STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

RE: PENNICHUCK EAST UTILITY, INC.
DW 23- ___

2023 QUALIFIED CAPITAL PROJECT ADJUSTMENT CHARGE FILING

DIRECT TESTIMONY
OF
John J. Boisvert

February 14, 2023

Professional and Educational Background

Q. What is your name and what is your position with Pennichuck Water Works, Inc.?

A. My name is John J. Boisvert. I am the Chief Engineer of Pennichuck Water Works, Inc. ("PWW"), which provides services to Pennichuck East Utility, Inc. ("PEU" or the "Company") pursuant to a management allocation agreement. I have worked for PWW 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 the Company, 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 manage and oversee the Company's Engineering Department. I lead the Company's Asset Management program. As head of the Engineering Department, 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. The Engineering Department staff provides regular technical assistance to the Company's Water Supply Department, Distribution Department, Customer Service Department, and Senior Management.

Q. What is the purpose of your testimony?

A. I will be providing details of the major capital projects planned and budgeted/forecasted for 2023-2025 as part of the Company's 2023 Qualified Capital Project Adjustment Charge ("QCPAC") filing. This testimony will also present and describe the major QCPAC projects initiated and completed in 2022, as well as the budgeted or proposed projects for 2023, 2024 and 2025. My

testimony supports, and is in addition to, testimony being provided by the Company's Chief Operating Officer Donald L. Ware for this docket. Detailed project listings mentioned in this testimony are included in Exhibit DLW-1, Pages 1-7 as part of Mr. Ware's testimony.

Q. What types of projects can be described as "major capital projects"?

A. Major capital projects require significant capital investment and are approved annually in the Company's capital budget by the Company's Board of Directors. Projects are associated with treatment facilities, pumping facilities, storage tanks, water main replacements, valve and hydrant replacements, building facility improvements and refurbishments, equipment purchases, as well as non-structural efforts to improve Company performance, such as engineering studies. These generally include:

- The replacement of infrastructure that has reached, or is reaching, the end of its useful life, does not achieve the level of service required of it (water quality, capacity, and efficiency), or the Company's ability to properly maintain it (outdated/lack of repair parts, etc.) and is either impractical or more costly to repair or rehabilitate, than replacing it.
- Infrastructure upgrades to improve system performance.
- Investments to ensure compliance with the primary and secondary Safe Drinking Water Act standards.
- Replacement of meter reading radios.

- Engineering studies and evaluations to assess infrastructure and system performance to aid in planning future capital investment needs.

Q. **What is the process that the Company employs and what are the factors the Company considers when developing the capital budget for water main replacements?**

A. The Company considers a number of factors in developing a capital budget for water main rehabilitation, replacement, and/or new construction. The Company has completed the first phase of its Asset Management Initiative. The Company has inventoried its pipeline assets and documented them within its Geographical Information System ("GIS") database. Also, an initial condition assessment and a preliminary evaluation of the consequence of failure of certain water main assets has been completed. This application and effort have thus far served as an effective tool to determine which assets are most critical and should be evaluated in more detail for possible inclusion in the current 2023 – 2025 capital budgets/forecasts. Since 2020, when the Company transitioned to a new Computerized Management and Maintenance System (CMMS) software, the Asset Management Initiative has and is being expanded to look more closely at specific assets to identify the risk of failure, whether there is a structural failure (break) or the asset is not attaining the required level of service (water quality, flow, or pressure). This is being done to facilitate more predictive guidance to plan for and implement future capital expenditures. This approach is ongoing and being refined or enhanced as more data and information on the Company's

assets become available. This Asset Management approach considers the following for all assets including:

