STATE OF NEW HAMPSHIRE

BEFORE THE

PUBLIC UTILITIES COMMISSION

AQUARION WATER COMPANY OF NEW HAMPSHIRE, INC.

DOCKET NO. DW 20-184

DIRECT TESTIMONY

OF

DANIEL R. LAWRENCE

December 18, 2020

I. INTRODUCTION AND OVERVIEW OF TESTIMONY

Q. Please state your name and business address.

A. My name is Daniel R. Lawrence and my business address is 600 Lindley Street, Bridgeport CT 06606.

Q. By whom are you employed and in what capacity?

A. I am the Vice President of Engineering and Real Estate for Aquarion Water Company of New Hampshire, Inc. ("Aquarion" or the "Company"), Aquarion Water Company of Massachusetts, and Aquarion Water of Connecticut and employed by Aquarion Water Company of Connecticut.

Q. Please describe your educational background.

A. I have a Bachelor's Degree in Civil Engineering (with a concentration in Environmental Engineering) from the University of Massachusetts. I am also a licensed Professional Engineer in the State of Connecticut.

Q. Please describe your business and professional backgrounds.

A. In 2020, I was appointed Vice President of Engineering and Real Estate for Aquarion and its affiliates. Prior to being appointed to Vice President I served as the Director of Engineering and Planning from 2014 to 2020.

Prior to joining with Aquarion I was hired by Weston & Sampson in 1997 as an Engineer. In 1999, I became a Senior Engineer and in 2001 was promoted to Project Manager. In 2006, I became a Senior Associate. Through these positions I have had increasing levels of responsibility in capital project management and planning, and have had oversight of capital investments throughout New England, New York and New Jersey. Prior to joining Weston & Sampson, I was employed as an engineer and project engineer with the consulting firm of Metcalf & Eddy and as an Engineer with Blasland, Bouck and Lee, LLC working throughout New England, New York, New Jersey, Pennsylvania and Michigan.

Q. Have you previously testified before the New Hampshire Public Utilities Commission (the "Commission") or any other regulatory commission?

A. I have not testified before the Commission. I have previously testified before the Public Utilities Regulatory Authority of Connecticut in support of Aquarion Water of Connecticut's Water Infrastructure and Conservation Adjustment ("WICA") proceedings and other regulatory proceedings.

Q. Are you familiar with the facilities and capital investments of Aquarion?

A. Yes, I am responsible for the development of the capital investment planning and execution for the Company working with our Company's Operations Manager, Mr. McMorran. Maintaining regular contact with the Company's local management team, including periodic site visits and regular communication, provides me with a familiarity with the Company's infrastructure.

Q. What is the purpose of your testimony?

A. My testimony has four overall objectives. In the following pages I will: (I) describe the Company's overall approach to capital investment; (II) provide an overview of the available water in service in 2020 and improvements that will occur in subsequent years to meet current and future water demands; (III) provide a summary of investments into the water distribution system since the last rate request and were recovered within the WICA program in New Hampshire; and (IV) provide a summary of infrastructure improvements completed in 2020 that are included within the rate filing as pro forma adjustments as well as a summary of the major capital investments to be included in the Company's proposed step adjustments.

Q. Describe the Company's overall approach to Capital Investment in the Water System

A. The overall goal of the Company's capital investment program is to ensure that capital is being deployed at an appropriate level, in targeted areas, and in a timely

manner. The Company's objective is to ensure optimum product quality and service in all of its improvements, while maintaining or enhancing customer service at rates that are appropriate and affordable.

The Company's identification of specific investments comes about through a variety of sources including Water Supply Evaluation (Margin of Safety), Distribution and Storage Master Plans, Water Quality Master Plan, coordination with communities and other utilities, as well as inputs from supply and distribution system operators, operational data, regulatory requirements and overall asset repair and replacement programs.

Capital investments are prioritized in terms of risks by evaluating the reduction of unwanted impacts in the following areas: water quality compliance; water quality complaints; inadequate supply; unplanned service interruptions; customer service complaints; excessive non-revenue water; environmental compliance; inadequate fire protection; inadequate pressure; and personal safety.

