?

RESPONSE:

We agree with the change and have replaced the previously stated information with that indicated in the Request. See Revised Attachment A; Schedule 2b, Page 4 of 7.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-7**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 2c; Page 5 of 7 (Substitute); Footnote 4: Staff believes that the reference indicated in Footnote 4 should be as follows: "Attachment A; Schedule 2b". (Please note emphasis) Does the Company concur?

RESPONSE:

We agree with the change and have replaced the previously stated information with that indicated in the Request. See Revised Attachment A; Schedule 2c, Page 5 of 7.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-8

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment A; Schedule 2d; Page 6 of 7 (Substitute); Line 25-M; Total Depreciation Expense – 2018: It appears that this total amount does not include the depreciation expense on the 2018 Net Plant Investment (Line 24-M). This also appears to be the case regarding Total Depreciation Expense – Total (Line 25-O) as well as Total Annual Depreciation Expense (Line 43-O). Please confirm. If yes, it would appear that this would also impact Attachment A; Schedule 3; Page 7 of 7 (Substitute). Please confirm.

RESPONSE:

We agree. The depreciation expense for each of the items indicated was incorrectly excluded from the totals. This has been adjusted on Revised Attachment A; Schedule 2d; Page 6 of 7, Lines 25-M, 25-O and 43-O, and reflected as well as on Schedule 3; Page 7 of 7. The Annual Revenue Requirement and Cumulative Revenue Requirements for years 2016 through 2019 have been impacted based on previously requested and implemented changes.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-9

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment A; Schedule 3; Page 7 of 7 (Substitute); Lines 4-5; Heading:
Staff suggests the following for lines 4 and 5 of the heading: "FOR APPROVED 2014 and 2015
WICA SURCHARGES, PROPOSED 2016 WICA SURCHARGE and PROJECTED 2017 –
2019 WICA SURCHARGES". (Please note emphases) Does the Company concur?

RESPONSE:

We agree. See Revised Attachment A; Schedule 3; Page 7 of 7 lines 4 and 5.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-10**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment A; Schedule 3; Page 7 of 7 (Substitute); Lines 27 – 38:

- a) Please explain the purpose of this portion of the schedule indicated as, "Per Most Recent Approved Rate Filing DW 15-043".
- b) Please explain how the amounts reported in this portion of the schedule were derived.

RESPONSE:

- a) This data shows the annual and cumulative revenue requirements for the Projected Years 2016 – 2019, as presented in DW 15-043, in comparison to the impact of the changes on the Projected Years 2016 - 2019 amounts in this year's filing.
- b) The amounts reported in this portion of the schedule were taken from the April 17, 2015 Staff Recommendation in DW 15-043.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-11**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment B; Page 3 of 4 (Substitute); Line 93-D; Total LF: It appears that this column totals to 16,350 LF rather than the 12,528 LF that is reported. Please confirm.

RESPONSE:

We agree. The formula used to capture the total LF incorrectly excluded a range of rows. The formula has been corrected and a Revised Attachment B included with this response now indicates 16,350 LF.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-12

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Testimony of Mr. Ware; page 4, lines 12-14:
How many of the WICA services replaced in 2015 were steel?

RESPONSE: Fourteen of the WICA services replaced in 2015 were steel.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-13

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Testimony of Mr. Ware in DW 15-043, page 8, lines 4-5; and in current docket, page 9, lines 7-9:

Only about 1/3 of the 2015 projects proposed in DW 15-043 were associated with municipal projects, whereas all but one of the 2016 projects as currently proposed are so associated. Please comment on any reasons for the increase in municipal project coordination since DW 15-043.

RESPONSE: When DW 15-043 was filed, the planned PWW-City project coordination was only with City/Town sewer and storm water projects. No coordination with City paving projects was anticipated, given the speed at which paving projects occur. The limited time to plan, design, bid and construct a water main replacement project in coordination with paving projects was not considered viable. In 2015, the City, the Gas Company and PWW worked together to coordinate work associated with sewer, storm drain and paving projects that were 12 months out. The key to coordinating with the paving projects was the City's willingness and ability to project actual paving projects for 2016 and their willingness to delay paving on streets where water main would be deferred from the summer/fall of 2016 until the spring of 2017, thus allowing PWW the time to design and construct water main projects in conjunction with City paving projects. Where possible, PWW hopes to be able to coordinate water replacement work with City paving work, provided the City can defer their planned paving work into the second half of their fiscal planning year.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-14**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Testimony of Mr. Ware; page 9, lines 12-19, and page 14, line 20:

- a) Please elaborate on the extent to which SRF funding was sought, or is anticipated, for the 2016 projects.
- b) To what extent do you anticipate funding limitations imposing restrictions on WICA budgets in future years?

RESPONSE:

- a) A total of \$1.4 million in SRF funds is being sought to help fund the 2016 WICA projects. PWW has submitted a financing petition seeking approval of those SRF funds in Docket DW 16-236.
- b) PWW plans to seek a combination of SRF and Bond funding to complete future WICA projects, consistent with past practice. PWW does not anticipate limitations on funding at levels necessary to complete appropriate levels of capital expenditures, inclusive of WICA projects, based on its recent experience.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-15

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment B; Page 1 of 4 (2015 Projects):

Do the respective single entries in the "END OF YEAR 2015 COSTS" column include the costs of:

- a) Both Chestnut Street projects?
- b) All three Lovell Street projects?
- c) All three Manchester Road (Bridge Crossing) listings?
- d) All five Aids Street listings?
- e) Both Howard Street projects?

RESPONSE:

- a) Yes. Please note that both projects are listed under a single work order number on Attachment B, Page 1 of 4.
- b) Yes. Please note that all three projects are listed under a single work order number on Attachment B, Page 1 of 4.
- c) Yes. Please note that all three projects are listed under a single work order number on Attachment B, Page 1 of 4.
- d) Yes. Please note that all five projects are listed under a single work order number on Attachment B, Page 1 of 4.
- e) Yes. Please note that both projects are listed under a single work order number on Attachment B, Page 1 of 4.

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

**Date Request Received: February 17, 2016
Request No. Staff 1-16**

**Date of Response: March 2, 2016
Witness: Donald L. Ware**

REQUEST: Re: Attachment B; Page 1 of 4 (2015 Projects):

Please explain the absence of an entry in the "END OF YEAR 2015 COSTS" column for School Street.

RESPONSE: The School Street project was completed as part of the Foundry Street project. Please note that both projects are listed under a single work order number on Attachment B, Page 1 of 4.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-17

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment B; Page 1 of 4 (2015 Projects):

Please comment on the relatively high cost per foot of the following projects:

- a) Kinsley Street (\$2,195/foot, including estimated 2016 paving cost)
- b) Mulberry Street (\$1,318/foot)
- c) Eldridge Street (\$757/foot)

RESPONSE: All three of the projects listed above were replacements of the sections of each street's water main within the limits of Main Street. Work in Main Street is required to be performed at night (premium rate on labor hours), hours of work were limited (start after 12 AM, midnight, and must be off the street before 5 AM), required the use of two police details for traffic control, involved major shutdowns (due to need to isolate sections of the 24" water main in Main Street), and required the placement of temporary pavement followed by the removal of temporary pavement and addition of permanent pavement (all done at night). The high costs are the result of work restrictions and the application of these costs against a small length of water main. These projects were part of larger competitively bid projects.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-18

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment B; Page 1 of 4 (2015 Projects):

Please elaborate on the outcome of the “Temple Street (Amory to E. Hollis St)” project, in which the cost estimate was initially reduced due to an anticipated cleaning and lining effort (July 14 quarterly update), then increased as a result of “additional work for City of Nashua sewer emergency” (October 15 quarterly update).

RESPONSE: The Temple Street (Amory to E. Hollis St) limits were increased by an expansion of the City sewer project along Temple in the late summer of 2015. An additional 300 lineal feet of pipeline was added to this project along Temple Street from Amory to Commercial Street (See 9/30/2015 quarterly update for this addition) in response to the City's project change. The Temple Street project was completed by cleaning and lining, and resulted in the cleaning and lining of 1,290 LF of water main. The Company's original estimate, for the entire project, cleaned and lined was \$339,700 (\$185,000 for Temple from Amory to E. Hollis and \$154,700 for Temple from Amory to Commercial). For this project, the low bid came in at \$254,252 (based on original scope of cleaning and lining Temple from Amory to E. Hollis) versus PW's estimate of \$185,000. The additional 300 LF of water main cleaning and lining work on Temple (Amory to Commercial) was handled as a change order to the original contract and resulted in the final cumulative price of \$387,045.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-19

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Testimony of Mr. Ware, page 8, lines 1-11:

Please elaborate on the extent to which cleaning and lining or other rehabilitation methods:

- a) Were considered for any of the 2015 projects;
- b) Are under consideration for any of the 2016 projects.

RESPONSE:

- a) Cleaning and lining was considered for every project. Cleaning and lining can only be used where:
 - 1. The condition of the existing pipe is good (limited graphitization of the existing pipe wall).
 - 2. There is no conflict, either existing or projected in the future, with any required rebuild of the sewer or storm drain systems.
 - 3. The existing water main is adequately sized to provide the required domestic and fire flows.
 - 4. The length of water main to be cleaned and lined is sufficiently long to result in a project that produces favorable pricing versus a water main replacement. The Company's experience is that a minimum of at least 500 LF to 750 LF of water main cleaning and lining is necessary to garner a cost savings over replacing a water main.

Based on the considerations noted above, only Temple Street met the criteria to be cleaned and lined.

- b) Based on the criteria detailed above, none of the proposed 2016 WICA projects meets the criteria for cleaning and lining. All the planned 2016 projects are planned as water main replacement projects.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-20

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment B; Page 2 of 4 (2016 Projects); Main Street projects (see also testimony of Mr. Ware, page 10, lines 32-38, and July 14, 2015 quarterly update);

- a) Please comment on the status of Dickerman Street and Orchard Avenue (both were included in the 2015 quarterly updates but neither is included in the proposed 2016 projects).
- b) Please comment on the omission of Montgomery Avenue and Park Avenue from these lists.
- c) It appears some, if not all, of the proposed side street mains will be transferred from an existing 6-inch unlined cast iron main (to be abandoned) to an existing 16-inch ductile iron main. Please provide additional comment on the age and condition of these two mains.

RESPONSE:

- a) The 2015 update included the replacement of the lead into Dickerman Street, and Orchard Avenue off of Main Street, in response to the proposed City paving plan for Main Street. As detailed engineering has begun on the Main Street connections to each side street, it was determined that:
 - 1. The 6" water main on Dickerman Street does not need to be reconnected as it is a high pressure main and, while connected to the 6" water main in Main Street that will be abandoned, it is isolated from the 6" water main via a closed 6" gate valve. There is no need to reconnect Dickerman Street to the 16" water main in Main Street so the existing 6" water main on Dickerman Street will be cut-capped on Dickerman Street and the section of water main from Dickerman on Main Street will be abandoned in place.
 - 2. The 10" water main on Orchard Avenue does not need to be reconnected as it is a high pressure main and, while connected to the 6" water main in Main Street that will be abandoned, it is isolated from the 6" water main via a closed 10" gate valve. There is no need to reconnect Orchard Avenue to the 16" water main in Main Street so the existing 10" water main on Orchard Avenue will be cut-capped on Orchard Avenue and the section of water main from Orchard Avenue on Main Street will be abandoned in place.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

- b) Montgomery Avenue and Park Avenue were not on the 2015 quarterly update associated with the addition of the Main Street project for the following reason:
 - 1. The 6" water main on Montgomery Avenue is currently connected to the 16" on Main Street and is a high pressure main and, while connected to the 16" water main in Main Street, it is isolated from the 16" water main via a closed 6" gate valve. The gate valve in Main Street will remain closed and the existing 6" water main leading into Montgomery Avenue will be cut-capped on Montgomery Avenue as opposed to replacing this section of water main.
 - 4. There is no connection from Main Street to Park Street so there is no water main to replace or abandon.
- c) The 6" unlined cast iron on Main Street was installed between 1887 and 1892 and is heavily tuberculated on the inside of the water main.

The 16" on Main Street in this area is not Ductile iron, it is unlined cast iron pipe that was installed in 1906. The exterior of the 16" water main is lightly corroded. The pipe wall of the existing 16" water main is over 1" thick and the interior of the water main (based on observations made at several locations along the water main where it has been cut into over the past twenty years) has a minimal amount of tuberculation and there is little graphitization of the pipe wall. The size of the pipe will allow bridging of any undercutting of this pipe in future sewer or storm drain replacement projects. The 16" water main in this section of Main Street is an excellent candidate for cleaning and lining at some point in the future. This is the type of water main that will last over 300 years in service.

DW 16-220
PENNICHUCK WATER WORKS, INC.

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 1
Water Infrastructure and Conservation Adjustment**

Date Request Received: February 17, 2016
Request No. Staff 1-21

Date of Response: March 2, 2016
Witness: Donald L. Ware

REQUEST: Re: Attachment B; Page 2 of 4 (2016 Projects):

Please comment on the reason for the relatively high estimated cost per foot (\$885) of the "Gorman Ave (Temple to Hoyts)" project.

RESPONSE: Gorman Avenue is only 8' to 10' wide and will require the use of small excavation equipment. The Street is so narrow that dump trucks cannot travel on this street, which necessitates the movement of excavated materials from, and fill materials into, this street via a small backhoe loader that will have to move all materials to the end of the street where they can be loaded or unloaded. Water main installation on this street will be very slow because of the limitations described above; the result is a high cost per foot. Engineering is investigating other options to replacing this pipe in hopes of identifying a more cost effective solution to replacing the water main in Gorman Avenue.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2																	
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6																	
7																	
8		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)								
9																	
10																	
11		2013 ¹	Actual Investment (DW 13-358)						Depreciation Expense								
12																	
13																	
14			Gross	Cost of													
15			Investment	Removal	Book Cost	Retirement	Net										
16					(2) - (3)		Investment										
17							(4) - (5)										
18																	
19		Mains	\$ 1,563,037	\$ (156,234)	\$ 1,406,803	\$ (14,422)	\$ 1,392,381		1.60%	\$ 22,278							
20		Contingency	-	-	-	-	-		1.60%	-							
21		Paving	28,395	(2,839)	25,556	-	25,556		1.57%	401							
22		Hydrants	59,164	(5,063)	54,101	(2,293)	51,808		2.24%	1,160							
23		Services	241,199	(22,980)	218,219	(6,924)	211,295		2.34%	4,944							
24		Valves	69,084	(6,908)	62,176	(2,174)	60,002		1.60%	960							
25		Total	\$ 1,960,879	\$ (194,024)	\$ 1,766,855	\$ (25,813)	\$ 1,741,042			\$ 29,744							
26																	
27																	
28		2014 ²	Actual Investment (DW 15-043)						Depreciation Expense								
29																	
30																	
31			Gross	Cost of													
32			Investment	Removal ^a	Book Cost	Retirement	Net										
33					(2) - (3)		Investment										
34							(4) - (5)										
35		Mains	\$ 2,744,191	(273,203)	\$ 2,470,988	\$ -	\$ 2,470,988		1.60%	\$ 39,536							
36		Contingency	-	-	-	-	-		1.60%	-							
37		Paving	-	-	-	-	-		1.57%	-							
38		Hydrants	35,249	(3,525)	31,724	(215)	31,509		2.24%	706							
39		Services	82,444	(8,244)	74,200	(1)	74,199		2.34%	1,736							
40		Valves	10,031	(1,003)	9,028	(538)	8,490		1.60%	136							
41		Total	\$ 2,871,915	\$ (285,975)	\$ 2,585,940	\$ (754)	\$ 2,585,186			\$ 42,114							
42																	
43																	
44																	
45		2015 ³	Actual Investment						Depreciation Expense								
46																	
47																	
48			Gross	Cost of													
49			Investment	Removal ^a	Book Cost	Retirement	Net										
50					(2) - (3)		Investment										
51							(4) - (5)										
52		Mains	\$ 3,093,451	\$ (309,345)	\$ 2,784,106	\$ (38,121)	\$ 2,745,985		1.60%	\$ 43,936							
53		Contingency	-	-	-	-	-		1.60%	-							
54		Paving	44,436	(4,444)	39,993	-	39,993		1.57%	628							
55		Hydrants	76,976	(7,698)	69,278	(9,516)	59,762		2.24%	1,339							
56		Services	76,496	(7,650)	68,846	(2,627)	66,219		2.34%	1,550							
57		Valves	10,558	(1,056)	9,502	(2,995)	6,507		1.60%	104							
58		Total	\$ 3,301,917	\$ (330,192)	\$ 2,971,726	\$ (53,259)	\$ 2,918,465			\$ 47,556							
59																	
60																	
61																	
62		2016 ⁴	Projected Investment						Depreciation Expense								
63																	
64																	
65			Gross	Cost of													
66			Investment	Removal ^a	Book Cost	Retirement	Net										
67					(2) - (3)		Investment										
68							(4) - (5)										
69		Mains	\$ 4,188,000	\$ (418,800)	\$ 3,769,200	\$ -	\$ 3,769,200		1.60%	\$ 60,307							
70		Contingency	418,800	(41,880)	376,920	-	376,920		1.60%	6,031							

