STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

RE: PENNICHUCK WATER WORKS, INC.
DW 22- xxx

2022 QUALIFIED CAPITAL PROJECT ADJUSTMENT CHARGE FILING

DIRECT TESTIMONY
OF
John J. Boisvert

February 14, 2022

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. (the "Company" or "PWW"). I have worked for the Company 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. I, as head of the Engineering Department, 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. My testimony will present the major Qualified Capital Projects initiated and completed in 2021, as well as providing details of the major capital projects planned and budgeted for 2022-2024 as part of the Company's 2022 Qualified Capital Project Adjustment Charge ("QCPAC") filing. 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 detailed in Mr. Ware's testimony (Exhibit DLW-1, Pages 1 – 7).

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 dams, treatment facilities, pumping facilities, storage tanks, water main replacements, valve and hydrant replacements, building facility improvements and refurbishments, as well as non-structural efforts to improve Company performance such as Asset Management. These generally include:

- The replacement of infrastructure that has: (1) reached or is reaching the end of its useful life, (2) does not achieve the level of service required of it (water quality, capacity, and efficiency), or (3) the Company's ability to properly maintain it (outdated/lack of repair parts, etc.) 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 ("SDWA") standards.
- Engineering studies and evaluations to assess infrastructure and system performance to aid in planning future capital investment needs.
- The implementation of processes and systems such as Asset Management, which incorporates/integrates Geographical Information Systems (GIS), Computerized Management and Maintenance System

(CMMS- Cityworks as of 12/31/2020), electronic time and record keeping, as well as inventory management, allowing the Company to have access to the data and information needed to make cost effective, immediate and long-term operations and planning decisions.

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?**

The Company considers several 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 GIS (Geographical Information System) database. 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 has 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 2022 – 2024 capital budgets/forecasts. During 2020 and 2021, upon the transition to a new Computerized Management and Maintenance software, the Asset Management Initiative has and is being expanded to: (1) look more closely at specific assets to identify the risk of failure, (2) determine if there is a structural failure (break), or (3) the asset is not attaining the required level of service (water quality, flow, or pressure). The usage of the Asset Management system in this regard has provided the ability to facilitate

more predictive guidance in planning for and implementing future capital expenditures. This approach is ongoing and being refined or enhanced as more data and information on the Company's assets becomes 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 to each other;
- 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, in the replacement of water mains where substandard plastic or aging unlined cast iron water mains are present. 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 to be a reasonable basis of main replacement planning and determination, until such time that the Asset Management System will better and more fully allow for a more system/asset specific assessment to be performed. In terms of targeted water mains to be considered and evaluated, the Company still has approximately: (1) 31.7 miles of unlined cast iron water main in service, most of which is over 100 years old and was installed beginning in 1853, (2) about 37.8 miles of Asbestos cement water main (most of which was installed between the mid 1950's and 1960's), (3) 1.2 miles of small diameter steel water main installed primarily in the 1950's, and (4) 1.0 miles of substandard plastic water mains, and (5) 1.1 miles of unknown material that was installed by the original developer in the 1970's and 1980's (prior to the NHDES setting minimum standards on water main materials). 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 are the major projects the Company started in 2020 that the Company completed as part of the 2021 Capital Budget?

A. Two projects, the Kessler Farm Tank Replacement and the Coburn Woods Water Main Replacement had delayed starts due to schedule impediments directly or indirectly impacted by Covid-19 construction availability and delays, supply chain disruption, protocols and policies. The Kessler Farm Tank (W/O#

2101759) was bid in 2020 and construction started in March 2021. The tank was used and useful by the end of 2021, but certain external and cosmetic components will not be finished until the second quarter of 2022, including final site restoration and concrete finishing/coloring of the external tank.

The Coburn Woods (W/O #'s 2002685 & 2101761) project mobilized in November 2020 and some construction was completed but winter set in halting work. Construction resumed in April 2021, with approximately $755,000 worth of water main replacement (954 LF), services (35 totaling 1,200 LF), and valves (9) installed becoming used and useful in 2021. A limited amount of construction associated with valve installation and site restoration will resume in the Spring of 2022.

