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, AND
OTHER TARIFF MODIFICATIONS

BPU Docket No. WR2201____

Direct Testimony of

THOMAS SHROBA

January 14, 2022

Exhibit P-4

NEW JERSEY-AMERICAN WATER COMPANY, INC.

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INTRODUCTION

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

A. My name is Thomas Shroba. My business address is 1 Water Street, Camden, NJ 08102.

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

A. I am employed by New Jersey-American Water Company, Inc. ("New Jersey-American Water", "NJAWC", or the "Company") as Vice President of Operations.

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

A. As Vice President of Operations, I am responsible for leading New Jersey-American Water's operations (production, distribution, field services, construction), water quality/environmental compliance, operational risk management (safety), and business performance (collectively, "Operations") functions. I lead the Company's Operations team by providing goals and directions that strive to increase cost effectiveness, performance, customer service and service quality.

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 submitted direct and rebuttal testimony for New Jersey-American Water in BPU Docket Nos. WR17090985 and WR19121516.

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

A. The purpose of my testimony is to provide an overview of New Jersey-American Water's operations and discuss our commitment to water quality and environmental compliance, health and safety, and customer service, and our continuing efforts to improve water efficiency. My testimony also supports the Company's proposed staffing levels and explains our compensation philosophy.

OVERVIEW OF OPERATIONS AND FACILITIES

7. Q. As Vice President of Operations, are you generally familiar with New Jersey-American Water's operations and the facilities and property that the Company maintains to serve customers?

A. Yes.

8. Q. Please describe New Jersey-American Water's operations.

A. NJAWC is the state's largest water utility serving a population of approximately 2.8 million people. As of December 31, 2021, NJAWC provides service to approximately 660,000 water and fire service customers and 49,900 wastewater service customers in 190 communities in 18 counties throughout the State of New Jersey.[1] The tan, green, red and orange shaded areas in the service area map

[1] NJAWC also provides water to 30 additional communities through bulk purchase water agreements.

attached as Schedule TS-1 represent the franchise territory served by NJAWC. New Jersey-American Water's customers are served by field operations employees who report to eight operations centers located in Short Hills, Shrewsbury, Egg Harbor Township, Delran, Plainfield, Belle Mead, Howell, and Washington (Warren County). The operations center locations are also shown on Schedule TS-1. The operating centers are organized into four geographically based management areas (Regions). Also included on Schedule TS-1 are the regulated wastewater systems owned by NJAWC.

In addition to providing direct water and wastewater service to its customers, NJAWC also provides regional water supply and "sale for resale" water service to approximately 47 other entities throughout the state. The areas shaded in grey shown on Schedule TS-1 are served by NJAWC through bulk purchase water agreements. The Company has been, and will continue to be, committed to providing regional water supply solutions that are consistent with sound business planning and the water needs identified and coordinated through state and local planning efforts.

9. Q. Please provide an overview of the water assets and facilities of the Company, including sources of water supply, treatment facilities, pumping equipment and distribution system property.

A. NJAWC currently owns, operates, and provides service through thirty two (32) separate public community water systems in the areas previously described. Each of the water systems includes its own source of supply, production, treatment,

storage and distribution facilities. The Company operates seven surface water treatment plants, 119 groundwater production and treatment facilities, and five raw water reservoirs with a combined capacity of 6.2 billion gallons. The average water production budget for 2020 was 275 million gallons per day ("MGD"). Within the NJAWC operations structure, the Production Department is responsible for the operations and maintenance of the sources of supply, reservoirs, treatment plants and treated water storage facilities.

In addition to these Company-owned surface water and groundwater sources of supply, NJAWC also purchases both raw water and finished (treated) water from several other water suppliers including, but not limited to the following: the Passaic Valley Water Commission ("PVWC"); the Morris County Municipal Utilities Authority ("MCMUA"); the Montclair Water Bureau; the New Jersey Water Supply Authority ("NJWSA"); and the City of Newark. Over 100 emergency interconnections are maintained with neighboring water purveyors to enhance reliability of NJAWC and other water systems.

10. Q. Please provide an overview of the Company's wastewater assets and facilities.

A. NJAWC currently owns and operates 29 wastewater collection systems, 22 of which also have wastewater treatment facilities. These wastewater treatment facilities incorporate membrane, sequence batch reactor or conventional activated sludge treatment technologies. Six of the collection systems -- Lakewood, Howell (Adelphia section), Ocean City, Washington Borough (Port Collden

Mall), Haddonfield, and Mt. Ephraim -- convey collected wastewater to regional wastewater treatment facilities owned and operated by the Ocean County Utilities Authority, the Cape May County Municipal Utilities Authority, the Washington Borough Municipal Utilities Authority, and the Camden County Municipal Utilities Authority, respectively. A statewide wastewater management team is responsible for the remaining 22 wastewater collection and treatment systems.

11. Q. How does NJAWC manage the operations and maintenance of its water and wastewater systems?

A. Field Operations is responsible for operating and maintaining transmission and distribution assets, utility service lines, fire services, metering facilities and wastewater collection assets. In addition, Field Operations provides field-level service to customers including meter reading, service requests, and field-related collections activities. Finally, Field Operations works with the Engineering Department and new customers to provide new and replacement services and to coordinate the construction of certain new and replacement or rehabilitated distribution and wastewater collection assets.

12. Q. Please describe the work performed by the Company's Customer and Operations Support group.

A. NJAWC operations also includes a Customer and Operations Support group that is based out of our Howell, New Jersey office. This team has several responsibilities including the following: operational performance reporting, management of customer inquiries and complaints, and liaison for the Board of

Public Utilities ("Board" or "BPU") contacts; special billing and collections coordination; customer service processes; and liaison with the American Water national customer service center.

13. Q. Please explain Operations' role in promoting safety and a safe working environment at NJAWC.

A. Operations is responsible for administering the health and safety program, which includes the delivery of all Occupational Safety and Health Administration ("OSHA") required training, training and qualification of employees, physical security, cyber security, business continuity planning, and event management. We are supported by functional departments within American Water Works Service Company, Inc. ("Service Company"), such as Health & Safety, Learning & Development, Security, and Human Resources, to deliver core operations services. Safety and security metrics are tracked and reviewed monthly.

COMMITMENT TO WATER QUALITY AND ENVIRONMENTAL COMPLIANCE

Overview

14. Q. Please describe New Jersey-American Water's overall commitment to water quality and environmental compliance.

A. We are acutely aware that water is the only utility intended for customers to ingest, and that our customers rely on NJAWC to provide them with safe and reliable water services. Water quality is of paramount importance to the health and well-being of our customers. Beyond health and safety, we know that NJAWC's customers are also interested in the aesthetic qualities of the water we

treat and deliver to them. We proactively look for ways to optimize treatment capabilities to continue to improve the overall quality of drinking water delivered to our customers and do so in a way that strives to create operational efficiencies that also benefit our customers. The Company's Water Quality and Environmental Compliance program is designed to ensure New Jersey-American Water complies with all drinking water quality, water pollution, residuals management, air pollution and hazardous materials laws and regulations.

15. Q. What specific environmental laws or regulations affect New Jersey-American Water?

A. New Jersey-American Water's operations are subject to approximately 11 major state and federal public health and environmental laws, the conformance with which is handled by the Company's Water Quality and Environmental Compliance ("WQ/EC") team. Those 11 major regulatory schemes are: (1) the federal Safe Drinking Water Act and its implementing regulations; (2) the New Jersey Safe Drinking Water Act and its implementing regulations; (3) the federal Clean Water Act and its implementing regulations; (4) the New Jersey Department of Environmental Protection ("NJDEP") Release Protection Program; (5) the federal Clean Air Act and its implementing regulations; (6) the Water Quality Accountability Act ("WQAA"); (7) the New Jersey Safe Dam Act; (8) the Delaware River Basin Commission regulations; (9) the New Jersey Solid and Hazardous Waste rules; (10) the federal Resource Conservation and Recovery Act ("RCRA") and its implementing regulations; and (11) the federal

Emergency Planning and Community Right-To-Know Act ("EPCRA"). NJAWC's Operations are also subject to other environmental laws, such as land use regulations, Green Acres, and the Highlands Water Protection and Planning Act.