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	DW 16-220																
2	PENNICHUCK WATER WORKS, INC.																
3	SUMMARY SCHEDULE OF WICA INVESTMENTS																
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015																
5	and PROJECTED CONSTRUCTION YEARS 2016- 2018																
6																	
7																	
8		(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
9																	
70	Paving		292,330		(29,233)		263,097		-		263,097		1.57%		4,131		
71	Hydrants		40,752		(4,075)		36,677		-		36,677		2.24%		822		
72	Services		64,077		(6,408)		57,669		-		57,669		2.34%		1,349		
73	Valves		14,784		(1,478)		13,306		-		13,306		1.60%		213		
74	Total		<u>\$ 5,018,743</u>		<u>\$ (501,874)</u>		<u>\$ 4,516,869</u>		<u>\$ -</u>		<u>\$ 4,516,869</u>				<u>\$ 72,852</u>		
75																	
76																	
77																	
78																	
79	2017 ⁵	Projected Investment										Depreciation Expense					
80																	
81																	
82			Gross		Cost of		Book Cost		Retirement		Net		Depreciation		Depreciation		
83			Investment		Removal⁶		(2) - (3)				Investment		Rate⁷		Expense		
84											(4) - (5)				(6) x (7)		
85	Mains		\$ 4,493,000		\$ (449,300)		\$ 4,043,700		\$ -		\$ 4,043,700		1.60%		\$ 64,699		
86	Contingency		449,300		(44,930)		404,370		-		404,370		1.60%		\$ 6,470		
87	Paving		250,000		(25,000)		225,000		-		225,000		1.57%		\$ 3,533		
88	Hydrants		40,752		(4,075)		36,677		-		36,677		2.24%		\$ 822		
89	Services		64,077		(6,408)		57,669		-		57,669		2.34%		\$ 1,349		
90	Valves		14,784		(1,478)		13,306		-		13,306		1.60%		\$ 213		
91	Total		<u>\$ 5,311,913</u>		<u>\$ (531,191)</u>		<u>\$ 4,780,722</u>		<u>\$ -</u>		<u>\$ 4,780,722</u>				<u>\$ 77,086</u>		
92																	
93																	
94																	
95																	
96	2018 ⁶	Projected Investment										Depreciation Expense					
97																	
98																	
99			Gross		Cost of		Book Cost		Retirement		Net		Depreciation		Depreciation		
100			Investment		Removal⁶		(2) - (3)				Investment		Rate⁷		Expense		
101											(4) - (5)				(6) x (7)		
102	Mains		\$ 5,490,000		\$ (549,000)		\$ 4,941,000		\$ -		\$ 4,941,000		1.60%		\$ 79,056		
103	Contingency		549,000		(54,900)		494,100		-		494,100		1.60%		\$ 7,906		
104	Paving		250,000		(25,000)		225,000		-		225,000		1.57%		\$ 3,533		
105	Hydrants		40,752		(4,075)		36,677		-		36,677		2.24%		\$ 822		
106	Services		64,077		(6,408)		57,669		-		57,669		2.34%		\$ 1,349		
107	Valves		14,784		(1,478)		13,306		-		13,306		1.60%		\$ 213		
108	Total		<u>\$ 6,408,613</u>		<u>\$ (640,861)</u>		<u>\$ 5,767,752</u>		<u>\$ -</u>		<u>\$ 5,767,752</u>				<u>\$ 92,878</u>		
109																	
110	Notes:																
111	¹ Based on PWV's WICA Filing in DW 13-358.																
112	² Based on PWV's WICA Filing in DW 15-043.																
113	³ Based on Attachment B, Page 1 of 4.																
114	⁴ Based on Attachment B, Page 2 of 4.																
115	⁵ Based on Attachment B, Page 3 of 4.																
116	⁶ Based on Attachment B, Page 4 of 4.																
117	⁷ The Depreciation Rates are based on the depreciation study approved in DW 06-073.																
118	⁸ The Cost of Removal for 2014 Mains is from Page 4 of the Final Audit Report in DW 15-043 dated 3/19/15. All other Cost of Removal																
119	amounts in 2015-2018 are based upon 10.00% of the Gross Investment.																

	A	B	C	D	E	F	G	H	I
1	DW 16-110								
2	PENNICHUCK WATER WORKS, INC.								
3	PROJECTED CALCULATION OF 2016 WICA SURCHARGE								
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015								
5									
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	A	B	C	D	E	F	G	H	I	J	K
1	DW 16-220										
2	PENNICHUCK WATER WORKS, INC.										
3	PROJECTED CALCULATION OF 2017 WICA SURCHARGE										
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015										
5	and PROJECTED CONSTRUCTION YEAR 2016										
6											
7											
8											
9											
10											
11	Plant in Service:										
12	Gross Plant Investment (Att A; Sch I; Col (2))	\$	1,960,879	\$	2,871,915	\$	3,301,917	\$	5,018,743	\$	13,153,454
13	Less: Cost of Removal (Att A; Sch I; Col (3))		(194,024)		(285,975)		(330,192)		(501,874)		(1,312,065)
14	Less: Plant Retirements (Att A; Sch I; Col (5))		(25,813)		(754)		(53,259)		-		(79,826)
15	Net Plant Investment		1,741,042		2,585,186		2,918,466		4,516,869		11,761,563
16											
17	Accumulated Depreciation										
18	Depreciation Expense ¹ (Att A; Sch I; Col (8)):										
19	2013 Net Plant Investment		14,872		29,744		29,744		29,744		104,104
20	2014 Net Plant Investment		-		21,057		42,114		42,114		105,284
21	2015 Net Plant Investment		-		-		23,778		47,556		71,334
22	2016 Net Plant Investment		-		-		-		36,426		36,426
23	Total Depreciation Expense		14,872		50,801		95,636		155,840		317,149
24	Less: Cost of Removal (Att A; Sch I; Col (3))		(194,024)		(285,975)		(330,192)		(501,874)		(1,312,065)
25	Less: Plant Retirements (Att A; Sch I; Col (5))		(25,813)		(754)		(53,259)		-		(79,826)
26	Net Accumulated Depreciation		(204,965)		(235,928)		(287,815)		(346,034)		(1,074,743)
27											
28	Net Plant in Service	\$	1,946,007	\$	2,821,114	\$	3,206,281	\$	4,862,903	\$	12,836,306
29	Pre-tax Rate of Return ²								x		6.17%
30	Return on Investment									\$	791,781
31											
32	Property Tax Expense ³	@	\$28.59	per	\$1.000						366,990
33											
34	Annual Depreciation Expense (Att A; Sch I; Col (8)):										
35	2013 Net Plant Investment										29,744
36	2014 Net Plant Investment										42,114
37	2015 Net Plant Investment										47,556
38	2016 Net Plant Investment										72,852
39	Total Annual Depreciation Expense										192,266
40											
41	2017 Cumulative Revenue Requirement									\$	1,351,037
42	Less: 2016 Cumulative Revenue Requirement ⁴										(839,196)
43	2017 Revenue Requirement									\$	511,841
44											
45	Water Revenues per DW 13-130 ⁵									\$	27,689,214
46											
47											
48	2017 Revenue Surcharge %										1.85%
49	2017 Cumulative Revenue Surcharge %										4.88%
50											
51											
52	Customer Impact										
53	5/8 Inch Meter Monthly Charge									\$	20.34
54	Volumetric Charge									\$	3.30
55	Average Single Family Residential Usage (CCF)										7.88
56	Average Monthly Usage Charge									\$	26.00
57	Total Average Monthly Charge									\$	46.34
58											
59	Average Monthly \$ Impact per Customer of 2017 Surcharge									\$	0.86
60	Average Monthly \$ Impact per Customer of 2017 Cumulative Surcharge									\$	2.26
61											
62	Notes:										
63	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation										
64	expense is recorded in the first and last year of an asset's service life.										
65	² Calculation of Pre-Tax Rate of Return (Based on PWV's Rate Filing in DW 13-130)										
66											
67	Debt		Weighted Cost		Tax Multiplier		Pre Tax Cost				
68	Equity		5.59%		1.000		5.59%				
69			0.35%		1.656		0.58%				
70			5.94%				6.17%				
71	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.										
72	⁴ Attachment A; Schedule 2a										
73	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).										

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	DW 16-220												
2	PENNICKUCK WATER WORKS, INC.												
3	PROJECTED CALCULATION OF 2018 WICA SURCHARGE												
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015												
5	and PROJECTED CONSTRUCTION YEARS 2016 - 2017												
6													
7													
8													
9													
10													
11	Plant Investment:												
12	Gross Plant Investment (Att A, Sch 1, Col (2))	\$ 1,960,879	\$ 2,871,915	\$ 3,301,917	\$ 5,018,743	\$ 5,311,913	\$ 18,465,367						
13	Less: Cost of Removal (Att A, Sch 1, Col (3))	(194,024)	(285,975)	(330,192)	(501,874)	(531,191)	(1,843,257)						
14	Less: Plant Retirements (Att A, Sch 1, Col (5))	(25,813)	(754)	(53,259)	-	-	(79,826)						
15	Net Plant Investment	1,741,042	2,585,186	2,918,466	4,516,869	4,780,722	16,542,284						
16													
17	Accumulated Depreciation:												
18	Depreciation Expense ¹ (Att A, Sch 1, Col (8)):												
19	2013 Net Plant Investment	14,872	29,744	29,744	29,744	29,744	133,849						
20	2014 Net Plant Investment	-	21,057	42,114	42,114	42,114	147,398						
21	2015 Net Plant Investment	-	-	21,778	47,556	47,556	118,890						
22	2016 Net Plant Investment	-	-	-	36,426	72,852	109,279						
23	2017 Net Plant Investment	-	-	-	-	38,543	38,543						
24	Total Depreciation Expense	14,872	50,801	95,636	155,840	230,809	547,958						
25	Less: Cost of Removal (Att A, Sch 1, Col (3))	(194,024)	(285,975)	(330,192)	(501,874)	(531,191)	(1,843,257)						
26	Less: Plant Retirements (Att A, Sch 1, Col (5))	(25,813)	(754)	(53,259)	-	-	(79,826)						
27	Net Accumulated Depreciation	(204,965)	(235,928)	(287,615)	(346,034)	(300,382)	(1,375,125)						
28													
29	Net Plant in Service	\$ 1,946,007	\$ 2,821,114	\$ 3,206,281	\$ 4,862,903	\$ 5,081,104	\$ 17,917,410						
30	Pre-tax Rate of Return ²						6.17%						
31	Return on Investment						\$ 1,105,198						
32													
33	Property Tax Expense ³		\$28.59 per \$1,000				512,259						
34													
35	Annual Depreciation Expense (Att A, Sch 1, Col (8)):												
36	2013 Net Plant Investment						29,744						
37	2014 Net Plant Investment						42,114						
38	2015 Net Plant Investment						47,556						
39	2016 Net Plant Investment						72,852						
40	2017 Net Plant Investment						77,086						
41	Total Annual Depreciation Expense						269,352						
42													
43	2018 Cumulative Revenue Requirement						\$ 1,886,808						
44	Less: 2017 Cumulative Revenue Requirement ⁴						(1,351,037)						
45	2018 Revenue Requirement						\$ 535,772						
46													
47	Water Revenues per DW 13-130 ⁵						\$ 27,689,214						
48													
49													
50	2018 Revenue Surcharge %						1.93%						
51	2018 Cumulative Revenue Surcharge %						6.81%						
52													
53													
54	Customer Impact:												
55	5/8 Inch Meter Monthly Charge						\$ 20.14						
56	Volumetric Charge						\$ 3.30						
57	Average Single Family Residential Usage (CCF)						7.88						
58	Average Monthly Usage Charge						\$ 26.00						
59	Total Average Monthly Charge						\$ 46.34						
60													
61	Average Monthly \$ Impact per Customer of 2018 Surcharge						\$ 0.90						
62	Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge						\$ 3.16						
63													
64	Notes:												
65	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation												
66	expense is recorded in the first and last year of an asset's service life.												
67	² Calculation of Pre-Tax Rate of Return (Based on PWV's Rate Filing in DW 13-130)												
68		Weighted Cost	1ax Multiplier	Pre Tax Cost									
69	Debt	5.59%	1.000	5.59%									
70	Equity	0.35%	1.656	0.58%									
71		5.94%		6.17%									
72	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.												
73	⁴ Attachment A, Schedule 2b												
74	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).												

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
1	DW 16-220															
2	PENNICHUCK WATER WORKS, INC.															
3	PROJECTED CALCULATION OF 2019 WICA SURCHARGE															
4	FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015															
5	and PROJECTED CONSTRUCTION YEARS 2016 - 2018															
6																
7																
8																
9																
10																
11	Plant Investment:															
12	Gross Plant Investment (Att A; Sch 1; Col (2))	\$	1,960,879	\$	2,871,915	\$	3,301,917	\$	5,018,743	\$	5,311,913	\$	6,408,613	\$	24,873,980	
13	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(330,192)		(501,874)		(531,191)		(640,861)		(2,484,118)	
14	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		(53,259)		-		-		-		(79,826)	
15	Net Plant Investment		1,741,042		2,585,186		2,918,466		4,516,869		4,780,722		5,767,752		22,310,036	
16																
17	Accumulated Depreciation:															
18	Depreciation Expense ¹ (Att A; Sch 1; Col (8)):															
19	2013 Net Plant Investment		14,872		29,744		29,744		29,744		29,744		29,744		163,593	
20	2014 Net Plant Investment		-		21,057		42,114		42,114		42,114		42,114		189,512	
21	2015 Net Plant Investment		-		-		23,778		47,556		47,556		47,556		166,446	
22	2016 Net Plant Investment		-		-		-		36,426		72,852		72,852		182,131	
23	2017 Net Plant Investment		-		-		-		-		38,543		77,086		115,628	
24	2018 Net Plant Investment		-		-		-		-		-		46,439		46,439	
25	Total Depreciation Expense		14,872		50,801		95,636		155,840		230,809		315,791		863,749	
26	Less: Cost of Removal (Att A; Sch 1; Col (3))		(194,024)		(285,975)		(330,192)		(501,874)		(531,191)		(640,861)		(2,484,118)	
27	Less: Plant Retirements (Att A; Sch 1; Col (5))		(25,813)		(754)		(53,259)		-		-		-		(79,826)	
28	Net Accumulated Depreciation		(204,965)		(235,928)		(287,815)		(346,034)		(300,382)		(325,071)		(1,700,196)	
29																
30	Net Plant in Service	\$	1,946,007	\$	2,821,114	\$	3,206,281	\$	4,862,903	\$	5,081,104	\$	6,092,822	\$	24,010,232	
31	Pre-tax Rate of Return ²													x	6.17%	
32	Return on Investment														\$ 1,481,021	
33																
34	Property Tax Expense ³	@	\$28.59 per \$1,000													686,453
35																
36	Annual Depreciation Expense (Att A; Sch 1; Col (8)):															
37	2013 Net Plant Investment														29,744	
38	2014 Net Plant Investment														42,114	
39	2015 Net Plant Investment														47,556	
40	2016 Net Plant Investment														72,852	
41	2017 Net Plant Investment														77,086	
42	2018 Net Plant Investment														92,878	
43	Total Annual Depreciation Expense														362,230	
44																
45	2018 Cumulative Revenue Requirement														\$ 2,529,703	
46	Less: 2017 Cumulative Revenue Requirement ⁴														(1,886,808)	
47	2018 Revenue Requirement														\$ 642,895	
48																
49	Water Revenues per DW 13-130 ⁵														\$ 27,689,214	
50																
51																
52	2018 Revenue Surcharge %														2.32%	
53	2018 Cumulative Revenue Surcharge %														9.14%	
54																
55																
56	Customer Impact:															
57	5/8 Inch Meter Monthly Charge														\$ 20.34	
58	Volumetric Charge														\$ 3.30	
59	Average Single Family Residential Usage (CCF)														7.88	
60	Average Monthly Usage Charge														\$ 26.00	
61	Total Average Monthly Charge														\$ 46.34	
62																
63	Average Monthly \$ Impact per Customer of 2018 Surcharge														\$ 1.08	
64	Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge														\$ 4.23	
65																
66	Notes:															
67	¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation															
68	expense is recorded in the first and last year of an asset's service life.															
69	² Calculation of Pre-Tax Rate of Return (Based on PWW's Rate Filing in DW 13-130)															
70			Weighted Cost		Tax Multiplier		Pre Tax Cost									
71	Debt		5.59%		1.000		5.59%									
72	Equity		0.35%		1.656		0.58%									
73			5.94%				6.17%									
74	³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.															
75	⁴ Attachment A, Schedule 2c															
76	⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).															

