BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF
NEW JERSEY-AMERICAN WATER COMPANY, INC.
FOR APPROVAL OF INCREASED TARIFF RATES AND
CHARGES FOR WATER AND WASTEWATER SERVICE,
CHANGE IN DEPRECIATION RATES, AND
OTHER TARIFF MODIFICATIONS

BPU Docket No. WR2401____

Direct Testimony of

Donald C. Shields

January 19, 2024

Exhibit P-5

NEW JERSEY-AMERICAN WATER COMPANY, INC.

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I. INTRODUCTION

1. Q. Please state your name and business address.

A. My name is Donald C. Shields, and my current business address is 1 Water Street, Camden, New Jersey 08102.

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

A. I am employed by American Water Works Service Company, Inc. ("Service Company") as Vice President of Engineering supporting New Jersey-American Water Company, Inc. ("New Jersey-American Water," "NJAWC" or the "Company"), Virginia-American Water Company ("VAWC") and Maryland-American Water Company ("MAWC").

3. Q. What are your responsibilities in this position?

A. My present responsibilities include providing oversight, expertise and consultation for comprehensive system planning for use in developing system priorities and projecting capital spending, as well as the planning, design and construction of capital improvement projects for NJAWC, VAWC and MAWC.

4. Q. Please describe your educational background and business experience.

A. Please refer to Appendix A for a summary of my educational background and business experience.

5. Q. Have you previously testified in regulatory proceedings?

A. Yes. I have previously testified on behalf of NJAWC in the Company's base rate case applications in BPU Docket Nos. WR15010035, WR17090985, WR19121516 and

WR22010019, in the Company's various DSIC and WSIC filings and in the Company's joint petition for approval of the acquisition of Shorelands Water Company, BPU Docket No. WM16101036. In addition, I have previously testified on behalf of Applied Wastewater Management, Inc. in its base rate case applications in BPU Docket Nos. WR08080550 and WR03030222.

6. Q. What is the purpose of your testimony in this proceeding?

A. I will explain NJAWC's capital investment planning process and describe and support the Company's investments in water and wastewater utility plant and equipment since the last base rate case through the end of the test year in this case, 12 months ending June 30, 2024 ("Test Year") and the six months post-test year ending December 31, 2024 ("Post-Test Year" or "PTY"), totaling approximately $1.0 billion. Although my testimony will highlight certain capital projects placed in service during the Test Year or planned to be in service by the end of the PTY period, all capital investments, including recurring projects, are reasonable and necessary to continue to provide safe and reliable water and wastewater service for the benefit of our customers. I will also describe the Company's plan for the engineered coating of steel structures. Finally, I describe some of the risks associated with the provision of water service, the provision of wastewater service and the challenges increased climate variability creates for water and wastewater utilities.

7. Q. Do you sponsor any schedules as part of your Direct Testimony?

A. Yes. I am sponsoring Schedule DCS-1 Test Year plant additions and Post-Test Year plant additions supporting the Company's capital expenditures utilized in rate base.

The Schedule was prepared by me and under my supervision and direction and will be updated over the course of the proceeding to include actual data for both the full twelve-months of the Test Year as well as the 6-month Post-Test Year period.

II. NEW JERSEY-AMERICAN WATER'S CAPITAL INVESTMENT PROGRAM

8. Q. Please explain the Company's capital investment planning and governance process.

A. The Company uses a standardized Capital Program Management ("CPM") process to manage all its capital investments. NJAWC conducts comprehensive planning studies ("CPS") to assess and make project recommendations for its capital assets and evaluates capital needs on an ongoing basis to assess any changed circumstances and ensure that appropriate projects are being prioritized. Capital investment programs and projects are prioritized within an overall strategic planning process, utilizing drivers associated with various asset investment strategies (such as safety, regulatory compliance, capacity, customer satisfaction, etc.) to formulate a five-year strategic capital investment plan (hereafter, referred to as "capital investment plan"), which largely supports the Company's capital construction plan. For investment projects contained within the capital investment plan, detailed design engineering is conducted, and implementation plans are developed. Main replacement projects are examined annually and assigned priorities on a state-wide basis.

Numerous factors are considered when determining funding allocations for infrastructure investment, such as current and future service needs, assessments of the physical condition of existing plant, economic and risk factors, performance

characteristics, regulatory compliance, financial impacts to customers (rate impact) and the potential to coordinate with municipalities and other utilities in joint improvement projects. The CPM governance process provides for formal approvals and consistent controls that optimize the effectiveness of asset investment. Strategic project planning, budgeting and ongoing reviews ensure that NJAWC can manage a wide variety of projects within the overall cost of its plant construction budget.

9. Q. Please describe the CPS process and project prioritization activities in more detail.

A. The CPS process includes a thorough evaluation of demand projections, regulatory requirements, asset service reliability and quality, infrastructure condition, asset impacts on safety and efficiency, customer rates, public fire protection, and environmental sustainability. The CPS identifies, assesses, and provides project recommendations for the Company's capital assets on a multi-year planning horizon and includes a thorough planning level evaluation of each component of utility infrastructure. The Company also undertakes separate studies or evaluations for specific capital projects that emerge between each CPS. Capital investment projects are identified and are prioritized using asset investment strategy considerations of safety, regulatory compliance, capacity and growth, infrastructure renewal, efficiency, resiliency, reliability, and quality of service. Each CPS and any additional prioritization of identified capital investment projects are key inputs to the Company's capital investment plan. Because of the specific nature of the large asset class of distribution system mains, the Company completes a separate distinct evaluation for

identifying capital investment priorities in the distribution system. This evaluation is a detailed prioritization modeling of the distribution system piping that, as further described below, assesses service risks associated with pipeline failure risks for all the Company's approximately 9,970 miles of mains.

10. Q. Please describe the distribution system prioritization modeling in more detail.

A. As discussed in the Company's Distribution System Improvement Charge ("DSIC") Foundational Filings, most recently NJBPU Docket No. WR22030230 Appendix B (of the filing), the Company maintains a Geographic Information System ("GIS") - based prioritization model using GIS software and prioritization modeling software for identifying and prioritizing pipeline replacement investments across its systems. The model prioritizes pipe replacements through identification of service risks associated with pipe failure. Pipe failure risks are identified through pipe failure history, pipe material type, the decade pipe was installed, and pipe diameter. Pipe failure history is a significant input into the main replacement prioritization model. These pipe failures are identified not only during the Company's unscheduled main replacement projects but also during pipeline repair work. Pipe failure data is collected and tracked in the Company's GIS system. Consequences of pipe failures, which include customer impacts, are also an input to the prioritization model. Pipe failures not only impact individual customers but can also cause consequences that are major in nature to businesses, hospitals, governmental buildings, and the ability to provide fire service.

11. Q. How does the Company develop and update its capital investment plan?

A. Investment projects are profiled in the capital investment plan to address priorities in each CPS in an appropriate time frame. For example, infrastructure capacity expansion investment projects are scheduled based on demand projections. Capital investment projects required to meet both environmental and water quality regulations are scheduled for completion before compliance deadlines to allow adequate time for testing and operational performance monitoring of the new facility/assets to ensure compliance. This process ensures the facility operates successfully through varying operating conditions. Rehabilitation projects for service reliability are scheduled with consideration of existing asset characteristics, and risks and impacts of failure on service reliability and quality. Main replacement projects are identified and prioritized using the prioritization model discussed earlier in my testimony.

12. Q. Please describe the general project categories in the Company's capital investment plan.

A. The Company's capital investment plan can be divided into two distinct areas: recurring projects ("RPs" or "RP") and investment projects ("IPs" or "IP"). RPs are designated as such because they are the type of capital projects that the Company undertakes on a frequent and regular basis, require less long-term financial and capital planning than an IP, and can be performed with either the Company's current workforce or existing contractors. IPs on the other hand, are typically projects that require more planning and design detail as well as a lengthier procurement lead time and actual construction time.. Whether RPs or IPs, all aspects of the Company's capital

program are essential to continuing to provide safe and adequate service to NJAWC's customers and support the long-term viability, reliability and resiliency of the Company's water and wastewater systems.

13. Q. Please describe the RPs that are included within the Company's capital investment plan.

A. NJAWC's RPs include main replacement projects that are generally 12 inches in diameter and smaller, reinforcement and replacement of service line and meter setting installations, meter purchases, projects to replace and maintain treatment equipment, vehicle replacements and to a lesser extent the purchase of tools, furniture, and equipment. The Company's RP investments during the Test Year and PTY total approximately $453.2 million (see Schedule DCS-1).

14. Q. Are RP projects a critical component of the Company's capital investment plan?

A. Yes, RPs are critical investments for both the Company and customers as these investments support the backbone of NJAWC's water systems by increasing both system resiliency and reliability.

15. Q. Please describe how RPs are included within the Company's capital investment plan.

A. The various line-item costs for recurring projects are trended from historical and forecasted data, with specific project details accounted for where available. Main replacements are planned in accordance with the Company's project prioritization plan as described herein. Cost estimates for main replacement projects are prepared for the

installation of new mains and service lines, meter settings, and the purchase of new meters based on preliminary plats from the appropriate governmental planning agencies and consultations with developers, homebuilders, and engineering firms. The criteria for evaluating the priority of the recurring projects are engineering requirements, consideration of national, state, and local trends, environmental impact evaluations, and water resource management. NJAWC engineering criteria are based on accepted engineering standards and are developed from regulations, professional standards and NJAWC engineering policies and procedures. The engineering criteria support NJAWC's ability to have a water system that will continue to provide adequate capacity and appropriate levels of reliability to satisfy residential, commercial, industrial, and public authority needs, and provide flows for fire protection.