16. Q. When the federal government has not pre-empted the field, does compliance with the federal law suffice for compliance with New Jersey law?

A. No, it does not. While there is some overlap between the state programs and federal requirements, state and local statutes and regulations can be more restrictive. New Jersey has: (1) more stringent diesel vehicle regulations than the federal Clean Air Act; (2) more stringent diesel backup generator requirements than federal regulations; (3) lower threshold quantities for hazardous materials and petroleum storage regulations; and (4) more stringent regulated drinking water contaminant standards.[2] For example, federal regulations currently set a maximum contaminant level ("MCL") for arsenic in drinking water of 10 ug/L (micrograms per liter, or parts per billion); however, the NJDEP MCL is 5 micrograms per liter, giving New Jersey the most protective arsenic drinking water standard in the nation. New Jersey also became the first state to create a binding standard for a perfluorinated compound, PFNA, setting a drinking water limit of 13 parts per trillion ("ppt"). The NJDEP also implemented drinking water limits of 14 ppt for PFOA and 13 ppt for PFOS, two

[2] NJDEP has also implemented more stringent health advisory levels than the EPA for 17 volatile organic chemicals ("VOCs").

types of per- and polyfluouralkyl substances known as PFAS. The United States Environmental Protection Agency's ("EPA") current health advisory is 70 ppt for PFOS and PFOA combined. Another example is the Drinking Water Quality Institute's Final Recommendation for establishment of a 1,4-dioxane MCL equal to 0.33 parts per billion. Prior to NJDEP's official recognition of the recommended standard, NJAWC began installing treatment to address this emerging compound. Installing an Advanced Oxidation Process at treatment facilities like Hummocks Groundwater Station and the Delaware River Regional Water Treatment Plant ("DRRWTP") (as described by Mr. Shields in his testimony) will continue to protect public health well before regulations require routine monitoring for 1,4-dioxane. In fact, NJAWC led monitoring and partnership efforts throughout the Delaware River watershed that ultimately identified and eliminated a significant source of 1,4-dioxane that impacted the DRRWTP and numerous other water purveyors.

A significant amount of work performed by the WQ/EC Team is ensuring that NJAWC keeps current with these more stringent requirements, and then designing and implementing compliance programs that minimize duplicative efforts while maintaining compliance with both the federal and state requirements. While there is little duplication in reporting requirements – typically a state agency is the primary enforcement agency for the major federal environmental laws – our operations are so pervasively regulated that the Company filed or prepared approximately 3,000 reports or other regulatory

filings in 2020 to comply with the 11 different regulatory schemes outlined previously.

17. Q. Please describe New Jersey-American Water's water quality testing program under the Safe Drinking Water Act.

A. NJAWC routinely tests water in all of its systems to determine if it is meeting the safety standards established by the federal and state regulatory authorities. Our drinking water is tested both before and after treatment to confirm that it satisfies all chemical and bacteriological criteria. To help protect the public health, we have multiple barriers in the treatment process to help prevent contamination from reaching our customers. We test for the presence of synthetic organic chemicals, inorganic chemicals, VOCs, radionuclides, bacteria, disinfection byproducts, and all other contaminants that the regulators require us to monitor, at the frequency prescribed by the federal and state regulations, and report the results of this testing to the NJDEP on a monthly, quarterly, annual, triennial, sexennial and novennial basis, in accordance with the regulations. In addition, we work with our customers to collect and analyze samples for compliance with the Lead and Copper Rule, as well as participate in the federal Unregulated Contaminant Monitoring Rule programs.

In 2021, New Jersey-American Water collected more than 14,000 water chemistry and routine bacteriological samples. Many additional samples are taken to assess process effectiveness, support pilot treatment studies, and monitor emerging contaminant threats. We also collect other bacteriological samples as

needed in response to main breaks and similar emergencies. All four regions have a WQ/EC Supervisor who: (1) reviews regulatory documents and sampling history to determine the need and schedule for collecting specific samples; (2) coordinates with operators to verify wells and treatment plants are available for sampling based on maintenance and seasonal operating conditions, and then reconcile availability to the regulatory schedule; (3) orders sampling kits from our laboratories and prepares those kits for operators to use in the field; (4) tracks the collection of samples by operators, the delivery of kits to laboratories, the analysis of the sample by the laboratory, and the receipt of laboratory results; (5) reviews laboratory results for compliance issues, then prepares the data for reporting to regulatory agencies; and (6) both the WQ/EC supervisor and licensed operator complete and submit an internal compliance certification form monthly to audit all regulatory sample requirements.

18. Q. Is water quality sampling the only task required to comply with the New Jersey and federal Safe Drinking Water Acts?

A. No. NJDEP also issues permits for each drinking water system, some of which contain other conditions relating to the operation of and recordkeeping for treatment plants and other facilities. The WQ/EC Team, in cooperation with Operations, works to ensure we are complying with those requirements and reports on our compliance as needed. In addition, there are various physical standards our facilities must meet. The WQ/EC Team routinely inspects our facilities to confirm these physical standards are being met. The WQ/EC Team

also coordinates with NJDEP to obtain regulatory approvals for the addition of new tanks, treatment plants and other facilities, or variances from approved treatment processes. The WQ/EC Team also oversees implementation of the Cross Connection Control Program to help avoid substances of an unknown quality being introduced into the distribution system by conditions on our customers' premises. Finally, the WQ/EC Team tracks the required levels of operator certifications necessary to comply with drinking water regulations and coordinate with operations management to ensure we have proper operator staffing for our facilities.

19. Q. Please describe NJAWC's program to comply with the National Pollutant Discharge Elimination System ("NPDES") with regard to its wastewater operations.

A. In New Jersey, EPA has delegated authority to issue NPDES permits ("NJPDES" permits when issued by New Jersey) to the New Jersey Department of Environmental Protection. NJAWC partners with a contractor to: complete and submit NJPDES Permit Renewals or Modification Forms; complete and submit monthly Discharge Monitoring Reports ("DMR"), as required by each facility NPDES permit; collect, submit and oversee regulatory sample testing by an outside (third-party) laboratory for those samples required under each facility NPDES permit, but for which the operator is not certified to perform; and notify the NJDEP Hotline for any event which violates, or could potentially violate, the facility NPDES permit or applicable law.

20. Q. Is the effluent from New Jersey-American Water's wastewater operations regulated?

A. Yes, effluent from our wastewater operations is regulated under NJPDES regulations. We monitor treated wastewater (effluent) prior to its discharge. Through a combination of physical, chemical, and biological treatment processes, the regulated constituents are removed or reduced to acceptable levels, and then discharged into the ground or appropriate waterway.

21. Q. Please describe how New Jersey-American Water manages compliance with applicable environmental laws and regulations.

A. The cornerstone of NJAWC's Water Quality and Environmental Compliance program are Environmental Management Plans ("EMPs"). An EMP is a compliance matrix that identifies a regulatory requirement, specifies the person responsible for NJAWC's compliance with that requirement, and contains information on the means the Company is using to achieve compliance. EMP reviews are conducted each quarter to ensure the information remains current. The EMPs contain the requirements for the regulatory schemes outlined previously, including specific permit conditions that regulators impose on individual equipment and facilities as well as general regulatory requirements.

22. Q. How else does New Jersey-American Water manage compliance with applicable environmental laws and regulations?

A. The Company uses a laboratory information management system ("LIMS") for managing some of the water quality data and sample reporting requirements. The

LIMS sample scheduling feature provides a tool to streamline thousands of water sample tests annually and ensures that the results are tracked and reported as required by the environmental regulators. In addition, NJAWC uses MapCall, an internally-built product, to manage bacteriological sample collection, as well as other NJDEP, EPA, and OSHA requirements, such as environmental permits, incidents, training, and lead and copper site requirements and forms. MapCall is accessible by mobile device, so samples can be collected in the field, permits can be referenced from a remote station, and any other documentation or training document can be pulled up at the time the work is being performed. NJAWC is also working with the Service Company Environmental Management team to finalize implementation of Sample1View. This application manages the scheduling, collection, analysis and reporting of bacteriological samples from utility-operated laboratories. Sample1View provides a combined view and reporting capability for bacteriological samples and the data from the LIMS system for a single view of compliance samples for a user-defined monitoring period. LIMS pre-populates state reports to enable all samples to be tracked from collection to upload in an Excel-based report. The reports are submitted to the Director and the Vice President of Operations as part of a Company sample certification practice. Together, these systems confirm all required samples are completed and submitted each month to help ensure environmental compliance.