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	DW 16-220												
2	PENNICHUCK WATER WORKS, INC.												
3	SUMMARY OF WICA SURCHARGE CALCULATIONS												
4	FOR APPROVED 2014 and 2015 WICA SURCHARGES, PROPOSED 2016 WICA SURCHARGE												
5	and PROJECTED 2017 - 2019 WICA SURCHARGES												
6													
7													
8			Actual		Actual						Projected		
9													
10			2014		2015		2016		2017		2018		2019
11													
12	SUMMARY OF CALCULATIONS (Att A; Sch's 2):												
13													
14	Annual Revenue Requirement		\$ 181,151		\$ 319,047		\$ 338,998		\$ 511,841		\$ 535,772		\$ 642,895
15	Cumulative Revenue Requirement		\$ 181,151		\$ 500,198		\$ 839,196		\$ 1,351,037		\$ 1,886,808		\$ 2,529,703
16													
17													
18	Annual Revenue Surcharge %		0.67%		1.15%		1.22%		1.85%		1.93%		2.32%
19	Cumulative Revenue Surcharge %		0.67%		1.81%		3.03%		4.88%		6.81%		9.14%
20													
21													
22	Annual Average Monthly \$ Impact per Customer		\$ 0.31		\$ 0.53		\$ 0.57		\$ 0.86		\$ 0.90		\$ 1.08
23	Cumulative Average Monthly \$ Impact per Customer		\$ 0.31		\$ 0.84		\$ 1.40		\$ 2.26		\$ 3.16		\$ 4.23
24													
25													
26													
27	PER MOST RECENT APPROVED RATE FILING DW15-043												
28													
29	Annual Revenue Requirement		\$ 181,151		\$ 319,047		\$ 529,073		\$ 543,192		\$ 444,906		
30	Cumulative Revenue Requirement		\$ 181,151		\$ 500,198		\$ 1,029,270		\$ 1,572,463		\$ 2,017,369		
31													
32													
33	Annual Revenue Surcharge %		0.67%		1.15%		1.91%		1.96%		1.61%		
34	Cumulative Revenue Surcharge %		0.67%		1.81%		3.72%		5.68%		7.29%		
35													
36													
37	Annual Average Monthly \$ Impact per Customer		\$ 0.31		\$ 0.53		\$ 0.89		\$ 0.91		\$ 0.74		
38	Cumulative Average Monthly \$ Impact per Customer		\$ 0.31		\$ 0.84		\$ 1.72		\$ 2.63		\$ 3.38		

Pennichuck Water Works, Inc. 2015 WPCA Water Main Projects - Final Status 1/11/2016											Revised Attachment B Page 1 of 4										
PIPE SEGMENT OR PROJECT NAME	CITY/TOWN	WORK ORDER #	MATERIAL	Original WPCA Est. Length (Feet)	Revised Length as of 3/30/2015 (Feet)	Estimated Length as of 6/30/2015 (Feet)	Estimated Length as of 9/30/2015 (Feet)	Estimated Length as of 12/31/2015 (Feet)	EXISTING PIPE DIAMETER (Inches)	PROPOSED NEW PIPE DIAMETER (Inches)	ORIGINAL WPCA PAVING ESTIMATED COST	ESTIMATED COST AS OF 3/31/2015	ESTIMATED COST AS OF 6/30/2015	ESTIMATED COST AS OF 9/30/2015	END OF YEAR 2015 COSTS (only coded for same projects)	ANTICIPATED FINAL PAVING COST IN 2016 FOR 2015 USED AND UNPAID PROJECTS	AGE OF PIPE	PIPE AGE USABLE LIFE	FULLY DEPRICED	EXPLANATION	
Chesnut Street (Lake to Lovell)	NASHUA	1502509	CAST IRON UNLINED	715	715	715	715	706	8	12	\$ 114,000	\$ 114,000	\$ 114,000	\$ 287,175	\$ 216,417	\$51,000	1919-1924	70	YES	Completed, Final Paving in 2016 - est. \$58,000.00	
Chesnut Street (Lovell to Elm)	NASHUA	1502509	CAST IRON UNLINED	263	263	263	263	267	8	12	\$ 105,000	\$ 105,000	\$ 105,000	\$ 136,300	\$ 130,000	\$20,000	1919-1923	70	YES	Completed, Final Paving in 2016 - est. \$50,000.00	
Lovell Street (Chesnut to Ash)	NASHUA	1502510	CAST IRON UNLINED	430	430	430	430	400	6	12	\$ 185,000	\$ 185,000	\$ 185,000	\$ 141,310	\$ 193,776	\$ 131,000	1897-1910	70	YES	Completed, Final Paving in 2016 - est. \$11,000.00	
Lovell Street (Ash to Pine)	NASHUA	1502510	CAST IRON UNLINED	750	750	750	750	814	4	8	\$ 288,000	\$ 288,000	\$ 288,000	\$ 187,500	\$ 262,000	\$ 124,000	1924-1934	40	YES	Completed, Final Paving in 2016 - est. \$62,000.00	
Lovell Street (Exterior of Chesnut to end)	NASHUA	1502510	CAST IRON UNLINED	187	187	187	187	303	1 1/4	4	\$ 48,000	\$ 48,000	\$ 48,000	\$ 77,000	\$ 29,000	\$ 19,000	1953	40	YES	Completed, Final Paving in 2016 - est. \$23,000.00	
Ash Street (Lovell to Elm)	NASHUA	1502514	CAST IRON UNLINED	190	190	190	190	342	4 & 1 1/2	4	\$ 62,000	\$ 62,000	\$ 62,000	\$ 96,600	\$ 61,396	\$ 77,000	1921	40	YES	Due to conflict with gas and sewer water was changed from PVC to DAP 8" due cost of small diameter - rain was more than anticipated - Completed, Final Paving in 2016 - est. \$27,000.00	
Rochester Avenue (Chesnut to exterior)	NASHUA	1502516	CEMENT LINED STEEL	183	183	183	183	175	2	4	\$ 46,000	\$ 46,000	\$ 46,000	\$ 61,000	\$ 30,719	\$ 11,500	1952-1916	40	YES	Completed, Final Paving in 2016 - est. \$13,500.00	
Marquis Avenue (Lovell to exterior)	NASHUA	1502517	CEMENT LINED STEEL	125	125	125	125	138	1 1/2	4	\$ 79,000	\$ 79,000	\$ 79,000	\$ 10,000	\$ 19,177	\$ 10,000	1943	40	YES	Completed, Final Paving in 2016 - est. \$10,000.00	
Marquis Avenue (Ash to exterior)	NASHUA	1500114	CAST IRON UNLINED	460	460	460	460	572	6	12	\$ 229,000	\$ 229,000	\$ 229,000	\$ 229,000	\$ 175,117	\$ 188,000	70	YES	Complete		
Foundry Street	AMHERST	1500270	TRANSITE	1,465	1,465	1,465	1,465	1,199	8	8	\$ 209,000	\$ 209,000	\$ 209,000	\$ 209,000	\$ 213,777	\$ 200,000	1910-1924	40	YES	Complete	
School Street	AMHERST	1500270	TRANSITE	240	240	240	240	280	4	6	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	1950	40	YES	Complete	
Manchester Road (Bridge Crossing)	AMHERST	1501462	TRANSITE	300	300	300	300	446	6	12	\$ 176,000	\$ 176,000	\$ 176,000	\$ 300,000	\$ 317,940	\$ 300,000	1950	40	YES	Complete	
Manchester Road (Bridge Crossing)	AMHERST	1501462	TRANSITE	185	185	185	185	185	6	10	\$ 88,000	\$ 88,000	\$ 88,000	\$ 88,000	\$ 88,000	\$ 88,000	1950	40	YES	Complete	
Manchester Road (Bridge Crossing)	AMHERST	1501462	TRANSITE	88	88	88	88	88	6	8	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	1950	40	YES	Complete	
Marble Street	NASHUA	1500270	TRANSITE	427	427	427	427	427	8	8	\$ 148,000	\$ 148,000	\$ 148,000	\$ 148,000	\$ 148,000	\$ 148,000	1927	40	YES	Deferred until 2018 by PWW	
Brook Street (Ash to Elm)	NASHUA	1500270	TRANSITE	1,141	1,141	1,141	1,141	1,141	8	8	\$ 187,000	\$ 187,000	\$ 187,000	\$ 187,000	\$ 187,000	\$ 187,000	1927	40	YES	Deferred until 2018 by PWW	
Hampton Street (Lake to Brook)	NASHUA	1500270	TRANSITE	411	411	411	411	411	8	8	\$ 130,000	\$ 130,000	\$ 130,000	\$ 130,000	\$ 130,000	\$ 130,000	1910-1941	70	YES	Deferred until 2018 by PWW	
Burket Street (Lake to Brook)	NASHUA	1500270	TRANSITE	434	434	434	434	434	8	8	\$ 155,000	\$ 155,000	\$ 155,000	\$ 155,000	\$ 155,000	\$ 155,000	1897-1921	70	YES	Deferred until 2018 by PWW	
Burket Street (Brook to exterior)	NASHUA	1500270	TRANSITE	183	183	183	183	183	4	4	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	\$ 43,000	1941	40	YES	Deferred until 2018 by PWW	
Ash Street (Lake to Lovell)	NASHUA	1500270	TRANSITE	517	517	517	517	517	8	8	\$ 166,000	\$ 166,000	\$ 166,000	\$ 166,000	\$ 166,000	\$ 166,000	1922	70	YES	Deferred until 2018 by PWW	
Lake Street (Pine St. to exterior)	NASHUA	1500270	TRANSITE	154	154	154	154	154	8	12	\$ 113,000	\$ 113,000	\$ 113,000	\$ 113,000	\$ 113,000	\$ 113,000	1908	70	YES	Deferred until 2018 by PWW	
Madison Street	NASHUA	1500275	TRANSITE	50	50	50	50	50	4	4	\$ 44,500	\$ 44,500	\$ 44,500	\$ 44,500	\$ 44,500	\$ 44,500	1912	70	YES	Complete	
Main Street	NASHUA	1500276	TRANSITE	627	627	627	627	627	4	4	\$ 102,000	\$ 102,000	\$ 102,000	\$ 102,000	\$ 102,000	\$ 102,000	1952-1957	40	YES	Complete	
Essex Street	NASHUA	1500389	TRANSITE	60	60	60	60	60	6	6	\$ 32,000	\$ 32,000	\$ 32,000	\$ 32,000	\$ 32,000	\$ 32,000	1952-1957	40	YES	Complete	
Temple Street (Armory to E. Main St.)	NASHUA	1502508	CAST IRON UNLINED	1,010	1,010	985	985	985	10	10	\$ 278,100	\$ 278,100	\$ 278,100	\$ 278,100	\$ 278,100	\$ 278,100	1908	70	YES	Complete	
Temple Street (Armory to Commercial St.)	NASHUA	1502508	CAST IRON UNLINED	300	300	300	300	300	8	8	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	1908	70	YES	Complete	
Farmington Street	NASHUA	1500445	CAST IRON UNLINED	215	215	215	215	211	6	4	\$ 57,000	\$ 57,000	\$ 57,000	\$ 57,000	\$ 57,000	\$ 57,000	1917	70	YES	Complete	
Ash Street (Main to Harbor, parallel 16" CI)	NASHUA	1501836	TRANSITE	1,722	1,722	1,722	1,722	1,722	12	12	\$ 123,000	\$ 123,000	\$ 123,000	\$ 123,000	\$ 123,000	\$ 123,000	1911	70	YES	Complete	
Ash Street (Main to Harbor, exclusive of bridge crossing)	NASHUA	1501836	TRANSITE	963	963	963	963	963	12	12	\$ 124,000	\$ 124,000	\$ 124,000	\$ 124,000	\$ 124,000	\$ 124,000	1961	85	NO	Complete	
Ash Street (Main to Harbor, exclusive of bridge crossing)	NASHUA	1501836	TRANSITE	59	59	59	59	59	12	12	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	1961	85	NO	Complete	
Ash Street - Salmon Brook Crossing	NASHUA	1501836	TRANSITE	760	760	760	760	760	12	20	\$ 425,000	\$ 425,000	\$ 425,000	\$ 425,000	\$ 425,000	\$ 425,000	1961	85	NO	20" HDPE - Complete	
Ash Street - Salmon Brook Crossing	NASHUA	1501836	TRANSITE	51	51	51	51	51	12	12	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	1961	85	NO	16" DIPS - Complete	
Kinsley Street	NASHUA	1502468	CAST IRON UNLINED	42	42	42	42	42	8	12	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	1912	70	YES	Completed, Final Paving in 2016 - est. \$20,000.00	
Howard Avenue (Emergency)	NASHUA	1500468	CAST IRON UNLINED	45	45	45	45	45	4	4	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	1912	70	YES	Completed, Final Paving in 2016 - est. \$15,000.00	
Howard Avenue (Emergency)	NASHUA	1500468	CAST IRON UNLINED	110	110	110	110	110	1 1/2	2	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	1968	70	YES	Completed, Final Paving in 2016 - est. \$19,000.00	
Columbiana	NASHUA	1500468	POLYBUTYLENE	700	700	700	700	700	2	4	\$ 274,000	\$ 274,000	\$ 274,000	\$ 274,000	\$ 274,000	\$ 274,000	1968	80	NO	Owner paved all streets - project - deferred 8+ years	
Ash Street at Main St	NASHUA	1501836	CEMENT LINED STEEL	44	44	44	44	44	2	4	\$ 105,000	\$ 105,000	\$ 105,000	\$ 105,000	\$ 105,000	\$ 105,000	70	YES	City delayed to 2016		
Pine St at Main St	NASHUA	1501836	CAST IRON UNLINED	44	44	44	44	44	6	6	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	70	YES	City delayed to 2016		
Pine St at Main St	NASHUA	1501836	CAST IRON UNLINED	44	44	44	44	44	6	6	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	70	YES	City delayed to 2016		
Pine St at Main St	NASHUA	1501836	CAST IRON UNLINED	36	36	36	36	36	12	12	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 80,000	70	YES	City delayed to 2016		
Pine St at Main St	NASHUA	1501836	CAST IRON UNLINED	34	34	34	34	34	6	6	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	70	YES	City delayed to 2016		
Forest Ave at Main St	NASHUA	1501836	CAST IRON UNLINED	36	36	36	36	36	6	6	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	70	YES	City delayed to 2016		
Waters St at Main St	NASHUA	1501836	CAST IRON UNLINED	38	38	38	38	38	6	6	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	70	YES	City delayed to 2016		
Forest St at Main St	NASHUA	1501836	CAST IRON UNLINED	15	15	15	15	15	6	6	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	70	YES	City delayed to 2016		
Buchanan St at Main St	NASHUA	1501836	CAST IRON UNLINED	15	15	15	15	15	6	6	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	70	YES	City delayed to 2016		
Lincoln St at Main St	NASHUA	1501836	CAST IRON UNLINED	15	15	15	15	15	6	6	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	70	YES	City delayed to 2016		
Russell Ave at Main St	NASHUA	1501836	CAST IRON UNLINED	15	15	15	15	15	6	6	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	70	YES	City delayed to 2016		
Taylor St at Main St	NASHUA	1501836	CAST IRON UNLINED	15	15	15	15	15	6	6	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,						

2016-2018 Project Aims II

Pennichuck Water Works, Inc.
Proposed 2017 WPCA Water Main Projects
1/11/2016

Revised Attachment B
Page 3 of 4

LINE	PIPE SEGMENT OR PROJECT NAME	CITY/TOWN	NATIONAL	LENGTH (FEET)	PIPE DIAMETER (INCHES)	PROPOSED NEW PIPE DIAMETER (INCHES)	ESTIMATED COST	AGE OF PIPE	PIPE AGE LAST 15 YRS	VALVE GROUPS	BURIAL METHOD	VALVE CUSTOMER	WATER QUALITY	PIPE PROTECTION (INCHES)	WORK COORDINATION WITH GAS, SEWER OR POWER DRAIN REPAIRS	Subtotal prior to Geographical Area Points	Geographical Points	TOTAL	Funding Source	Included in 2015 WPCA projects filed in January 2015
104	Bridge St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	1300	8	12	151,000	125,000	70	YES				2	P & G	11	1	12	Yes	
105	South St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	525	8	8	38,000	1242	70	YES				2	P & G	10	1	11	Yes	
106	E St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	308	4	5	118,000	1000	70	YES				2	P & G	10	1	11	Yes	
107	E St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	275	8	12	128,000	1000	70	YES				2	P & G	11	1	12	Yes	
108	South St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	485	8	12	143,000	1000	70	YES				2	P & G	10	1	11	Yes	
109	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	415	8	8	118,000	1000	70	YES				2	P & G	8	1	9	Yes	
110	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	330	8	12	75,000	1000-1000	70	YES				2	P & G	11	1	12	Yes	
111	South St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	1151	8	8	158,000	1007-1020	70	YES				2	P & G	11	1	12	Yes	
112	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	515	6 & 4	12	175,000	1007	70	YES				2	P & G	11	1	12	Yes	
113	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	154	8	12	51,000	1000	70	YES				2	P & G	11	1	12	Yes	
114	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	470	8	8	218,000	1012-1012	70	YES				2	P & G	11	1	12	Yes	
115	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	285	8	8	102,000	1006-1005	70	YES				2	P & G	11	1	12	Yes	
116	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	411	8	8	111,000	1008-1001	70	YES				2	P & G	11	1	12	Yes	
117	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	434	8	8	117,000	1007-1001	70	YES				2	P & G	11	1	12	Yes	
118	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	182	8	8	107,000	1001	70	YES				2	P & G	11	1	12	Yes	
119	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	517	8	8	130,000	1002	70	YES				2	P & G	11	1	12	Yes	
120	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	340	8	8	125,000	1000	70	YES				2	P & G	11	1	12	Yes	
121	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	380	6 & 4	8	270,000	1006-1000	70	YES				2	P & G	11	1	12	Yes	
122	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	195	8	8	34,000	1000	70	YES				2	P & G	11	1	12	Yes	
123	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	438	8	8	177,000	1000	70	YES				2	P & G	11	1	12	Yes	
124	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	500	8	8	174,000	1000	70	YES				2	P & G	11	1	12	Yes	
125	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	373	8	8	123,000	1000-1001	70	YES				2	P & G	11	1	12	Yes	
126	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	350	8	8	127,000	1000-1001	70	YES				2	P & G	11	1	12	Yes	
127	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	364	8	8	17,000	1000	70	YES				2	P & G	11	1	12	Yes	
128	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	1470	6 & 4	12	140,000	1000-1000	70	YES				2	P & G	11	1	12	Yes	
129	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	430	6 & 4	8	174,000	1000-1001	70	YES				2	P & G	11	1	12	Yes	
130	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	1177	6 & 4	8	108,000	1007	70	YES				2	P & G	11	1	12	Yes	
131	Chase St (Bridge to E St)	MAJIMA	CAST IRON UNLINED	350	8	8	100,000	1000	70	YES				2	P & G	11	1	12	Yes	
132				Total LF -	56,400		Total -	4,083,000												
133							Funding from 2015 projects -	130,000												
134							Values Replacement -	7	0	1	2,112	-	0	0	0	0	0	0	0	0
135							Sewer Replacement -	11	0	1	3,057	-	0	0	0	0	0	0	0	0
136							Hydram Replacement -	9	0	1	4,526	-	0	0	0	0	0	0	0	0
137							Planning Contingency -	0	0	0	0	-	0	0	0	0	0	0	0	0
138							Total Estimated WPCA \$0 in 2017 -	0	0	0	0	-	0	0	0	0	0	0	0	0

2014-2015 Projeção Anual do IB

**MCLANE
MIDDLETON**

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March 18, 2016

VIA ELECTRONIC MAIL

Rorie E. Patterson, Esq.
Staff Attorney
New Hampshire Public Utilities Commission
21 South Fruit Street
Concord, NH 03301-2429

**Re: DW 16-220; Pennichuck Water Works, Inc. Water Infrastructure Conservation
Adjustment – Response to Staff's Second Set of Data Requests**

Dear Attorney Patterson:

In connection with the above-referenced matter, I enclose Pennichuck Water Works, Inc.'s responses to Staff's Second Set of Data Requests.