16. Q. Please describe how IPs are included within the Company's capital investment plan.

A. IPs represent investments made to meet environmental or water quality regulations, enhance system resiliency and reliability, expand infrastructure capacity, and either rehabilitate or replace aging facilities. These projects allow the Company to meet the service demands of the community, maintain regulatory compliance, and reduce asset failure.

The determination to include an IP within the capital investment plan begins with the development of the anticipated demand projections of the system, the identification of improvements needed to meet those demands, and the adoption of strategies designed to bring about the correct prioritization and distribution of capital spending for the

various requirements of the business. Specific capital planning requirements are addressed in both the short term (one year) and the longer term (five years). Projects are prioritized using objective criteria that validate the need for a project and assess the risk of not doing the project. A key aspect of this planning technique is that it is flexible and can be adjusted as needed to address new priorities, such as unplanned equipment failures, large or sudden growth of a service area, and new regulatory requirements.

17. Q. Please describe the Company's recent performance with respect to its capital investment plan.

A. NJAWC has successfully delivered its capital investment plan over the past five years. Capital investment plans, actual capital investment deliveries, and variances to the plan by year are shown in the table below:

NJAWC Capital Investment Plan vs. Actual				
Year	Plan	Actual	Variance	%
2016	310,129,159	312,717,235	2,588,076	0.83%
2017	395,807,573	396,832,035	1,024,462	0.26%
2018	343,331,837	347,782,915	4,451,078	1.30%
2019	344,838,815	362,158,711	17,319,896	5.02%
2020	438,245,187	430,413,130	(7,832,057)	-1.79%
2021	406,456,859	422,127,704	15,670,845	3.86%
2022	523,659,537	556,096,133	32,436,596	6.19%
Cumulative	2,762,468,967	2,828,127,863	65,658,896	2.38%

18. Q. Does NJAWC focus on control of capital expenditure costs in its normal day-to-day activities?

A. Yes. All significant construction work is performed by independent contractors and some significant purchases are completed pursuant to a bid solicitation process. NJAWC maintains a list of qualified bidders, and Service Company annually receives competitive bids for materials and supplies, such as pipe, valves, fittings, meters, chemicals, and other commodity items that are either manufactured or distributed both regionally and nationally through its centralized procurement group. Through the size and breadth of American Water, NJAWC has the advantage of being able to purchase these materials and supplies on an as-needed basis at favorable prices. In recent years, Service Company also has undertaken procurement initiatives for services and materials to reduce costs or mitigate price increases through either streamlined selection or utilization of large volume purchasing power. Among the initiatives that have directly impacted capital expenditures are the use of master services agreements with pre-qualified engineering consultants, national vehicle fleet procurement, and national preferred vendor identification. Mr. Shroba describes how NJAWC utilizes the Supply Chain team within Service Company to take advantage of the purchasing power of the entire American Water enterprise and control costs.

19. Q. Please describe some key achievements realized by the capital investment program at the Company.

A. There are several key areas that NJAWC has addressed with its capital investment program. First, we've made significant improvement in replacing aging infrastructure,

largely attributable to the main replacement program. As stated in the Company's latest DSIC Foundational filing (WR22030230):

Prior to 2012, approximately forty-five percent (45%) of NJAWC's mains were cast iron ("CI") (unlined & lined), indicating that almost half of NJAWC's water mains were more than fifty years old, and in many cases, significantly older. Through the main replacement program, measurable progress is being made. NJAWC's cast iron inventory as of December 2021 is approximately 38% of the total inventory, and approximately 49% of the CI inventory is lined, which includes rehabilitation through the cleaning and lining method. There remains a total of approximately 1,778 miles (19%) of unlined cast iron mains within NJAWC's distribution system. Since 2012, there has been a net reduction of the cast iron pipe inventory of 7%.

Since 2012, the Company has:

- replaced over 950 miles of main, 120,200 service lines, 15,500 hydrants and 30,700 valves.
- lowered its water main replacement rate from over 500 years to below 120 years, which is within the New Jersey Water Quality Accountability Act requirement of 150 years.
- invested a total of $1.553 billion in DSIC-eligible system improvement projects to replace or rehabilitate aging infrastructure.

Second, the Company has made significant enhancements for asset renewals which also include system reliability and resiliency. Some key projects completed within the last five years include:

- Mill Road Iron and Manganese Removal
- Route 9 Water Main Replacement
- Linden NJ 42" PCCP main replacement
- Oxford Station Treatment System Upgrades
- Vincentown Supply Reliability

Lastly, the Company has invested significantly in facilities for regulatory compliance. Of note, the Company now operates many systems to treat for regulated perfluorinated compounds (PFOA, PFOS and PFNA) throughout the State. Additional facilities under construction currently include the following:

- Oak Street PFAS (Lakewood)
- Cooper Ivy Station Upgrades (PFAS, Radium and 1-4 Dioxane)

As further discussed below in my Direct Testimony, the Company continues to prepare for new and more stringent regulations on emerging compounds and intends to take early action on planned upgrades and operational mitigation strategies to address these regulatory challenges.

III. DESCRIPTION OF PLANT ADDITIONS

20. Q. How much capital investment is the Company seeking to recover in this case?

A. Since the effective date of rates in the Company's last rate case, the Company has invested, or plans to invest, approximately $1.3 billion in capital expenditures through the end of 2024. For total plant in service please see Ms. Hawn's Direct Testimony, Exhibit P-6. As shown on Schedule DCS-1, beginning July 1, 2023, and through the end of the post-test year, the Company has invested or plans to invest over $860 million in its water and wastewater facilities. Of that amount, $561.4 million will be invested during the Test Year and an additional $300 million will be invested during the Post-Test Year.

21. Q. Please describe some of the key objectives related to the Company's investments and how they benefit customers.

A. The Company's investments since the last rate case address key issues for our customers, including improving asset resiliency, managing source of supply and system demands, renewing aging assets, increasing operational efficiency, and maintaining regulatory compliance. The projects the Company undertakes are designed to achieve multiple goals and are essential for the Company to continue to provide safe, adequate, and reliable service in a manner that is in the long-term interest of our customers. For example, many of these projects in Schedule DCS-1 are described below and include improved resiliency and reliability at treatment plants, as well as in the distribution system, managing source of supply both from a treatment and capacity perspective, improved pump efficiency, treatment changes to maintain regulatory compliance, and

so on. Additional examples include investments that further enhance the Company's hardware, software, and related technology appurtenances and systems. In each instance, these projects support the Company's continued provision of safe, adequate, and reliable service to customers.

22. Q. Please describe generally the capital expenditures through the Test Year as detailed further in Schedule DCS-1.

A. Schedule DCS-1 provides a summary of capital expenditures for the Test Year and Post-Test Year periods. The Test Year investment of approximately $358 million shown in Schedule DCS-1 includes five months of actual capital expenditure data for the period July 1, 2023, through November 30, 2023 and seven months of projected capital expenditure data for the period December 1, 2023, through June 30, 2024. As the Test Year is fully realized, NJAWC will supplement the projected data with actual data through June 30, 2024, in the Company's 9&3 and 12&0 updates to be submitted in this case.

23. Q. Please summarize the Post-Test Year capital expenditures for which NJAWC is seeking rate relief in this proceeding as shown on Schedule DCS-1.

A. The Company's Post-Test Year investment of approximately $312 million is based on projected capital expenditures NJAWC plans to make during the six-month period July 1, 2024, through December 31, 2024. NJAWC's Post-Test Year capital expenditures are known and measurable consistent with Board precedent, including *In Re Elizabethtown Water Company*, BPU Docket No. WR8504330 (May 23, 1985). Moreover, NJAWC's Post-Test Year capital expenditures are "prudent and major in

nature and consequence" and, therefore, have been included in rate base for cost recovery.

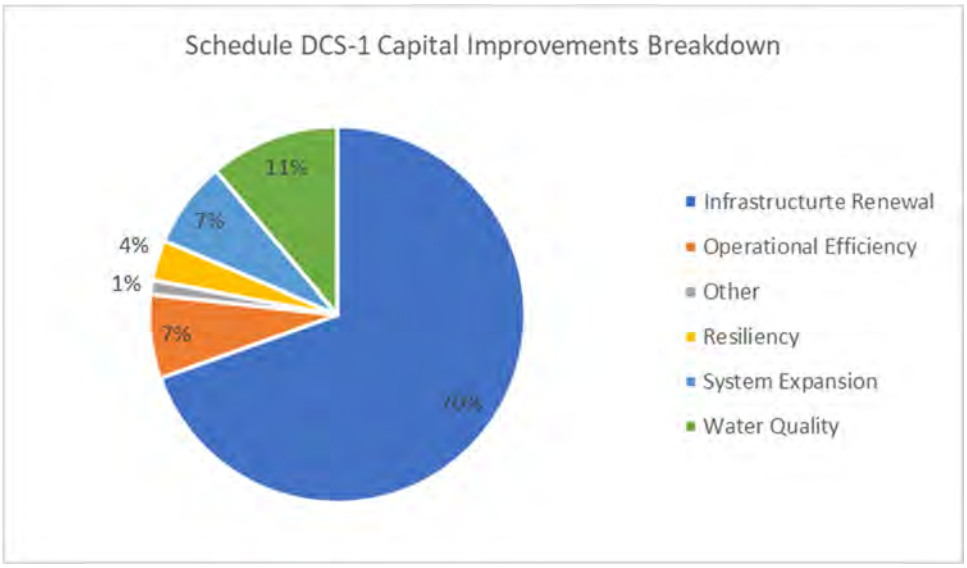
24. Q. Please provide an overview of the investments included in Schedule DCS-1.