A third project, the Merrimack River Pump Station (W/O/# 2102256) included: (1) the completion of structural improvements to the station enclosure, (2) electrical system/equipment upgrades for the addition of a third raw water pump and the installation of an emergency generator connection, (3) a new 350 horsepower pump (Pump #3), and (4) the rebuilding of the 350 horsepower pump (Pump #2). The third pump was installed for essential redundancy in the event of failure of one of the other two pumps, as two pumps running at the same time are required to generate the necessary flows from the Merrimack River to meet summer peak demand flows. It is the Company's intent to withdraw as much water from the Merrimack River whenever possible, because the raw water levels of the contaminant PFOA in the Merrimack River range between 3 and 5 parts per

trillion (ppt), whereas the range of PFOA in the Pennichuck Brook System raw water has been in the range of 15 to 35 ppt. The cost of electricity to run the Merrimack pumps is less than 1/5th the cost of a carbon media change-out at the filtration plant. The usage of the Merrimack River water with the lower PFOA raw water levels is therefore more economically advantageous versus the cost of replacing the carbon media on a more frequent basis, if the Pennichuck Brook water was used exclusively. The NHDES drinking water standard for PFOA is 12 parts per trillion.

The Company completed several water main replacement/additions in 2021 that began and went used and useful in 2020. The projects went used and useful just prior to winter, and as such, the final landscaping and paving could not be completed in 2020, and this restoration work carried over into the 2021 budget. These 2020 carry over water main projects include:

<u>Final Paving and/or restoration for Water Main Replacement (W/O#'s 2102529, 2102528, 2102523, 2102534, 2102531, 2102530, and 2102535 totaling $305,996)</u>

- Brook Street
- Hamilton Street
- Burritt Street (two sections)
- Verona Street
- Sarasota Avenue
- Ash Street
- Manatee Street including the Pine Street Intersection

Q. What were the major water main projects completed in 2021?

A. Because of the construction of the Kessler Farm Tank and the capital dollars reserved at the start of 2021 for the Harris Dam (W/O# 2101956) and the Supply Pond Dam (W/O# 2101927) projects, the Company held back on major water main improvements due to budgetary constraints. At the end of the second quarter of 2021, it became clear that environmental permitting associated with Harris and Supply Pond Dams would preclude construction of those projects in 2021. This allowed the Company to reallocate those budgeted dollars and initiate design work on one major water main replacement project to be completed in 2022 and complete one emergency water main replacement in 2021. This project, the Niquette Avenue (W/O# 2103936) water main replacement project was completed in 2021. The work included the replacement of an existing 2-inch steel pipe water main with 4-inch PVC water main, crossing East Dunstable Road which was being impacted by sewer and other utility work within the Niquette and East Dunstable intersection.

Q. Please identify and describe water main projects budgeted or planned for 2022-2024.

A. Proposed water main construction and corresponding water main trench restoration is presented, by year, below. The majority of the water main being replaced is in Nashua and is near or greater than 100 years old. The pipe is generally 2-inch through 8-inch diameter unlined cast iron pipe (CI). Most of this

pipe suffers from internal corrosion (tuberculation) resulting in substandard fire flows. This internal corrosion also increases the risk of the delivery of substandard quality water to our customers, including bacteria (from the potential loss of chlorine residual) and colored water from flow fluctuation or pipe disturbance. Some of the work in 2022-2024 may be done in conjunction with sewer improvement projects by the City of Nashua. The City schedules and completes their work annually based upon a July 1st – June 30th fiscal year and does not finalize and provide the Company with their capital project plans until March or April each year. And finally, a substantial amount of water main construction will be the replacement of small diameter steel and galvanized steel water mains. These small diameter steel mains are suffering from both internal and external corrosion and are very brittle. As such, they lack flow capacity and they do not withstand heavy vibration from paving operations and nearby excavation of other buried utilities.