Based on the assigned priority coming from the above risk analysis, capital investments and projects are put into the appropriate year of the Company's five-year capital budget. Urgent projects are included in the next year's capital budget along with essential annual programmatic work and general purchases.

Q. Would you provide a brief summary of available water and how the Company will meet current and future water system demands?

A. The Company's water system is served by 17 wells and has a current average day available water of 3.43 million gallons per day ("mgd") and maximum day available water of 4.57 mgd. The expected available water for 2020, 2021, 2022, and 2023 is noted in Table 1.

Table 1

Summary of Available Water by Source

Source		Available Water (mgd)		
	2020	**2021**	**2022**	**2023**
Well 5A	0.14	0.14	0.14	0.14
Well 6	0.29	0.43	0.43	0.43
Well 7	0.69	0.69	0.69	0.69
Well 8A	0.23	0.23	0.23	0.23
Well 9	0.60	0.60	0.60	0.60
Well 10	0.50	0.50	0.50	0.50
Well 11	0.72	0.72	0.72	0.72
Well 12	0.24	0.24	0.24	0.24
Well 13B	0.10	0.10	0.10	0.10
Well 14A	0.00	0.00	0.11	0.11
Well 16	0.14	0.14	0.14	0.14
Well 17, 18, & 19	0.22	0.22	0.22	0.22
Well 20 & 21	0.24	0.24	0.24	0.24
Well 22	0.46	0.46	0.46	1.07
Average Day	**3.43**	**3.53**	**3.61**	**4.07**
Maximum Day	**4.57**	**4.71**	**4.82**	**5.43**

Note: average day available water is based on 18 hours of pumping in a 24-hour period.

The available water in 2020 is impacted by the presence of per- and polyfluoroalkyl substances ("PFAS") in the Mill Road Wellfield and arsenic detected in Well 22. Proposed projects in 2021 through 2023 will include replacement Well 14A, treatment for PFAS at Well 6 and treatment for arsenic at Well 22, which will increase the total available water on an average day to 4.57 mgd and 5.43 mgd on a maximum day. The proposed treatment at Well 6 and Well 22 will allow for full use of the capacity of each of the wells, rather than the current reduced capacity.

The Company is working to ensure long term sustainable water by evaluating customers near and longer term needs alongside the available water supply. The Company has a standard to meet to maintain 15% more supply than is required to service a water system, referred to as a Margin of Safety ("MOS"). MOS is the unit less ratio of supply to demand. The Company bases it's planning on maintaining a minimum MOS of 1.15 under average day and maximum day

demand scenarios to provide an adequate safety factor for available water and demand projections and to provide adequate time to develop additional supplies when needed.

Tables 2 and 3 present the water system MOS comparing the available water scenarios from Table 1 with current and projected demands.

As presented in Table 2, with current supplies the water system has less than the targeted 1.15 MOS under projected maximum day demand conditions. Completion of the Well 6 PFAS treatment, Well 14A replacement and completion of arsenic treatment at Well 22 will increase the MOS and meet the Company's planning standard under projected demands as shown on Table 3.

Table 2

Margin of Safety – Current Conditions

Year	Average Day			Maximum Day		
	Demand (mgd)	Available Water (mgd)	Margin of Safety	Demand (mgd)	Available Water (mgd)	Margin of Safety
2018	2.25	3.43	1.52	3.95	4.57	1.16
2019	2.02	3.43	1.70	3.53	4.57	1.29
2020	1.91	3.43	1.80	3.79	4.57	1.21
2021	2.03	3.43	1.69	3.90	4.57	1.17
2022	2.04	3.43	1.68	3.91	4.57	1.17
2023	2.04	3.43	1.68	3.92	4.57	1.17
2030	2.08	3.43	1.65	3.99	4.57	1.14
2040	2.15	3.43	1.60	4.13	4.57	1.11

Table 3

Margin of Safety with Proposed Improvements

at Well 6, 14A and Well 22

Year	Average Day			Maximum Day		
	Demand (mgd)	Available Water (mgd)	Margin of Safety	Demand (mgd)	Available Water (mgd)	Margin of Safety
2018	2.25	3.43	1.52	3.95	4.57	1.16
2019	2.02	3.43	1.70	3.53	4.57	1.29
2020	1.91	3.43	1.80	3.79	4.57	1.21
2021	2.03	3.53	1.74	3.89	4.71	1.21
2022	2.04	3.61	1.77	3.91	4.82	1.23
2023	2.04	4.07	2.00	3.92	5.43	1.39
2030	2.08	4.07	1.95	3.99	5.43	1.36
2040	2.15	4.07	1.89	4.13	5.43	1.31

Q. Please provide a summary of investments in the water main distribution system since the last rate request that were recovered within the WICA program. How did these investments meet the goal of the WICA Program?