- Water main break/failure history;
- Water quality problems;
- Fire protection flows;
- The proximity of and support provided to key critical customers (public safety, government, hospitals, etc.);
- Coordination with gas company (or other buried utility assets) replacement projects;
- Geographic grouping of streets where mains are to be replaced/rehabilitated for improved efficiency by aggregating main replacement work in close proximity;
- The opportunity to take advantage of efficiencies gained from coordinating with the paving, storm water and sewer projects of cities and towns served by the Company, and in the replacement of water mains where substandard plastic water pipes were originally installed by the water company or developer at the time of installation. There are cost savings in pavement repair and traffic control costs associated with completing projects while the municipality or other utility company is also working on a street.
- Industry guidelines of the American Water Works Association for the replacement of water mains using an average life expectancy for water mains of 100 years absent specific information on a particular asset. The Company considers this rate and modality of replacement to be reasonable until the

Asset Management System allows for a more system/asset specific assessment to be performed, giving more precision to replacement time frames. While all the Company's water mains are less than 60 years old, a portion of those water mains are substandard plastic water mains that were installed by the original developer prior to the NHDES setting minimum standards on water main materials. As such, those plastic water mains break or fail with much greater frequency than water mains constructed with today's approved materials, such as ductile iron pipe. By example, the break per mile on substandard plastic (Sch 40 PVC, 100 psi HDPE or PB – 496 breaks on about 68 miles of substandard plastic over the past 24 years) is about 7.2 breaks per mile versus 0.16 breaks per mile on ductile iron pipe (51 breaks on about 324 miles of DIPCL) between 1998 and 2021, or about 45 times greater in frequency.

- There are also geographic areas of the PEU system where environmental/soil conditions have likely caused water main leaks and failure due to external corrosion primarily on pipes that are ductile iron. The number/occurrence of failures is not large enough at this time to require immediate action. It is, however, a situation that the Company will continue to monitor and assess with respect to existing water mains. With the use of GIS and Asset Management tools, soils exhibiting corrosive potential and other environmental conditions such as wetlands, high water groundwater tables, and other anthropogenic facilities (landfills) that could foster corrosive conditions have been mapped and overlaid on to the water main networks.

This has allowed to Company to note/designate areas of the distribution system monitored for leakage and for further investigation (excavation and inspection) should failures in these areas increase. With the knowledge of where these conditions exist, it allows the Company to select/specify pipe materials for new water main construction that are more resistant to corrosion or to specify measures such as zinc coating of ductile iron (now the Company standard for ductile iron and most favored) and polyethylene encasement (plastic wrapping), if added protection is warranted.

Replacement of aging and substandard infrastructure will continue to be a major driver of the Company's water main replacement for the foreseeable future.

Q. What were the major water main projects completed in 2022?

A. The following water main projects were completed in 2022 with carry over expenditures into 2023, or deferred from 2022 into 2023:

<u>Londonderry System Improvements (W/O# 2200455 at a cost of $113,134)</u>

<u>Permitting and Design.</u>

Design and local Town of Londonderry land use permitting, and design efforts in 2022 resulted in the acceptance and approval of site plan designs for the storage tank and the booster station on December 7, 2022. Final designs of the storage tank, booster station, and the transmission main that connects the booster station with the storage tank will commence in the first quarter of 2023, leading to

bidding of all three components by April 1, 2023. Construction is expected to begin in 2023 and be complete in 2024.

<u>W&E Water Main Improvements - Windham (W/O# 2200453 at a cost of $471,847) Interconnection to the Southern NH Regional Water System.</u>

To complete the interconnection to the Southern NH Regional Water System (SNHWS), the Company added approximately 400 feet of 4 inch, 80 feet of 6 inch, and 775 feet of 8 inch ductile iron water main along with a meter vault. The interconnection allows the Company to purchase up to 30,000 gallons per day (gpd) from the Town of Salem through the SNHRWS. This purchase water agreement eliminates the need for the company to use one of the three wells in the W&E system that has such poor water quality (elevated iron, manganese, & hardness) that the treatment equipment is not capable of adequately treating those existing raw water conditions. The 30,000 gpd purchase further improves finished water quality when combined with the treated water from the remaining two wells. The interconnection offers a redundant source of supply given, such that the interconnection can supply 100% of the W&E system demand in an emergency, or if the remaining two wells become contaminated or fail in the future.