Please call me with any questions or concerns.

Sincerely,


Thomas B. Getz

TBG:rs3

Enclosures

cc: Discovery List

**DW 16-220
PENNICHUCK WATER WORKS, INC.**

**Pennichuck Water Works' Responses to
Staff Data Requests – Set 2
Water Infrastructure and Conservation Adjustment**

**Date Request Received: March 11, 2016
Request No. Staff 2-1**

**Date of Response: March 18, 2015
Witness: Donald L. Ware**

Staff 2-1

**Re: Revised Attachment B; Page 1 of 4; Line 60P and Staff Audit Report Dated 03/09/16;
Page13:** The Staff Audit Report indicates that 'Paving for 2014 Projects' included in the WICA investment for 2015 has been adjusted to an amount of \$39,808. However, the Company's Revised Attachment B, provided in response to Staff's first round of discovery, still indicates this amount as \$44,436; a difference of \$4,628. This amount is also reflected in the Company's Revised Attachment A. Should not this amount be revised to \$39,808 as indicated in the Staff Audit Report? If yes, please provide updated Attachments A and B to reflect this change. If no, please explain.

RESPONSE:

We agree with the recommendation in the Staff Audit Report indicating that 'Paving for 2014 Projects' included in the WICA investment for 2015 should be adjusted to an amount of \$39,808. We attached revised Attachments A and B to reflect this change. There was no impact on the customer surcharge in any of the years as a result of this change.

DW 16-220 PENNICHUCK WATER WORKS, INC. SUMMARY SCHEDULE OF WICA INVESTMENTS FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015 and PROJECTED CONSTRUCTION YEARS 2016 - 2018							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2013 ¹							
Actual Investment (DW 13-358)					Depreciation Expense		
	Gross Investment	Cost of Removal	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
Mains	\$ 1,563,037	\$ (156,234)	\$ 1,406,803	\$ (14,422)	\$ 1,392,381	1.60%	\$ 22,278
Contingency	-	-	-	-	-	1.60%	-
Paving	28,395	(2,839)	25,556	-	25,556	1.57%	401
Hydrants	59,164	(5,063)	54,101	(2,293)	51,808	2.24%	1,160
Services	241,199	(22,980)	218,219	(6,924)	211,295	2.34%	4,944
Valves	69,084	(6,908)	62,176	(2,174)	60,002	1.60%	960
Total	\$ 1,960,879	\$ (194,024)	\$ 1,766,855	\$ (25,813)	\$ 1,741,042		\$ 29,744
2014 ²							
Actual Investment (DW 15-043)					Depreciation Expense		
	Gross Investment	Cost of Removal ⁸	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
Mains	\$ 2,744,191	(273,203)	\$ 2,470,988	\$ -	\$ 2,470,988	1.60%	\$ 39,536
Contingency	-	-	-	-	-	1.60%	-
Paving	-	-	-	-	-	1.57%	-
Hydrants	35,249	(3,525)	31,724	(215)	31,509	2.24%	706
Services	82,444	(8,244)	74,200	(1)	74,199	2.34%	1,736
Valves	10,031	(1,003)	9,028	(538)	8,490	1.60%	136
Total	\$ 2,871,915	\$ (285,975)	\$ 2,585,940	\$ (754)	\$ 2,585,186		\$ 42,114
2015 ³							
Actual Investment					Depreciation Expense		
	Gross Investment	Cost of Removal ⁸	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
Mains	\$ 3,093,451	\$ (309,345)	\$ 2,784,106	\$ (38,121)	\$ 2,745,985	1.60%	\$ 43,936
Contingency	-	-	-	-	-	1.60%	-
Paving	39,808	(3,981)	\$ 35,827	-	35,827	1.57%	\$ 562
Hydrants	76,976	(7,698)	\$ 69,278	(9,516)	59,762	2.24%	\$ 1,339
Services	76,496	(7,650)	\$ 68,846	(2,627)	66,219	2.34%	\$ 1,550
Valves	10,558	(1,056)	\$ 9,502	(2,995)	6,507	1.60%	\$ 104
Total	\$ 3,297,289	\$ (329,729)	\$ 2,967,560	\$ (53,259)	\$ 2,914,300		\$ 47,491
2016 ⁴							
Projected Investment					Depreciation Expense		
	Gross Investment	Cost of Removal ⁸	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
Mains	\$ 4,188,000	\$ (418,800)	\$ 3,769,200	\$ -	\$ 3,769,200	1.60%	\$ 60,307
Contingency	418,800	(41,880)	376,920	-	376,920	1.60%	6,031

DW 16-220
PENNICHUCK WATER WORKS, INC.
SUMMARY SCHEDULE OF WICA INVESTMENTS
FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015
and PROJECTED CONSTRUCTION YEARS 2016- 2018

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
70	Paving	292,330	(29,233)	263,097	-	263,097	1.57%	4,131
71	Hydrants	40,752	(4,075)	36,677	-	36,677	2.24%	822
72	Services	64,077	(6,408)	57,669	-	57,669	2.34%	1,349
73	Valves	14,784	(1,478)	13,306	-	13,306	1.60%	213
74	Total	<u>\$ 5,018,743</u>	<u>\$ (501,874)</u>	<u>\$ 4,516,869</u>	<u>\$ -</u>	<u>\$ 4,516,869</u>		<u>\$ 72,852</u>

2017 ⁵ Projected Investment						Depreciation Expense	
	Gross Investment	Cost of Removal ⁸	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
85	Mains	\$ 4,493,000	\$ (449,300)	\$ 4,043,700	\$ -	1.60%	\$ 64,699
86	Contingency	449,300	(44,930)	404,370	-	1.60%	\$ 6,470
87	Paving	250,000	(25,000)	225,000	-	1.57%	\$ 3,533
88	Hydrants	40,752	(4,075)	36,677	-	2.24%	\$ 822
89	Services	64,077	(6,408)	57,669	-	2.34%	\$ 1,349
90	Valves	14,784	(1,478)	13,306	-	1.60%	\$ 213
91	Total	<u>\$ 5,311,913</u>	<u>\$ (531,191)</u>	<u>\$ 4,780,722</u>	<u>\$ -</u>		<u>\$ 77,086</u>

2018 ⁶ Projected Investment						Depreciation Expense	
	Gross Investment	Cost of Removal ⁸	Book Cost (2) - (3)	Retirement	Net Investment (4) - (5)	Depreciation Rate ⁷	Depreciation Expense (6) x (7)
102	Mains	\$ 5,490,000	\$ (549,000)	\$ 4,941,000	\$ -	1.60%	\$ 79,056
103	Contingency	549,000	(54,900)	494,100	-	1.60%	\$ 7,906
104	Paving	250,000	(25,000)	225,000	-	1.57%	\$ 3,533
105	Hydrants	40,752	(4,075)	36,677	-	2.24%	\$ 822
106	Services	64,077	(6,408)	57,669	-	2.34%	\$ 1,349
107	Valves	14,784	(1,478)	13,306	-	1.60%	\$ 213
108	Total	<u>\$ 6,408,613</u>	<u>\$ (640,861)</u>	<u>\$ 5,767,752</u>	<u>\$ -</u>		<u>\$ 92,878</u>

Notes:

¹ Based on PW's WICA Filing in DW 13-358.

² Based on PW's WICA Filing in DW 15-043.

³ Based on Attachment B, Page 1 of 4.

⁴ Based on Attachment B, Page 2 of 4.

⁵ Based on Attachment B, Page 3 of 4.

⁶ Based on Attachment B, Page 4 of 4.

⁷ The Depreciation Rates are based on the depreciation study approved in DW 06-073.

⁸ The Cost of Removal for 2014 Mains is from Page 4 of the Final Audit Report in DW 15-043 dated 3/19/15. All other Cost of Removal amounts in 2015-2018 are based upon 10.00% of the Gross Investment.

DW 16-220				
PENNICHUCK WATER WORKS, INC.				
PROJECTED CALCULATION OF 2016 WICA SURCHARGE				
FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015				
	Actual			
	2013	2014	2015	Total
Plant in Service:				
Gross Plant Investment (Att A, Sch 1; Col (2))	\$ 1,960,879	\$ 2,871,915	\$ 3,297,289	\$ 8,130,083
Less: Cost of Removal (Att A, Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(809,728)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	(79,826)
Net Plant Investment	1,741,042	2,585,186	2,914,301	7,240,528
Accumulated Depreciation:				
Depreciation Expense ¹ (Att A; Sch 1; Col (8)):				
2013 Net Plant Investment	14,872	29,744	29,744	74,360
2014 Net Plant Investment	-	21,057	42,114	63,171
2015 Net Plant Investment	-	-	23,745	23,745
Total Depreciation Expense	14,872	50,801	95,603	161,276
Less: Cost of Removal (Att A; Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(809,728)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	(79,826)
Net Accumulated Depreciation	(204,965)	(235,928)	(287,385)	(728,278)
Net Plant in Service	\$ 1,946,007	\$ 2,821,114	\$ 3,201,686	\$ 7,968,807
Pre-tax Rate of Return ²			x	6.17%
Return on Investment				\$ 491,539
Property Tax Expense ³	@	\$28.59 per \$1,000		227,828
Annual Depreciation Expense (Att A; Sch 1; Col (8)):				
2013 Net Plant Investment				29,744
2014 Net Plant Investment				42,114
2015 Net Plant Investment				47,491
Total Annual Depreciation Expense				119,348
2016 Cumulative Revenue Requirement				\$ 838,716
Less: 2015 Cumulative Revenue Requirement ⁴				(500,198)
2016 Revenue Requirement				\$ 338,517
Water Revenues per DW 13-130 ⁵				\$ 27,689,214
2016 Revenue Surcharge %				1.22%
2016 Cumulative Revenue Surcharge %				3.03%
Customer Impact:				
5/8 Inch Meter Monthly Charge				\$ 20.34
Volumetric Charge				\$ 3.30
Average Single Family Residential Usage (CCF)				7.88
Average Monthly Usage Charge				\$ 26.00
Total Average Monthly Charge				\$ 46.34
Average Monthly \$ Impact per Customer of 2016 Surcharge				\$ 0.57
Average Monthly \$ Impact per Customer of 2016 Cumulative Surcharge				\$ 1.40
Notes:				
¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation expense is recorded in the first and last year of an asset's service life.				
² Calculation of Pre-Tax Rate of Return (Based on PW's Rate Filing in DW 13-130)				
	Weighted Cost	Tax Multiplier	Pre Tax Cost	
Debt	5.59%	1.000	5.59%	
Equity	0.35%	1.656	0.58%	
	5.94%		6.17%	
³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.				
⁴ WICA Revenue Requirement approved in DW 15-043 by Commission Order No. 25,784 (4/30/15)				
⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).				

DW 16-220 PENNICHUCK WATER WORKS, INC. PROJECTED CALCULATION OF 2017 WICA SURCHARGE FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015 and PROJECTED CONSTRUCTION YEAR 2016					
	Actual			Projected	
	2013	2014	2015	2016	Total
Plant in Service:					
Gross Plant Investment (Att A; Sch 1; Col (2))	\$ 1,960,879	\$ 2,871,915	\$ 3,297,289	\$ 5,018,743	\$ 13,148,826
Less: Cost of Removal (Att A; Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(1,311,603)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	-	(79,826)
Net Plant Investment	1,741,042	2,585,186	2,914,301	4,516,869	11,757,397
Accumulated Depreciation:					
Depreciation Expense ¹ (Att A; Sch 1; Col (8)):					
2013 Net Plant Investment	14,872	29,744	29,744	29,744	104,104
2014 Net Plant Investment	-	21,057	42,114	42,114	105,284
2015 Net Plant Investment	-	-	23,745	47,491	71,236
2016 Net Plant Investment	-	-	-	36,426	36,426
Total Depreciation Expense	14,872	50,801	95,603	155,774	317,051
Less: Cost of Removal (Att A; Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(1,311,603)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	-	(79,826)
Net Accumulated Depreciation	(204,965)	(235,928)	(287,385)	(346,100)	(1,074,378)
Net Plant in Service	\$ 1,946,007	\$ 2,821,114	\$ 3,201,686	\$ 4,862,969	\$ 12,831,775
Pre-tax Rate of Return ²				x	6.17%
Return on Investment					\$ 791,501
Property Tax Expense ³	@	\$28.59 per \$1,000			366,860
Annual Depreciation Expense (Att A; Sch 1; Col (8)):					
2013 Net Plant Investment					29,744
2014 Net Plant Investment					42,114
2015 Net Plant Investment					47,491
2016 Net Plant Investment					72,852
Total Annual Depreciation Expense					192,201
2017 Cumulative Revenue Requirement					\$ 1,350,563
Less: 2016 Cumulative Revenue Requirement ⁴					(838,716)
2017 Revenue Requirement					\$ 511,847
Water Revenues per DW 13-130 ⁵					\$ 27,689,214
2017 Revenue Surcharge %					1.85%
2017 Cumulative Revenue Surcharge %					4.88%
Customer Impact:					
5/8 Inch Meter Monthly Charge					\$ 20.34
Volumetric Charge					\$ 3.30
Average Single Family Residential Usage (CCF)					7.88
Average Monthly Usage Charge					\$ 26.00
Total Average Monthly Charge					\$ 46.34
Average Monthly \$ Impact per Customer of 2017 Surcharge					\$ 0.86
Average Monthly \$ Impact per Customer of 2017 Cumulative Surcharge					\$ 2.26
Notes:					
¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation expense is recorded in the first and last year of an asset's service life.					
² Calculation of Pre-Tax Rate of Return (Based on PWW's Rate Filing in DW 13-130)					
	Weighted Cost	Tax Multiplier	Pre Tax Cost		
Debt	5.59%	1.000	5.59%		
Equity	0.35%	1.656	0.58%		
	5.94%		6.17%		
³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.					
⁴ Attachment A, Schedule 2a					
⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).					