A. The purpose of the WICA mechanism is to enable Aquarion to recover the fixed costs of certain categories of non-revenue producing capital improvements completed and placed in service between general rate cases. In particular, subject to certain limitations the WICA-eligible capital improvements include: services, meters, hydrants, mains and valves, main cleaning and re-lining projects, replacement of production meters, and replacement of pressure reducing valves.

Under this program, the Company has invested in the water distribution system and filed for recovery through the WICA program in each year from 2013 through 2018. The cumulative investment in water main replacement is $4,846,417.

Identifying the specific main replacements for a given year is an on-going process within Engineering and Planning and the New Hampshire Operating Team. The plan is developed through a review and evaluation of water mains related to:

- Break history
- Age and material
- Elimination of bleeders
- Water quality issues
- Hydraulic restrictions related to water transmission or fire flows
- Operations input
- Ranking within the 2015 Capital Efficiency Plan, which addresses water main distribution improvements.

The above criteria are then evaluated based on coordinating projects with communities of Hampton, North Hampton, Rye and the New Hampshire Department of Transportation ("NHDOT") paving plans in an effort to save on overall restoration costs, such as paving.

This method of evaluation and planning results in a high-level coordination with the communities and NHDOT and prioritizes the highest need projects. The plan is adjusted as conditions change and more typically, when paving coordination opportunities come forward.

A summary of the projects and related savings related to paving are provided below in Table 5.

Table 5

Summary of Paving Savings for

Water Main Replacement Projects - 2013-2020

Project(s) Name	Docket #	Paving Coordination	Savings Related to Paving Coordination	Paving Contribution	Adjusted Paving Cost Savings	In Service Date
Auburn Avenue	DW13-314	Project coordination w/ Town sewer work	$16,582	$0	$16,582	9/30/2013
Auburn Avenue Extension	DW13-314	Project coordination w/ Town sewer work	$9,990	$0	$9,990	9/30/2013
Perkins Avenue	DW13-314	Project coordination w/ Town sewer work	$21,372	$0	$21,372	9/30/13
Ocean Boulevard	DW13-300	Project coordination with NH DOT paving	$85,978.67	$0	$85,979	9/30/14
Ross Avenue	DW15-476	Project coordination w/ town paving schedule	$28,660	$0	$28,660	9/30/14
Mill Road (Pine Street to Atlantic)	DW18-161	Milling and Overlay not Required	$163,769	$0	$163,769	9/30/2018
Route 101 (Tide Mill Road PRV to Church Street)	NA	Milling and Overlay not Required	$203,840	$0	$203,840	12/30/2019
Mill Road Connection to Shop Road	NA	Milling and Overlay not Required	$25,480	$0	$25,480	7/30/2018
Mill Road	NA	Trench Paving Required along with a contribution to the Town of Hampton for a portion of final paving	$218,109	$65,300	$152,809	10/30/2020

Project(s) Name	Docket #	Paving Coordination	Savings Related to Paving Coordination	Paving Contribution	Adjusted Paving Cost Savings	In Service Date
Elaine Street	NA	Trench Paving Required along with a contribution to the Town of Hampton for a portion of final paving	$63,700	$23,540	$40,160	12/30/2020
Locke Road	NA	Trench Paving Required along with a contribution to the Town of Hampton for a portion of final paving	$152,880	$65,677	$87,203	9/30/2020
Richard Street	NA	Trench Paving Required along with a contribution to the Town of Hampton for a portion of final paving	$59,623	$22,470	$37,153	12/30/2020
		Total Estimated Costs	$1,049,984	$176,987	$872,997	

Notes:

1. Milling costs estimated at $3.50/square yard and asphalt costs estimated at $115 per ton for the purpose of calculating paving cost savings.
2. Project listed without a docket number would have qualified for WICA if the Company had not reached the percentage cap.