<u>Gage Hill CWS – Pelham (W/O's 22078843, 1702834, 2307844, 2307845, 2307847 at a cost of $578,607) Water Main Replacement</u>

The Gage Hill CWS water distribution system was a developer installed water system that was constructed with substandard pipe and fitting materials. Much of the original piping was 2 inch diameter polyethylene tied together with nylon (plastic) “stab fittings” secured by hose clamps. Since 2000, the Company has recorded 88 main and service breaks/repairs in this system. The break/repair frequency was likely to continue at that level, or become worse over time. Because of the geometry of the pipe network (no loops) and the lack of distribution valves, sometimes large sections of the system, if not the entire system, would need to be depressurized and drained risking contamination from groundwater. The frequency of these situations was an inconvenience to customers and costly for the Company. The Company had planned for the full replacement of the distribution system with approximately 4,200 feet of new 4 inch diameter C-900 PVC water main and all 28 of the Company owned main to stop services (Vassar Drive, Radcliff Drive, Wellesley Drive, and Bridge Street). With the delay of the construction of the Londonderry System Improvements (W/O# 2200455) to 2023 and 2024 (and the dollars that freed up in the 2022 budget for projects), the Company was able to move (and complete) the construction of Gage Hill to 2022 from 2023. Street restoration will be completed in 2023 under a new work order.

Q. Please identify and describe water main projects budgeted or planned for 2023, 2024, and 2025.

A. Budgeted (2023) or planned (2024-2025) water main replacements and additions are listed below by year.

2023 Water Main Replacements/Additions

- Related to the 2022 Gage Hill project, there will be carry over water main work on Route 38 in order to relocate a section of existing water main and service connection into the public right of way. There will also be site/roadway restoration at Gage Hill, for the project that was completed and placed into service in 2022. These efforts are currently budgeted at $700,000.
- Otherwise, there are no new water main replacements currently budgeted in 2023.
- The 2023 Capital expenditures are more focused upon the Londonderry Storage tank and pumping/treatment station upgrades, and the replacement of the Sunrise Estates CWS Treatment/Booster station and storage tanks. Those activities will be discussed later in this testimony.

2024 Water Main Replacements/Additions

- There are no planned distribution water main improvements planned for 2024.
- Major capital projects efforts will be focused on completion of the Londonderry storage tank, transmission main, and booster station projects plus the Sunrise Estates CWS project discussed later in this testimony.

2025 Water Main Replacements/Additions

- There are no planned distribution water main improvements planned for 2025.
- Major capital project will be focused on booster station and storage tank replacement discussed later in this testimony.

Q. Your testimony states that water main replacement varies each year (2023-2025) due to balancing the investment in water main replacements with other major capital projects. What are those other major capital projects completed in 2022? Budgeted/Planned for in 2023-2025?

A. These “other major capital projects” investments are associated with vertical assets, including storage tanks, pumping stations, treatment facilities, source of supply and process related improvements (SCADA, Asset Management, etc.). In some years there may be more need for horizontal asset investment (main replacements) rather than vertical assets. In other years the opposite may be true. The balancing of these focused objectives is necessary to maintain a balance between timely replacement of aging infrastructure, while also keeping water rates from increasing too quickly, in order to fund those incurred costs. A large vertical asset can consume most of the targeted annual PEU capital investment dollars and result in the Company delaying a horizontal project for a number of years to lessen rate impacts. These deferments are weighed and considered carefully, such that the deferment is not an adverse decision as it

relates to the ability to meet the core objectives of delivering water to customers as needed.

