STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

Pennichuck East Utility, Inc.

DW 13-126

DIRECT PREFILED TESTIMONY OF JOHN J. BOISVERT

IN SUPPORT OF PERMANENT RATES

May 31, 2013

Professional and Educational Background

Q. What is your name and what is your position with Pennichuck East Utility?

A. My name is John J. Boisvert. I am the Chief Engineer of Pennichuck Water Works, Inc. which provides services to Pennichuck East Utility ("PEU" or the "Company") pursuant to a management allocation agreement. I have worked for Pennichuck Water works, Inc. since February 1, 2006. I am a licensed professional engineer in New Hampshire and Maine.

Q. Please describe your educational background.

A. I have a Bachelor of Science degree and a Master of Science degree in Civil Engineering from the University of New Hampshire in Durham, New Hampshire. I also have a Master's degree in Environmental Law and Policy from Vermont Law School in South Royalton, Vermont.

Q. Please describe your professional background.

A. Prior to joining Pennichuck Corporation, I served as a Team Leader for Weston & Sampson Engineers of Portsmouth, New Hampshire in their Water Practices Group from 2000 to 2006. Prior to Weston & Sampson I was employed by the Layne Christensen Company of Shawnee Mission, Kansas as Regional Manager for their Geosciences Division in Dracut, Massachusetts from 1994 to 2000. I completed graduate school in 1992 and was employed by Hoyle, Tanner, & Associates of Manchester, New Hampshire as a Project Engineer from 1992 to 1994. Prior to entering full time graduate programs at the University of New Hampshire and Vermont

Law School I was employed by Civil Consultants of South Berwick, Maine as a Project Engineer from 1986 to 1989 and by Underwood Engineers of Portsmouth, New Hampshire as a project Engineer from 1985 to 1986.

Q. What are your responsibilities as Chief Engineer of the Company?

A. As Chief Engineer, I am responsible for the planning, design, permitting, construction, and startup of major capital projects, including pipelines, reservoirs/dams, building structures, pumping facilities, treatment facilities, and groundwater supplies. I provide regular technical assistance to Pennichuck Water Works' Water Supply Department, Operations Department, Customer Service Department, and Senior Management.

Q. What is the purpose of your testimony?

A. I will be providing details of the Company's major capital expenditures for improvements made to our PEU "North Country" systems, i.e., Birch Hill in North Conway, Sunrise Estates in Middleton, and Locke Lake in Barnstead (these systems were part of Pittsfield Aqueduct Company, Inc. through December 31, 2009) from 2008 through 2012 and all other PEU systems from 2007 through 2012.

<u>Overview of Capital Expenditures</u>

Q. Did the Company make capital expenditures during the period of January 1, 2007 through December 31, 2012 to its distribution, storage, treatment, and supply facilities?

A. Yes. The Company made capital expenditures totaling $10.3 million from 2007 through 2012, including $1.1 million of North Country system assets in 2008 and 2009, most of which were non-revenue producing assets.

Q. What do you mean by non-revenue producing assets?

A. Non-revenue producing assets are related to projects that do not result in new customers or additional revenues to the Company. Examples of typical non-revenue producing assets are projects that are the result of government regulations such as the Safe Drinking Water Act ("SDWA"), local and State highway projects, water conservation and efficiency projects, and other State or Federal mandates. Capital expenditures to enhance customer service or replacements of aging infrastructure are also examples of non-revenue producing assets.

Q. Are all of the capital expenditures completed during the period (and described further below) currently used and useful?

A. Yes.

Q. What were the major focal points of the Company's capital projects in the period of 2007 through 2012?

A. The Company's focus continues to be multifaceted and includes replacing and/or upgrading water treatment facilities to ensure compliance with all State and Federal Drinking Water Regulations, replacing aging infrastructure including treatment and pumping stations and water mains and services, and completing water supply and water quality improvement projects for its stand-alone community water systems. The Company added a total of $9.1 million

on capital improvements within these areas during the period. Each of the major project areas are described in more detail below.

Source of Supply, Water Treatment, Pumping, and Storage Expenditures

Q. What are the other major projects that the Company completed to ensure sufficient source of supply, treatment, pumping capacity, and system storage?

A. There were several such projects. They will be addressed as detailed below by year.

2007 Projects

Capital projects completed in 2007 included significant replacement and upgrade items and will be addressed in broad terms later in this testimony.