DW 16-220 PENNICHUCK WATER WORKS, INC. PROJECTED CALCULATION OF 2018 WICA SURCHARGE FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015 and PROJECTED CONSTRUCTION YEARS 2016 - 2017						
	Actual			Projected		
	2013	2014	2015	2016	2017	Total
Plant Investment:						
Gross Plant Investment (Att A, Sch 1, Col (2))	\$ 1,960,879	\$ 2,871,915	\$ 3,297,289	\$ 5,018,743	\$ 5,311,913	\$ 18,460,739
Less: Cost of Removal (Att A, Sch 1, Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(531,191)	(1,842,794)
Less: Plant Retirements (Att A, Sch 1, Col (5))	(25,813)	(754)	(53,259)	-	-	(79,826)
Net Plant Investment	1,741,042	2,585,186	2,914,301	4,516,869	4,780,722	16,538,119
Accumulated Depreciation:						
Depreciation Expense ¹ (Att A, Sch 1, Col (8)):						
2013 Net Plant Investment	14,872	29,744	29,744	29,744	29,744	133,849
2014 Net Plant Investment	-	21,057	42,114	42,114	42,114	147,398
2015 Net Plant Investment	-	-	23,745	47,491	47,491	118,726
2016 Net Plant Investment	-	-	-	36,426	72,852	109,279
2017 Net Plant Investment	-	-	-	-	38,543	38,543
Total Depreciation Expense	14,872	50,801	95,603	155,775	230,744	547,794
Less: Cost of Removal (Att A, Sch 1, Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(531,191)	(1,842,794)
Less: Plant Retirements (Att A, Sch 1, Col (5))	(25,813)	(754)	(53,259)	-	-	(79,826)
Net Accumulated Depreciation	(204,965)	(235,928)	(287,385)	(346,100)	(300,448)	(1,374,826)
Net Plant in Service	\$ 1,946,007	\$ 2,821,114	\$ 3,201,686	\$ 4,862,968	\$ 5,081,169	\$ 17,912,945
Pre-tax Rate of Return ²					x	6.17%
Return on Investment						\$ 1,104,923
Property Tax Expense ³	@	\$28.59 per \$1,000				512,131
Annual Depreciation Expense (Att A, Sch 1, Col (8)):						
2013 Net Plant Investment						29,744
2014 Net Plant Investment						42,114
2015 Net Plant Investment						47,491
2016 Net Plant Investment						72,852
2017 Net Plant Investment						77,086
Total Annual Depreciation Expense						269,286
2018 Cumulative Revenue Requirement						\$ 1,886,340
Less: 2017 Cumulative Revenue Requirement ⁴						(1,350,563)
2018 Revenue Requirement						\$ 535,777
Water Revenues per DW 13-130 ⁵						\$ 27,689,214
2018 Revenue Surcharge %						1.93%
2018 Cumulative Revenue Surcharge %						6.81%
Customer Impact:						
5/8 Inch Meter Monthly Charge						\$ 20.34
Volumetric Charge						\$ 3.30
Average Single Family Residential Usage (CCF)						7.88
Average Monthly Usage Charge						\$ 26.00
Total Average Monthly Charge						\$ 46.34
Average Monthly \$ Impact per Customer of 2018 Surcharge						\$ 0.90
Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge						\$ 3.16
Notes:						
¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation expense is recorded in the first and last year of an asset's service life.						
² Calculation of Pre-Tax Rate of Return (Based on PW's Rate Filing in DW 13-130)						
	Weighted Cost	Tax Multiplier	Pre Tax Cost			
Debt	5.59%	1.000	5.59%			
Equity	0.35%	1.656	0.58%			
	5.94%		6.17%			
³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.						
⁴ Attachment A, Schedule 2b						
⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).						

DW 16-220
PENNICHUCK WATER WORKS, INC.
PROJECTED CALCULATION OF 2019 WICA SURCHARGE
FOR COMPLETED CONSTRUCTION YEARS 2013 - 2015
and PROJECTED CONSTRUCTION YEARS 2016 - 2018

	Actual			Projected			
	2013	2014	2015	2016	2017	2018	Total
Plant Investment:							
Gross Plant Investment (Att A; Sch 1; Col (2))	\$ 1,960,879	\$ 2,871,915	\$ 3,297,289	\$ 5,018,743	\$ 5,311,913	\$ 6,408,613	\$ 24,869,352
Less: Cost of Removal (Att A; Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(531,191)	(640,861)	(2,483,655)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	-	-	-	(79,826)
Net Plant Investment	1,741,042	2,585,186	2,914,301	4,516,869	4,780,722	5,767,752	22,305,871
Accumulated Depreciation:							
Depreciation Expense ¹ (Att A; Sch 1; Col (8)):							
2013 Net Plant Investment	14,872	29,744	29,744	29,744	29,744	29,744	163,593
2014 Net Plant Investment	-	21,057	42,114	42,114	42,114	42,114	189,512
2015 Net Plant Investment	-	-	23,745	47,491	47,491	47,491	166,217
2016 Net Plant Investment	-	-	-	36,426	72,852	72,852	182,131
2017 Net Plant Investment	-	-	-	-	38,543	77,086	115,628
2018 Net Plant Investment	-	-	-	-	-	46,439	46,439
Total Depreciation Expense	14,872	50,801	95,603	155,775	230,744	315,725	863,520
Less: Cost of Removal (Att A; Sch 1; Col (3))	(194,024)	(285,975)	(329,729)	(501,874)	(531,191)	(640,861)	(2,483,655)
Less: Plant Retirements (Att A; Sch 1; Col (5))	(25,813)	(754)	(53,259)	-	-	-	(79,826)
Net Accumulated Depreciation	(204,965)	(235,928)	(287,385)	(346,100)	(300,448)	(325,136)	(1,699,962)
Net Plant in Service	\$ 1,946,007	\$ 2,821,114	\$ 3,201,686	\$ 4,862,968	\$ 5,081,169	\$ 6,092,888	\$ 24,005,832
Pre-tax Rate of Return ²							x 6.17%
Return on Investment							\$ 1,480,750
Property Tax Expense ³	@ \$28.59 per \$1,000						686,327
Annual Depreciation Expense (Att A; Sch 1; Col (8)):							
2013 Net Plant Investment							29,744
2014 Net Plant Investment							42,114
2015 Net Plant Investment							47,491
2016 Net Plant Investment							72,852
2017 Net Plant Investment							77,086
2018 Net Plant Investment							92,878
Total Annual Depreciation Expense							362,164
2018 Cumulative Revenue Requirement							\$ 2,529,241
Less: 2017 Cumulative Revenue Requirement ⁴							(1,886,340)
2018 Revenue Requirement							\$ 642,901
Water Revenues per DW 13-130 ⁵							\$ 27,689,214
2018 Revenue Surcharge %							2.32%
2018 Cumulative Revenue Surcharge %							9.13%
Customer Impact:							
5/8 inch Meter Monthly Charge							\$ 20.34
Volumetric Charge							\$ 3.30
Average Single Family Residential Usage (CCF)							7.88
Average Monthly Usage Charge							\$ 26.00
Total Average Monthly Charge							\$ 46.34
Average Monthly \$ Impact per Customer of 2018 Surcharge							\$ 1.08
Average Monthly \$ Impact per Customer of 2018 Cumulative Surcharge							\$ 4.23

Notes:

¹ The half-year convention for depreciation expense is employed whereby one-half of the annual depreciation expense is recorded in the first and last year of an asset's service life.

² Calculation of Pre-Tax Rate of Return (Based on PW's Rate Filing in DW 13-130)

	Weighted Cost	Tax Multiplier	Pre Tax Cost
Debt	5.59%	1.000	5.59%
Equity	0.35%	1.656	0.58%
	5.94%		6.17%

³ City of Nashua 2015 Mill Rate of \$21.99 and State Utility Property Tax Rate of \$6.60.

⁴ Attachment A; Schedule 2c

⁵ Base rate revenue requirement approved in DW 13-130 by Commission Order No. 25,693 (7/15/14).

DW 16-220						
PENNICHUCK WATER WORKS, INC.						
SUMMARY OF WICA SURCHARGE CALCULATIONS						
FOR APPROVED 2014 and 2015 WICA SURCHARGES, PROPOSED 2016 WICA SURCHARGE						
and PROJECTED 2017 - 2019 WICA SURCHARGES						
	Actual	Actual	Projected			
	2014	2015	2016	2017	2018	2019
SUMMARY OF CALCULATIONS (Att A; Sch's 2):						
Annual Revenue Requirement	\$ 181,151	\$ 319,047	\$ 338,517	\$ 511,847	\$ 535,778	\$ 642,901
Cumulative Revenue Requirement	\$ 181,151	\$ 500,198	\$ 838,716	\$ 1,350,563	\$ 1,886,340	\$ 2,529,241
Annual Revenue Surcharge %	0.67%	1.15%	1.22%	1.85%	1.93%	2.32%
Cumulative Revenue Surcharge %	0.67%	1.81%	3.03%	4.88%	6.81%	9.13%
Annual Average Monthly \$ Impact per Customer	\$ 0.31	\$ 0.53	\$ 0.57	\$ 0.86	\$ 0.90	\$ 1.08
Cumulative Average Monthly \$ Impact per Customer	\$ 0.31	\$ 0.84	\$ 1.40	\$ 2.26	\$ 3.16	\$ 4.23
PER MOST RECENT APPROVED RATE FILING DW15-043						
Annual Revenue Requirement	\$ 181,151	\$ 319,047	\$ 529,073	\$ 543,192	\$ 444,906	
Cumulative Revenue Requirement	\$ 181,151	\$ 500,198	\$ 1,029,270	\$ 1,572,463	\$ 2,017,369	
Annual Revenue Surcharge %	0.67%	1.15%	1.91%	1.96%	1.61%	
Cumulative Revenue Surcharge %	0.67%	1.81%	3.72%	5.68%	7.29%	
Annual Average Monthly \$ Impact per Customer	\$ 0.31	\$ 0.53	\$ 0.89	\$ 0.91	\$ 0.74	
Cumulative Average Monthly \$ Impact per Customer	\$ 0.31	\$ 0.84	\$ 1.72	\$ 2.63	\$ 3.38	

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1. 2015 year end costs reflect actual \$5 spent on 5 valve replacements, 37 service replacements and 17 hydrant replacements. The average cost for each replacement types is the average cost for 2015. Updated \$5 for Hydrant, Service and Valve replacements reflect 2015 Year to date work order set costs.

2. Project contingencies are not included as all billing for WICA projects completed in 2015 have been received and included in the WICA totals.

⁸ Lowell Street - W/O 1502513 - the end of year cost has been revised. The original cost included CIAC (\$41,000) which should not have been included. This was identified during the audit discovery process. This has been removed.

^a Elridge Street - W/O 150266 - the end of year cost has been revised. Subsequent to the original filing, during the audit discovery process, we have identified savings costs of \$4,629 of the project which should be included. Also there was an immaterial error (\$78.15) in the calculation of overhead which overstated the original amount which has now been revised.

DW 16-220
Pennichuck Water Works, Inc.
Attachment to Staff 2-1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
Pennichuck Water Works, Inc. Proposed 2016 WICA Water Main Projects 1/11/2016																			Revised Attachment B Page 2 of 4	
4	PIPE SEGMENT OR PROJECT NAME	CITY/TOWN	MATERIAL	LENGTH (FEET)	EXISTING PIPE DIAMETER (INCHES)	PROPOSED NEW PIPE DIAMETER (INCHES)	ESTIMATED COST	PIPE INSTALLATION DATE	PIPE AGE USEFUL LIFE	FULLY DEPRIC	BREAK HISTORY	KEY CUSTOMERS	WATER QUALITY	FIRE PROTECTION FLOWS ²	Work coordination with Gas, Sewer or Storm Drain Replacement ^{3,4,5}	Subtotal prior to Geographical Area Points	Geographic Points	TOTAL	Funding Source	Included in 2015-2017 WICA projects filed in January 2015
7	Potomac Ave Int with Main St	NASHUA	CAST IRON UNLINED	68	6	8	65,000	1978	70	YES				2	P	8	8	11	12/2014 Bond	Yes - 2016
8	Buchanan St Int with Main St	NASHUA	CAST IRON UNLINED	45	8	8	65,000	1934	70	YES				1	P	7	8	10		Yes - 2016
9	Lincoln Ave Int with Main St	NASHUA	CAST IRON UNLINED	36	8	8	65,000	1889	70	YES				2	P	8	8	11		Yes - 2016
10	Plummet Ave Int with Main St	NASHUA	CAST IRON UNLINED	18	8	8	65,000	1906	70	YES				2	P	8	8	11		Yes - 2016
11	Taylor St Int with Main St	NASHUA	CAST IRON UNLINED	26	8	12	65,000	1906	70	YES				2	P	8	8	11		Yes - 2016
12	Potomac St Int with Main St	NASHUA	CAST IRON UNLINED	15	8	8	65,000	1906	70	YES				2	P	8	8	11		Yes - 2016
13	Albion St Int with Main St	NASHUA	CAST IRON UNLINED	60	16	16	90,000	1961	70	YES		8		2	P	9	8	12	12/2014 Bond	Yes - 2015
14	Albion St Int with Main St (NW Albion)	NASHUA	CAST IRON UNLINED	50	7	8	15,000	1930	70	YES		8		2	P	11	8	14		No
15	Field St Int with Main St	NASHUA	CAST IRON UNLINED	42	6	8	48,000	1922	70	YES				2	P	8	8	11		No
16	Flowers St Int with Main St	NASHUA	CAST IRON UNLINED	38	6	8	45,000	1921	70	YES				2	P	8	8	11		Yes - 2016
17	Pratt St Int with Main St	NASHUA	CAST IRON UNLINED	23	6	12	90,000	1909	70	YES				2	P	8	8	11		Yes - 2016
18	Flowers St Int with Main St	NASHUA	CAST IRON UNLINED	37	6	8	45,000	1919	70	YES				2	P	8	8	11		Yes - 2016
19	Flowers St Int with Main St	NASHUA	CAST IRON UNLINED	15	6	8	54,000	1830	70	YES				2	P	8	8	11		Yes - 2016
20	Tolson Street (Canal to Whitney)	NASHUA	CAST IRON UNLINED	470	6	8	144,000	1888	70	YES		1		1	S & P	11	3	14		No
21	Terrace Street (Armory to Commercial St.)	NASHUA	CAST IRON UNLINED	300	8	8	93,000	1888	70	YES		1		1	S & G & P	11	3	14	12/2014 Bond	Yes - 2016
22	Water Street	NASHUA	CAST IRON UNLINED	251	6	0	56,000	1888	70	YES		1		2	7	10	3	13		No
23	Chapman St (Lund to end)	NASHUA	CAST IRON UNLINED	130	1 1/4	4	34,000	1948	70	YES				1	P	9	0	9		No
24	McKean St (Jefferson to 801 McKean)	NASHUA	CAST IRON UNLINED	970	6	8	127,000	1888	70	YES		1		1	P	8	8	11		Yes - 2017
25	Amherst Street	NASHUA	CAST IRON UNLINED	3150	6	12	1,071,000	1892-1913	70	YES		1		2	P	9	3	12		No
26	Terrace Street	NASHUA	CAST IRON UNLINED	280	4 & 2	4	73,000	1934, 1948	70	YES				1	P	7	3	10	SAF	No
27	Brace Street	NASHUA	CAST IRON UNLINED	280	6	8	73,000	1909-1916	70	YES				1	P	8	3	11		No
28	Berkshire Street	NASHUA	CAST IRON UNLINED	575	6	8	158,000	1918-1919	70	YES				1	P	8	3	11		No
29	Whitney Street (Whitney to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
30	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
31	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
32	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
33	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
34	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
35	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
36	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
37	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
38	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
39	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
40	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
41	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
42	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
43	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
44	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
45	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
46	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
47	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
48	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
49	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
50	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
51	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
52	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
53	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
54	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
55	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
56	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
57	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
58	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
59	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
60	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
61	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
62	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
63	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
64	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
65	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
66	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
67	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
68	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
69	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
70	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
71	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
72	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
73	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
74	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
75	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70	YES		1		2	S & G & P	11	3	14		Yes - 2017
76	Whitney Street (Sprague to Sprague)	NASHUA	CAST IRON UNLINED	700	6	8	245,000	1882-1914	70											