<u>Planned 2022 Water Main Replacements/Additions</u>

Water main work is anticipated within the City of Nashua and the Town of Amherst as part of ongoing replacement of aging infrastructure. The projects total approximately $3,371,000 in reinvestment. Much of this effort will be associated/coordinated with other utility work and road reconstruction. Specific Projects are as follows:

- Coburn Woods (carry over): Replacement of approximately 250 LF of water main, 24 valves, and site restoration of the remaining Phase 1 work initiated in 2020.
- Miami Street: Replace 429 LF of 2" CL steel pipe with 8" DIPCL.
- Kendrick Street: Replace 6" CI pipe with 466 LF of new 6" DIPCL.
- Faxon Avenue: Replace 2" Cl pipe with 205 LF of new 4" C900 PVC.
- Faxon Street: Replace 6" CI pipe with 528 LF of new 6" DIPCL.
- Chataqua Avenue: Replace 1.25"/4"/6" installed in 1915-1963 with 780 LF of 4"/6" DIPCL.
- Niquette Drive: Replace of 2" steel pipe installed in 1960 with 525 LF of 4” C900 PVC.
- Pine Hill Avenue: Replace 1.25" steel pipe installed in 1953 with 300 LF of 4” C900 PVC.
- Mt. Pleasant Street: Replace 1.5" steel pipe installed in 1955 with 400 LF of 8” DIPCL.
- French Street: Replace 2"/6" steel/CI pipe installed in 1887 & 1926 with 340 LF of 4"/6" DIPCL.
- Dudley Street: Replace 1.25"/8" CI/AC pipe installed in 1957-1971 with 830 LF of 8" DIPCL.
- Ledgewood Hills Drive/Heather Court: Add 10 feet of 8” DIPCL to connect two dead end pipe runs.
- Rita Street: Replace 0.5" CICL pipe installed in 1956 with 210 LF of 4" C900 PVC.

- Salem Street: Replace/Add 855 feet of 4"/6" installed in 1888-1927 with 6".
- Walnut Street: Replace 6"/8" cast iron pipe installed in 1888-1931 with 830 LF of 12" DIPCL.
- Route 101A Water Main Relocation: Remove and relocate approximately 1,100 LF of 24 inch DIPCL with 1,100 of 24 inch DIPCL due to NHDOT highway/intersection reconstruction.
- Replacements associated with City of Nashua Sewer Replacement: Budgeted the replacement of 1,000 LF of cast iron or asbestos cement pipe impacted by sewer construction (to be determined).

<u>Planned 2023 Water Main Replacements/Additions</u>

Approximately 16,000 LF of water main replacement is anticipated in 2022. Roughly 3,400 LF will be associated/coordinated with City sewer projects with the remainder of the work consisting of aging infrastructure replacement at a budget of approximately $5,462,000. The specific locations include:

- City Sewer Projects (2023): Replace CI, AC, and other older water main disrupted by sewer construction.
- Swan Street: Replace of 2" CI installed in 1953 with 156 feet of 4” DIPCL.
- Chapman Street: Replace 1.25" steel pipe installed in 1948 with 156 LF of 4" C900 PVC.

- Savoy Street: Replace 1.25" steel pipe installed in 1947 with 142 LF of 6" DIPCL.
- Palm Street: Replace 4" CI installed in 1890 with 420 LF of 6" DIPCL.
- Almont Street: Replace 370 feet of unknown pipe material and diameter with 370 LF of 8" DIPCL.
- D Street: Replace 4" CI installed in 1898 with 500 LF of 8" DIPCL.
- Union Street: Replace 1.25" and 4" pipe installed in 1909-1978 with 520 LF of 12" DIPCL.
- Cherry Street: Replace 4" CI installed in 1926 with 340 LF of 4" PVC.
- Union Street: Replace 1.25" and 4" pipe installed in 1909-1978 with 520 LF of 12" DIPCL.

<u>Planned 2024 Water Main Replacements/Additions</u>

Water main replacements total approximately 10,700 LF for 2024 at a budget of $5,400,000 and includes the following locations/categories:

- City Sewer Projects: Replace approximately 1,700 LF of CI with DICLP.
- Water Main Replacement: Replace approx. 9,000 LF of small diameter water main associated with the lead and copper rule and city paving.
- Coburn Woods Phase 2: Replace the remaining 4,200 LF of 2” water main and services with 4” C900 PVC.