A. As described in my Direct Testimony above, the capital program is driven by investments in plant to address the following issues:

- Infrastructure Renewal
- Operational efficiency
- Water Quality
- System Expansion
- Resiliency/Reliability
- Other – administrative and facilities

Projects can fall into several categories that meet various identified needs. For example, a filter upgrade project at a remote groundwater station can be identified as an asset renewal project if it is needed to replace outdated technology, which would also qualify it for operational efficiency. In addition, the project could also be categorized as a water quality enhancement should the filtration technology be upgraded to also remove new emerging compounds.

As can be seen in the chart below, the vast majority of NJAWC's projects fall into the Infrastructure Renewal category.



A further explanation and description of these categories is included herein, along with additional details regarding certain projects in each category. Additional information regarding all the projects or line items in Schedule DCS-1 can be provided upon request.

25. Q. Please describe the Company's infrastructure and asset renewal investments in more detail.

A. Asset management is recognized as an industry best practice, and the United States Environmental Protection Agency ("USEPA") has been directed under America's Water Infrastructure Act of 2018 ("AWIA") to require states to incorporate asset management into their capacity plans, with several states having adopted requirements for water utilities to complete asset management plans ("AMPs"). Additionally, under the New Jersey Water Quality Accountability Act ("WQAA"), water utilities are required to maintain an AMP similar to the AWIA requirements. NJAWC follows the key steps set forth by both USEPA and the WQAA for sound asset management,

including maintaining an accurate inventory of assets, providing an assessment of the condition and performance of these assets, with particular emphasis on high-criticality assets, performing risk assessment of assets in terms of their criticality and potential for failure and service disruption, and providing a recommended renewal program that includes operations and maintenance ("O&M") and inspection.

It is well documented that the water and wastewater utility industry is faced with significant capital investment needs to renew aging infrastructure.[1] Nationwide, water system pipeline replacement rates are in the range of 0.45% per year, which translates to a replacement cycle of approximately 200 years. Through heightened focus on this issue, and as described herein, NJAWC has significantly improved its pipeline replacement rate over the last few years, from near industry average levels in 2011 to a five-year average rate of 0.85% from 2018-2022 (latest full year available).

NJAWC regularly assesses whether the current asset renewal investment levels, for both above ground and buried assets, are sufficient to maintain appropriate levels of service. NJAWC employs a multi-faceted approach to managing assets, including the use of innovative technologies to detect, mitigate, or repair asset failures; condition-based and/or reliability-centered maintenance; and a risk-based strategic plan and framework for prioritizing and implementing asset renewal while considering the impact on customer rates. Alternative asset renewal technologies, including pipeline rehabilitation, are considered wherever cost-effective.

[1] *See, e.g.*, American Water Works Association, *Buried No Longer: Confronting America's Water Infrastructure Challenge* (2012), https://www.awwa.org/Portals/0/AWWA/Communications/BNLReport.pdf.

Some examples of infrastructure and asset renewal projects included on Schedule DCS-1 follow:

- Central Lead Service Line Replacements – This project includes the investigation of all unknown Company and customer side service lines as well as the investigation and replacement of known lead service lines in Central Raritan East operating region. The replacement of known lead service lines in the Central Raritan East operating region will occur within eight towns and will be addressed in order of the prioritization model produced by CDM Smith as part of the statewide program. The bulk of the replacements that have already occurred under this project were located in Hillside. The remaining scope of the project includes an anticipated 4,000 services replacement goal for DEP reporting Period of July 2023 to July 2024 with an average estimated cost of $6,000 each. The remaining seven towns are:
  - Dunellen- 21 Suspected and 1929 Unknown -Anticipated Total of 151 Replacements.
  - Linden- 192 Suspected and 9,952 Unknown -Anticipated Total of 1283 Replacements.
  - Middlesex- 23 Suspected and 4,266 Unknown -Anticipated Total of 297 Replacements.
  - North Plainfield- 581 Suspected and 3,150 Unknown -Anticipated Total of 1685 Replacements.
  - Plainfield- 861 Suspected and 8,399 Unknown -Anticipated Total of 4,905 Replacements.

- Roselle- 212 Suspected and 4,381 Unknown -Anticipated Total of 1,121 Replacements.
- Roselle Park- 484 Suspected and 2,016 Unknown -Anticipated Total of 1,250 Replacements.
- The estimated project total is 11,742 Anticipated Replacements.

Note that this project will be eligible for Principal Forgiveness ("PF") under the I-Bank program. Estimated PF for this project is $5M. Final PF amounts will be determined by the I-Bank at the conclusion of the project (conversion to long term loan).

- Raritan Millstone ("RM") Filterhouse and HVAC Improvements – This project consists of replacing aging heating cooling and ventilating systems within the filter buildings and "head house" building at the RM plant to improve reliability and energy efficiency at these areas. These areas are of critical importance as they house sensitive instrumentation and control systems for measuring flows, turbidity and chlorine levels and any temperature and humidity variations can cause condensation and subsequent corrosion of these systems. The older steam-based heating system had reached the end of useful life and was inefficient and incapable of adequate heating. Ventilation units were likewise older, and inefficient as well as incapable of providing adequate air changes. Also, doors, windows and roof penetrations (skylights, etc.) are aged and do not provide adequate insulation and are prone to significant air leakage.

The project includes removal and replacement of the old inefficient components with new high efficiency heating systems, air handling units, ventilation system components as well as replacement of doors windows and roofing components. Elements of heat recovery from the engine driven pumps will be incorporated to enhance efficiency.

- Long Hill Twp. ("LHT") WWTP Filter and Pump Improvements – the existing LHT WWTP is currently unable to pump and treat peak daily and hourly flow. The system has historically needed to bypass the tertiary filter units once flows exceed 2.8MGD. Additionally, the influent pumping capacity is limited to a reliable capacity of only 3.4MGD while the plant is rated for a flow (peak hour) of 5.2 MGD. The inability to pump the peak flows results in sewer system backup into the collection system which increases the potential risk of sanitary system overflows which would result in a Notice of Violation to be issued by the New Jersey Department of Environmental Protection ("NJDEP"). Additionally, the building is also located in a flood plain area and is in need of flood protection measures to enhance the plant's resiliency. The buildings also require various repairs to the roof, walls, windows and doors. The improvements included in this project include the following:
  - Replace the existing influent pumps No. 3 and No. 4
  - Replace the four (4) Return Activated Sludge (RAS) pumps
  - Replace the existing sand filters with new disc filters
  - Perform UV Building Improvements
  - Perform Digester Building Improvements

- Perform miscellaneous site repairs/replacement

- Glen Meadows WWTP Upgrades – The Glen Meadows WWTP is a small extended aeration wastewater treatment facility located in Clinton Township, Hunterdon County, NJ. The plant serves both the Glen Meadows and Twin Oaks residential developments, having a combined total of 58 single family homes. The plant receives only gravity flow from the customers. Its rated capacity is 25,000 gallons per day and operates under NJPDES Permit NJ0100528. The existing extended aeration treatment equipment is nearing the end of its useful life. There is a structural deficiency with the base slab for the aeration tanks and the steel walls of the aeration tanks have become structurally unstable. There is significant corrosion of the walls with holes in certain areas requiring frequent patching. The existing sand filters have corroded and are leaking. The project includes removal and replacement of all treatment tanks and equipment and replacing same with new tanks and equipment to handle existing flows.

26. Q. Please describe the Company's operational efficiency investments in more detail.

A. Targeted capital investment can improve operational efficiency which can decrease, or mitigate increases to, O&M expenses. For example, NJAWC routinely seeks opportunities for energy use reduction when evaluating equipment rehabilitation and replacement needs to continue to support the provision of reliable service. While the primary focus is on pumps and motors, alternative energy production is also considered, as these technologies are becoming more cost-effective, especially where incentives are available. NJAWC also has identified advanced leak detection methods

that can more efficiently identify and address leakage. Reducing water loss has the attendant benefit of reducing the costs associated with producing and pumping the non-revenue water ("NRW") over time. These types of projects, along with technology solutions that improve worker productivity, streamline the customer experience, or improve overall system efficiency to help keep our costs down. One key example of the Company's efforts for improving water efficiency includes the NRW Management – Central Project. This project entails replacement of 1735 hydrant mounted nodes that have reached the end of their useful life (battery depletion and discontinuance of 3G cellular communication). The units to be replaced are located in Piscataway, Roselle, Somerville, Jamesburg, Manville, and Kenilworth. The updated units are expected to have an increased useful life of 10 years and will allow the Company to continue its efforts to reduce leakage in its Central Operating Region.

27. Q. Please describe the Company's water quality investments in more detail.

A. NJAWC is committed to maintaining compliance with existing drinking water standards and works hard to identify and address potential water quality issues before they become MCL exceedances. Water quality projects are considered high priority as they are related to public health protection of our customers.

Additional capital projects related to applicable environmental regulations are also included to ensure any compliance deadlines are met.

Over the past several years, there has been an increasing concern regarding the presence of compounds of emerging concern ("CECs") such as per- and polyfluoroalkyl

substances ("PFAS") and 1,4-dioxane in drinking water supplies. Recent advances in analytical methods have revealed the presence of CECs in some drinking water supplies at previously undetectable parts-per-trillion ("ppt") levels. Research is ongoing, but some scientific studies have identified potential health concerns for a number of these compounds even at the low ppt levels. As a result, USEPA had established health advisory levels ("HALs") for some PFAS and other CECs and has begun the process to establish MCLs for PFOA and PFOS.

The State of New Jersey has established MCLs for some CECs, including PFNA, PFOS and PFOA,[2] in advance of USEPA establishing federal limits; limits for PFNA were adopted by NJDEP in 2018 while limits for PFOS and PFOA were adopted by NJDEP in 2020. The Company has completed or is in the process of completing several projects to meet state MCLs.