The coordination of projects with the communities and NHDOT has saved $872,997, noted above, and reduced the cost of the projects and impacts to rates for customers. The coordination also puts a new water main in service reducing the risk of mains breaks and other problems that could result from the construction projects, reduces risks of breaks within newly paved streets, and reduces the disruption of neighborhoods and traffic.

Water system reliability is generally evaluated by reviewing disruptions within the water system. A summary of water main breaks within the water system from 2013 to 2020 is summarized below in Table 6.

Table 6

Summary of Water Main Breaks

2007 to 2020

Year	Number of Water Main Breaks	Breaks Per 100 Miles of Water Main
2007	6	0.04
2008	13	0.10
2009	16	0.12
2010	13	0.10
2011	19	0.14
2012	20	0.15
2013	8	0.06
2014	17	0.12
2015	5	0.04
2016	13	0.10
2017	18	0.13
2018	16	0.12
2019	20	0.15
2020 (estimated)	11	0.08
Average	14	0.10

The information above demonstrates that the number of water main breaks varies year to year which is typically associated with weather conditions and changes in conditions of the water mains. The results also clearly show that the breaks per 100 miles of water main are well below the industry average of 0.23, indicating that the system is being maintained appropriately.

The lower incidents of main breaks and disruptions are a good measure of reliability. Underinvestment in water mains will result in a higher break rate within

the water system over time, higher main break repair expenses, and higher investment levels in the future, while consistent investment in water main replacement limits disruptions from water main breaks, reduces repair expenses, reduces lost water, maintains a high level of reliability and service, and mitigates the need for large investments in future years.

Q. Please provide a summary of the infrastructure improvements that were put in service in 2020 that are included within the rate request filing.

A. The Company has included four projects within the rate case that were completed and placed in service in 2020. These projects are summarized below:

Water Supply - Well 22

The Company has been working to increase the available water supply for the water system through the development of a new water source. The evaluation of additional water supply dates back to 2003, leading to the drilling of Well 22 in 2012, and culminated with the well being put in service in 2020. Well 22, which is located in the Little River Wellfield, was planned to be placed in service in 2019, based on the date and timing of the testing and application. While the Company had completed its work and had provided the relevant information and documentation to the New Hampshire Department of Environmental Services ("NHDES") on a timely basis to allow this new source to go into service in 2019, delays in the permitting and the approval process resulted in the final permit being received in January 2020. All of the relevant construction, testing, and other work had been completed in 2019, and only the delay in receiving the final permit resulted in the well going into service in 2020.

Water Treatment – Mill Road Water Treatment Facility

The Mill Road Water Treatment Facility is located off of Mill Road near the Town line between North Hampton and Hampton. The Mill Road Wellfield consists of Wells 6, 8A, 9, 11, 20, and 21 with five separate buildings for electrical, controls and treatment. The facilities were constructed in the early 1950s and their change

in condition over the last 70 years meant that they were in need of replacement. In lieu of replacing each facility separately the Company chose to consolidate the treatment facilities into one building with adequate space for electrical, controls, treatment, and chemical deliveries to serve all of the wells. The design and permitting of the facility started in 2017 with the intent to complete the project in 2018. During the permitting process an abutter appealed a decision of the North Hampton Planning Board. The appeal, which eventually went to the New Hampshire Supreme Court, was finally decided in favor of the Company in March of 2019, but had created a substantial delay in the work at the site. The Company worked diligently to complete the work in 2019, but did not finalize the project until early 2020 with the majority of the costs invested prior to the end of 2019. In that the project was substantially complete in 2019 and would have been entirely complete even before that but for the permitting delay, the Company has included it in this initial request.

Water Main Replacement – Locke Road

The Town of Hampton notified the Company that it planned to complete sewer improvements on Locke Road in 2020. Consistent with the information provided above, the Company modified its main replacement plan to take advantage of the paving coordination and replaced the existing 6-inch AC water main and 8-inch Cast Iron (CI) main with a new 12-inch DI main to improve hydraulic capacity, fire flows and reliability. This water main replacement had been identified in the 2015 Capital Efficiency Plan and was prioritized as a result of paving coordination with the Town and water main breaks that would have occurred during and after the sewer construction project.