2008 Projects

Maple Hills Community Water System ("CWS") /Derry Interconnection Booster Station

Project Amount: $830,375

The Maple Hills CWS was a stand-alone system with its own bedrock supply wells, treatment/pumping station, and storage tanks. The treatment system was aging, modifications were needed to offer higher levels of iron and manganese filtration and the source capacity, though adequate for domestic purposes, struggled to meet summer demand without water use restrictions. The Maple Hills System was in close proximity to the Town of Derry water system, which receives its source of supply from Manchester Water Works. The quality of that water meets or exceeds State and Federal standards and

the quantity would not be limited like the Maple Hill Wells. The engineering analysis concluded that it was more cost effective to abandon the existing wells and treatment system in favor of an interconnection to the Derry system. A water purchase agreement was reached with Derry and the interconnection pipeline and a new booster station was constructed to feed water to Maple Hills. The booster station was necessary because the hydraulic grade line to serve Maple Hills was higher than that of the Derry System. This project received a loan from the New Hampshire Department of Environmental Services ("NHDES") State Revolving Fund ("SRF") and qualified for a State Interconnection Grant ("SIG").

Locke Lake Peacham Road New Well #15

Project Amount: $96,548

System demand at Locke Lake outpaced the production from the six existing wells. The previous owner identified three well sites at the Peacham Road site but only developed wells at two of them (Well #13 and #14). The consultant's report identified the location for the third well. The Company engaged the services of the previous consultant to drill, test, and permit the third well at the site. The new well tested at more than 50 gallons per minute but was permitted for 40 gallons per minute.

Gage Hill Atmospheric Storage Tank

Project Amount: $133,332

This project, located in Pelham, NH, was funded through the American Recovery and Reinvestment Act ("ARRA"). The project included the removal

of an existing 20,000 gallon steel storage tank and the installation of two new 15,000 gallon fiberglass reinforced plastic storage tanks with associated piping and appurtenances. The existing steel tank was heavily corroded and needed significant repairs. The Company determined that it was more cost effective to replace the tank with a new tank. The second new tank was added to increase the available storage in accordance with regulatory standards.

Beaver Hollow Replacement Well

Project Amount: $35,883

Beaver Hollow is a very small CWS in Sandown, NH that serves eleven (11) customers. The system was served by a single well prior to this project. A mechanical failure of the well pump would leave the system without a source of supply. A high system demand (system leak) would exceed the capacity of the existing well. Both conditions would cause diminished service to the customers and require the transport of water to the system at significant expense. The second well was constructed, tested, and permitted. The new well provides redundant capacity and greater operational flexibility. The Company evaluated the potential for interconnecting this system to an adjacent municipal or CWS but there were no feasible options due to distance and cost.

Sunrise Estates Station Confined Space Elimination

Project Amount: $16,693

The pumping station for the Sunrise Estates system was located in a below ground vault with roof top hatch and ladder access. Confined space entry procedures require two staff members to conduct station inspections at significant cost. The Company designed and constructed modifications to the station to provide walk in/walk out access to facilitate station operation without the confined space requirement.

2009 Projects

Birch Hill Chlorination Station

Project Amount: $54,404

The Company purchases water from the North Conway Water Precinct ("NCWP") to supply the Birch Hill system in North Conway. The NCWP operates a non–chlorinated water system. The Company determined that due to the materials of construction in the distribution system, and a history of distribution samples that tested with a presence for total coliform after breaks or shutdowns (depressurization), a permanent chlorination system was required at Birch Hill. A 12 foot by 6 foot building was constructed to house chlorine (sodium hypochlorite) feed equipment, controls, and monitoring devices.

Portable Emergency Generator Connections

Project Amount: $14,584 (6 work orders)

The company added emergency generator connections and transfer switches so the following stations could be powered by portable trailer mounted generators in the event of an extended power outage.

- Pioneer Park, Atkinson
- Gage Hill, Pelham
- Hardwood, Windham
- Pine Haven, Londonderry
- Beaver Hollow, Sandown
- Shaker Heights, Chester

Emergency Generator Installations

Project Amount: $155,647(3 work orders)

The Company added permanent emergency generators at the following stations to power the station automatically during a power outage.