Q. Your testimony states that water main replacement projects may vary each year due to balancing the investment in water main replacements with other major capital projects. What are those types of projects?

The Company has typically targeted overall capital investment (reinvestment) between $8 million-$12 million per year. The Company is limited to investing no more than around $11.5 million per year in total capital expenditures due to the limits on the maximum amount that it can fund annually through its Fixed Asset Line of Credit during construction. Annually, all or nearly all of the Fixed Asset Line of Credit balance is re-financed to long term debt via the issuance of tax-exempt or taxable bonds using the New Hampshire Business Finance Authority as its conduit to those bond markets.

These "other major capital project" 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.

Q. What were the other major projects completed in 2021?

A. Meter Radio Replacement Year 1 (W/O# 2101626): The Company did not reach the anticipated number of radio replacements budgeted for 2021 due to Covid-19

restrictions/impacts. The Company replaced 1,271 radios in 2021 at a cost of $121,635. Radios not replaced in 2021 will be shifted to future years.

Kessler Farm Tank (W/O# 2101759): The Kessler Farm Tank was substantially complete, and used and useful in December 2021. There will be additional carry over work in 2022 for final site restoration and exterior concrete finishing that could not be completed due to winter conditions.

Merrimack River Pumping Station (W/O# 2102256): This project included structural improvements, electrical system improvements, and addition of a third 350 horsepower (HP) pump. The structural improvements included the enlargement of roof openings to facilitate pump removal by crane and the replacement of the roofing materials. Electrical improvements included the control panels for the third pump, as well as the addition of an emergency generator connection with a manual transfer switch.

Rebuild of Merrimack River Pumping Station - Pump #2 (W/O# 2108557): Following the completion of W/O# 2102256 above, existing Pump #2 was removed and rebuilt to address significant vibration that was occurring, due to wear and tear from usage. Pump #2 has been in service since 2011. Prior to the completion of the Company's new deep water intake in 2019, the former intake allowed sand from the riverbank to be drawn into the station and through the pumps causing wear to pump bowls, impellers, drive shafts, bearings, and seals.

CMMS Replacement Project (W/O# 2101752): The Company's Cityworks CMMS was placed into service on December 31, 2020. The additional efforts in 2021

included the refinement of the integration of Cityworks with other accounting, engineering, and operational software systems.

CMMS Cityworks PLL Implementation (W/O# 2103213): Cityworks PLL is primarily an engineering function/application (accessed by other Company departments) used to initiate, track progress, document, and manage the following:

- New service applications
- Main extension agreements and main extension construction
- Capital projects (water main replacement, treatment/booster stations, and tanks for example)

Cityworks PLL allows for the transfer of electronic documents such as plans, specifications, contract documents, test results and material shop drawings between the Company, engineers, contractors, and customers. The process enables project documents to be attached and save as part of the work order file within Cityworks. This allows all stakeholders within the Company to review project status and project materials when access to project information is needed, in a more efficient and timely manner.

Redundant Internet (W/O# 2102359): The Company developed a second internet pathway as a backup to the single pathway that the Company's systems operated on. Much of the Company's work activity relies on communication and the transfer of information between persons and systems. Completion of this project was driven by the recently completed Risk and Resiliency Assessment

(RRA) and Emergency Response Plan (ERP) required by the American Water Infrastructure Act (AWIA) completed in 2020.

Water Treatment Facility and Distribution Facility Security (W/O# 2103934): Facility security improvements were also the result of the AWIA RRA and ERP. One of the modifications included dual authentication (badge swipe and keypad PIN) for facility access by Company personnel.

Q. Please identify and describe other projects planned for 2022 - 2024.

A. The selected projects are the more significant non-water main projects described by year below as follows:

2022 Projects

Meter Radio Replacement Year 2: In 2022, the Company will continue the process of replacing customer meter radios that are at or approaching their useful life. The 2022 budget for this effort is $280,000.