2022 Completed Vertical Projects

Pioneer Park CWS – Windham (W/O# 2300449 at a cost of $16,244) Arsenic Filtration

Arsenic levels in the single well at Pioneer Park have increased such that the four quarter running average of 5 parts per billion (ppb) in the raw water was going to be exceeded in the fourth quarter of 2022. The Company decided to preemptively install arsenic filtration rather than exceeding the standard, which is problematic on numerous levels. This work was completed in December 2022. The fourth quarter treated water sample for arsenic was below the standard of 5 ppb maintaining compliance with the NHDES standard.

2023 Vertical Projects

Sunrise Estates CWS Booster Station & Storage Tank Replacement

The Sunrise Estates CWS booster station structure and steel atmospheric and hydropneumatic storage tanks are original to the water system and are beyond their useful service life. The station is located partially below ground, with the storage tanks being fully buried except for where they protrude through the station wall. Where the tanks protrude through the wall, they are heavily corroded. The design is underway to replace the station with a new above ground building structure, new pumps, controls, electrical system and room for additional treatment (primarily manganese filtration and disinfection) and a new

below ground concrete atmospheric storage tank. The project will be bid in the first quarter of 2023 and be complete in December 2023. The estimated project cost is $500,000.

Londonderry Core, Londonderry, NH

To provide a contextual background, the following *italicized* text previously provided in DW 22-005 provides a summary of the need and the regulatory history for the Londonderry Core storage tank, transmission main, and booster station project.

The Company had planned to replace the Gilcrest Road Pressure Reducing Valve (PRV) Pit in 2019. This pit is a converted below ground vault that was installed in the late 1980's. The internal piping, which is painted steel, is corroded, and multiple small pin hole leaks have been repaired over the past five years. The PRV's in the pit reduce the pressure from the elevation 620-foot pressure zone down to the 498-foot pressure zone, as they exist in the Londonderry Core portion of the Company's distribution system in that community. The addition of a second PRV vault, as part of the Woodmont Commons development will replace the Gilcrest PRV pit. The change in how water will be fed into the Londonderry system, as discussed below, provides system redundancy and eliminates the need to rebuild the Gilcrest PRV pit.

The Company planned to design and permit a 1.25 million gallon water storage tank to address water supply capacity shortfalls in the Londonderry Core system, as documented by the NHDES in their Sanitary Survey dated January 9, 2018.

A Private Developer is prepared to contribute 51% of the cost of the tank.

Additionally, the construction of the tank will reduce the Company's purchased cost of water from Manchester Water Works by about $70,000 per year. The Company sought and received, through its petition to the Commission (Docket No. DW 18-101), an approval of a Special Contract with a private entity, Pillsbury Realty Development, LLC ("Pillsbury") for Pillsbury to fund approximately 51% of the project cost. Pillsbury's contribution is the result of their impact on the Londonderry water system from a significant development (Woodmont Commons) that Pillsbury is constructing. The elevated tank required a variance due to its height at the location where it was to be constructed. Unfortunately, the Londonderry Zoning Board of Adjustment denied the variance in November 2019. Since the denial of the variance, PEU has engaged the services of an engineering consultant to assess other water supply storage and distribution options to achieve the objectives of the original elevated storage tank project and assess the relative costs. During this evaluation process, PEU engaged in discussions with Town of Londonderry staff, our consultants, and NHDES to advise local officials of the need to make system improvements of which the most technically feasible options include water storage to meet existing water demand conditions regardless of Woodmont Commons. In addition, PEU met with representatives of Pillsbury to present system improvement options that achieve PEU's responsibilities as the public water utility and meet the needs of the Woodmont Commons development consistent with the Special Contract approved by the Commission in Docket No. 18-101 by Order 26,285 on August 9, 2019. During these discussions, a number of opportunities were discovered or

offered by Woodmont Commons that advanced technical alternatives previously unavailable to PEU and would result in similar rate impact to the elevated tank option (originally identified as the "least cost option"). PEU filed a petition detailing this alternative (see DW 18-101) to present a new alternative consisting of a ground level storage tank, transmission main, and water booster pumping station. This alternative revised the project scope but is consistent with the cost sharing arrangements with Pillsbury in the Special Contract approved by a subsequent Order 26,473 on April 21, 2021.