DW 16-220
Pennichuck Water Works, Inc.
Attachment to Staff 2-1

585960616263

Pennhuck Water Works, Inc.
Proposed 2017 WICA Water Main Projects
3/11/2016

Released Attachment B
Page 3 of 4

64	PIPE SEGMENT OR PROJECT NAME	CITY/TOWN	MATERIAL	LENGTH (FEET)	PIPE DIAMETER (INCHES)	PROPOSED NEW PIPE DIAMETER (INCHES)	ESTIMATED COST	AGE OF PIPE	PIPE AGE USEFUL LIFE	FULLY DEPRIC	BREAK HISTORY	KEY CUSTOMERS	WATER QUALITY	FIRE PROTECTION FLOWS ¹	Work coordination with Gas, Sewer or Storm Drain Replacement ^{1A}	Subtotal prior to Geographical Area Points	Geographic Points	TOTAL	Funding Source	Included in 2015-2017 WICA projects filed in January 2015
65	Bridge St (Ansony to E St)	NASHUA	CAST IRON UNLINED	1300	8	12	\$ 443,000	187-1885	70	YES		1		3	P & G	11	3	14		No
66	Grand St (Bridge to end)	NASHUA	CAST IRON UNLINED	576	8	0	\$ 30,000	1942	70	YES		1		3	P & G	9	3	12		No
67	D St (Bridge to E. Hollis)	NASHUA	CAST IRON UNLINED	500	8	8	\$ 186,000	1998	70	YES				3	P & G	10	2	12		No
68	E St (Bridge to E. Hollis)	NASHUA	CAST IRON UNLINED	375	8	12	\$ 128,000	1808	70	YES		3		3	P & G	13	3	16		No
69	Hobbs Ave (E. Hollis to Grant)	NASHUA	CAST IRON UNLINED	485	8	12	\$ 169,000	1902	70	YES				3	P & G	10	2	12		No
70	Chase St (E. Hollis to Grant)	NASHUA	CAST IRON UNLINED	415	8	8	\$ 145,000	1802	70	YES				3	P & G	8	2	10		No
71	Crown St (Chase to Arlington)	NASHUA	CAST IRON UNLINED	220	8	12	\$ 75,000	2003-1908	70	YES		1		3	P & G	12	8	15		No
72	Brook Street (Ash to Falls)	NASHUA	CAST IRON UNLINED	1141	8	8	\$ 182,000	1887-1934	70	YES		1		3		6	2	6		Yes - 2015
73	Chandler Street (in. Orleans to Nevada)	NASHUA	CAST IRON UNLINED	515	6.6.4	12	\$ 275,000	1687	70	YES				3		3	2	5		No
74	Lake Street (Pine St. easterly)	NASHUA	CAST IRON UNLINED	154	6	12	\$ 52,000	1888	70	YES	2			2		8	2	8		Yes - 2015
75	Verona Street (Spartan to Maynard)	NASHUA	CAST IRON UNLINED	866	8	8	\$ 325,000	1915 - 1915	70	YES		1		4		3	3	6		Yes - 2016
76	Saratoga Avenue (Pine to Verona)	NASHUA	CAST IRON UNLINED	250	8	8	\$ 100,000	1936-1949	70	YES				2		5	3	6		Yes - 2015
77	Hamden Street (Lake to Brook)	NASHUA	CAST IRON UNLINED	411	8	8	\$ 113,000	1905-1941	70	YES		1		3		2	3	5		To Be Determined
78	Burrill Street (Lake to Brook)	NASHUA	CAST IRON UNLINED	424	8	8	\$ 117,000	1887-1911	70	YES		1		3		4	3	7		Combination of various Bond and Active \$100 Funding
79	Burrill Street (Brook St. easterly)	NASHUA	CAST IRON UNLINED	184	4	4	\$ 207,000	1941	40	YES							2	2		Yes - 2015
80	Ash Street (Lake to Level)	NASHUA	CAST IRON UNLINED	517	6	6	\$ 180,000	1892	70	YES				1		3	2	3		Yes - 2015
81	Pine Street (Lake to end)	NASHUA	CAST IRON UNLINED	381	8	8	\$ 258,000	1915	70	YES				4		3	2	7		Yes - 2015
82	Pine Street (Lake to end)	NASHUA	CAST IRON UNLINED	381	6.6.4	12	\$ 258,000	1915 - 1949	70	YES		1		3		3	2	8		Yes - 2015
83	Pine Street (Pine St. to end)	NASHUA	CEMENT LINED PIPE	701	7	4	\$ 28,000	1940	40	YES			1			1	2	3		Yes - 2015
84	Pine Street (Pine St. to end)	NASHUA	CEMENT LINED PIPE	701	7	4	\$ 28,000	1940	40	YES			1			1	2	3		Yes - 2015
85	Pine Street (Pine St. to end)	NASHUA	CEMENT LINED PIPE	701	7	4	\$ 28,000	1940	40	YES			1			1	2	3		Yes - 2015
86	Bedford Street (Lake to Lake)	NASHUA	CAST IRON UNLINED	390	8	8	\$ 76,000	1920	70	YES				1		4	2	6		Yes - 2015
87	Bedford Street (Lake to Lake)	NASHUA	CAST IRON UNLINED	390	8	8	\$ 76,000	1920 - 1915	70	YES				1		4	2	6		Yes - 2015
88	Bedford Street (Lake to Lake)	NASHUA	CAST IRON UNLINED	390	8	8	\$ 76,000	1920 - 1915	70	YES				1		4	2	6		Yes - 2015
89	Chapel Street (Lake to Lake)	NASHUA	CEMENT LINED PIPE	104	7	4	\$ 22,000	1940	40	YES				1		1	2	3		Yes - 2015
90	Chapel Street (Lake to Lake)	NASHUA	CEMENT LINED PIPE	104	7	4	\$ 22,000	1940	40	YES				1		1	2	3		Yes - 2015
91	Highland St (Pine to Lake)	NASHUA	CAST IRON UNLINED	620	6.6.4	8	\$ 171,000	1882-1882	70	YES				1		6	0	6		No
92	Ardur St (Ardur to Charles)	NASHUA	CAST IRON UNLINED	1225	4.6.8	6	\$ 340,000	1887	70	YES				2		7	0	7		No
93	Board St (Lake to Lake)	NASHUA	CAST IRON UNLINED	350	8	8	\$ 108,000	1940	70	YES						5	0	5		No
94				Total LF -	18,350		Total - \$	4,483,000												
95							Paving from 2016 projects -	\$	250,000											
96	Valve Replacements ²		7	@	\$	2,112	-	\$	14,784											
97	Service Replacements ³		11	@	\$	2,067	-	\$	64,677											
98	Hydrant Replacements ⁴		9	@	\$	4,524	-	\$	40,752											
99							Planning Contingency ⁵ -	\$	446,500											
100							Total Estimated WICA \$ in 2017 -	\$	5,511,913											
101																				
102	1. Material Integrity - Rating of 1 point for each break in the last 20 years.																			
103	2. ISO Fire Ratings - A rating of 1 for each 500 gpm that the flow in the watermain is less than the ISO required rating.																			
104	3. Number of Service, Valve and hydrant replacements is the average of the past 5 years. The average cost for each replacement type is the average cost for 2016.																			
105	4. P&WH must complete replacement of its mains when the City replaces its sewer mains.																			
106	5. The City operates on a fiscal year basis between July 1 and June 30 of the following calendar year.																			
107	6. Work Coordination Legend: - P - Project in street affected by City Paving Program, - G - Project in street where Gas Company master plan calls for gas main replacement, - S - Project in street where sewer and/or storm drain replacement is occurring.																			
108	7. Projects that are highlighted in same color are located in the same geographical area. If there is no highlighting the projects are not located in proximity to any other planned WICA projects.																			
109	8. S&G&P - Water replacement related to sewer and gas replacement with 1/3 cost sharing of pavement, must move water due to conflict with sewer - 10 points.																			
110	9. S&P - Water replacement related to sewer replacement with 1/2 cost sharing of pavement, must move water due to conflict with sewer - 9 points.																			
111	10. G&P - Water replacement related to gas replacement and City Street paving with 1/2 cost sharing of pavement. Water does not have to be moved, no conflict with gas - 8 points.																			
112	11. P - City paving street over water main, 1/2 cost sharing of pavement. Reduced risk of damage to new pavement by break of old water main if not replaced with paving project - 6 points.																			
113	12. G - Water replacement related to gas replacement with 1/3 cost sharing of pavement. Water does not have to be moved, no conflict with gas - 5 points.																			

102103104105106107108109110111112113

1. Material Integrity - Rating of 1 point for each break in the last 20 years.
2. ISO Fire Ratings - A rating of 1 for each 500 gpm that the flow in the watermain is less than the ISO required rating.
3. Number of Service, Valve and hydrant replacements is the average of the past 5 years. The average cost for each replacement type is the average cost for 2016.
4. P&WH must complete replacement of its mains when the City replaces its sewer mains.
5. The City operates on a fiscal year basis between July 1 and June 30 of the following calendar year.
6. Work Coordination Legend: - P - Project in street affected by City Paving Program, - G - Project in street where Gas Company master plan calls for gas main replacement, - S - Project in street where sewer and/or storm drain replacement is occurring.
7. Projects that are highlighted in same color are located in the same geographical area. If there is no highlighting the projects are not located in proximity to any other planned WICA projects.
8. S&G&P - Water replacement related to sewer and gas replacement with 1/3 cost sharing of pavement, must move water due to conflict with sewer - 10 points.
9. S&P - Water replacement related to sewer replacement with 1/2 cost sharing of pavement, must move water due to conflict with sewer - 9 points.
10. G&P - Water replacement related to gas replacement and City Street paving with 1/2 cost sharing of pavement. Water does not have to be moved, no conflict with gas - 8 points.
11. P - City paving street over water main, 1/2 cost sharing of pavement. Reduced risk of damage to new pavement by break of old water main if not replaced with paving project - 6 points.
12. G - Water replacement related to gas replacement with 1/3 cost sharing of pavement. Water does not have to be moved, no conflict with gas - 5 points.

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: March 21, 2016

AT (OFFICE): NHPUC

FROM: Douglas W. Brogan

SUBJECT: DW 16-220, Pennichuck Water Works, Inc.
2016 WICA Adjustment Filing

TO: Mark A. Naylor
Director, Gas & Water Division

This memo is being submitted at your request to provide observations and recommendations in relation to docket DW 16-220, the 2016 WICA adjustment filing of Pennichuck Water Works, Inc. (Pennichuck or company). I have filed recommendations as a consultant to the Commission in the company's two most recent WICA dockets, DW 13-358 and DW 15-043. In the current docket the company is seeking approval of a WICA surcharge for projects completed in 2015, approval of projects proposed for 2016, and preliminary approval of 2017 projects. My review is limited primarily to the engineering and operational aspects of the current filing and is based on review of the filing, case discovery and associated materials. My comments focus in particular on the water main project listings in Attachment B, pages 1 through 4, of the testimony of Donald Ware in the case.

2015 Projects

The projects completed in 2015 differed in many instances from those approved for 2015 in DW 15-043. Such changes in 'year 1' projects have been typical of previous WICA dockets and are largely the result of coordination with projects planned by the City of Nashua and others. What was different in 2015 was new quarterly reporting by the company, implemented through a tariff change in DW 15-043, apprising those involved in the case of changes to the approved list, and the reasons behind them. The enhanced ability to trace the history of project evolution proved valuable.

The company has provided reasonable explanation through the quarterly reporting, testimony, line item project explanations and discovery, of significant variances in project scope and, for example, project cost per foot of main (see response to Staff 1-17).

The company continues to pursue cost-efficient options such as rehabilitation, instead of replacement, of mains when conditions allow. Unfortunately, due to the age and condition of many of Pennichuck's mains and the potential impact from future City sewer and storm drain work, rehabilitation opportunities are limited. The company completed one cleaning and lining project (Temple Street) in 2015, its first under the WICA program. See responses to Staff 1-18, 1-19, and 1-20 c.

The company has affirmed that the projects completed in 2015 and proposed for inclusion in its WICA surcharge are used and useful. These include valve, service and hydrant replacements in addition to the water main work.

2016 - 2018 Projects

New to future year projects is a significant increase in coordination with municipal and even gas company work. (Staff 1-13) Such coordination can provide substantial cost savings. Coordination with the City now includes not only sewer and storm drain projects, but paving-only projects that have been difficult to coordinate in the past. A matrix based on the various levels of such coordination has been incorporated into the rating system Pennichuck uses to rank potential projects.

The company's concern for cost-effectiveness is again evident in its detailed approach to challenging projects, such as those on Main Street (Staff 1-20) and the difficult side street project of Gorman Ave. (Staff 1-21).

In the larger view, the company is continuing to ramp up overall main replacement projections consistent with its interim goal of replacing 15,000 feet per year, pending completion of an asset management program. That completion will allow more accurate targeting of subpar mains and is anticipated to support even higher levels of replacement, but is still at least a couple years away. In the meantime, the increase in main replacement projections toward the interim goal is evident below (numbers are the average of the three future years proposed in each docket; lengths are in feet, spending in millions of dollars):

	DW 12-359	DW 13-358	DW 15-043	DW 16-220
Length of Main	7,462	10,205	14,473	15,247
Total WICA Spending	2.3	2.8	5.0	5.6

The 2016 replacements proposed in the current docket (12,164 feet) were limited due to a lack of funding. However, the company does not expect similar limitations to occur in the future (Staff 1-14), and the two subsequent year projections (2017/2018) make up for the shortfall.

These higher projections will begin to approach the 2 percent per year rate cap of Pennichuck's WICA pilot program beginning next year, and are projected to exceed the overall 7.5 percent cap between rate cases as of the 2018 construction year (2019 surcharge). (Ware Schedule A, p. 7) It should be noted, however, that actual spending has consistently fallen below proposed, due mainly to the various unplanned project changes, deletions and deferrals that inevitably occur.

Conclusion

The company's 2015 projects appear to have been completed prudently, and its proposed 2016 - 2018 projects appear reasonable. As such, I support approval of the company's petition.

I trust these comments are responsive to your request. Please let me know if you need anything further in this regard.

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: March 22, 2014
AT (OFFICE): NHPUC

FROM: Jayson P. Laflamme, Utility Analyst, Gas-Water Division

SUBJECT: DW 16-220, Pennichuck Water Works, Inc.
2016 Water Infrastructure and Conservation Adjustment Filing

TO: Mark A. Naylor
Director, Gas-Water Division

This memo is being submitted at your request to summarize my review of Docket DW 16-220, the petition of Pennichuck Water Works, Inc. (PWW), relative to its 2016 Water Infrastructure and Conservation Adjustment (WICA) filing. PWW's petition requests approval of a WICA surcharge for effect as of June 1, 2016, on a bills-rendered basis, as well as final approval of proposed projects for 2016 to be eligible for recovery through the WICA surcharge mechanism, and preliminary approval of proposed projects for 2017. PWW also provided its 2018 proposed projects for informational purposes, only. PWW's petition was accompanied by the direct testimony of Donald L. Ware, Chief Operating Officer, which presented the calculation of a proposed cumulative WICA surcharge for 2016 of 3.04% based on a WICA revenue requirement of \$840,557. This increase in PWW's WICA revenue requirement from 2015 is \$340,358 and is based on a 2015 WICA investment of \$3,297,881.

My review focused primarily on PWW's calculation of the proposed WICA surcharge. My review included the gathering and analysis of additional information from PWW, through formal and informal data requests. A copy of PWW's responses to Staff's data requests is attached to this recommendation. Additionally, the Commission's Audit Staff examined the final, actual costs of PWW's 2015 WICA projects. The Audit Staff's recommendations have been incorporated into my conclusions contained in this memo. A copy of the Final Audit Report dated March 9, 2016 is also attached to this memorandum.

As a result of Staff's discovery as well as the audit in this case, PWW has reduced its cumulative surcharge request to 3.03% based on \$838,716 in proposed WICA revenues. *See* PWW's Response to Staff Data Request 2-1. This is a decrease in PWW's requested cumulative WICA revenue requirement of \$1,841 (\$840,557 - \$838,716). The majority of this reduction is due to certain corrections in the WICA revenue calculation that the Company made in response to Staff's first round of discovery. Most specifically, the Company's calculation of annual depreciation expense on its 2015 WICA investment has been reduced from \$49,363 as indicated in the original filing to \$47,491 as shown in PWW's response to Staff 2-1; a difference of \$1,872. *See* the Company's response to Staff Data Request 1-1.

The Audit Staff verified a total of \$3,297,289 as PWW's 2015 WICA plant investment. This is \$592 less than the investment indicated in PWW's original filing of \$3,297,881. The Company communicated to Staff that it fully agrees with the Audit Staff's recommendations and it has incorporated the revised investment amounts into its calculations contained in its response to

Staff Data Request 2-1. A summary of the Audit Staff's determinations can be found on pages 17-18 of the Audit Report.

In conclusion, I have reviewed the Company's calculation of the WICA surcharge specifically as provided in its response to Staff Data Request 2-1. As a result, I recommend approval of the revised WICA surcharge for 2016 of 3.03%. This amount has been shown to be adequately supported through Staff discovery as well as the Audit Staff's examination. I also believe that the proposed calculation of the 2016 surcharge will result in just and reasonable rates for both PWW and its customers. The impact of the new calculated surcharge is estimated to result in an additional \$1.40 on the monthly bills of PWW's average, single-family residential customers, based on an average usage of 7.88 ccf per month. This represents an approximate increase of \$0.57 per month over the 2015 WICA surcharge.

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: March 9, 2016
AT (OFFICE): NHPUC

FROM: Bridget Nelson, Examiner

SUBJECT: Pennichuck Water Works, Inc.
DW 16-220 Water Infrastructure and Conservation Adjustment Mechanism
Final Audit Report

TO: Mark Naylor, Director Gas-Water Division, NHPUC
Jayson Laflamme, Utility Analyst IV
Robyn Descoteau, Utility Analyst III

Introduction

Pennichuck Water Works, Inc. (PWW, The Company) has been participating in a Water Infrastructure and Conservation Adjustment Mechanism (WICA) since approved by Commission Order 25,230 on June 9, 2011.

In Docket DW 15-043, Pennichuck, petitioned for approval of its proposed 2015 projects to be eligible for recovery through the WICA surcharge mechanism. Order 25,784, issued April 30, 2015, granted the approval for the projects.

On February 2, 2016, Pennichuck filed the 2015 costs for recovery beginning June 1, 2016 in Docket DW 16-220.

2015 Projects

Order 25,784 in Docket DW 15-043 approved a capital budget of \$5,162,295. The budget of \$4,503,600 was approved for twenty main projects. \$77,522 of the total budget was for paving costs of 2014 projects. \$16,050 was for valve replacement, \$85,388 for service replacement and \$29,374 for hydrant replacement. The remaining \$450,360 of the budget was for the planning contingency.

During 2015, Pennichuck submitted quarterly update reports to remove originally proposed and approved projects and to add new projects (See "Change Orders" below). The filing of the cost for recovery provided final costs for the 2015 WICA projects.

A total of \$3,297,881 was filed for recovery with \$3,089,415 being spent on the main projects. \$44,436 in paving costs from 2014 projects, valve replacement of \$10,558, service replacement of \$76,496 and hydrant replacement of \$76,976 make up the other \$208,466 of costs.

During the audit process some project and paving costs were added and removed. The total audited amount was \$3,297,289.

Audit has included the following table showing the original projects and their cost compared to the completed used and useful projects and their respective cost.