- Forest Ridge, Exeter
- Goldenbrook, Windham
- Thurston Woods, Lee

WESCO/Bow Highlands Booster Station Phase 1 & 2

Project Amount: $541,917

The Company was approached by the developer of Bow Highlands for water service for its development in Bow, NH. The Company and the Bow Highlands developer agreed to share in the project costs as the existing facilities of WESCO required an upgrade at the time, and it required an expansion to accommodate the additional Bow Highlands customers. The project required the acquisition of a water main owned by the NH Department of Transportation, the replacement and expansion of the water pumping

station to benefit WESCO and accommodate Bow Highlands, and local and state permitting.

2010 Projects

Locke Lake Golf Course Station Confined Space Elimination

Project Amount: $6,503

The Golf Course pumping station, located in Barnstead, NH, was a below ground vault with roof top hatch and ladder access. All of the electrical boxes and controls were located in the vault along with well motor starting equipment, well flow meters, and the storage tanks. The construction of the Peacham Road treatment facility and the Peacham Road storage tank eliminated the need for the storage tanks but access to the vault was still required to access all of the electrical, well meters and sample taps. The project moved the electrical controls to an above ground weather resistant cabinet and elevated the sample taps to permit above ground access. This effort reduced the labor needed to perform routine station checks. Confined space entry procedures require two staff members to conduct station inspection at significant time and cost. The Company designed and constructed modifications to the station to provide walk in/walk out access to facilitate station operation without the confined space requirement.

2011 Projects

Spruce Pond Treatment Upgrades, Windham

Project Amount: $139,336

The Company expanded the booster station to accommodate treatment and control equipment to address elevated sodium and chloride levels, elevated levels of iron and manganese, and the presence of total organic carbon in the raw water. The elevated sodium and chloride levels were likely the result of a permitted water softener (containing salt brine) discharge infiltrating back into the aquifer. A holding tank was installed to collect the brine for later disposal at a public wastewater treatment facility. Disinfection of finished water using chlorine (sodium hypochlorite) ensured protection from bacteria if it were ever present in the water and in distribution pipes. As a consequence, however, iron and manganese were oxidized, resulting in colored water, a secondary aesthetic standard of the Safe Drinking Water Act. The other consequence of using chlorine in the presence of total organic carbon is the formation of disinfection byproducts including trihalomethanes ("THM's") and halo acetic acids ("HAA's"). The disinfection byproducts are regulated as a primary contaminant in drinking water. The levels at Spruce Pond exceeded the primary standards. The iron and manganese filters, in addition to reducing iron and manganese, reduce total organic carbon thereby reducing the potential for THM's and HAA's to be formed when chlorine is added. The modifications resulted in continued compliance with the Safe Drinking Water Act and customer service was enhanced.

Emergency Generator Installations

Project Amount: $85,357 (2 work orders)

The Company added permanent emergency generators at the following stations to power the station automatically during a power outage.

- Harvest Village, Londonderry
- Ministerial Heights, Londonderry

Locke Lake Airstrip Station Storage Tank Cleaning and Painting

Project Amount: $95,163(2 work orders)

The services of an outside tank inspection and painting contractor were engaged to clean the interior of the more than 20 year old tanks at the Airstrip Station and assess their structural condition. The structural condition was good and the Company installed outside access hatches to each tank in order to provide two points of exit/entry. The contractor then did final cleaning, prepared the interior surface of the tanks, and applied a new coating.

2012 Projects

Northern Shores CWS Treatment/Pumping station Improvements

Project Amount: $88,059

The Northern Shores station located in Tilton was a below ground vault with pumping, piping, and electrical systems that were in extremely poor condition and not compliant with current electrical code and NHDES water system practices. The below ground vault was modified to allow for walk in and walk out access to eliminate confined space entry requirements to the basement. A twelve (12) foot by twelve (12) foot wood framed structure was constructed on top of the vault. All electrical systems were replaced and relocated to "dry environment" in the new above ground vault structure. Manganese filtration

and chlorination were added to prevent manganese deposition in the distribution system and at customer locations as well as reducing the potential for "colored" water concerns. The booster pumps were replaced and all station piping and valves were replaced and reconfigured in the basement of the station. The final addition to the station was an emergency generator.

Sunrise Estates CWS - Electrical Control Panel

Project Amount: $14,785

The Company consolidated all of the station's older electrical systems into a new control panel with PLC and RTU components to convey operational data via the Company's SCADA system. The effort will reduce unnecessary emergency call outs, especially during off hours and poor weather conditions. The overall reliability of the system is improved by these additions.

Distribution Improvements

Q. Can you please describe the water distribution (water main, hydrants, and service) improvements that Pennichuck completed during the period?