AWIA RRA – ERP Projects (Budget $500,000): The company will be completing assessments of the recommendations derived from the RRA-ERP to prioritize improvements that result in risk mitigation and improved emergency response. These may include, but are not limited to:

- Security enhancements at remote facilities including locks, alarms, security lighting, cameras, fencing, etc.
- Redundancy improvements/additions such as back up pumps, portable pumps and generators, or water main improvements

- Structural enhancements to building structures to withstand extreme weather events
- SCADA system improvements including a possible transition from radio telemetry to more reliable communication technologies.

English Woods Alternative Source Interconnection (Budget $310,000): This project will be the completion of an interconnection water main from the Company's Powder Hill system to the English Woods CWS in Bedford. The English Woods CWS is served by bedrock wells that have limited capacity (there is a water restriction history at English Woods) and lack redundancy during maximum day conditions. There is no readily available land to install additional wells in a different aquifer. The interconnection watermain will connect from the Company's existing Powder Hill water main on Donald Street and run approximately 2,300 linear feet through a cross country easement to connect at the English Woods Station. Water from Powder Hill is purchased from Manchester Water Works (MWW). MWW uses chloramines to disinfect its water while chlorine is used at English Woods. Treatment equipment will be added to the English Woods Station to remove chloramines in order for the Company to maintain using chlorine as its primary disinfectant.

Coburn Tank Area HP Zone Watermain (Budget $800,000): The Coburn Tank Area of the Nashua Core water system is in the western side of Nashua at the Hollis Town line. The area is heavily developed with single family homes in the elevated ground area surrounding the Coburn Storage Tank. Because the water storage elevation in the Coburn Tank is not much higher than the homes near the

tank, working pressures are very low as some homes have pressure less than 15 pounds per square inch (psi) and even more have less than the Company's minimum target pressure of 40 psi. This project, coupled with the Coburn Tank Area HP Booster Station project discussed below, will create a constant pressure booster station to improve service to customers at higher ground elevation that experience pressures below regulatory minimums. The project includes the installation of 2 and 4 inch diameter water main along with appropriate control valves to provide domestic demand. Fire flow will be maintained by the existing 8 and 12 inch mains in the area.

Coburn Tank Area HP Booster Station (Budget $550,000): This project is coupled with the Coburn Tank Area Watermain described above.

Snow Station Building Addition Design/Permitting (Budget $100,000): The existing Snow Station provides water to the Company's Nashua Core Northwest Pressure System (NWS). Maximum day demand in the NWS requires that both existing pumps in Snow Station be operational. If one of the pumps were to be out of service, the Company could not meet the maximum day demand in the NWS. As such, a third pump is needed for essential redundancy. There is not enough space within the existing Snow Station building to accommodate the addition of a third pump. This project will be the design and permitting of the third pump and related equipment as well as an addition to the Snow Station to accommodate the third pump.

Atherton Commons (Budget $125,000): The Company is completing this project in accordance with the acquisition agreement when the Company acquired this

CWS system in the 1990's. The agreement places the responsibility on the Company to install individual meters within the Atherton Commons development when the need arises. Nine (9) outside meter pits and forty-five (45) inside customer premises residential meters are being installed as part of this project.

Bowers Dam Spillway reconstruction/increase capacity (Budget $1,850,000): The Company plans to complete a reconstruction of the Bowers Dam spillway in response to a letter of deficiency issued by the NHDES. The spillway reconstruction will increase the capacity of the spillway to ensure passage of the required flood flows and for more efficient operations of the overall required height of the dam spillway, as required by NHDES revised 100-year flows. The work will also include, depending upon the final analysis and design, enhancements to the earthen abutments to increase stability and ensure against overtopping during potential and designed for, flood events.

Carbon Filter Media (Budget $1,300,000): In order to ensure compliance with the NHDES standard for perfluorooctanoic acid (PFOA) of 12 parts per trillion (ppt), the Company needs to refresh or change out the existing granular activated carbon filter media in 8 or its 12 filter beds. The Company originally anticipated the change out to occur in 2023; however, sampling and testing of filter effluent has identified breakthrough of PFOA sooner than was anticipated, such that the change out has been advanced into 2022.