As stated previously in this testimony, the local Town of Londonderry land use permitting, and design efforts in 2022 resulted in the acceptance and approval of site plan designs for the storage tank and the booster station on December 7, 2022. Final designs of the storage tank, booster station, and the transmission main that connects the booster station with the storage tank will commence in the first quarter of 2023 leading to bidding of all three components by April 1, 2023. Construction is expected to begin in 2023 and the storage tank and the transmission main could be complete and in use by the end of 2023. It is anticipated that the entire project will be used and useful in 2024, as the booster station will have a longer construction schedule due to long lead times on critical equipment.

The Company estimates its 49% share of the total project expenditure to be $1,600,000. The project will be financed through drawdowns on the Company's FALOC with CoBank (to be subsequently converted to long-term debt via the

QCPAC process filing in 2024 and/or 2025, as phases of the project go used and useful). Once the entire Project is completed, the Company projects its purchased water costs from Manchester Water Works to the Londonderry Core to be about $70,000 per year less than before the tank was constructed.

2024 Vertical Projects

Completion of the Londonderry Core

As stated previously, the Company anticipates completion of the entire Londonderry Core tank, transmission main, and booster station projects in the fourth quarter of 2024.

2025 Vertical Projects

Atkinson CWS Station Reconstruction

The Company has planned an amount of $800,000 to reconstruct an existing water pumping and storage facility that serves a limited area in the Town of Atkinson (Pioneer Park). The station pumping and piping equipment are beyond the design life and have deteriorated where replacement is necessary. The storage tanks are buried steel and show signs of significant corrosion. The tanks need to be replaced. Finally, the station is required to provide limited fire protection. Existing storage volumes and pumping equipment are not capable of providing the required fire protection flows.

Q. Are there other capital expenditures completed in 2022 and/or budgeted/proposed for 2023, 2024, and 2025 that the Company plans to complete?

A. Yes. The Company has a number of routine capital activities that are not classified as "major" but are necessary to operate the business and serve our customers. Some examples are as follows:

- The Company carries "run rate" budgeted amounts for well rehabilitation, pump replacements, SCADA improvements, security enhancements, along with other treatment and pumping equipment. The Company also budgets a number of hydrant, valve, and service (main to stop) replacements each year.
- The Company will continue the process of replacing customer Radio Meter Interface Units (MIU) that are beyond their warranty period of 10 years and approaching the end of their useful life (original Radio MIU's were installed in 2008). The project is targeted to replace all the radios over ten years resulting in radios being replaced between years 13 and 23 of their lives. All the Radio MIU's planned for replacement were installed in 2008. Annual radio failure rate has increased from about 0.5% per year to just over 3% per year in 2022. The plan is designed to avoid mass failure of the radios and to spread the investment of the aggregate replacement over time. Replacing radios at the time of failure results in an estimated meter read and a special trip to the location of the failed radio to complete the radio replacement. On average (based on system geography), the average time for a single radio change out (inclusive of travel) in PEU is about 2 hours in remote systems, or

about $230 per replacement. This is opposed to a dedicated, planned replacement program where all radios in a remote area are replaced at once with one trip versus individual trips where the time spent per radio replacement is no more than 15 minutes per radio, resulting in a replacement cost per unit of about $125. Extending the replacement plan over 10 years will allow the Company to view radio failure rates for radios between 13 and 23 years old and allow a better planned timing of the next set of radio replacements, while further spreading the radio replacements out over a longer period of time than the original single year implementation. The 2023 budget for this effort is $91,000. This work will continue into and be further budgeted in 2024 and 2025 at $91,000 per year respectively.

These Capital expenditures will be funded through the FALOC with CoBank, for which drawdowns are annually refinanced with a term loan from CoBank.

Q. Does this conclude your testimony?

A. Yes.