A. Yes, the major projects are separated and described below by year.

2007 Projects

Radio Meter Read Project

Project Amount: $505,478 (5,054 Neptune readers installed)

This project began in 2007 and was completed in 2009. The Company was manually reading meters and billing customers monthly at the start of the project. The radio read capability improved the accuracy and efficiency of

reads. Monthly reading and billing by radio further enhance the Company's water conservation efforts. Production meters and retail meters can now be read within a very short time period (within a few hours of each other). Comparing the production volume to the retail volume allows a more accurate estimate of unaccounted for water and has shortened leak response time.

2008 Projects

Maple Hills CWS/Derry Interconnection

Project Amount: Included above

This project is the distribution portion of the interconnection and booster station project described in the previous section of this testimony. The work included the addition of 1,780 feet of 8-inch diameter main, of which approximately 800 feet was required to connect the booster station to the Derry system, and the remainder was needed to upsize the distribution network to accommodate the flow from the new source of supply. Approximately 940 feet of 4-inch plastic water main was retired as part of the project.

2009 Projects

Locke Lake - Northwest Pipeline Loop

Project Amount: $133,703

The Northwest Pipeline Loop closed a gap in the distribution network around Locke Lake. The closure of the loop allows flow from the Peacham Road Treatment Facility to travel in two directions around the lake in the system. Prior to its completion, main breaks and repairs would require the shutdown

of large sections of the distribution system. The addition of this pipeline section helps minimize the number of customers impacted when main break repairs are performed, and improves flow and pressure during peak demand periods.

Locke Lake Section "S" Interconnection

Project Amount: $153,762

The Section "S" interconnect was completed in conjunction with the Northwest Pipeline Loop above. It allowed a small independent section (Section "S") to be connected to the main system. The interconnection allowed the Company to abandon the Section "S" well and booster station, reducing costs and the liability of a well that did not have the proper wellhead protection radius. The Northwest Pipeline Loop and the Section "S" Interconnection resulted in the addition of approximately 1,600 feet of new main with no retirements.

Birch Hill Redridge Lane Connection

Project Amount: $222,136

The project looped a long dead end section of the Birch Hill distribution system and added several homes in the higher elevations of Red Ridge Lane to the Birch Hill high service system, improving water delivery and pressure to over 40 pounds per square inch. The project added approximately 2,800 feet of 4-inch and 2-inch of water main to the system.

2010 Projects

Locke Lake Colony Drive Main Replacement

Project Amount: $43,880

Company service crews identified a significant leak in a section of 2-inch plastic main along Colony Drive, in Barnstead. This section of main crossed under a wetland area with standing water. The exact location of the leak could not be identified. The solution was to replace approximately 290 feet of the old main with 475 feet of new main that would go around the wetland and within the Colony Drive right of way. The new location will allow future access to the main and facilitate additional system replacement in the future.

2011 Projects

Nesenkeag CWS/Londonderry Core Interconnection

Project Amount: $357,183

The Nesenkeag CWS located in Londonderry serves 44 customers. The sources of supply were bedrock wells of marginal yield. The system was served by an aging below ground, confined space storage, treatment and pumping station. Additional source capacity was needed for the system. Additional wells had been drilled but there was no additional land area associated with the system that would meet state standards for new well construction. The station required complete replacement at a location adjacent to the existing station. The cost of building a new station with marginal source capacity was not cost effective, when compared to completing this 2,050 foot pipeline connection to the Londonderry Core water system. Source capacity now meets and exceeds regulatory standards, the source capacity is not limited (like it was when the source of supply was the

wells), and the elimination of the pumping station and associated treatment equipment allows for more efficient operations.

Locke Lake North Shore Road and Rogers Road Main Replacement

Project Amount: $552,074

This project is another phase in the long term plan to replace all of the substandard water main in Locke Lake. Approximately 8,700 feet of new 6-inch and 4-inch diameter main replaced nearly 9,000 feet of mostly 2-inch diameter and 4-inch diameter main. Water service "main to curb stop" sections were replaced for existing customer locations. Where two customers shared a single main to curb stop section, new separate services were provided to each customer.