In March of 2023, USEPA issued proposed national primary drinking water regulation for certain PFAS as described in the March 29, 2023, *Federal Register* (88 FR 18638). In summary, the USEPA has proposed MCLs of 4.0 parts per trillion (ppt) for PFOA and PFOS while introducing regulation of PFHxS, HFPO-DA, PFNA, and PFBS coupled with the use of a Hazard Index Approach to Regulate PFHxS, HFPO-DA, PFNA, and PFBS[3].

[2] See https://dep.nj.gov/pfas/standards/ for details.
[3] See https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas.

Some examples of water quality projects included on Schedule DCS-1 follow:

- Mill Road – North Linwood Iron Removal – In recent years the area around the Mill Road Station has experienced high levels of discolored water resulting from excess Manganese levels. The station had historically sequestered both iron and manganese with a sequestering chemical (Klephos 100) but increasing levels of manganese as well as oxidation issues (from required chlorination) caused the release of the manganese (as well as lesser levels of iron). The levels have exceeded the secondary drinking water quality standards and cause the Company to expend significant resources to resolve the issues for customers; operational mitigation includes increased flushing frequency, changes to chemical levels flows and pressures as well as individual customer outreach. While these efforts are somewhat effective in the short term, they are not long-term solutions to the problem. The project includes construction of a new building at the MRS site to house manganese dioxide media filters for the removal of particulate iron and manganese. The plant is designed to treat the current well capacity of 1,390 gpm. The design also allows for the expansion of the facility to treat as much as 2,140 gpm (3.08 mgd) in the future, with future provisions for the construction of a new well will be brought online for treatment at the facility. This includes, but is not limited to, additional filtration, packed tower air stripping, chemical storage and feed, and hydraulic capacity.

- Oak Street PFAS – Due to elevated levels of PFOA/OS at the Oak Street Well Station, located in Lakewood, NJ, installation of new treatment equipment is

required. The new equipment will consist of either granular activated carbon or anionic exchange media and associated vessels, chemical feed equipment as well as upgrades to instrumentation and control systems. The equipment will be housed in a new structure and will be sized for full system flow.

- Oxford Well Station ("OWS") Treatment Upgrades – The OWS treats water from two wells for Volatile Organic Compounds ("VOC's") removal with GAC adsorption and sodium hypochlorite is added for disinfection. Low levels of trichloroethene ("TCE") are treated with a temporary treatment system consisting of seven (7) GAC contactors. As part of its permit renewal process, NJDEP required that the temporary GAC units be replaced with a permanent treatment solution. In addition to the VOC removal, 1,4-dioxane has also been detected at the wells. Because these wells are the primary source of water for Oxford customers, the Company plans to install a new treatment system designed to address VOCs and 1,4-dioxane in addition to TCEs. The system includes AIX and peroxide for advanced oxidation for 1,4-dioxane removal while also removing the VOC's in the raw water.

28. Q. Please describe the Company's resiliency and reliability investments in more detail.

A. The increasing frequency of extreme weather events and other natural disasters as magnified by climate variability has significantly challenged NJAWC's infrastructure. Water and wastewater systems have been traditionally designed and maintained to provide reliable service under standard design conditions (*e.g.*, 1-in-50 year drought,

1-in-100 year flood, etc.). Such standards, however, are based on historic climate patterns that may no longer be typical. Systems may be expected to cope with more extreme and frequent droughts, floods, power outages, and storms that may impact service. In addition, other man-made events such as source water contamination, and accidental or purposeful damage to facilities may result in significant impacts on customer service and asset integrity.

For NJAWC's most critical assets, defined as those with the highest consequence of failure, capital investments to further "harden" systems against identified natural threats are prioritized for implementation. Non-capital solutions are also part of the solutions toolkit to provide more system resiliency in mitigating such risks, such as more robust emergency response plans ("ERPs"), drought management plans, condition-based and/or reliability-centered maintenance, and other operations plans and asset management strategies that enable better preparedness and ultimately more assurance that reliable service can be maintained.

In October 2018, Congress passed AWIA, which includes revisions to the Safe Drinking Water Act ("SDWA") that require all water systems serving populations greater than 3,300 people to complete Risk & Resiliency Assessments ("RRAs") and update their ERPs over a three-year period. NJAWC has completed RRA's for affected systems in accordance with compliance deadlines. Capital improvements identified through this process aimed at reducing risk and improving system resiliency are considered for incorporation into the Company's capital plan.

Some examples of resiliency and reliability projects included on Schedule DCS-1 follow:

- Oak Tree Booster Station Upgrades – The Oak Tree Booster Station Complex is located in Edison Township, New Jersey. On this property are three critical NJAWC facilities: New Oak Tree Booster Station, New Oak Tree MCC/Generator Building, and the Old Oak Tree SCADA/Pump Building. Also on site are storage tanks #1-4 which are 10 MG, 10 MG, 5 MG, and 1 MG. This station is a critical facility that supports flows that feed the eastern half of the Central 273 and 274 gradients and serves as an interconnect to feed the Jerusalem Road reservoir and booster station as well as feed to NJAWC's North (Passaic) system Diamond Hill Booster. Reliability at this station is critical to maintain service to hundreds of thousands of residential customers as well as commercial and bulk customers.

  The Oak Tree booster station suffers from both aging/obsolete infrastructure and poor pump efficiencies. The existing pumps were installed between 1965 and 1993. Pump efficiency tests indicated that the existing pumps were performing below their rated efficiencies and were in the mid to low 60% range. Furthermore, the age of the equipment (specifically Pumps 1-4; vintage 1960's) is a concern relative to reliability, repairs and maintenance. The booster station has a number of structural deficiencies, including concrete deterioration and cracking which has required emergency structural stabilizing. Significant structural repairs are needed to extend the useful life of the original structures.

The project work includes installation of new pumps and motors within pump station 1&2 building as well as pumps 3-6 within pump station 3-6 building. The work also includes removal and replacement of the motor control center and associated electrical equipment. Electrical components for the pumps include complete replacement of the panels and electrical equipment for Pumps 1-2 currently housed in the existing block building, and replacement electrical equipment for pumps 3-4 with new equipment but to remain in the same housing. Other related work includes replacement of electrical feeder cables for all upgraded pumps.

Building structural improvements include rehabilitation of the existing CMU building; cleaning of the masonry building, crack repair, protective waterproofing, drain replacement and flashing, and reinforcement of the existing masonry pipe and exhaust fan openings. And lastly the work also includes installation of new 400kv back up generator.

- Vincentown Supply Reliability – The existing Vincentown Well Station ("VWS") building (circa 1904) treats water withdrawn from two wells screened in the Mt Laurel – Wenonah aquifer, Well No. 1 and Well No. 2. The well supplies are routed to an old masonry building that also houses electrical switchgear, SCADA controls, and chemical treatment [sodium hypochlorite and tetrapotassium pyrophosphate (Klenphos-100)]. The VWS is located near the edge of a drop-off to a creek below. Erosion of the embankment has gradually led to settling of the building. Additional structural support was added in 2013 to reinforce the building and reduce the risk

of immediate failure. However, further erosion of the embankment could lead to failure of the building, loss of the treatment process, and loss of the only supply station for the Vincentown System. Well No. 1 is also located close to the embankment and has suffered from instability as well; it, too, is at risk of failure and cannot be either redeveloped or otherwise serviced due to the embankment stability concerns.

Due to significant site constraints at the existing well station, a new site was investigated and procured. The project work includes installation of new production wells and a well station (treatment) on an easement on the Southampton Board of Education property. Included in project will be two replacement wells, a new treatment building for the addition of corrosion inhibitor and sodium hypochlorite (on-site generation), all necessary piping and analyzers, an electrical/control room as well as a permanent back-up generator. The existing Vincentown station (along Retreat Road) will be removed and the existing wells on that site will be abandoned.

- Jerusalem Rd Booster Station Improvements – This project includes design and construction work to replace the existing below grade Jerusalem Road pump 1 and 2 booster station with a new above grade booster station building with individual mechanical and electrical rooms. The existing booster station has reached the end of its useful life and is in poor condition, with the pumps and electrical equipment requiring upgrades. Servicing this facility also presents a safety hazard, as pumps 1 and 2 are in an underground vault (confined space entry). Improvements are needed for safe and continued operation of the booster station. Targeted piping

replacement is also needed at the station to improve hydraulic conveyance. The new booster station will include two 1,500 gpm vertical turbine pumps equipped with VFD's and an emergency backup generator. The new pumps will be installed along with new 16-inch suction and discharge piping. Electrical upgrades to site power and SCADA control functionality will also be included. In addition, a motor-operated control valve MOV (altitude valve) is to be installed for the storage tank.

29. Q. Please describe the Company's administrative and facilities investments in more detail.

A. While the above categories are broad and generally encompass nearly all projects within the Company's capital program, there are certain projects that may fall into the facilities category. This category can contain elements of each area above. For instance, older facilities may lack important security features, may have inadequate ingress or egress, or may have substandard fire detection and suppression systems. Mechanical and electrical systems may be old and inefficient resulting in higher electric and gas expense charges. And in some cases, the facilities are simply inadequate to handle the materials and equipment necessary to manage the required repairs and replacements for the level of service that customers expect and deserve. Lack of adequate storage space for materials and equipment is often a key driver for facility improvements. Projects for facility upgrades also include investments in employee offices, restrooms, lockers and other support facilities. These are key investments in infrastructure necessary to attract and retain an engaged workforce.

Some examples of administrative and facilities projects included on Schedule DCS-1 follow:

- Lawnside Operations Center Block C – The Lawnside facility was originally designed without inside parking/storage of diesel trucks and equipment. The new Block C building was added in order to maximize the operating lifespan of the trucks, excavation equipment and related items. In addition to protection from inclement weather it will also prevent theft of any key parts of the equipment.