23. Q. Please explain how these software systems can be used to support the Company's WQ/EC program.

A. The WQ/EC Team currently utilizes standard spreadsheet programs to track, analyze, and report the voluminous amount of data generated by the Company's operations. The amount of data the Company needs to collect grows as new regulatory requirements are added, such as for PFAS, and the additional rules the NJDEP has for cross-connection controls and the Lead and Copper rule ("LCR"). In addition, most of the regulatory schemes require NJAWC to maintain the data we collect and the reports we submit for 3 to 5 years.

The use of software systems such as LIMS, MapCall and Sample1View reduces the manual re-entry of data collected on paper forms or otherwise generated from diverse sources. They also consolidate the information into structured databases with querying and reporting tools, instead of managing it in multiple separate spreadsheets. This allows for better data analysis, which in turn supports better decision making in compliance and operating matters and makes mandatory reporting more efficient.

24. Q. Please describe NJAWC's program to manage cross connections.

A. NJAWC added two Cross Connection Specialists in 2020 to support the Company's enhancement of its cross connection program. The enhanced cross connection program will help the Company protect its water systems and customers from the accidental introduction of contaminants by implementing a proactive program to help prevent water backflow into our networks. The NJAWC Cross Connection Control Program identifies customers that pose an elevated risk to distribution system water quality due to industrial or commercial

use or who maintain an unapproved water supply pursuant to N.J.A.C. 7:10-10.2 and, in coordination with the NJDEP Physical Connection Permit Program, helps ensure that the appropriate backflow prevention device is installed and tested at the appropriate frequency. Cross Connection Specialists leverage record reviews of water use surveys, plumbing sub-code permit information, State and County Well Permit data, and physical inspections to identify, prioritize and mitigate risk from the potential backflow of water from a service connection to the distribution system.

25. Q. Please describe NJAWC's efforts to protect and monitor source water.

A. NJAWC has established new Source Water Protection Plans ("SWPPs"), building on the work done in the past Source Water Monitoring Plans. Throughout 2021, Water Quality, Engineering, and Production teams at all surface water treatment facilities reviewed and added new potential sources of significant contamination and prioritized land-, water- and transportation-based risks. Mitigation strategies were identified and assigned in the SWPPs. The SWPPs represent a proactive approach to lessening the likelihood and/or consequence of a source water contamination event across all regional operations and prescribe the actions to be taken if a contamination event is expected or observed.

COMMITMENT TO SAFETY

26. Q. Please describe NJAWC's overall commitment to safety.

A. Protecting the health and safety of our employees and customers and the quality of the water we deliver is the top priority for our Company and is critical to our

success. Our co-workers', contractors', and customers' safety is of vital importance, and we focus on it every day. Our goal every single day is to have every NJAWC employee get home in the same or better condition as when they came to work.

With the safety of our employees, customers, contractors, and the public in mind, we approach safety with a focus on continuous improvement through the implementation of proactive initiatives, plans, practices and processes that complement and sustain a robust workplace safety program.

New Jersey-American Water is also committed to securing assets across our system and recognizes the importance of protecting our water sources, treatment plants, infrastructure, and data from malevolent acts, as demonstrated by our robust security and cyber security programs. In addition, the Company's emergency response program demonstrates the Company's recognition that rapid response and recovery from security incidents are critical to maintaining the water and wastewater systems.

27. Q. Is safety relevant to operational performance?

A. Yes. The Company considers safety to be a core value, as well as a strategy. We ask our employees to place safety first in everything they do. We have a strong commitment to our employees (and their families) to keep them, our customers and the public safe. A safe workplace increases employee morale, increases our

commitment to one another, and, in the long run, makes for a more engaged and productive workforce.

New Jersey-American Water's Safety Approach, Plans and Programs

28. Q. Please describe NJAWC's safety program.

A. The Company's safety program includes multiple activities and initiatives to maintain compliance, support employee engagement, and help ensure the safety of our workforce, our customers, and the public. The Operations Leadership Team holds biweekly safety meetings to discuss ongoing programs and the progress of initiatives. Some of the ongoing programs include:

- Peer-to-Peer Safety Observations (BAPP Teams)
- Employee Injury Review Meetings
- Pre-Job Safety Briefing completion prior to every job
- NovaCare Employee Care Program
- OSHA compliance and NJAWC required Training
- Supervisor Inspections and Feedback
- Near miss, first aid, incident investigations
- Certified Safe Worker Program
- Stop Work Authority
- Utility Mechanic, Field Service Representative, and Maintenance Mechanic Training
- Fleet meetings which include vehicle safety items and design reviews for new vehicles
- Accident Prevention Committee meetings

29. Q. What primary safety initiatives were implemented in 2021 to further drive safety performance?

A, In addition to the programs noted above, the Company implemented the following primary safety initiatives in 2021:

- Life Saving Rule program reviews to identify areas for improvement
- Safety intervention practice to support employees injured multiple times at work over a specific period of time
- Safety leadership survey and action planning
- Foreman leadership training
- Monthly safety leadership forum meetings with frontline personnel

30. Q. How does NJAWC investigate injuries to help prevent future incidents?

A. For incident investigations, New Jersey-American Water utilizes a "5-Why" investigation process coupled with an enterprise-wide online tool called TapRoot® for more significant incidents. TapRoot is a systematic process for identifying root causes of safety incidents. The 5-why investigations must be completed within 72 hours for every injury no matter how minor, vehicle incidents, and selected near misses. A TapRoot must be completed within 7 days for all OSHA recordable injuries and SIF (serious injury/fatality) potential incidents. TapRoot is also used to investigate and identify the root causes of major accidents, everyday incidents, minor near-misses, quality issues, human errors, maintenance problems, productivity issues, manufacturing mistakes, and environmental releases. The systematic TapRoot process is based on in-depth

human factors and equipment reliability research. It is designed to help investigators maintain objectivity during their investigation.

The results of these investigations are then considered by the business to evaluate the incident and determine what safety process improvements may be appropriate going forward. American Water also maintains a security hotline that can be used to report a safety near miss or safety/security incident, request security system service, report or request an identification badge or report an operational event. Typically, near misses are submitted online through a link on MySource to the Perspectives platform. The Perspectives platform is used to generate reports and ensure corrective action follow up.

31. Q. How do you promote safety with your contractors?

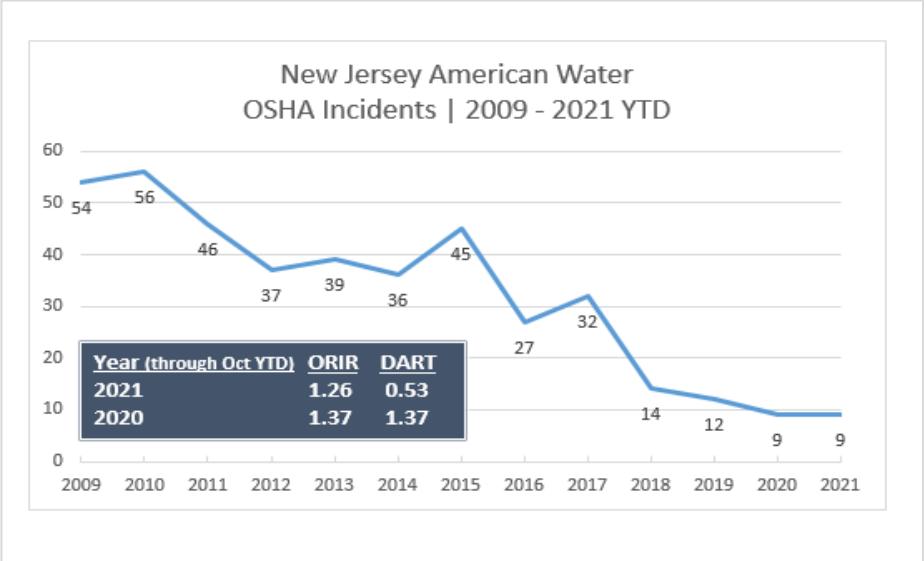
A. NJAWC utilizes internal and external inspectors to help ensure our contractors are complying with all regulations and maintaining safe work environments. Our inspectors have extensive safety backgrounds and have been selected based on their safety expertise as well as their engineering knowledge. Annual meetings are held with all contractors to refresh them on NJAWC safety program requirements and introduce any new requirements added since the previous year.