Water Main Replacement – Mill Road

The replacement of the existing 12-AC and 8-inch cast iron mains along Mill Road from the Mill Road Wellfield to the Mill Road Tank are identified within the 2015 Capital Efficiency Plan. This stretch of water main is critical to the reliability of the water system as it conveys water through the distribution system from the Mill

Road Wellfield and connects to Barbour Road, in close proximity to the Little River Wellfield (Well 7 and Well 22).

The existing 8-inch and 12-inch main on Mill Road were replaced in 2019 and 2020 with a new 16-inch DI water main from Reddington Landing to Ann's Lane and connected to a new 16-inch main installed from the Mill Road Wellfield up to Reddington Landing.

Q. Please provide a summary of major capital investments (Non-WICA) for 2021, 2022, and 2023.

A. The Company is currently planning and preparing for certain significant capital investments in the coming years. To provide the Company with a reasonable opportunity to earn its allowed rate of return after permanent rates go into effect, while continuing to invest in the system and provide safe, reliable drinking water, the Company is proposing a series of step adjustments as described in Ms. Szabo's testimony. Specifically, the Company is proposing that plant placed in service in 2020 through 2023 be considered for inclusion in the step adjustments. There are three significant (non WICA eligible) projects planned during that time which are summarized in Table 7, below.

Table 7
Summary of Major Projects and Estimated Costs for Steps 1, 2 and 3

Step	Project Description	Estimated Cost
1	PFAS Treatment at Well 6	$1,713,000
2	Well 22 Chemical Treatment	$3,590,000
3	Well 22 Arsenic Treatment	$2,385,000
	Estimated Major Project Costs for Steps 1, 2 and 3	$7,688,000

Given the extraordinary costs of these investments in developing new water supply to meet current and future demands along with water treatment to provide water to

ensure compliance with NHDES and USEPA water quality standards, along with other investments planned during those years, the Company believes the step increases are necessary. Refer to the testimony of Ms. Szabo for a reconciliation of these investments to the full proposed step increases.

Each of these major investments is described below.

2021 – PFAs Treatment at Well 6

The Company's well sources have been impacted to varying degrees by PFAS. A discussion on the overall impacts to the water supply is included in Mr. Carl McMorran's testimony.

The PFAS at the Mill Road Wellfield has been closely monitored since 2017, when elevated levels were detected as part of routine water sampling. At this time, the Company has determined that treatment of PFAS at Well 6 is needed to avoid exceeding the NHDES levels for PFAS at the Mill Road Wellfield and to mitigate further migration of the PFAS groundwater plume toward Wells 9 and 11.

The bench scale testing and pilot testing of the treatment was completed in 2019 and the Company initiated the design of the improvements in the fall of 2020 with the intent of putting the treatment in service in 2021. Having this in service will allow for the full operation of Well 6 as a water supply and lower the overall PFAS in the water system.

2022 – Little River Treatment Plant Chemical Treatment (Wells 7 and 22)

The development of Well 22 will increase the available water at the Little River Water Treatment Plant from 0.69 MGD to 1.76 mgd by 2023. The increase in available water requires improvements to the treatment facility to accommodate

the higher production capacity. Improvements include a new building, electrical, plumbing, HVAC, controls, chlorination, corrosion control and pH adjustment. These improvements will be designed and constructed to meet the 2023 capacity of 1.76 mgd.

2023 - Little River Treatment Plant – Arsenic Treatment for Well 22

The upgrade of the Little River Treatment plant as noted above will continue in 2023 to include arsenic removal for Well 22. The improvements generally include plumbing, and treatment vessels. The work at Little River Road in 2022 and 2023 will be designed, bid and built under one contract. The project is separated into two phases based on the type of treatment to be implemented and the duration of the overall project. The treatment vessels will be designed to remove arsenic to meet the new (2021) NHDES standard of 5 parts per billion (ppb). The existing NHDES standard for Arsenic through June 30, 2021 is 10 ppb.

Q. Mr. Lawrence, does this conclude your testimony?

A. Yes it does.