- Somers Point Storage Yard – NJAWC is currently storing stone materials and other necessary items for everyday T&D work at the Somers Point Tank site. Due to the location of the site and local residents' concerns about use of the site during off hours operations, primarily related to emergency main repairs at night, NJAWC is either faced with requesting a zoning variance or relocating the material being stored. Somers Point has allowed NJAWC to continue to operate with restricted hours in a temporary manner until a more permanent solution can be achieved. After several rounds of investigating and evaluating several sites, the location at the well station between Delilah Road and Commerce Drive has been selected as the best solution. The work will involve site work and material storage equipment and facilities at the well station.

30. Q. Are the projects about which you are testifying in this proceeding necessary and prudent in order for the Company to continue to provide safe, adequate and reliable utility service?

A. Yes, they are. These projects are necessary to continue to provide safe, adequate and reliable water service in a manner that is in the long-term best interest of our customers. For example, plant improvements designed to meet water quality regulations will minimize the risk of both Notices of Violation ("NOVs") and MCL violations. Projects aimed at addressing health and safety risks mitigate potential accidents and improve both employee and customer safety. Projects designed to improve energy efficiency help to achieve the goals of improving operational efficiency and reducing energy usage. Replacement of deteriorated assets can reduce the risk of system outages, which helps promote high customer satisfaction. All of these examples show that prudent capital investment is in the best long-term interest of our customers.

IV. WATER STORAGE TANK REINVESTMENT PROGRAM

31. Q. Please describe the Company's water storage tank reinvestment program ("WSTR"), also referred to as Engineered Coating of Steel Structures.

A. The Company invests millions of dollars each year in its WSTR to extend the service life of these critical distribution system storage assets. NJAWC owns and operates 193 structures to store potable water in distribution systems for fire protection, flow equalization and pressure management as well as management of peak demands. Another 58 process tanks are used at treatment plants to provide potable water to customers across the state. The integrity of these structures is crucial to helping to

protect public health and providing safe, adequate and reliable water service to customers. Investments in these structures include the replacement of corroded steel components, safety and security upgrades, and renewal or replacement of existing paint (coating) systems.

The WSTR entails an inspection of the interior and exterior structure of the tank, a prioritization program to define an annual program, bidding the work to qualified licensed contractors, awarding contracts and scheduling the work, releasing the tank to the contractor for the replacement of corroded steel components, the installation of new safety and security upgrades, and the coating reinvestment work, followed by disinfecting the tank and returning the tank to service.

32. Q. Please describe the service life considerations for water storage tanks in distribution systems.

A. Water storage tanks are generally constructed of steel or concrete, and can be configured as ground level storage tanks, elevated tanks or standpipes. Material of construction and type of tank are dictated by service requirements and cost. Of NJAWC's tank inventory of 251 tanks, 210 are steel and 41 are concrete. If properly designed, constructed and maintained, these tanks can be expected to have service lives of numerous decades despite exposure to harsh environmental conditions. A majority of these tanks are located outside and are exposed to a wide range of air temperature, humidity, water temperatures, wind loading, and seasonal weather conditions. Steel tanks need to be protected from exterior corrosion that can result from the harsh outdoor environment and interior corrosion that can result from the effects of chlorinated water.

This is especially true for coastal areas where salt air is highly corrosive to steel surfaces. In general, minor corrosion spots can be repaired; however, significant corrosion, if left unattended, can lead to structural damage and poor aesthetic conditions. In addition, this corrosion could potentially result in a breach of the tank, which could lead to contamination of the tank contents from infiltration or worse, tank structural failure. Proper inspection, ongoing routine care to address spot corrosion, and major recoating projects can therefore extend the service life of steel tanks. Concrete tanks are generally more costly to construct than steel but do not require the same level of exterior reconditioning.

33. Q. Please describe the importance of the WSTR.

A. Steel tanks require occasional, but significant investment in the coating system. NJAWC utilizes a high-performance engineered coating system on both interior and exterior surfaces of tanks. The service life of the interior and exterior coatings varies depending upon several conditions, but typical high-performance coatings can last up to about 20 years. Installation of new coating systems on existing tanks typically requires removal of existing coatings to bare metal through abrasive blasting and then installation of a new, engineered, three-coat system that will coat the structural metal and extend its useful life significantly. Containment systems are often used to control dust and overspray during blasting and coating installations. Some existing steel structures may have previously been coated with lead-based paint systems. Under those circumstances, the project activities are supplemented with lead abatement efforts to

contain, collect, and properly dispose of possible lead-based residuals and other efforts to help protect workers and the environment.

34. Q. What amount is the Company projecting for annual tank rehabilitation?

A. The Company estimates its annual rehabilitation costs to be approximately $9.3 million.

35. Q. What factors are taken into consideration when determining this cost?

A. The detailed tank inspections and subsequent report and recommendations will weigh heavily in determining the actual tank rehabilitation needs and priorities. Further, the various geographical differences in tank location, *i.e.*, tanks located along the coastal regions may have a decreased coating life compared to a tank in more remote wooded regions in the central part of the state.

36. Q. Does the Company complete inspections and development of detailed plans and specifications for the WSTR work on an annual basis?

A. Yes, the Company performs inspections and has detailed plans and specifications prepared for the work identified in the inspections every year. It is the foundation for the tank rehabilitation program.

V. THE RISKS OF FURNISHING WATER AND WASTEWATER SERVICES

A. Public Water Service

37. Q. Please provide an overview of the risks associated with furnishing safe and adequate water quantity and water quality and complying with drinking water

and environmental regulations that apply to NJAWC's water supply facilities and operations.

A. Water supply utilities are subject to a complex array of regulations at the federal, state and local levels with respect to water quantity, water quality and other environmental aspects of their facilities and operations. NJAWC's surface water and groundwater sources are subject to run off from upstream sources that can lead to possible contamination and resulting treatment challenges such as cryptosporidium, PFAS, or an unexpected chemical release upstream. These episodic challenges will continue to face the Company, all while needing to meet the everyday requirements imposed by programs administered by the NJDEP.

Drinking water quality is addressed by a combination of federal regulations established under the SDWA coupled with state regulations and enforcement. The federal act established the USEPA as the federal regulatory authority on drinking water. Under that authority, USEPA has created standards for contaminant levels in drinking water and a series of mandatory treatment method standards, coupled with monitoring and reporting requirements, and public notification mandates in the event of contaminant level or treatment method noncompliance. The USEPA has granted primacy to the NJDEP, which administers the federal regulatory standards. In recent years there has been an increase in public concern over water quality standards and regulation. This increase has led to growth and increased stringency in USEPA and state drinking water research and regulation.

The following is a brief summary of some of the key risk issues associated with current and prospective regulation of water quantity, quality and other environmental aspects of water supply system operations:

In addition to existing rules such as the Long Term 2 Enhanced Surface Water Treatment Rule ("LT2ESWTR") and Stage 2 Disinfectants and Disinfection Byproducts Rule ("Stage 2 DBPR") that continue to evolve, the Third Unregulated Contaminant Monitoring Rule ("UCMR 3") is a rule published by the USEPA in 2012 that assesses the prevalence in water supplies of certain contaminants not currently regulated under the SDWA. Certain contaminants have received particular scrutiny under UCMR 3. These include perfluorooctanoic acid ("PFOA"), 1,4-dioxane, and hexavalent chromium (chromium (VI)). PFOA is a perfluorinated compound ("PFC"), a manmade chemical used in a variety of consumer products. PFOA is prevalent in New Jersey, particularly in groundwater sources that have a history of contamination from other VOCs. Previous studies have documented developmental effects from PFOA including liver toxicity, kidney toxicity, immune effects, and cancer. Since the UCMR 3 rule requirement, the NJDEP has enacted MCL levels for PNFA, PFOA, PFOS[4], at the following limits:

- PFOA: 14 ng/L, or 0.014 µg/L
- PFNA: 13 ng/L, or 0.014 µg/L
- PFOS: 13 ng/L, or 0.014 µg/L

[4] https://www.nj.gov/dep/newsrel/2020/20_0025.htm

Prior to this regulation, PFOA had a health reference level established by the New Jersey Drinking Water Quality Institute ("NJDWQI") of 40 ng/L. PFOA has been detected in many system wells above the concentration of the NJDEP MCL. Several wells in the Central Region had been found to have elevated levels of PFOA, including Charles St, Quinton Ave, Green Brook, Rock Ave Piscataway, Clinton Ave, Netherwood, Hummocks, and Springfield.

This NJDEP MCL promulgation for PFOA has had a significant impact on the groundwater supply of NJAWC's systems. Regulation requires discontinued use of affected wells or installation of treatment systems. Since the implementation of the new limits, NJAWC has discontinued use of PFOA impacted wells at Greenbrook Station, Charles Street Station, Quinton Ave. Station, Rock Avenue Station and Clinton Avenue Station. Many of these stations were repurposed to act as boosters to move surface water into the associated pressure gradients. The Company has mitigated the risks of a system supply deficit which could compromise system integrity if not addressed through its proactive efforts to discontinue the use of certain wells and/or install effective treatment at others. Supply, capacity and distribution system improvements were completed in order to comply with the regulation and to ensure adequate levels of service are provided. As described within my testimony, there are several projects that the Company has completed or will complete that address the PFOA (and broader PFAS) issues throughout the state. Recent completions include Baltusrol Station, Short

Hills Station as well as Springfield Station and Hummocks Station. Treatment for the Netherwood Station is planned and construction expected to start in late 2023.[5]

On March 14, 2023,[6] the USEPA issued proposed drinking water regulations for six PFAS, which will establish legally enforceable levels (Maximum Contaminant Levels, or "MCLs" and Maximum Contaminant Level Goals ("MCLGs")) for each of these six PFAS that are known to occur in drinking water, all of which are more stringent than those currently in place in New Jersey. In addition to the MCLs and enforceable limits for these six PFAS, the USEPA is proposing requirements for the continued monitoring of PFAS, public notification of monitoring results if they exceed defined limits, and the treatment of drinking water to reduce PFAS to required limits. The USEPA is expected to finalize its PFAS Rule in January 2024 at which point public water systems will be required to modify their facilities to comply within three years.