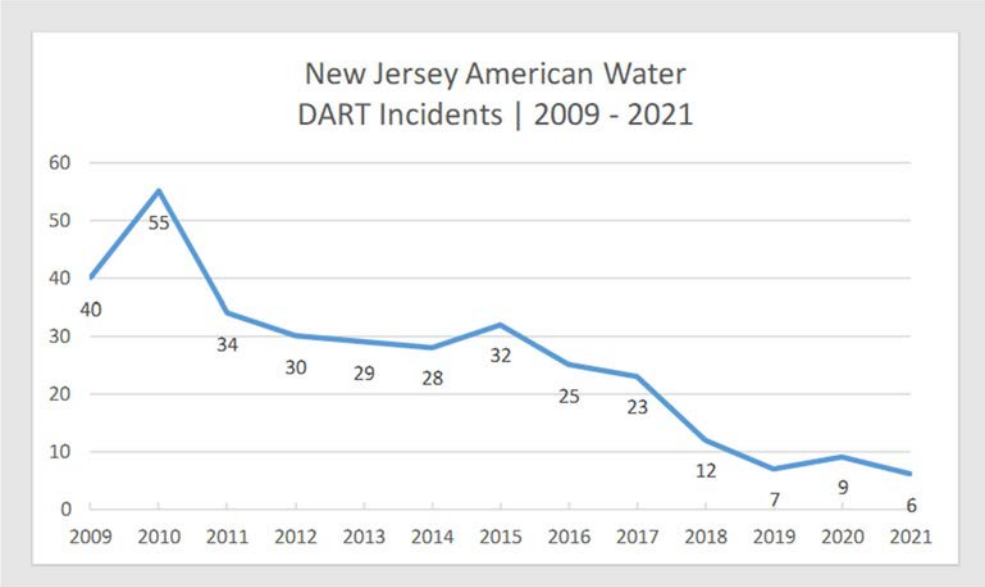
ISN is a safety prequalification program utilized by NJAWC for all contractors. Contractors must register with ISN and provide their safety documentation. ISN, with the oversight of NJAWC safety professionals, ensures contractors have all required programs and practices in place. Contractor safety includes everything

from paperwork in the contractor's office to performance in the field. The ISN system helps manage New Jersey-American Water's risk and our contractors' performance by: having an ISN representative verify the contractors' data; centralizing contractor data into an easy-to-use, online database; providing contractor statistics on health, safety and environmental issues; giving contractors a personalized customer service representative to answer their questions and assist them through the process; and validating that regulatory forms and statistics are submitted properly and accurately.

32. Q. How have NJAWC's safety initiatives improved the Company's OSHA recordable injury rate?

A. New Jersey-American Water has experienced a reduction in OSHA recordable incidents since making safety a core value and strategy in 2009. There has been dramatic improvement in both the OSHA recordable incident rate ("ORIR") and severity of the injuries (measured by the days away, restricted or transferred ("DART") rate) since the implementation of our various programs and initiatives:





33. Q. Has NJAWC experienced a reduction in workers compensation claims due to the safety program and initiatives?

A. Yes, the number of claims has steadily decreased. For example, the Company has experienced 23 claims year-to-date in 2021, compared to 33 total claims in 2019.

34. Q. How do the safety programs benefit employees?

A. Employees receive direct benefits from strong safety, security and emergency response programs. Training provides the employee with the ability to identify hazards; and incident and reporting processes allow employees to report and assist in identifying root cause and causal factors so actions can be taken to prevent accidents from occurring. The primary benefit to employees is reduction of risk of injury on the job. In addition, a safe workplace increases employee

morale, increases our commitment to one another, and in the long run, makes for a more engaged and productive workforce.

35. Q. How do safety programs benefit customers?

A. Customers benefit because the Company, through strong health and safety programs, has enhanced productivity and decreased absenteeism. This means that crews operate with a full staff and can fix problems quicker, reducing any service down time to the customer. In addition, a strong safety culture also reduces safety-related incidents, resulting in lower insurance and workers compensation costs.

36. Q. How do safety programs provide an overall public benefit?

A. The public benefits from NJAWC's safety and security programs because they help us provide safe water and wastewater services. Our safe operations and compliance with occupational safety regulations provide the public with the confidence that the Company operates in a safe and secure manner. In addition, NJAWC crews operate daily in public areas and must protect their worksites from hazards as well as help shield the public from exposure to these hazards.

Physical Security and Cybersecurity

37. Q. What is New Jersey-American Water doing to address physical security?

A. New Jersey-American Water has taken a comprehensive approach to addressing physical security. Physical security consists of cameras, badge readers and cyber keys that monitor situations and are programmed to limit access to secure areas, including offices, shops, well sites, treatment, pump and lift stations. New Jersey-

American Water uses standards from the American Water Works Association ("AWWA") and the American Society for Industrial Security ("ASIS"). The Company has strategically placed cameras at critical infrastructure, (e.g., tank and well sites) and secure work locations (e.g., offices and shops). Cameras are connected to a secure line that provides video output to the local operations control rooms and American Water's central security and reliability control room.

Identification badges are issued for the purpose of facility access control at New Jersey-American Water. NJAWC's policy limits access to all Company-owned and leased property to authorized persons in the conduct of official activities as approved by the local management. All employees must wear and visibly display the identification badge while on any NJAWC property, while on Company business, or while representing the Company publicly or privately. Unauthorized entries are registered as an alarm that is received by the local operations control room and American Water's central security and reliability control room.

CyberLock® systems are integrated at two of the Company's largest districts, with plans to expand throughout NJAWC's operations. Keys and locks are programmable with access permissions for each key holder. In addition, a key can be assigned a start and end date, and depending on the work, it can be programmed to allow access to one set of locks from 8 a.m. to 6 p.m. on weekdays and to another set of locks only from 10 a.m. to 4 p.m. on weekends. Setting short-term expiration dates is an excellent way to minimize risk due to lost or stolen keys, and programmed access further ensures the security of our facilities.

38. Q. How is cybersecurity being addressed?

A. Cybersecurity technology solutions are vital to reliable and resilient water and wastewater systems. For that reason, cybersecurity is core to the American Water vision of resiliency and sustainability. As we continue to implement intelligent water and wastewater systems, we ensure that industry-leading cyber controls are designed, built and integrated into all aspects of the technology. These controls help protect our existing systems and enable the implementation of secure innovation. Safeguarding the integrity of Company information and systems while enhancing the customer experience is our cybersecurity mission.

The Company's cybersecurity program is consistent with industry best practices, including the National Institute of Standards and Technology ("NIST") Cybersecurity Framework and the AWWA Process Control System Security Guidance for the Water Sector.

Emergency Response

39. Q. Provide an overview of the Company's emergency response program.

A. Emergency response and recovery is a critical aspect in the operation of water and wastewater systems. NJAWC maintains response plans, agency and industry emergency contacts and attends public and industry specific conferences on emergency response and preparedness in order to continually enhance and sustain Company readiness for various types of emergencies. Integration of the various responders, communications and flow of information during an emergency or natural disaster is critical. NJAWC follows the National Incident Management

System ("NIMS") and Incident Command System ("ICS") protocols and procedures.

40. Q. How does the American Water Operations Security team and the Integrated Operations Center support the Company's security programs?

A. American Water Operations Security supports the business in the overall management of physical and cyber security systems at facilities across the country. This includes developing procedures, guidelines and training related to our security systems and processes. Operations Security also conducts internal security reviews and partners with the federal Department of Homeland Security ("DHS") on external security assessments, using the results to develop improvement initiatives and further enhance security controls of company assets and systems. In addition, the Operations Security team provides technical support and guidance to identify potential security vulnerabilities and develop appropriate solutions.

Staffed 24 hours a day, seven days a week, the Integrated Operations Center ("IOC") monitors security cameras, alarms and incoming calls. In addition, they have access to the CyberLock system and can view lock and key activity. The IOC also monitors American Water security and technology systems; continuously tracks weather alerts, security threats and intelligence; and serves as a key collaboration point for operations, leadership and functional teams.