Project Name	City/Town	Work Order	DW 15-043 Approved Estimated Costs	DW 16-220 Final Projects Costs	Revised and Audited Costs	Final Paving Costs in 2016	Status
Foundry St	Amherst	1500270	\$ 209,000	\$ 233,322	\$ 233,322	\$ -	Completed
Manchester Rd	Amherst	1501462	\$ 176,000	\$ 317,860	\$ 317,860	\$ -	Completed
Allds St	Nashua	1501836	\$ 872,000	\$ 885,949	\$ 926,435	\$ -	Completed
Ash St	Nashua	1502514	\$ 62,000	\$ 61,596	\$ 61,596	\$ 27,000	Completed
Chestnut St	Nashua	1502509	\$ 419,000	\$ 236,617	\$ 236,617	\$ 83,000	Completed
Eldridget St	Nashua	1500269	\$ -	\$ 27,996	\$ 32,547	\$ -	Completed
Fairmount St	Nashua	1500445	\$ 57,000	\$ 70,325	\$ 70,325	\$ -	Completed
Harbor Ave	Nashua	1500314	\$ 229,000	\$ 135,122	\$ 135,122	\$ -	Completed
Howard Ave	Nashua	1504064	\$ -	\$ 152,071	\$ 152,071	\$ 37,830	Completed
Kinsley St	Nashua	1502868	\$ -	\$ 101,174	\$ 101,174	\$ 2,000	Completed
Lovell St	Nashua	1502510	\$ 502,000	\$ 234,726	\$ 193,726	\$ 116,000	Completed
Marquis Ave	Nashua	1502517	\$ 39,000	\$ 19,177	\$ 19,177	\$ 10,000	Completed
Mulberry St	Nashua	1500275	\$ 46,500	\$ 55,341	\$ 55,341	\$ -	Completed
Ninth St	Nashua	1500276	\$ 102,000	\$ 140,334	\$ 140,334	\$ -	Completed
Rochette Ave	Nashua	1502516	\$ 46,000	\$ 30,758	\$ 30,758	\$ 13,500	Completed
Temple St	Nashua	1502508	\$ 278,100	\$ 387,045	\$ 387,045	\$ -	Completed
Ash St	Nashua		\$ 166,000	\$ -	\$ -	\$ -	Deferred until 2018
Brook St	Nashua		\$ 397,000	\$ -	\$ -	\$ -	Deferred until 2018
Burritt St	Nashua		\$ 198,000	\$ -	\$ -	\$ -	Deferred until 2018
Hamilton St	Nashua		\$ 130,000	\$ -	\$ -	\$ -	Deferred until 2018
Lake St	Nashua		\$ 113,000	\$ -	\$ -	\$ -	Deferred until 2018
Miami St	Nashua		\$ 148,000	\$ -	\$ -	\$ -	Deferred until 2018
Coburn Woods	Nashua		\$ 274,000	\$ -	\$ -	\$ -	Deferred 5 years
			\$ 4,463,600	\$ 3,089,415	\$ 3,093,451	\$ 289,330	
Paving from 2014 Projects			\$ 77,522	\$ 44,436	\$ 39,808		
Valve Replacement			\$ 16,050	\$ 10,558	\$ 10,558		
Service Replacement			\$ 85,388	\$ 76,496	\$ 76,496		
Hydrant Replacement			\$ 29,374	\$ 76,976	\$ 76,976		
Planning Contingency			\$ 450,360	\$ -			
			\$ 5,122,294	\$ 3,297,881	\$ 3,297,289		

The work order detail report was verified to the continuing property records and the trial balance for all projects.

Change Orders

On April 20, 2015, Pennichuck filed a letter with the Commission noting a change in the 2015 WICA project list. A main replacement on Tolles Street in Nashua was added with the estimated cost of \$139,500. The WICA budget was not increased as the inclusion of this project reduced the planning contingency. On the quarterly update submitted July 16, 2015, the Tolles

project was noted as deferred until 2016 to keep the WICA budget at or below the original amount.

Another letter revising the 2015 WICA project schedule was filed on July 16, 2015 by Pennichuck. The following changes were to take place:

- Main Street and intersecting streets were added due to the City of Nashua's intention to overlay Main Street. Streets include: Allds Street, Field Street, Fossa Avenue, Revere Street, Pratt Street, Fowell Avenue, Stevens Street, Faxon Street, Buchanan Street, Lincoln Street, Russell Avenue, Taylor Street, Dickerman Street, Orchard Avenue and Main Street. The total estimated cost was \$1,005,000.
- The Kinsley Street project in the estimated amount of \$80,000 was also added to the project list.
- Miami Street, Hamilton Street, Coburn Woods, and Tolles (noted above) were removed from the 2015 WICA project list. A portion of the Burritt Street and Ash Street projects were also deferred. The total cost of the projects removed was \$1,012,500.

On October 10, 2015, the Commission received the 3rd quarter reporting which had the following changes to the 2015 WICA projects schedule:

- Two projects were added to the list: Eldridge Street and Howard Ave. The estimated cost for the two projects was \$310,300.
- The Main Street and intersecting street projects added 7/16/2015 were deferred due to the work schedule of the City of Nashua.
- Three additional projects were deferred until 2016 due to a shortage of contractors to perform the work. These jobs are Brook Street, the remaining portion of Burritt Street, and Lake Street.

All originally proposed projects in Docket DW 15-043 were completed or deferred through the quarterly project update Pennichuck submitted to the Commission. The quarterly reports also provided updated project costs as work was completed.

Bid Summary

Audit requested and was provided with a record of bid proposals for the 2015 projects.

Projects are put out to bid with several streets involved. The 2015 projects were put out to bid in five area projects. Four of the area projects received two to four bids, while one project, sent out to five contractors, only received one bid. All of the selected contractors were the lowest bidders.

Three additional area projects have extended from prior years. One project began in 2013 and the other two began in 2014. These projects were originally put out to bid in the year they began. Two of the projects received two bids and the third project received three bids. The lowest bidder on each of the three projects was chosen.

Main Projects

Foundry Street, Amherst – Work Order #1500270

The E-22 submitted January 31, 2014 has the total estimated costs being \$208,000 for the replacement of 1,375' of 6" main with 8" main. The project was originally proposed as a 2014 project in Docket DW 13-358 in the amount of \$234,400 and was subsequently deferred.

Docket DW 15-043 approved the 1,465' replacement of 6" main with 8" for an estimated cost of \$209,000. The completed project replaced 1,199' with 8" main for the amount of \$233,322.

93%, or \$316,031, of the total charges was for the contractor. The remaining 7% of the charges were for labor, overheads, trucks, paving and material. No exceptions were noted.

Audit questioned the amount paid to the contractor because the support provided appears to have two different amounts due. The "Application for Payment on Contract" sheet sent in by the Contractor provides a current payment due. Supporting detail for the amount due was provided in an Excel "Unit Billing" sheet. The amount due on the application for payment and the current value total on the Excel sheet differed.

Pennichuck provided Audit with the following explanation:

"The difference between the amount requested for payment and the amount on the AIA backup for the invoice is retainage that's accrued for. The cost put on the books is the actual work performed for the assets at that time. Retainage is released upon satisfactory completion of the job."

The amounts paid by Pennichuck were based on the Excel "Unit Billing" sheet.

The project impacted the following general ledger account:

331200 Distribution Mains - New	\$	185,897
331250 Distribution Mains - Gate Valves	\$	2,300
333200 Renewed Services	\$	30,500
335000 Fire Protection Equip: Hydrants	\$	14,625
	\$	<u>233,322</u>

Manchester Road, Amherst – Work Order #1501462

The Mack Hill Road project replaced 300 feet of existing 8" water main with a new 12" main. The existing water main was going to be destroyed with the Town of Amherst's bridge replacement on Mack Hill Road. 486 feet of 12", 185 feet of 8" and 88 feet of 6" was installed for this project.

DW 15-043 approved the project for an estimated cost of \$176,000. The E-22 submitted on March 20, 2015 for the first quarter of 2015, estimated the project to be \$180,000. The final cost, and amount reviewed by Audit was \$317,860.

Audit reviewed all supporting documentation for charges listed on the work order detail report without exception. 95% of the total costs, or \$300,845, was paid to the contractor. The remaining 5 % of the costs were for labor, truck charge, overhead and shipping. No exceptions were noted.

The General Ledger reflects the following accounts were impacted by this project:

331200 Distribution Mains - New	\$	294,860
331250 Distribution Mains - Gate Valves	\$	23,000
	\$	<u>317,860</u>

Allds Street, Nashua – Work Order #1501836

Docket DW 15-043 approved the Allds Street main replacement project with estimated costs to be \$872,000. A total of 3,444' was to be replaced with 1722' of the existing main to be abandoned. The E-22 submitted March 20, 2015 estimated the costs to be \$875,000 with the project beginning May 4, 2015 and ending December 10, 2105.

The final cost of the Allds Street project provided in Docket DW 16-220 were \$885,949. During the audit discovery process Pennichuck discovered they did not include \$40,486 of easements in the project expenses. Audit reviewed expenses for the project totaling \$926,435.

Charges noted on the work order detail report were reviewed by Audit. 73% of the total costs, or \$674,964.25, was paid to the contractor. The other 27% of the costs were for attorney fees, land surveyors, easements, real estate appraisals, wetland replanting plans, plumbing, structure assessments, labor, overhead, and materials. No exceptions were noted.

The following general ledger accounts were impacted by the Allds Street project:

331200 Distribution Mains - New	\$	715,638
331250 Distribution Mains - Gate Valves	\$	18,451
333200 Renewed Services	\$	125,332
335000 Fire Protection Equip: Hydrants	\$	26,527
303300 Easements	\$	<u>40,486</u>
	\$	926,435

Ash Street, Nashua – Work Order #1502514

The Ash Street project was approved for \$62,000 in Docket DW 15-043. An estimated 707' of main was to be replaced.

An E-22 was submitted for the fourth quarter of 2015 on January 18, 2016. The Ash Street project was part of the Lake Street Area Water Main Replacement-Phase 1. The project replaced mains on five streets for a total of \$1,105,000. Estimated construction dates were September 22, 2105 through November 16, 2015.

Final costs noted on Docket DW 16-220 were \$61,596. A total of 342' of main was replaced. Additional charges of \$27,000 are expected in 2016 for paving costs.

Audit reviewed the work order detail report's noted charges. \$56,840, or 92% of the total charges, was for the contractor. The remaining 8% of the charges were made up of labor and overhead, Engineering & Information Systems overhead, and vehicle expenses. No exceptions were noted.

The following general ledger accounts were impacted by the project:

331200 Distribution Mains - New	\$	56,596
331250 Distribution Mains - Gate Valves	\$	1,750
333200 Renewed Services	\$	3,250
	\$	<u>61,596</u>

Chestnut Street, Nashua – Work Order #1502509

The Chestnut Street project was approved for the amount of \$419,000 in Docket DW 15-043. A total of 998' of 6" main was to be replaced with 12" main. The final costs proposed in Docket DW 16-220 was \$236,617 for the replacement of 1,103' of main.

An E-22 was submitted for the fourth quarter of 2015 on January 18, 2016. The Chestnut Street project was part of the Lake Street Area Water Main Replacement-Phase 1. The project replaced mains on five streets for a total of \$1,105,000. Estimated construction dates were September 22, 2105 through November 16, 2015.

Paving for the project will be completed in 2016 for an estimated cost of \$83,000.

Audit reviewed the charges noted on the work order detail report. 95% of the total costs, or \$224,472, was paid to the contractor. Other expenses include labor, overhead, printing, advertising fees, vehicle expenses, and material. Also, included in the project costs was a payment of \$40 that was paid to a customer who experienced sewer issues due to the contractor hired for the project. Audit notes that Pennichuck should not be liable for this \$40 expense as it should fall on the contractor but considers the amount immaterial.

The following general ledger accounts were impacted by the Chestnut Street project:

331200 Distribution Mains - New	\$ 175,174
331250 Distribution Mains - Gate Valves	\$ 8,500
333200 Renewed Services	\$ 28,500
335000 Fire Protection Equip: Hydrants	\$ 24,443
	<u>\$ 236,617</u>

Eldridge Street, Nashua – Work Order #1500269

The Eldridge Street project was originally approved in DW 13-358 as a 2014 project and was subsequently deferred. The City of Nashua planned to replace the drain and sewer lines which lie only 2-3 feet away from the mains. 410' of main was to be replaced away from the sewer so it would not be disturbed by the City's construction. The E-22 submitted January 31, 2104, estimated the total project costs to be \$148,000.

The Change Order filed with the Commission on October 21, 2015, took the originally deferred Eldridge Street project and added it to the 2015 WICA projects.

Audit reviewed all supporting documentation for charges listed on the work order detail report in the amount of \$32,547. Only 40%, or \$12,999, were for contractor charges. The other 60% of the charges were for shared paving costs with the City, trucks, labor, overhead and materials. No exceptions were noted.

The following general ledger accounts were impacted by this project:

331002 Pavements - Distribution Mains	\$ 4,629
331200 Distribution Mains - New	<u>\$ 27,918</u>
	\$ 32,546

Fairmont Street, Nashua – Work Order #1500445

DW 12-359 approved the Broad Street project for an estimated cost of \$360,000. The E-22 submitted April 18, 2013, provided an estimated project cost of \$276,000. This project began in 2013 and continued through 2015. The Broad Street project was to replace a total of 1127' 6" CIP with 1421 8" of DIPCL. The water main needed to be relocated due to road construction.

Per DW 15-043 approval, the 2015 work consisted of replacing 215' of 6" main for an estimated cost of \$57,000. Final project data notes that 211' was replaced with 4" main. The final cost of work completed in 2015 was \$70,325.

Audit reviewed the supporting charges, listed on the work order detail report, for the total \$70,325 without exception. \$63,868 or 91% of the total costs were paid to the contractor. The remaining charges were for labor, trucks, overhead and materials. No exceptions were noted.

The following GL accounts were impacted by this project:

331200 Distribution Mains - New	\$	60,176
331250 Distribution Mains - Gate Valves	\$	1,222
333200 Renewed Services	\$	8,199
335000 Fire Protection Equip: Hydrants	\$	729
	\$	<u>70,325</u>

Harbor Ave, Amherst – Work Order #1500314

Docket DW 15-043 approved the 2015 Harbor Avenue project in the estimated amount of \$229,000. 480' of 6" cast iron main was to be replaced with 12" main. The E-22 was submitted March 20, 2015 estimating the cost of the project to be \$180,000. The final project costs of \$135,122 were for the replacement of 572'.

Audit reviewed the work order detail report and the supporting charges. Expenses totaling \$135,122 were for engineering & information system overhead, printing, shipping, traffic light sensors and contractor invoices. The total contractor expenses were \$125,304, or 93% of the project total cost. No exceptions were noted.

The following general ledger accounts were impacted by the Harbor Ave project:

331200 Distribution Mains - New	\$	96,803
333200 Renewed Services	\$	32,545
335000 Fire Protection Equip: Hydrants	\$	5,775
	\$	<u>135,122</u>

Howard Ave, Nashua – Work Order #1504064

The Howard Street project was an emergency main repair was not approved on the original 2015 WICA project schedule. This project was added to the schedule on the October 21, 2015 quarterly update.

Pennichuck was receiving customer complaints and after investigation it was revealed that the main is in poor condition and unable to deliver water to customers' properties. The Howard Street project would replace and estimated 544' of cast iron and steel main.

An E-22 from September 30, 2015 estimated the project to cost \$247,500 with construction beginning October 5, 2015 and ending August 1, 2016.

Docket DW 16-220 noted that 539' of main was replaced and the total cost of the project was \$152,071. Paving is expected to be completed in 2016 at an estimated cost of \$37,830.

Audit review the charges on the work order detail report in the amount of \$152,071. 93% of the costs, or \$140,989 was contractor charges. The remaining charges include bid requests, printing, vehicles, materials, labor and overhead. No exceptions were noted.

The following general ledger accounts were impacted by the Howard Ave project:

331200 Distribution Mains - New	\$ 139,421
331250 Distribution Mains - Gate Valves	\$ 4,300
333200 Renewed Services	\$ 8,350
	<u>\$ 152,071</u>

Kinsley St, Nashua – Work Order #1502868

The Kinsley Street project was not approved in Docket DW 15-043 with the 2015 WICA projects. The City of Nashua intended on overlaying Kinsley Street and Pennichuck wanted to replace the water main before the City's paving moratorium goes into effect. Pennichuck was doing work in the area already so they extended the job to Kinsley Street.

Kinsley Street was added to the 2015 WICA project list on the July 16, 2015 quarter update.

An E-22 from September 30, 2015 estimated the project costs to be \$146,250. Final project costs per Docket DW 16-220 were \$101,174. An additional \$2,000 is expected in 2016 for paving expenses.

Audit reviewed the charges on the work order detail report. \$80,428, or 79% of the total, was contractor expenses. The additional 21% of the charges were made up of signs, police detail, materials, labor and overhead. No exceptions were noted.