For the Company, these new requirements will require investments of over $500 million before the end of 2027, based on preliminary estimates; specific projects and investments will depend on the results of monitoring and pilot testing as envisioned by the regulations. Regarding 1,4-dioxane, the state of New Jersey is investigating the regulation of this compound through the Drinking Water Quality institute. Recently the DWQI recommended to the NJDEP that a MCL of 0.33 parts per billion ("ppb") be approved by the NJDEP for implementation. During this time, NJAWC has actively

[5] In the interim, these wells are not in use. Supply from the Raritan Millstone and Canal Road WTPs is available to serve customers in the region. This station is one of several groundwater stations used for resiliency in Central Region.
[6] US EPA Fact Sheet – *EPA's Proposal to Limit PFAS in Drinking Water* https://www.epa.gov/system/files/documents/2023-04/Fact%20Sheet_PFAS_NPWDR_Final_4.4.23.pdf.

participated in monitoring both surface water and groundwater systems for 1,4-dioxane. Advanced Oxidation treatment using peroxide and ultraviolet light is in place at the Hummocks station (which also has PFAS removal equipment). Additionally, the Company has completed the installation of treatment equipment for 1,4-dioxane at the Delran WTP, in response to increased levels in the Delaware River.[7]

As the result of conditions that arose in Flint, Michigan and other jurisdictions across the country, including Newark, increased scrutiny is being placed at all levels concerning lead concentrations in water systems and the adoption[8] of more stringent requirements under the federal Lead and Copper Rule. The lead issue typically arises not from constituents in source water, but rather from the leaching of lead from older pipes and joints into the water as it passes through household service lines and plumbing. While providing centralized treatment that adjusts the pH can, in many cases, help minimize lead corrosion, the fact is that the plumbing in many older communities (including those in NJAWC's service territory) are older lead pipes or contain the type of copper and galvanized pipes with solder joints where lead contamination is an increased risk.

The USEPA recently issued and formally adopted Long Term Revisions to the Lead and Copper Rule ("LCR" or "Rule").[9] Generally, the revisions center around providing

[7] https://www.nj.gov/dep/14-dioxane/
[8] https://www.epa.gov/newsreleases/epa-announces-intent-strengthen-lead-and-copper-regulations-support-proactive-lead.
[9] The EPA has also recently issued the Lead and Copper Rule Improvements Draft as of December 6, 2023, the requirements of which the Company is still evaluating. *See* https://www.epa.gov/ground-water-and-drinking-water/proposed-lead-and-copper-rule-improvements.

for a more protective and enforceable health standard. Key areas that the revised Rule covers include more robust inventory management, strengthened corrosion control, treatment, increased sampling, and improved risk communication. The Rule as promulgated will impose significant additional capital investment requirements and increased operating expenses on all water systems. In addition, the New Jersey legislature has supplemented USEPA's recommendations with legislation (A5343/SS3398) that provides for more stringent inventory and lead line replacement requirements than the revised LCR ("NJ LSL Legislation").[10]

Most details of the changes to the Rule, as supplemented by the NJ LSL Legislation, include the following:

1. Identifying areas most impacted: this will require a lead line inventory for the first time, due in 2024. The NJ LSL Legislation requires a first inventory in January 2022. The Company is in compliance with the legislation and most recently submitted an updated annual inventory in January of 2023.
2. Strengthening Treatment Requirements: a new trigger limit of 10 ppb; systems that currently provide for corrosion control treatment, such as certain NJAWC systems, would be required to optimize the existing treatment scheme. Systems that do not practice corrosion control would be required to complete a corrosion control study.

[10] *See* https://www.asdwa.org/2021/07/26/nj-governor-signs-law-requiring-all-lead-service-lines-to-be-replaced-in-10-years/#:~:text=10%20Years%20%2D%20ASDWA-,NJ%20Governor%20Signs%20Law%20Requiring%20All%20Lead%20Service,be%20Replaced%20in%2010%20Years&text=Last%20Thursday%20(7%2F22),service%20lines%20within%2010%20years; *see also* https://nj.gov/governor/news/news/562021/approved/20210722a.shtml

3. Replacing Lead Service Lines: The 10 ppb trigger would require the utility to work with the state to set an annual goal of lead service line replacement so that a level below the 10 ppb trigger could be achieved. Also, partial lead service line replacements would not be allowed under the proposed Rule. The NJ LSL Legislation requires all lead service lines to be removed within 10 years, including galvanized lines.
4. Increased Sampling Reliability: a new sampling techniques and selection criteria to ensure the most at-risk communities receive the greatest sampling efforts.
5. Improving Risk Communication: 24-hour notification of any action exceedance levels, along with requiring systems to make the lead service line inventory publicly available. There are also additional annual reporting requirements under NJ LSL Legislation.
6. Protecting Children in Schools: schools are required to sample and test schools and day care facilities in a similar manner to public water systems. The NJ LSL Legislation has additional requirements for schools and other community facilities.

In addition to the items above, NJDEP has shared a few ideas with external stakeholders through various workshops and stakeholder meetings that suggest it is considering changes above and beyond the USEPA revised Rule as published. As of the date of this writing these changes are not yet formalized.

38. Q. Are there any additional contaminant testing initiatives from USEPA?

A. Yes, in 2016, the USEPA issued the Fourth Unregulated Contaminant Monitoring Rule ("UCMR 4"), which required monitoring for 30 chemical contaminants[11] between 2018 and 2020 using analytical methods developed by the USEPA and consensus organizations to provide a basis for future actions to help protect public health.

Following a successful UCMR4 sampling effort, NJAWC has used the resulting data to direct current and future operational mitigations and projects. Specifically, the Company has directed resources and expertise in expanding its utility-owned laboratory cyanotoxin analytical capabilities. Cyanotoxins, especially microcystin, can now be detected at levels far below what was previously possible. Our water quality laboratory staff have trained and supported the efforts of the NJDEP and NJWSA for drinking water reservoir monitoring and management. These capabilities have made proactive WTP and reservoir management programs possible and have strengthened the protection of public health for New Jersey drinking water customers. Disinfection byproduct ("DBP") sampling results have highlighted the importance of balancing strong surface water treatment programs, disinfection, and distribution system water quality. Comprehensive programs are in place to manage DBP formation from source water to customer taps.

[11] The 30 chemical contaminants included 10 cyanotoxins (nine cyanotoxins and one cyanotoxin group) and 20 additional contaminants (two metals, eight pesticides plus one pesticide manufacturing byproduct, three brominated haloacetic acid ("HAA") disinfection byproducts groups, three alcohols, and three semivolatile organic chemicals ("SVOCs").

Most recently, the USEPA released the Final Fifth Unregulated Contaminant Monitoring Rule ("UCMR 5").[12] According to the USEPA,

> UCMR 5 requires sample collection for 30 chemical contaminants between 2023 and 2025 using analytical methods developed by EPA and consensus organizations [].[13] This action provides EPA and other interested parties with scientifically valid data on the national occurrence of these contaminants in drinking water. Consistent with EPA's PFAS Strategic Roadmap, UCMR 5 will provide new data that is critically needed to improve [US]EPA's understanding of the frequency that 29 PFAS (and lithium) are found in the nation's drinking water systems and at what levels. This data will ensure science-based decision-making and help prioritize protection of disadvantaged communities.[14]

The Company has executed and continues to execute this updated sampling plan and, given its track record of implementing solutions for PFAS, plans to engage with USEPA and the NJDEP in helping to provide solutions for providing treatment for these compounds, particularly in light of the proposed USEPA limits for PFAS compounds as discussed earlier in my testimony. Also, given the extensive work done under prior UCMR efforts, the Company expects a significant level of increased operational and capital outlays in future years. In fact, the USEPA has estimated the annual average cost to manage the UCMR5 effort for very large systems to be $2.2

[12] https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule
[13] Planning activities started in 2022, with final reporting expected to be completed in 2026 in accordance with the rule.
[14] *Id.*

million.[15] This only includes the monitoring and analysis related to the UCMR5 CECs. And now that USEPA (and NJDEP) has decided to implement new MCL's related to these compounds, further expenses will ultimately be incurred for ongoing monitoring, customer communication, and if needed, capital outlays for system improvements needed to treat for these compounds. As noted by USEPA:

> The public benefits from the information about whether or not unregulated contaminants are present in their drinking water. If contaminants are not found, consumer confidence in their drinking water should improve. If contaminants are found, related health effects may be avoided when subsequent actions, such as regulations, are implemented, reducing or eliminating those contaminants.[16]

B. Public Wastewater Service

39. Q. Please provide an overview of the risks that environmental regulation poses for NJAWC as the owner and operator of public sewer systems.

A. Like the provision of public water supply service, the operation of wastewater collection and treatment systems entails a range of environmental regulatory risks. Sewer operations are also regulated at both the federal and state levels pursuant to a number of statutes and voluminous regulations. At the federal level, sewer systems are regulated pursuant to the Clean Water Act and numerous regulations adopted by the USEPA under that law, which programs are administered by the NJDEP pursuant to

[15] *See* Federal Register, Vol. 86, No. 245, p. 73135 (Dec. 27, 2021) available at https://www.govinfo.gov/content/pkg/FR-2021-12-27/pdf/2021-27858.pdf.
[16] *Id.*

regulations adopted in furtherance of setting standards for the construction and operation of sewer treatment systems.