The IOC also reviews safety and security situation reports that are entered online through the security portal, which can also be used to report safety near-miss activities, safety or injury incidents, and security incidents. The IOC also has an event information hotline that is used to provide key information about facility closing and other information when an event has been declared (e.g., hurricane, snow emergency).

The Company has access to Operational Security and the IOC for assistance in the response to and recovery from an emergency event and in restoring service as quickly as possible.

41. Q. How else does American Water support the Company's s security efforts?

A. American Water has developed security awareness training for physical and cybersecurity risks, incident response and emergency preparedness. This training reinforces the shared responsibility for security with all employees, contractors and visitors, and supports a safe and secure work environment. Although the Company works hard to prevent incidents from happening, it must also be prepared for their occurrence. Preparedness exercises are a powerful way to bring solid planning and years of experience to bear on the new and diverse challenges we face. American Water has led dozens of preparedness exercises across the business, while also participating in regional and national level exercises with state and federal partners.

42. Q. How does New Jersey-American Water prepare for emergencies?

A. NJAWC has established a business continuity framework, bringing functional and operational teams together for the purpose of reducing risk and enhancing resiliency. As part of the framework, the Company has adopted the nationally recognized ICS, which enables unified emergency response and close, effective coordination with emergency management in the communities we serve.

Each NJAWC district maintains an emergency response plan utilizing the NJDEP format that is reviewed annually. The emergency response plan includes: mutual aid information and procedures; system descriptions; critical system components; event management process; security; incident command system; plan development, maintenance and training; actions plans for various emergency scenarios; emergency contact lists; emergency equipment lists; sampling protocol; and other site-specific data.

Emergency response drills are conducted annually and include large system outages, contamination events, natural disasters, cybersecurity events, and environmental spills. Drills are coordinated by Operations and include on-site mock drills, tabletop exercises and after-action reporting.

43. Q. How do customers benefit from the Company's emergency response program?

A. Emergency response planning is a process that helps the Company explore vulnerabilities, make improvements, and establish procedures to follow during an

emergency. It also encourages strategic partnerships and knowledge sharing between utilities and government agencies. Preparing and practicing a response plan can save lives, prevent illness, enhance system security, minimize property damage, and maximize the resiliency of the water and wastewater service we provide to our customers. The benefits of emergency response planning were fully realized during Tropical Storm Isaias in August of 2020. The storm caused statewide power outages for 1.3 million customers, and for some, it took almost a week before infrastructure was repaired and electricity restored. NJAWC lost utility power to approximately 120 critical water treatment and booster facilities in the aftermath of the storm. All facilities remained in service on emergency generator power until utility power could be restored. Many facilities operated on emergency power for a week. Through the Company's emergency response planning, partnerships with government agencies, utilities, and suppliers, and investment in stationary and mobile emergency generators, not a single customer lost water or wastewater service as a result of the storm.

OPERATING AND MAINTENANCE EXPENSE

44. Q. What level of O&M expense is the Company seeking in this case?

A. NJAWC is seeking recovery of approximately $230.1 million in O&M expense which represents expense levels going into 2023. The Company's proposed O&M expense per customer (excluding purchased water and sewer costs) of $320 has increased 4.23% over the average per customer cost of $307 for the period 2010 through 2020. As NJAWC witness Mr. Tomac explains, this compares

favorably to inflation, which increased 15.78% based on the average inflation rate measured over the same ten-year period 2010 through 2020 compared with the estimated inflation rate at the end of 2022.

45. Q. Why is the Company seeking an increase in O&M expense in this case?

A. The Company is requesting an increase in O&M expense in order to continue providing high quality water and wastewater service in the most cost-effective way to our customers over the long term. The Direct Testimony of NJAWC witness Ms. Jamie Hawn discusses NJAWC's specific O&M pro forma adjustments in this case. The requested increase in O&M expense is driven by increases in employee related expenses, increases in the cost of insurance other than group insurance, and increases in our production costs. Our production costs include the chemicals we use to treat water, power, water diversion fees, and waste disposal. Some of the increases in costs for chemicals and waste disposal are driven by new water and wastewater contaminant standards. The increases in insurance and production costs are not unique to NJAWC but rather are national phenomena. As discussed later in my testimony, NJAWC mitigates these increases by leveraging the buying power and expertise of the Service Company.

IMPROVING WATER EFFICIENCY

46. Q. What is water efficiency?

A. In simple terms, water efficiency means using improved practices and technologies to deliver safe, reliable and adequate water service more effectively. NJAWC's water efficiency efforts cover a wide range and include supply-side

practices, such as leak detection and our geographic information system ("GIS"), as well as demand-side strategies, such as rate design and public education programs. From an operations perspective, improving water efficiency requires operational excellence, which in turn entails achieving a cost-effective mix of prudent investments and improved operations and maintenance management capabilities targeting safety, customer satisfaction, environmental compliance, sustainability, asset performance and operational efficiency. Proactive investment in these improved capabilities improves efficiency in the delivery of water and wastewater service, thus mitigating cost increases in the long run and helping keep rates affordable.

47. Q. Please describe New Jersey-American Water's efforts to improve water efficiency.

A. The Company strives to improve water efficiency through operational excellence, the use of technology, system maintenance, and efforts to manage costs as efficiently as possible to provide a more cost-effective level of service for our customers over the long term. In addition, NJAWC uses various operational and efficiency reviews to further focus on improving customer service and efficiency of production and field operations. The Company also leverages the size and scale of American Water to improve transactional efficiencies through increased automation, the adoption of more effective business practices and a continuous improvement mindset.

48. Q. How does NJAWC gain efficiencies from its relationship with American Water?

A. As a subsidiary of American Water, NJAWC has available to it the resources of the Service Company, which provides access to highly trained professionals who possess expertise in various specialized areas and who work exclusively for American Water's subsidiaries. Not only does NJAWC benefit from getting these services and expertise at cost, through the size and breadth of American Water, NJAWC has continued to increase its purchasing power to obtain discounts and favorable purchasing arrangements on the equipment and supplies needed to manage and maintain our system—including pipes, fittings, and water treatment chemicals—that we otherwise would be unable to obtain were we a separately owned water system. In addition, the Company's ongoing investment in technology enables a better end-to-end view of its water and wastewater business. For example, Service Company's Information Technology Services ("ITS") team works side-by-side with end-users to develop technological solutions engineered with a focus to enhance our employees' effectiveness and to allow our customers to do business with us more easily. These products and applications are designed with ease of use in mind. They take advantage of augmented intelligence technologies that enhance human decision making and continuously learn from their interactions with humans and the environment, meaning information evolves with usage.

49. Q. How is the American Water Supply Chain team utilized by the Company?

A. All goods and services purchased that can be leveraged across the entire American Water enterprise are done so by the Supply Chain team within Service Company ("Supply Chain") in order to maximize the purchasing power of the entire American Water enterprise. Such goods and services include but are not limited to water treatment chemicals, pipe valves and fittings, meters, engineering services, consulting services, professional services and employee benefits. The value realized from Supply Chain's work are a benefit to all American Water subsidiaries.

State-specific and regional services, which include but are not limited to infrastructure and facility maintenance and repairs, are the responsibility of the supply chain team maintained at the state level ("state Supply Chain"). The state Supply Chain's strategic objectives are to leverage state-specific requirements to obtain greatest value across the entire state or specific region(s) within the state. The goal is to obtain the highest quality services at greatest value to the state operating company.

50. Q. What are some of the significant categories in which Supply Chain managed to control costs?

A. The following areas are a representative list of ways in which the Supply Chain has worked to control the Company's costs:

Water Treatment Chemicals: Annually, Supply Chain solicits bids for all water treatment chemicals. By leveraging the volume of the entire American Water

enterprise, Supply Chain has been successful in securing consistent access to chemicals required to operate New Jersey-American Water on favorable pricing terms. In addition, supply chain can leverage alternate suppliers or work with other American Water affiliates at times when chemical supply is limited.

Maintenance Repair and Operating ("MRO") Supplies: In 2019, Supply Chain conducted multiple bid exercises for MRO Supplies. Supply Chain was able to leverage the volumes across the entire enterprise to lower the overall costs of these products and maintain favorable pricing.