The following general ledger account was impacted by the Kinsley Street project:

331200 Distribution Mains - New	\$ 101,174
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The project was originally put out to bid with three other streets with the winning bidder being RH White. Audit noticed that CSSI was the contractor performing the work and questioned Pennichuck about it. Pennichuck provided the following response:

"The City of Nashua surprised us with plans to replace the sewer at the Kinsley Street intersection. Their time frame was aggressive and since we already had shutdowns in the works for Eldridge St and Mulberry Street it made sense to carry out the Kinsley Street work simultaneously. The Intersection of Kinsley Street was a last minute addition to the project. RH White was already maxed out with Eldridge Street and Mulberry Street. They had no one else available for night work. We were already working with CSSI on the Allds Street/Harbor Ave project so we asked them if they could accommodate Kinsley Street on short notice. They were able to do the job. The City has not done any work at the intersection as of this writing. (3/7/2016)"

Lovell Street, Nashua – Work Order #1502510

The Lovell Street project was approved in Docket DW 15-043 for an estimated cost of \$502,000. The Lovell Street project was pushed to the forefront due to a housing development

being built on Lovell Street. The poor firefighting flows at hydrants along Lovell have received ongoing complaints from the Nashua Fire Department.

An E-22 was submitted for the fourth quarter of 2015 on January 18, 2016. The Lovell Street project was part of the Lake Street Area Water Main Replacement-Phase 1. The project replaced mains on five streets for a total of \$1,105,000. Estimated construction dates were September 22, 2105 through November 16, 2015.

The final costs proposed in Docket DW 16-220 for the Lovell Road project were \$234,726. During the audit discovery process it was discovered that the final proposed costs included \$41,000 of Contributions in Aid of Construction (CIAC). Pennichuck removed the CIAC which resulted in the final costs being \$193,726.

Paving for the project will be completed in 2016 at an estimated cost of \$116,000.

Audit reviewed the charges, in the amount of \$193,726, noted on the work order detail report. \$221,619, or 94% of the total prior to the CIAC removal, was paid to the contractor. Other expenses include labor, overhead, vehicle expenses, and payment for scans. No exceptions were noted.

The following general ledger accounts were impacted by this project:

331200 Distribution Mains - New	\$	189,649
331250 Distribution Mains - Gate Valves	\$	10,500
333200 Renewed Services	\$	18,500
335000 Fire Protection Equip: Hydrants	\$	16,078
271200 CIAC	\$	(41,000)
	\$	193,726

Marquis Street, Nashua – Work Order #1502517

The Marquis Street project was approved as part of the 2015 WICA in Docket DW 15-043. An estimated cost of \$39,000 would replace 125' of 1-1/2" main with 4" main.

An E-22 was submitted for the fourth quarter of 2015 on January 18, 2016. The Marquis Street project was part of the Lake Street Area Water Main Replacement-Phase 1. The project replaced mains on five streets for a total of \$1,105,000. Estimated construction dates were September 22, 2105 through November 16, 2015.

Docket DW 16-220 notes that 128' was replaced and the final cost of the project are \$19,177. An additional \$10,000 is estimated for 2016 paving expenses.

Audit reviewed the charges noted on the work order detail report. 91% of the cost, or \$17,503, was for the contractor. The remaining charges were for Engineering & Information Systems overhead and a small charge for scans. No exceptions were noted.

The following general ledger accounts were impacted by the Marquis Street project:

331200 Distribution Mains - New	\$	17,677
331250 Distribution Mains - Gate Valves	\$	750
333200 Renewed Services	\$	750
	\$	<u>19,177</u>

Mulberry Street, Nashua – Work Order #1500275

Docket DW 15-043 approved the Mulberry Street project for an estimated \$46,500. 50' of 8" main was to be replaced. The final costs proposed in DW 16-220 were \$55,341 for the replacement of 42'.

An E-22 was submitted March 27, 2014, noted the project was to begin 7/1/14 and concluding 11/1/2015. A change order was submitted during the 2014 WICA year adding this project as it was discovered that the 8" main valve was broken shut or partially closed.

Audit reviewed the supporting charges listed on the Work order detail report. Of the \$55,341 project total, \$40,463 (73%) was contractor charges. The remainder of the charges was for police detail, vehicle use, labor, materials and supplies, and overhead. Audit verified the overhead charge to the 54.92% 2015 rate provided. No exceptions were noted.

The following general ledger accounts were impacted by the Mulberry Street project:

331002 Pavements - Distribution Mains	\$	16,599
331200 Distribution Mains - New	\$	37,596
331250 Distribution Mains - Gate Valves	\$	1,145
	\$	<u>55,341</u>

Ninth Street, Nashua – Work Order #1500276

Docket DW 15-043 approved the Ninth Street project to replace 627' of 2" main with 4" main. The proposed estimated costs were \$102,000. The final projects costs submitted in DW 16-220 were \$140,334. A total of 637' of main was replaced.

An E-22 was submitted March 27, 2014. The project was added to the 2014 WICA project list due to the City of Nashua overlaying the street. Estimated construction dates on the E-22 noted the project would commence 7/1/2014 and end 11/1/2015.

The work order detail report for the project costs totaling \$140,334 was reviewed by Audit. \$133,499 or 95% of the total charges were paid to the contractor. The remaining 5% of the charges were for labor, vehicles, home depot expense, and overhead. The overhead charge was verified to the 2015 overhead rate of 54.92%. No exceptions were noted.

The following general ledger accounts were impacted by the Ninth Street project:

331002 Pavements - Distribution Mains	\$	6,411
331200 Distribution Mains - New	\$	110,501
331250 Distribution Mains - Gate Valves	\$	1,306
333200 Renewed Services	\$	16,428
335005 Pavements - Hydrants	\$	5,687
	\$	<u>140,334</u>

Rochette Ave, Nashua – Work Order #1502516

Docket DW 15-043 approved the Rochette Avenue project of replacing 163' of 2" main with 4" main. The final cost of the project as noted in Docket DW 16-220 was \$30,758 for 175' of main replacement.

An E-22 was submitted for the fourth quarter of 2015 on January 18, 2016. The Rochette Street project was part of the Lake Street Area Water Main Replacement-Phase 1. The project replaced mains on five streets for a total of \$1,105,000. Estimated construction dates were September 22, 2105 through November 16, 2015.

Final paving costs, to be completed in 2016, are estimated to be \$13,500.

Audit reviewed all the charges on the work order detail report. \$28,748, or 93% of the total costs, was paid to the contractor. The remaining 7% of the charges were for printing and Engineering & Information Systems overhead. No exceptions were noted.

The following general ledger accounts were impacted by this project:

331200 Distribution Mains - New	\$	28,758
331250 Distribution Mains - Gate Valves	\$	750
333200 Renewed Services	\$	<u>1,250</u>
	\$	30,758

Temple Street, Nashua – Work Order #1502508

The Temple Street project, to replace an estimated 1,030' of 10" main with 12" main, was approved in Docket DW 15-043. The proposed cost for the project was \$278,100. The E-22 submitted September 30, 2015, estimated the cost to be \$343,250. The final cost noted in Docket DW 16-220 is \$387,045 for 990' of main replaced.

The work order detail report with project costs totaling \$387,045 was reviewed by Audit. The contractor expenses totaled \$364,688, or 94% of the total project costs. The other 6% of costs were for labor, overhead, shipping, portable toilet rentals, materials and printing.

A Unishipper's invoice in the amount of \$59.23 was changed to the Temple Street project. Upon Audit's review, it appeared that the invoice may include shipments for other

projects. Audit questions Pennichuck as only \$48.48 appeared to be for Temple. Pennichuck provided the following response:

“The Unishipper invoice should be \$48.48 for Temple St. - \$7.05 should be on Howard St. (1504064) and the remaining \$7.05 should be on Lake St. (1502515, 2016 WICA). The cost will be moved in our fixed assets system for Howard St. and Lake St. will need to be reclassified back into CWIP until the project is used in 2016.”

The following general ledger accounts were impacted by the project:

331200 Distribution Mains - New	\$	336,251
331250 Distribution Mains - Gate Valves	\$	10,829
333200 Renewed Services	\$	14,700
335000 Fire Protection Equip: Hydrants	\$	25,265
	\$	<u>387,045</u>

Overhead Rate

Overhead rates are calculated at the beginning of each year as part of the management fee. Overhead calculations are automatically calculated and posted to the general ledger when the work orders are posted to the GL at the end of the month.

For 2015, the Union overhead rate was 54.92% and the general overhead rate was 2%. Audit verified the Union overhead rate based on the labor charges for each of the main projects. The general overhead rate was verified to the valve, service and hydrant replacements based on the total project costs. No exceptions were noted.

Paving for 2014 Projects

Docket DW 15-043 approved the estimate cost of \$77,522 for the paving of 2014 projects. The final paving costs filed in DW 16-220 totaled \$44,436.

On February 24, 2015 Pennichuck provided Audit with revised project costs. During the audit discovery process, paving costs in the amount of \$4,629 should have been included in the Eldridge Street project (WO#1500269). The project costs were increased by \$4,629 and the paving costs were reduced by the same amount.

The revised paving costs for the 2014 projects were \$39,808.

DW 16-220 final paving costs	\$ 44,436.00
Less: Amount moved to WO#1500269	<u>\$ (4,629.00)</u>
Revised paving costs	\$ 39,808.00

Valve, Service and Hydrant Replacements

Audit requested and received the work order summary support for the valve, service and hydrant replacement costs.

These replacements are separate and in addition to the water main projects.

	DW 15-043	DW 16-220
	Estimated Costs	Final Costs
Valves	\$ 16,050	\$ 10,558
Services	\$ 85,388	\$ 76,496
Hydrant	\$ 29,374	\$ 76,976
	<u>\$ 130,812</u>	<u>\$ 164,030</u>

Valves

DW 15-043 estimated a total of eight valves, totaling \$16,050, would be replaced during 2015. The final costs per DW 16-220, were \$10,558 for the replacement of five valves.

Work Order #	Location	City	Cost
1505498/01	Manchester St	Nashua	\$ 631
1505092/01	125 Chestnut	Nashua	\$ 2,733
1504936/01	Courtland	Nashua	\$ 4,886
1502875/01	700 Hollis	Nashua	\$ 1,229
1501611/01	Aldgate	Nashua	\$ 1,079
			<u>\$ 10,558</u>

All five project costs were verified to the appropriate general ledger account based on valve size without exception. (GL #331251 – Gates: 4” and under)

Audit selected work order #1504936 to review in detail. The work order summary includes labor, truck and backhoe costs, and material for the project. Overhead rates were verified to the 54.92% labor rate and 2% general overhead rate provided to Audit. No exceptions were noted with the work order detail.

Services

A total of 29 services, totaling \$85,388 were estimated to be completed during 2015 per Docket DW 15-043. Actual final costs filed in Docket DW 16-220 were for 37 service replacements totaling \$76,496.

Work Order #	Location	City	Cost
1506698/01	Monza	Nashua	\$ 3,260
1506592/01	Dunstable Rd	Nashua	\$ 226
1506118/01	Hollis St	Nashua	\$ 897
1506117/01	Vine St	Nashua	\$ 1,234
1506116/01	Ayer	Nashua	\$ 1,062
1506086/01	Watson	Nashua	\$ 2,642
1506035/01	Watson	Nashua	\$ 2,739
1506017/01	Dunstable	Nashua	\$ 2,820
1505699/01	Ayer	Nashua	\$ 583
1505597/01	Manchester St	Nashua	\$ 4,283
1505533/01	New Dunstable	Nashua	\$ 1,413
1505502/01	Westwood	Nashua	\$ 5,121
1505496/01	Hollis St	Nashua	\$ 363
1505368/01	Manchester St	Nashua	\$ 1,883
1505367/01	Reservoir	Nashua	\$ 1,748
1505139/01	Vine St	Nashua	\$ 241
1505093/01	Hollis St	Nashua	\$ 1,237
1504812/01	Pine Hill Ave	Nashua	\$ 1,362
1504427/01	Vine St	Nashua	\$ 891
1504291/01	Hopkins	Nashua	\$ 1,127
1503727/01	Park Ave	Nashua	\$ 149
1503490/01	Barker Ave	Nashua	\$ 757
1503152/01	Lake St	Nashua	\$ 1,113
1503131/01	Park Ave	Nashua	\$ 1,703
1503130/01	Biscayne Pkwy	Nashua	\$ 3,037
1503015/01	Tinker Rd	Nashua	\$ 2,091
1502096/01	Bruce St	Nashua	\$ 2,596
1501835/01	Lantern Ln	Nashua	\$ 2,719
1501612/01	Aldgate	Nashua	\$ 4,864
1501097/01	Barker Ave	Nashua	\$ 4,968
1500969/01	Weathersfield	Nashua	\$ 3,124
1500940/01	Newburgh	Nashua	\$ 1,969
1500939/01	Burritt	Nashua	\$ 1,969
1500938/01	Greenlay	Nashua	\$ 2,133
1500936/01	Deerhaven	Nashua	\$ 2,095
1500935/01	Lovewell	Nashua	\$ 2,148
1500180/01	Leslie	Nashua	\$ 3,927
			<hr/>
			\$ 76,496

All 37 projects were verified to general ledger account, 333200 – Renewed Services, without exception.

Audit selected two work orders, 1505502 and 1506116 to review in detail. The work order summary included expenses for backhoe, vehicles, labor, contractor, and materials. Audit verified the overhead expenses with the rates provided. Audit noted that the labor overhead was based on the \$2,116.19 labor charge and did not include “other pay” of \$240.07.

The work order summary for project 1505502 included: backhoe, contractor, vehicles, material and supplies, labor and overheads. The labor overhead was calculated at the correct 54.92%. The general labor, 2% of the total project costs, was miscalculated in error. Contractor pay of \$90 and Other Pay of \$240 were left out of the calculating. The total general overhead booked was \$93.95 and the correct amount should have been \$100.54. The \$6.59 variance is immaterial.

The work order summary for project 1506116 included: labor, a contractor expense, vehicles and backhoe charges. Audit verified the overhead expenses to the rates provided to Audit. No exceptions were noted.

Hydrants

Docket DW 15-043 approved the estimated costs of \$29,374 for five hydrant replacements. The final costs per Docket DW 16-220 were \$76,976 for 17 hydrant replacements.

Work Order #	Location	City	Cost
1506832/01	Central St	Nashua	\$ 4,801
1506219/01	Beverlee Dr	Nashua	\$ 3,582
1506114/01	Manchester St	Nashua	\$ 1,062
1506099/01	Central St	Nashua	\$ 3,557
1505555/01	Manchester St	Nashua	\$ 4,802
1505531/01	Manchester St	Nashua	\$ 7,010
1505491/01	Hobart St	Nashua	\$ 4,088
1505412/01	Manchester St	Nashua	\$ 575
1505129/01	E. Hobart St	Nashua	\$ 3,437
1505128/01	Elgin St	Nashua	\$ 3,022
1504897/01	Manchester St	Nashua	\$ 8,753
1504835/01	Main St	Nashua	\$ 8,547
1504741/01	Main St	Nashua	\$ 6,920
1504618/01	Natick	Nashua	\$ 3,250
1503591/01	Main St	Nashua	\$ 4,256
1503086/01	East Hollis St	Nashua	\$ 5,537
1500441/01	Marie Ave	Nashua	\$ 3,778
			<u>\$ 76,976</u>

All seventeen projects were verified to general ledger account, 335000 – Fire Protection Equipment: Hydrants, without exception.

Audit selected work order #1504897 to review in detail. The work order summary included expenses for vehicles, backhoe, materials, labor and overhead. The overhead rates were verified and Audit notes the labor overhead is based on the \$1,857.10 labor expense and does not include \$2.78 “other pay”.

Retirements

Pennichuck provided Audit with an “Asset Disposition” report for the period of January 1, 2105 to December 31, 2015 for Mains, Services and Hydrants.

Retirements were booked to the general ledger on a quarterly basis. Audit tied the individual plant listed on the Asset Disposition report to the quarterly retirement amounts on the trial balance. No issues were noted.

The following retirement amounts were booked to the general ledger:

331200 Distribution Mains - New	\$ 41,116
333100 New Services	\$ 2,627
335000 Fire Protection Equip: Hydrants	\$ 9,516
	<u>\$ 53,260</u>

Summary

Docket DW 16-220 provided final costs of 2015 WICA projects to be \$3,089,415. Paving for 2014 projects that took place in 2015 totaled \$44,436. Valve, service and hydrant replacement projects were an additional \$164,030. The total costs noted in the Docket were \$3,297,881.

During the Audit discovery process, three project costs changed, netting to an increase of \$4,037. Paving costs were reduced by \$4,628 and the valve, service and hydrant replacements remained unchanged.

Audit reviewed the used and useful WICA projects for 2015, totaling \$3,093,451, excluding anticipated 2016 paving costs. Support for the projects’ costs were provided in the form of trial balances, continuing property record, work orders, contracts and invoices.

Audit also reviewed paving expenses in the amount of \$39,808 and valve, services and hydrant replacement projects were an additional \$164,030 for 2015, totaling \$203,838.

DW 16-220

	Final	Revised and
	Projects Costs	Audited Costs
Projects	\$ 3,089,415	\$ 3,093,451
Paving from 2014 Projects	\$ 44,436	\$ 39,808
Valve Replacement	\$ 10,558	\$ 10,558
Service Replacement	\$ 76,496	\$ 76,496
Hydrant Replacement	\$ 76,976	\$ 76,976
	<u>\$ 3,297,881</u>	<u>\$ 3,297,289</u>