Security Cameras at the Water Treatment Plant (Budget $ 137,000): The camera project is being completed as a result of the AWIA RRA-ERP evaluation to

enhance security around and within the water treatment facility and as an action to mitigate potential risk to the facility and staff working within the facility from potential malevolent acts or other safety concerns.

2023 Projects

Meter Radio Replacement Year 3 (Budget $ 364,000): In 2023, the Company will continue the process of replacing customer meter radios that are at or approaching their useful life.

Milford Booster Station (Budget $850,000: The replacement of the Milford Booster Station is also anticipated in 2023. The replacement will eliminate an over 30-year old below ground, confined space entry, EFI steel station and its existing steel piping infrastructure. The steel piping has developed several small leaks and will continue to develop additional leaks with more frequency until that infrastructure is replaced. Station and pumping equipment upgrades are being made to ensure the Company can meet its contractual obligations to the Town of Milford for water purchases from the Company. The current plan is to relocate the new station closer to the Milford meter location, which will improve the water distribution system capacity and performance by allowing two major pipeline branches to be closed into a loop. Final station size, location and capacity will be determined in consultation with the Milford Water Department. The Town of Milford will pay the Company for 110% of the principal and interest incurred by the Company to finance the construction of this booster station.

Snow Station Transmission Main (Budget $850,000): Flows from Snow Station into the NWS is limited by a single 16 inch diameter water main that runs approximately 1,500 feet before it connects to an existing 24 inch diameter water main. The project will install a 1,500 foot long 24 inch diameter water main parallel to the existing 16 inch water main, and connect it to the same 24 inch diameter water main that the 16 inch water main is currently connected to. This improvement will reduce back pressure on the existing Snow Station pumps and improve the delivery capacity into the NWS in order to sustain flow and pressures during maximum demand periods.

Nashua Water Treatment Facility Improvements Design (Budget $300,000): This project is anticipated to follow on from the evaluation of the Company's chemical storage and chemical feed capacity at the water treatment facility. Recent history/data has shown that the raw water quality with respect to turbidity and total organic carbon (color) entering the plant from the Merrimack River and from Pennichuck Brook has increased. Drought conditions that began in 2020 and carried through into June 2021, were followed by a wet early summer of 2021, which saw raw water quality becoming significantly worse. Though treatable, the need to inject higher volumes of coagulant into the raw water strained the capacity and limits of existing chemical feed pumping equipment, and on several occasions, saw the stored coagulant volume at the water treatment facility fall below regulatory required volume levels. This project will design and permit improvements to the Company's chemical storage facilities to comply with regulatory requirements and operational practices.

Snow Station Building Addition (Budget $1,200,000): This project involves the construction of the expansion of the Snow Station to accommodate the third high lift pump that feeds the NWS. The project will be based on the design completed in 2022.

Carbon Filter Media (Budget $500,000): This effort will complete the round of carbon filter media change out initiated in 2022, for the remaining 4 filter beds. This currently anticipates a return to normalized cost of the carbon media, assuming current supply chain disruption conditions have abated by 2023. The project is necessary to ensure compliance with the NHDES PFOA standard of 12 ppt.

2024 Projects

Meter Radio Replacement Year 4 (Budget $364,000): In 2024, the Company will continue the process of replacing customer meter radios that are at or approaching their useful life.

Nashua Water Treatment Facility (Budget $3,000,000): This project is the gross estimate of the construction of the improvements to the water treatment facility chemical feed and storage systems based upon the completed design on 2023. The project anticipates a major building expansion to house chemical bulk storage and additions/improvement chemical feed pumps, controls, monitoring, and piping. The budget is a high level “place holder” estimate, which will be revised, as needed, following the 2022 evaluation and the final design completed in 2023.

Rebuild WTP High Lift Pump (Budget $100,000): The high lift pumps in the finished water pumping station at the Nashua water treatment facility were installed and have been in operation since 2007. The pumps are estimated to have a 15 to 20-year operating life. As such, and due to the high criticality of these pumps, it is sound asset management practice to begin to remove the pumps and have them: (1) disassembled and inspected for wear, (2) followed by repair and reassembly, if necessary. This practice will ensure proper performance and reliability of this critical pumping equipment.

Q. Does this conclude your testimony?

A. Yes.