Ductile Iron Pipe: Supply Chain can leverage company volumes to secure discounts and thus minimize cost increases at a time where the market price is up more than 50%. In addition, we can leverage our scale to have the shortest delivery lead times in the industry. This allows New Jersey-American Water to complete more infrastructure work in a shorter time at a lower cost.

Fleet: In 2020, Supply Chain conducted an RFP for Fleet Management Services. The result was a change to a new fleet management company that offers New Jersey-American Water higher levels of service at a lower price than the previous vendor.

Network Repair: In 2021, state Supply Chain competitively bid, negotiated, and established agreements for Network Repair services with a two-year term. Conducting a competitive bid exercise for these services ensured that New

Jersey-American Water is receiving the most competitive pricing for these services.

Meter Replacement Services: In 2019, state Supply Chain established two-year agreements for meter replacement services. In 2021, the existing agreements were extended through 2022 with no price increases.

Patchwork Paving Services: In 2019, state Supply Chain established two-year agreements for patchwork paving services with multiple contractors in our service territory. The agreements were extended in 2021, holding pricing flat through 2022.

Utility Markouts: In 2021, state Supply Chain competitively bid and established an agreement for Utility Markout services. Conducting a competitive bid exercise for these services ensured that New Jersey-American Water is receiving the most competitive pricing for these services.

Energy: Supply Chain monitors the energy markets for buying opportunities and coordinates with NJAWC to purchase both electricity and natural gas supply for use in system operations. The goal of our collaboration is to minimize the unit price while also mitigating price risk from an extremely volatile energy market. Most recently, NJAWC purchased electric supply utilizing a reverse auction involving five suppliers in October 2019. The resulting agreement has a five-year term beginning in January 2020 and the pricing structure is 70% fixed and 30% index. The fixed/index structure is meant to provide price certainty while

allowing us to participate in the daily market. The index price allowed NJAWC to avoid approximately $250,000 in energy cost increases. Energy market prices have increased in recent months, which enhances the value of the fixed price portion of the supply agreement. Natural gas supply is also a key part of NJAWC's system operations, and Supply Chain works with the Company to buy natural gas supply using a dollar cost averaging approach to supply purchasing by entering the market periodically when buying opportunities exist.

In each instance, New Jersey-American Water and its customers have benefited from leveraging the size and scale of American Water enterprise wide through Supply Chain and leveraging the size and scale of NJAWC through the efforts of state Supply Chain.

51. Q. How is NJAWC using GIS to improve employee effectiveness?

A. Accurate electronic maps ensure that the Company's institutional infrastructure knowledge is readily available for use by employees. To that end, NJAWC has loaded its facilities into GIS so that maps of its water and wastewater system assets are accessible on its internal network. The information available in GIS includes the location and a short description of the facilities, giving an electronic spatial view of the entire system. GIS also helps locate customers that might be affected by related service issues and allows us to more effectively communicate with our customers. We continue to enhance our GIS platform through integration with our SAP Enterprise Asset Management ("EAM") system, our computer-aided design ("CAD") system, MapCall and our PowerPlant fixed asset

records. This integration allows communication across the various platforms that makes data retrieval more efficient. The Company continues to build the GIS platform by adding new assets and retiring old assets to ensure our technicians have access to the most current information while working in the field. In 2021, the Company implemented a 'Digital As-built Workflow' that is focused on standardizing the how, what and when GIS is updated as well as facilitating better integration between GIS and MapCall. This improved the lag time between when the asset was installed to when GIS and other systems are updated. The goal is to keep our GIS current, complete and accurate for our end users.

52. Q. How has NJAWC benefitted from its GIS platform?

A. The location of water quality events, chlorine residuals, maintenance events and pipe failures are all plotted on GIS map layers. The spatially presented information can be used to answer customer water quality inquiries, identify trends and prioritize water main replacement projects.

The GIS system is a tool used to assist compliance with federal and state lead service line inventory and management. Known customer and Company service line material data has been loaded into the MapCall service records that is integrated to display on the GIS maps. This will provide employees and customers with a visual representation of known and suspected lead service lines within the service territory.

53. Q. What work management system is NJAWC using to improve employee effectiveness?

A. The Company uses MapCall, a web-based application that enables Operations Production employees, Field Operations employees, and contractors to complete the lifecycle of work orders and assets in the field. Employees can view historical information including work order history on an asset, standard operating practices associated with an asset, maintenance history, O&M manuals, and tap card images. MapCall provides the flexibility to create work orders, configure workflows and report progress while in the field. For example, a supervisor can create a work order to flush a dozen hydrants in a particular area. Using MapCall, the field worker can report progress as flushing is performed, and both the supervisor and others in the field can visually see the progress made toward completing the identified work in real time through the MapCall interface. The same can be done to schedule and monitor other routine work, as well as emergency work, such as main break repairs.

MapCall also allows those in the field to communicate water quality and other events more efficiently through preloaded notifications via email to both internal and external stakeholders, including regulators, allowing workers to quickly shift back to focusing on the task at hand and providing quality service to customers.

Water main break locations are continually added to the GIS and InfoAsset, a pipe replacement prioritization database, to help identify sections of pipe that

have outlived their useful life. This information is used to prioritize water main replacements by strategically focusing on the pipe with the highest risk of failure.

MapCall is a "single pane of glass" for all operational needs including Health & Safety, Environmental & Water Quality and also serves as the transactional engine between Work1View

54. Q. Are there other technology solutions that have been implemented to improve employee effectiveness?

A. Yes. In addition to GIS platform enhancements and MapCall, American Water has enhanced employee effectiveness in several ways. These include Customer1View ("C1V"), Meter1View ("Meter1V") and Work1View ("W1V"); each of which provides more comprehensive and easily accessible information to employees.

C1V has been implemented by the Company to better serve our customers in a way that also improves our efficiency. C1V provides improved access to customer information (e.g., premise and service order history, meter details, billing and payment information) to field service representatives ("FSRs") who regularly interact with our customers. This means that FSRs can view the same information as customer service representatives ("CSRs") located at the customer service center ("CSC"). This allows our FSRs to review customer information that can help them address the customer's issue and provide customers information while speaking with them, rather than having to contact the CSC for

information or requiring customers themselves to follow up with the CSC. FSRs can also update customer information and record notes on customer interactions on the spot, providing other employees that serve our customers' timely access to the most up-to-date information.

Meter1Vis another application that supports our continued efficiency. Meter 1V monitors key attributes for each meter, including manufacturer, size, installation date, location (both on a map and whether it's located inside or outside), customer information, and historical data, such as past alarms, work orders, customer contacts and visits, and reading and billing information. This provides local operations supervisors and managers a real-time view of meter performance and reports such as Inactive with Consumption, Unexpected Zeros, and Consecutive Estimates. The system has the ability to more easily monitor and manage length of service meter replacements and identify and address potentially problem meters in a timelier manner.

In addition, all this information is available to, and can updated by, our employees and contractors while they're in the field so, here again, they have a full, real-time, view of information they can use to better serve our customers.

W1V is a single view for managing customer service order work in the field, customer information and meter information. W1V includes a real-time operations map to see work orders with optimized routing, as well as other types of work and alerts happening nearby. In addition, using W1V, FSRs can manage

their own work based on the day's demands by adding or deferring undated work, and putting orders on hold to do emergency work needed at another location. Supervisors can also reroute work as appropriate. W1V has been integrated with C1V for easy access to customer information during field visits. It has also been integrated with Meter1V and MapCall to provide FSRs one point of access for all information needs. Taken together, these types of improvements will continue to drive a better customer experience and level of satisfaction.

55. Q. Please describe the Company's advanced metering infrastructure ("AMI") technology strategy?

A. New Jersey-American Water is using a "hybrid" approach to AMI deployment to leverage the fixed network technology already deployed in the short term and to transition slowly to a modern, smart endpoint system following the 10-year length of service meter change requirements. The AMI system will not be a single technology but an integration of two technologies that provide an intelligent connection between the customer and the water utility. The systems that will be utilized are as follows:

Fixed-Network System:

With AMI fixed-network systems, meter reading is accomplished by meter transmission units ("MTU's") installed on each meter. The MTUs collect real-time water use readings from the meter and transmit them via radio signals to data collection units ("DCUs") that are owned by the utility.