The significant risks associated with operating wastewater systems include the following:

Effluent limitations imposed on wastewater treatment plant discharges are stringent and can become more stringent over time. The Clean Water Act requires wastewater systems to obtain and comply with National Pollutant Discharge Elimination System ("NPDES") permits, which, in New Jersey, are issued and enforced by the NJDEP. These NPDES permits establish stringent effluent limits based upon the stricter of: (1) technology-based effluent limits; and (2) water quality based effluent limits.

Several NJAWC treatment plants, including the Homestead wastewater treatment plant ("WWTP") and the Long Hill WWTP face more stringent effluent limits for a series of parameters, particularly lowering ammonia and phosphorous limits due to classification of the receiving stream. Additionally, PFAS effluent discharge limits for WWTP permit holders (owners such as NJAWC) are being considered at both the federal and state level. There is also consideration at the federal and state levels for limits on PFAS in sewage plant residuals (sludge) that, if adopted, will ultimately require extensive capital equipment treatment outlays with associated increased operational expense[17].

[17] https://www.epa.gov/newsreleases/epa-announces-plans-wastewater-regulations-and-studies-including-limits-pfas-new-study.

More stringent effluent limits may be imposed when technology evolves or stream conditions and discharge requirements change, engendering requirements for significant capital improvements and/or increased operating costs for enhanced treatment performance. Every 3-5 years, NPDES permits are up for renewal, and in any such renewal, more stringent limits may be triggered.

Other potential liability risks from wastewater system operations arise from backups, overflows or releases that may occur from the collection system onto private property or into the environment. The Company has deployed level sensing and alarming technology (Telog and SmartCover) which provide effective monitoring for optimized cleaning to help prevent such backups and potential overflows. As an example, some wastewater system operators have been confronted with claims under the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") for cleanup of contamination that occurred when wastewater containing "hazardous substances" leaked from wastewater lines into soils or groundwater. While not as extreme, liabilities resulting from wastewater backups into buildings or other unplanned discharges are an inherent part of wastewater system risks.

C. Climate Variability

40. Q. Does climate variability pose additional risk for water supply utilities such as NJAWC?

A. Yes. Whatever the debate may be concerning the causes of climate variability, water supply utilities face the reality of climatic variability and attendant stresses on water resources and system recovery. The recent trend in precipitation not only in New

Jersey[18] but also throughout Northeastern United States has been towards increases in rainfall intensity and rainfall is also projected to increase in amount and persistence in addition to intensity.[19] That means we can expect more intense high-precipitation events, river and coastal floods, along with high damaging storm events – which impact water utilities. In addition, these climate-related disruptions will exacerbate existing aging infrastructure issues experienced by water utilities.[20]

Recently the remnants of Hurricane Ida devastated much of Central New Jersey.[21] The storm claimed five lives and resulted in millions of dollars in property damage. Fortunately, the Company completed a $35 million improvement in the RMWTP's floodwall system back in 2018 and as a result of these improvements was able to sustain safe, reliable service throughout the storm event. Additionally, the Company also upgraded its backup generator system which provided uninterrupted power during the event (even though utility side power was interrupted). Had these improvements not been made, hundreds of thousands of customers would have been without safe, reliable water during this event.[22] These investments demonstrated clearly the wisdom and

[18] See https://njclimateresourcecenter.rutgers.edu/wp-content/uploads/2023/04/State-of-the-Climate-2022-042423.pdf

[19] USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, Chapter 18 - Northeast [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018, available at https://nca2018.globalchange.gov/chapter/18/.

[20] *Id.*

[21] https://www.tapinto.net/towns/bridgewater-slash-raritan/sections/somerset-county-news/articles/somerset-county-one-of-6-in-new-jersey-named-in-major-disaster-declaration-after-tropical-storm-ida

[22] https://www.roi-nj.com/2021/09/10/industry/energy-utilities/at-njaw-preparing-for-100-year-floods-that-now-come-every-few-years/?utm_source=ROI-NJ+MAIN+Newsletter+List+%282%2F4%2F19%29&utm_campaign=b8a2a59891-EMAIL_CAMPAIGN_2021_09_09_11_48&utm_medium=email&utm_term=0_6732b2b110-b8a2a59891-44402630

prudence of the Company's focus on reducing risk and maintaining safe and reliable service to its customers. Water supply systems are fundamentally resource-dependent and, therefore, the effects of climate variability pose a significant on-going risk and create challenges with regard to maintaining a reliable water supply during the full range of potential future conditions, including even what might be assumed to be "normal" periods. The safe yields of water supply sources have historically been evaluated based on historical climatic patterns, data from so called "droughts of record" or dry period frequency analysis. Changing climatic conditions, however, suggest that historical hydrologic data (which in many cases only reflect 50-100 years of rainfall and stream flow measurement collection – a quite short period in geologic or climatic time) may not accurately predict future conditions. Thus, the calculated safe yield of streams, reservoirs and groundwater wells are put in question as the effects of climate variability are experienced across the southeastern United States. Thus, in response to climate variability, water supply systems must address the risks posed to the reliability and resilience of their sources. While droughts are the major challenge for water supply systems, heavy precipitation and high-flow events are the concern of wastewater systems.

The effects of climate variability impact the resiliency of a system to withstand an event without disrupting service to customers or, if service is interrupted, to restore the service in a timely manner. Like all large users dependent on electricity from the grid, water utilities must plan for power outages and develop plans for maintaining continuity of operations when such outages occur. Nonetheless, recent weather patterns

combined with the issue of aging infrastructure are causing utilities to review traditional planning and design criteria. The design standards for supplies, treatment plants, pump stations and tanks are taken together to achieve a level of zero service outages. The so-called new normal has led experts to look beyond traditional reliability and emergency planning into a world that needs the speed of recovery and resiliency for much more widespread and damaging events. Updating infrastructure to keep up with the increase in extreme weather and ensuring that adequate service can be maintained for extended time periods after an extreme event is just as important as addressing the aging infrastructure.

The Company looks for ways to reduce or mitigate increases in expense in many areas of the business, which also has an environmental benefit. Examples such as increased leak detection allow for more efficient routing of repair crews to the highest priority leaks. Controlling leaks before they create larger issues results in less fuel usage, and minimizes excavation and repair materials; not to mention inconvenience to customers from interruptions in service, detours, etc. This proactive approach of deploying active leak detection not only minimizes treatment exposure but also helps preserve source water; every gallon that is saved is a gallon that can be provided at a later date, particularly during times of drought.

In addition, NJAWC has and will continue to evaluate its systems and systematically look for opportunities to add additional standby power capacity, look for ways to diversify its fuel supply and review and implement various other projects to minimize its potential impact to climate change.

41. Q. Does this conclude your Direct Testimony?

A. Yes, it does.

NEW JERSEY-AMERICAN WATER COMPANY, INC.

Appendix A

1. Q. Please describe your educational background and professional associations.

A. I earned a Bachelor of Mechanical Engineering degree (1991) from Villanova University, Villanova, Pa. I am a registered Professional Engineer in the State of New Jersey and am currently licensed in an inactive status in multiple states including Pennsylvania, Ohio, New York, Missouri, Maryland, and Delaware.

2. Q. What has been your business experience?

A. I have over twenty-six years of experience in the water and wastewater utility engineering field. From 1991 to 2001, I was employed by the Bergen County Utilities Authority ("BCUA") in various engineering positions of increasing responsibility including, Assistant Engineer and Senior Environmental Engineer where I designed, managed, and commissioned multi-disciplined wastewater infrastructure projects. I led projects that were focused on operational efficiency and data collection along with significant plant and collection system improvements. Some examples include:

- Upgrade of all of the BCUA's open channel flow metering equipment.
- Management of permitted overflow level monitoring
- Replacement of 42" PCCP Force Main
- Rehabilitation of 12" Gravity sewers with fold and form lining technology
- Treatment plant additions including addition of Sludge thickening centrifuge and associated equipment; polymer feeds, electrical equipment and controls
- Replacement of Waste Activated Sludge Pumping System

NEW JERSEY-AMERICAN WATER COMPANY, INC.

Appendix A

From 2001 through 2011 I was employed by Applied Water Management Inc. ("AWM"), where I worked in various positions of increasing responsibility from staff engineer to Design Build Director (Company Officer). I also held a position of Officer and Director on the Board of Applied Wastewater Management, Inc. ("AWWM"), a New Jersey Board of Public Utilities ("BPU" or "Board") -regulated subsidiary of AWM. Much of my experience at AWM was in design construction and operations of small, decentralized water and wastewater treatment facilities. My work included responsibility for complete design, construction and facility commissioning for Integrated Biological Membrane Filtration Plants for sewage treatment and discharge to ground water. These plants were designed for strict groundwater discharge limits (Nitrogen) and allowed for a high degree of automation for continuous unattended operation. Water systems design and construction included well stations with treatment (air stripping, disinfection) and distribution equipment (hydro pneumatic tanks, pumping systems, fire flow systems).

AWM was a subsidiary company of American Water Works Company, Inc. ("AWW") until 2011. Upon the completion of the sale of AWM in December 2011, I took a position with AWW as an engineer with the American Water Works Service Company, Inc. ("AWWSC"). I held a Director of Engineering position, primarily supporting business development activities as a technical expert. I also provided engineering support and leadership for various strategic initiatives including wastewater growth opportunities and water/wastewater system planning and infrastructure renewal. In

NEW JERSEY-AMERICAN WATER COMPANY, INC.

Appendix A

January of 2014 I was appointed to the position of Vice President - Engineering for NJAWC which position I held until being appointed to my current position as Vice President of Engineering for the Eastern Division in September of 2019.