Sunrise Estates Main Replacement

Project Amount: $416,709

Sunrise Estates was originally developed as a seasonal community. Water mains and services were of small diameter plastic and were generally buried in roadway ditch lines at shallow depths often less than 3 feet. The Town of Middleton initiated a roadway reconstruction project in 2011 that included significant drainage improvements. The drainage improvements included the upsizing of all road and driveway culverts and the deepening and widening of all ditches and drainage swales. The road work began to further reduce the ground cover over our mains and services and in some cases exposed them completely. The roadway improvements covered the entire extent of the water distribution system. Company operation staff measured main and

service depths in valve and curb boxes. The measurements revealed that road and ditch finished grades were leaving too much of the distribution system (especially customer services) susceptible to freezing in the winter. The Company determined that the only way to remove the threat of freezing would be to replace the entire distribution system and customer services so that they were in the roadway and at a depth greater than 5 feet to avoid winter frost. The Company installed almost 7,500 feet of new 4-inch diameter water main to replace over 7,000 feet of 1.5-inch diameter and 1-inch diameter distribution pipe.

Londonderry Reed Street Main Replacement

Project Amount: $21,973

The Company replaced 100 feet of failing 6-inch ductile iron pipe with PVC pipe. This section of pipe failed 3 times over a 2-month period. The failure was due to a significant amount of external corrosion. Delay in replacement would have resulted in additional failure under new pavement, thus increasing repair cost and service interruption.

2012 Projects

Locke Lake Dam Site Road Area Phase 1

Project Amount: $468,389

This project is another phase in the long term plan to replace all of the substandard water main in Locke Lake. Approximately 6,600 feet of new 6-inch and 4-inch diameter main replaced over 6,000 feet of mostly 2-inch diameter and 4-inch diameter main. Water service main to curb stop sections

were replaced for existing customer locations. Where two customers shared a single main to curb stop section, new separate services were provided to each customer.

Stonegate Estates (Sawmill) Main Replacement

Project Amount: $657,465(2 work orders)

Stonegate Estates in Pelham had been interconnected to the Williamsburg system of Pelham by Consumers New Hampshire Water Company. The interconnection allowed the Company to abandon the former well and pump station but the distribution system remained as originally constructed. The system has a history of leak repairs. The mains were of substandard construction and the numerous shutdowns for leak repair resulted in expensive road restoration and required the system to be drained, exposing the pipes and our customers to potential contamination by infiltrating groundwater. To minimize interruption to customer service, the most feasible alternative was to replace the entire distribution system and the main to curb stop section of the customer service. Approximately 4,700 feet of new 4-inch diameter and 8-inch diameter main was installed to replace 6,300 feet of 2-inch diameter and 1.5-inch diameter main. The Company worked with the Town to site five new hydrants within the development.

Q. Is this expected to be the anticipated level of pipeline replacement/rehabilitation in the future for PEU?

A. Main replacement at Locke Lake will continue at its current pace of about $400,000 per year for at least the next decade. There are other community

systems within the company where Company staff is tracking the history of leak repairs, unaccounted for water, and customer feedback to determine if main replacement is needed.

Q. What other types of capital expenditures has the Company undertaken to maintain and enhance service?

A. There have been other efforts classified as capital projects that fall into this general category. These projects are predominantly replacements of plant and equipment as well as technology upgrades that improve operational efficiency. Examples of these projects include: booster pump replacements, well pump replacements, treatment equipment upgrades and replacements, filter media change outs, improvements to buildings (such as new roofs), electrical system upgrades, SCADA and communications additions.

Q. What **other capital initiatives is the Company pursuing to improve planning, reduce costs, improve efficiency and provide higher levels of customer service?**

A. The Company completed the initial phase of an Enterprise Asset Management Initiative. The initial phase set forth a road map to implement the initiative over a five to seven year period. The program consists of three interdependent components including a Geographical Information System ("GIS") in order to improve record dissemination of buried assets, a Computerized Management and Maintenance System ("CMMS") to plan and track work and associated costs to specific company assets, and finally a means to convert our operations from a paper work order system to an

electronic work order system otherwise know to the Company as DPaC (Data Presentation and Collection). The Asset Management system will facilitate asset data extraction and analysis in order to enable the conversion of operational and financial data to useful decision making information. Armed with asset specific information, the Company's ability to predict and plan for the replacement of aging infrastructure will improve.

In addition, the Company will continue to seek low cost financing through the NHDES State Revolving Fund. A new requirement for this funding will be that any utility seeking SRF financing will be required to have an appropriate level of Asset Management in place to qualify. The Company is a 2013 recipient of a $15,000 grant to assist with the development of its Asset Management program.

Q. Does this complete your testimony?

A. Yes.