The Company has approximately 542,000 Neptune R900 MTU's installed because of previous length of service meter replacement requirements. The R900 MTU's are in use as drive by advanced meter reading ("AMR") units and can be migrated to a fixed network AMI system that can collect reads using a network of fixed antennas. The AMI fixed network system will allow for remote reading of our meters at customers' homes and businesses. Currently, approximately 40,000 customers are set up on a fixed network system. The Company plans to deploy additional antennas over the next three years to capture 80% of the R900 customer reads.

Smart Endpoints (Cellular-Network Systems):

AMI cellular-network systems utilize smart endpoint cellular endpoints installed on each meter to transmit the meter data via an existing 3rd party cellular infrastructure to a central database system for analysis and reporting.

The smart endpoint utilizes a cell-based network provided by major companies such as AT&T and Verizon to capture daily interim customer reads and eliminates the requirements of a fixed data collector network. The new smart endpoint will replace our existing R900 MTU's and will be installed following the length of service schedule over the next 10 years starting in 2022. The fixed network system will be gradually retired over the 10-year period as the smart endpoint deployment reaches saturation.

56. Q. Why is NJAWC installing AMI technology?

A. The transition to an AMI program will enable strategic and permanent improvements in safety, customer experience, operational efficiencies, and environmental benefits. The Company looks forward to leveraging AMI to empower customers with near real-time consumption data to enable smart water use choices, enhance customer communication regarding customer water consumption patterns and unusually high-water use, optimize NJAWC's ability to measure and address non-revenue water, and improve water system operations and management, among other things. Implementation of AMI will allow NJAWC to realign its business processes and redeploy personnel previously focused on meter reading to other work, as discussed below.

57. Q. How will AMI improve customer service?

A. The implementation of AMI will increase billing accuracy and reduce the likelihood of estimated bills (e.g., due to weather events or other obstacles to accessing customer meters) by automatically providing timely, accurate reads through the network. In addition, re-reads will be reduced due to the human factor being removed from obtaining the actual read. With the planned implementation of a meter data management system in 2022, the Company will also be able to more efficiently collect, organize, analyze, and communicate large quantities of meter data. Customers will have access to near real-time water usage data which will allow them to identify opportunities for conservation and bill reducing tips to enable smart water use choices. AMI data can be used to uncover irregularities

that may signal a leak, meter tampering or water theft. The system will enable the communication of high use water alerts and continuous flow alerts. AMI is an example of how prudent investment in technology can produce a wide range of customer benefits.

58. Q. How does AMI improve employee and public safety?

A. Having employees in the field reading meters in potentially unsafe environments, inconvenient locations, inclement weather, and exposed to vehicular traffic, animals, and the like, creates an exposure to potential injuries and accidents. Being able to read meters remotely reduces this potential risk, both for injuries to our employees and injuries and damage to third parties.

59. Q. How will AMI benefit the environment?

A. The AMI technology helps conserve water by providing timely information to customers so they can adjust their usage and enables the early identification of customer leaks. AMI reduces fuel consumption by eliminating the need to drive by premises to collect reads. The technology will also eliminate the need to roll a truck to complete certain high volume service orders such as “Move in-Move out orders”. The reduction in truck rolls and meter reading vehicles will reduce our carbon footprint and supports New Jersey’s Energy Master Plan.

60. Q. How will AMI improve water efficiency?

A. The deployment of AMI will reduce the number of full time employees needed to read meters and maintain the system. Over the next few years, NJAWC will

be able to redeploy some of the full-time positions to length of service meter replacement work and lead service line material identification requirements.

61. Q. How does NJAWC protect the data transmitted across the AMI network?

A. All of the meter reads are encrypted before they are transmitted from the meter across the Company owned network to the cellular carrier and ultimately to the Company's meter read collection database.

62. Q. How else is NJAWC using technology to improve customer service?

A. Our web-based customer portal, MyWater, has been enhanced to provide expanded self-service capabilities for online payment assistance, bill and usage review, service requests, and viewing service and emergency alerts. The portal is available 24/7 and is more user friendly, accessible, and compliant with the Americans with Disabilities Act by, for example, using more graphical information. MyWater also has a "single pane of glass" for the customer service representative and the customer. They have a greater ability to view a high bill due to a past due amount or high-water usage by month to help facilitate quicker resolutions.

The customer service infrastructure has been upgraded to improve interactions with customers and make customer information more easily accessible in the field. In addition to the tools described above, upgrades include replacing our CSC call management software and meter data management solution. Our new CSC telephone software system improves call routing, automates many call

handling tasks and uses voice prompts to gather information, all of which serve to minimize the time customers have to spend on the telephone. CSR One View provides CSRs access to relevant customer information more efficiently by bringing together information from multiple sources into a single, easy to use view. This will lead to more effective customer communications, service and outreach, as well as more effective utilization of CSC resources. A multichannel (email/call/text/chatbots/Alexa/Google) capability will be available to allow customers select and manage communications. The system also enables customers to select and manage payment preferences. CSR One View has been being integrated with MyWater to enable communications with customers via online chat.

63. Q. Are there technology solutions NJAWC is implementing to operate systems with improved efficiency, resiliency, and security?

A. Yes. NJAWC continues to focus on Automation and Controls (also referred to SCADA) capital projects throughout our operational areas. These upgrades continue to target the installation of field instrumentation, network security devices, the replacement of legacy remote terminal units ("RTUs"), along with enhancements to human machine interface ("HMI") software, and the standardization of data and its consolidation via high-speed connections. These upgrades have equipped our operational sites with components that provide more advanced programming and connectivity capabilities and robust security monitoring, along with redundancy to ensure operational continuity.

Focused efforts have yielded the standardization of programming to help protect operational assets along with enhancing water treatment process controls and monitoring. An example is the automation of filter controls that provide supplemental alarming and interlocks. These additional layers of protection assist in meeting all state and federal regulatory requirements while providing the best service to our customers. Implemented technologies have provided additional tools for mobile solutions for Operations, allowing for secure access to internal systems to make operational decisions. To address the increased cybersecurity threats, additional security solutions, protocols and procedures are continually being implemented to ensure that all infrastructure is properly protected and monitored.

64. Q. Are there other technology solutions NJAWC is implementing to improve water efficiency?

A. Yes. The Company is implementing an advanced analytic program. The advanced analytics program is building a QuickSight dashboard that displays current data from enterprise systems (MapCall, W1V, SAP, etc.) and compares the information to targets to help measure and improve performance, capacity, quality, reliability and environmental compliance. Example reports are service order performance, operations performance, health and safety, system delivery, call center and customer results, non-revenue water, and water quality.

System Maintenance

65. Q. Please describe the key components of NJAWC system maintenance activities.

A. Keeping abreast of system maintenance is the hallmark of a healthy water distribution system. Among its core activities, NJAWC staff diligently completes annual maintenance programs, including length of service meter replacements, fire hydrant maintenance and valve exercising programs. These programs help us ensure that our assets are performing as expected, so that we can continue to provide the high quality, reliable service our customers have come to expect. In 2020, the Company replaced 37,567 meters, inspected all 47,134 fire hydrants and exercised 113,843 valves.

66. Q. What is the guiding document used to establish maintenance program targets?

A. NJAWC's state-wide Asset Management Plan ("AMP") is the guiding document for maintenance plan targets. The AMP was implemented by April 19, 2019 as required by the WQAA.

67. Q. Is New Jersey-American Water meeting its operational obligations under the Safe Drinking Water Act?

A. Yes. The Company certified compliance with the Safe Drinking Water Act when submitting the certification for the WQAA on December 22, 2021.

68. Q. What other maintenance programs support the Company's efficient operation of its system?

A. NJAWC completes several programs designed to keep its water system operating efficiently. Pipeline replacement programs, described throughout the testimony of Company witness Donald Shields, water flushing programs and a Condition-Based Maintenance Program are among them.