NJAW Additions to Plant in Service 07/01/23 - 12/31/24				
Project	Description	Service	Project Total	Est In Service Date
Investment Projects				
I18180050	36" Rumson Pl Little Silver	Water	$1,682,011	04/01/21
I18130147	Beckett Station PFAS Removal	Water	1,593,788	12/01/22
I18260100	Jerusalem Rd Booster Sta Imprv	Water	3,735,525	07/05/23
I18260115	2023 Transmission Main Inspection	Water	501,251	07/17/23
I18120050	Coastal South A&C Upgrades Phase 6	Water	598,515	07/28/23
I18340002	2nd Ave Lift Station Replacement	Wastewater	2,449,709	08/01/23
I18190049	Howell Field Ops Center	Water	4,904,553	08/01/23
I18250126	CRWTP Alum Tank Replacements	Water	2,469,512	08/07/23
I18260114	2022 Transmission Main Inspection	Water	2,555,335	08/07/23
I18300002	Vincentown Supply Reliability	Water	4,587,655	08/10/23
I18190055	Farmingdale Transmission Loop	Water	2,045,270	08/29/23
I18190054	Rt 9 Water Main Replacement	Water	10,675,860	08/30/23
I18260134	North Plainfield C&L	Water	2,531,165	08/31/23
I18180100	JBWTP Belt Filter Press	Water	770,739	09/18/23
I18120049	Mill Rd-N.Linwood Iron Removal	Water	16,846,817	09/28/23
I18240002	Pottersville Sewer Addison Rd Rehab A-26	Wastewater	1,205,501	09/29/23
I18170008	Oxford Sta Treatment Upgrades	Water	3,657,503	11/30/23
I18150114	Phase 6 NRW 2023	Water	618,124	11/30/23
I18280006	Statewide Sewer A&C Upgrades Ph 2 2023	Wastewater	529,135	12/31/23
I18230014	Pearl St Sewer Upsize (A-5)	Wastewater	149,429	12/31/23
I18350001	Long Hill WW Vac Truck Building IF-4	Wastewater	7,762,398	12/31/23
I18130157	Lawnside Ops Center: Block-C	Water	3,641,236	12/31/23
I18180081	Coastal North JB/SR A&C Upgrades Phase 4	Water	1,611,845	12/31/23
I18260137	NRW Management 2023 - Central	Water	2,047,523	12/31/23
I18260131	Linden 36in PCCP Replacement-Phase 4	Water	7,400,904	02/28/24
I18190052	Bay Head HDD and Main	Water	1,762,809	04/26/24
I18280003	Glen Meadows-TreatUnitUpgrd IF-2 2022	Wastewater	4,556,387	04/30/24
I18350003	Long Hill PS Improvements Project - IF-2	Wastewater	2,715,637	06/30/24
I18190063	Point Pleasant I/C	Water	1,401,746	08/31/24
I18280004	Fawn Run-Plant Upgrades IF-1 2022	Wastewater	1,257,000	10/30/24
I18150133	Chester Booster Pump Upgrade	Water	29,167	10/30/24
I18180092	Monmouth County Trans Main Inspection	Water	1,218,748	10/31/24
I18270004	Homestead Chem Feed & Storage	Wastewater	1,289,390	12/27/24
I18220010	Bay Avenue Sanitary Sewer Imprv	Wastewater	2,562,800	12/27/24
I18250127	CRWTP Solar Inverter&Panel Repl- A-16	Water	3,800,000	12/27/24
I18010037	2023 LEUP Program	Water	750,000	12/29/24
I18150093	Basking Ridge BS Generator	Water	800,000	12/29/24
I18250077	RMWTP Filter 31 36 Iso Gates Imprv	Water	1,500,475	12/29/24
I18260094	Oak Tree Booster Sta Upgrades A-18	Water	8,349,985	12/30/24
I18270005	Hawk Pointe WW Plant Upgrade (IF-4)22	Wastewater	3,076,480	12/31/24
I18350010	LH Aerial Crossing Mitigation - IF-7	Wastewater	1,152,717	12/31/24
I18230020	Ridge Ave/Negba St Sewer Up-size (A-11)	Wastewater	2,118,365	12/31/24
I18350004	WWTP Filter and Pump Improvements - IF-1	Wastewater	6,979,759	12/31/24
I18350020	LH WW Sys SCADA Upgrades IF-6	Wastewater	450,000	12/31/24
I18070002	EDC Bed 1 PS Improvements	Wastewater	84,831	12/31/24
I18230038	Yellowbrook Station Sanitary Relocation	Wastewater	451,172	12/31/24
I18270007	Crossroads WWTP Imprv(A-7)2022	Wastewater	1,500,000	12/31/24
I18280007	Statewide Sewer A&C Upgrades Ph 3 2024	Wastewater	1,400,004	12/31/24
I18350008	2024 Long Hill WW C&L	Wastewater	1,000,000	12/31/24
I18150132	Irvington LSL Replacement - Company Owned	Water	11,241,688	12/31/24
I18260136	Central LSL Replacements 2023 - Company Owned	Water	38,479,043	12/31/24
I18260068	Central A&C Upgrades Ph 6e,g	Water	2,771,666	12/31/24
I18130150	AMI Installations – Delran	Water	1,573,824	12/31/24

NJAW Additions to Plant in Service 07/01/23 - 12/31/24				
Project	Description	Service	Project Total	Est In Service Date
I18180087	AMI Installations Shrewsbury	Water	880,210	12/31/24
I18180096	Tinton Falls 30" Concrete Main	Water	6,442,866	12/31/24
I18130024	Cooper Ivy Radium Removal (A2)	Water	12,982,817	12/31/24
I18190062	Oak Street PFAS	Water	5,862,899	12/31/24
I18180088	Swimming River Intake Rehab	Water	1,020,118	12/31/24
I18250125	RM FilterHouse Dehumi & HVAC Impr	Water	9,019,406	12/31/24
I18130138	Burlington Main to North Creek Xing	Water	1,900,731	12/31/24
I18130132	Ranney Sta New Shallow Wells A2	Water	2,501,142	12/31/24
I18250167	RM Permanganate Chemical System Upgrades	Water	2,008,261	12/31/24
I18260135	Green Brook Well Sta 5 MGD Transfer Mod	Water	1,208,759	12/31/24
I18120058	Smithville Generator Replacement	Water	510,958	12/31/24
I18130115	Southwest A&C Upgrades Phase 6	Water	2,162,614	12/31/24
I18150063	North A&C Upgrades Phase 6	Water	2,477,289	12/31/24
I18190056	Coastal North - Corrosion Control Optimi	Water	501,861	12/31/24
I18250158	CRWTP Raw Water 40 MGD Pump	Water	3,001,843	12/31/24
I18120059	Somers Point Storage	Water	1,084,170	12/31/24
I18130097	Pipeline Condition Assessment (A15)	Water	1,060,000	12/31/24
I18150088	CBWTP Raw Wtr Intake Impr A11	Water	3,523,398	12/31/24
I18150130	North A&C Upgrades Phase 7	Water	1,562,500	12/31/24
I18170032	ITC Main Extension	Water	2,000,000	12/31/24
I18180083	Coastal North JB/SR A&C Upgrades Phase 5	Water	1,500,000	12/31/24
I18180098	Glendola Intake Structure Improvements	Water	1,033,625	12/31/24
I18250084	RMWTP LowLift to EHL Wtr Line Imprv Comp	Water	360,000	12/31/24
I18260123	2024 Transmission Main Inspection	Water	2,500,000	12/31/24
I18260142	NRW Central 2024	Water	1,500,000	12/31/24
I18250146	CRWTP Phosphoric Acid System Impr	Water	1,552,867	12/31/24
	Various Investment Projects	Water	3,001,250	Various
	Various Investment Projects	Wastewater	691,297	Various
Total Investment Project Spend			$264,695,875	
Recurring Projects (RP)				
RP-A	New Mains	Water	19,897,182	Various
RP-B	Replaced Mains	Water	189,180,759	Various
RP-C	Unscheduled Main Replacements	Water	19,935,013	Various
RP-E	New Hydrants & Valves	Water	6,444,134	Various
RP-F	Replaced Hydrants & Valves	Water	29,369,045	Various
RP-G	New Services	Water	24,685,709	Various
RP-H	Replaced Services	Water	82,275,183	Various
RP-I	New Meters	Water	4,947,977	Various
RP-J	Replaced Meters	Water	57,514,956	Various
RP-K	ITS Equipment & Enterprise Solutions	Water	37,258,377	Various
RP-L	SCADA	Water	3,860,783	Various
RP-M	Security	Water	2,725,357	Various
RP-N	Offices & Facilities	Water	3,531,025	Various
RP-O	Vehicles	Water	18,625,067	Various
RP-P	Tools & Equipment	Water	3,293,164	Various
RP-Q	Plant Process Equipment	Water	41,625,154	Various
DV	Developer Funded Projects	Water	23,348,101	Various
RP-B	Replaced Mains	Wastewater	6,032,606	Various
RP-C	Unscheduled Main Replacements	Wastewater	665,513	Various
RP-E	New Hydrants & Valves	Wastewater	44,094	Various
RP-F	Replaced Hydrants & Valves	Wastewater	1,400,765	Various
RP-G	New Services	Wastewater	3,565,741	Various

NJAW Additions to Plant in Service 07/01/23 - 12/31/24				
Project	Description	Service	Project Total	Est In Service Date
RP-H	Replaced Services	Wastewater	3,969,033	Various
RP-L	SCADA	Wastewater	797,961	Various
RP-M	Security	Wastewater	50,000	Various
RP-P	Tools & Equipment	Wastewater	326,142	Various
RP-Q	Plant Process Equipment	Wastewater	8,086,428	Various
DV	Developer Funded Projects	Wastewater	2,252,305	Various
Total RP/DV Spend			$595,707,574	
Total Additions to Plant In Service 07/01/2023 - 12/31/2024			$860,403,449	