69. Q. Please explain the Condition-Based Maintenance Program.

A. NJAWC employs a Condition-Based Maintenance Program on a rotating basis at facilities where electrical equipment is used. This equipment includes pumps, motors, and electrical panels. In addition to visual, mechanical, and audible inspections, a host of other in-depth inspections are performed. For example, thermal imaging tests are performed to determine excessive heat on electrical equipment such as motors, electrical panels, transformers, and safety switches. Vibration inspections are performed to determine deflection in a pump shaft, which is an indicator of potentially damaged pump or motor bearings. The Condition-Based Maintenance Program also includes electrical tests to determine proper operation of disconnects, breakers, fuses, contactors, voltage/protective equipment devices, etc. After the inspections are performed, a report is generated that categorizes severe or critical issues for immediate attention, as well as less severe issues for subsequent attention.

70. Q. How do NJAWC's system maintenance efforts enhance operational efficiency?

A. System maintenance helps reduce failures and unexpected repairs, which are disruptive and expensive to correct. One of the byproducts of an adequately maintained system is fewer unexpected failures, which rarely occur at convenient times and, again, are costly to repair.

Non-Revenue Water

71. Q. What is non-revenue water ("NRW")?

A. Non-revenue water is the difference between system delivery and water sales. Typically, NRW is measured as a volume or a percentage of system delivery based on a 12-month rolling average. Composed of several disparate elements, NRW is not just leakage; it also includes, among other things, water for firefighting, annual flushing, theft, and meter inaccuracies.

72. Q. Please describe the Company's efforts to reduce its level of NRW.

A. In addition to utilizing its DSIC mechanism to accelerate the replacement of aging infrastructure in the Company's service territory, NJAWC addresses apparent and real NRW losses using various industry-endorsed processes and practices, including an annual water loss management plan, water audits, and leak detection methods that are described below.

73. Q. What is the Annual Water Loss Management Plan?

A. The Company's Annual Water Loss Management Plan incorporates water accountability and loss control processes and practices promulgated by the

AWWA. The processes and practices are found in the 4th Edition of the AWWA Manual 36 publication, *Water Audits and Loss Control Programs*. Incorporated by reference is AWWA Water Audit software, currently versions 5.0 and 6.0, which includes an additional auditing capability which "grades" the validity of the water audit input data. The grading measure also provides guidance on the means to improve data collection and therefore the functionality of the water audit.

74. Q. Has NJAWC performed water audits throughout its system?

A. Yes. NJAWC has performed extensive water audits throughout its service territory. Beginning in 2013, water audits have been completed annually for systems in the jurisdiction of the Delaware River Basin Commission ("DRBC").

Beginning in 2016, the Company submitted water audits to NJDEP for systems that were impacted by the NJDEP 2016 drought warning.

In addition, in the latest closed calendar year (2020), the Company performed water audits for all our qualifying systems.

Thus, the Company has completed water audits of all its systems that have the proper parameters for a standard water audit – that is, 24 of 29 systems. While the Company tracks NRW performance and other indicators for every operating system, water audits have limited applicability for very small systems. Where customer density is less than 32 connections per mile and system overall size is less than 5,000 customers, the water audit benefits are limited. This is also true

for systems that have system delivery of less than 100,000 gallons per day. For these small systems, NJAWC performs a basic water balance. A basic water balance compiles system delivery and sales data for a discrete area. Both data elements are tracked over many years. Trends in the data are then used to determine if the system is operating efficiently or if there is excessive water loss which requires remedial actions.

75. Q. What indicators are reported within the water audit?

A. The water audit provides five key indicators as reported by the Reporting Worksheet of the AWWA Water Audit Software. These indicators are:

1) Apparent Losses: The sum of unauthorized consumption, customer metering inaccuracies, and systematic data handling errors;

2) Real Losses: Total water losses less Apparent Losses;

3) NRW: Total water losses including unbilled metered, unbilled unmetered, and authorized Company use;

4) Financial Indicators: NRW as a percentage by volume supplied and NRW as a percentage by cost of operating system; and

5) Operational Efficiency: Unavoidable Annual Real Losses ("UARL"), Current Annual Real Losses ("CARL"), and Infrastructure Leakage Index ("ILI") or CARL/UARL. The indicator of system performance is the ILI. The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.

76. Q. How does NJAWC use the information it gathers through its water audits to manage NRW?

A. The information gathered is analyzed and action plans are developed for NRW management and reduction as part of NJAWC's overall water loss management strategy.

77. Q. What are the main characteristics of the Company's NRW strategy?

A. The Company's NRW strategy follows the latest industry-accepted standards including the water audit methodology set out above, while also working to maximize customer satisfaction and operational efficiency at an acceptable level of risk. The key elements include the following:

1) providing accurate, regular metering of production flows and customer consumption volumes;

2) maintaining a system of real time hydraulic data collection and monitoring via SCADA, AMI, or similar system of instruments and data collection technology;

3) compiling an annual water audit as a standard business practice for qualifying systems; and

4) employing sufficient loss control methods to contain water and revenue losses at economic levels and to minimize system upsets.

78. Q. What efforts has the Company employed to align functional areas of the Company to support the NRW efforts?

A. In 2013, NJAWC established a business unit to manage the Company's non-revenue water. This team of water loss professionals measures and analyzes the losses and advises the Company on the type of water loss management that is appropriate in each district. Programs are statewide and include leak detection, pressure management, water audits, reduction of theft of services, monitoring zero consumption, and leaks on customers' lines. In 2016, the team was realigned with the SCADA team, the work management team (MapCall) and the ITS service technicians. Between 2018 and 2020, further refinements in NRW management structure were implemented. This included assigning Operations Project Managers within the local operations team the task of managing and tracking the field aspects of the NRW program. This realignment allows for a more rapid engagement in data management and quality and engineering opportunities and issues. Examples of these opportunities include reviewing areas of apparent high pressure to determine if additional pressure management or modulation is feasible, creation of additional district metered areas, use of innovative technologies to perform condition assessment and leak detection on transmission mains and supplementing existing leak detection tools with additional equipment. The team has direct input into Company practices on system delivery, sales and NRW. Moreover, the team can directly engage the asset planning group and GIS group and results in better alignment with the various comprehensive planning studies and capital improvement projects associated with the engineering group.

79. Q. What are real losses?

A. Real losses are physical losses of water from the distribution system, including leakage from pipes and any associated appurtenance and tank overflows.

80. Q. What does the Company do to reduce real losses?

A. In addition to the continued accelerated replacement of aging infrastructure supported by the DSIC, the Company is also addressing real losses through its leak detection efforts. Of course, surfacing leaks are often pinpointed by employees and are quickly repaired, resulting in improvement in reducing real losses. For subsurface leaks, the Company is actively working to identify such leaks and to repair them. The Company's ability to address these leaks quickly saves customers from potential disruptions of service and saves the Company the increased costs associated with losing millions of gallons of treated and pumped water. Employees have been afforded technical training from both internal and external resources and have been provided with new tools to perform proactive leak work. The Company has an established internal goal of repairing 90 percent of all leaks within 96 hours of discovery. (This 96-hour time period provides the time required for mobilization and for One Call mark outs.) As a result, 791 and 1,134 miles of mains were proactively or reactively surveyed in 2019 and 2020, respectively. These surveys resulted in the location of 178 leaks in 2019 and 211 leaks in 2020. Many of these leaks had no surface indications.

81. Q. Please describe the specific methods that the Company uses to actively control leaks.

A. Leak surveying is typically done on a proactive basis when leaks are suspected to be a significant contributing factor to NRW. Focused, proactive surveys are mainly conducted in the Raritan, Essex/Passaic, and Morris/Warren Districts, where the distribution network is generally older and more prone to failure due to geographic variations and consolidated geology. The Company also has completed numerous leak surveys of its Warren systems utilizing consultants. Currently, these systems are either proactively surveyed or continuously monitored acoustically. We have seen an immediate improvement in the systems' water losses, where leaks on our mains, hydrants, valves and both Company-side and customer-side service lines have been located. During 2019 and 2020, these efforts resulted in the identification and repair of 834 leaks.

In addition, the Company provides more leak detection training to targeted Company employees across the state, and the Company has purchased additional equipment (discussed below) for continuous, proactive leak detection work in the Delaware, Coastal North and Coastal South Districts as deemed necessary. For the Essex/Passaic and Raritan Districts, the Company has increased the number of man hours spent on proactive leak surveying. The additional manpower has enabled the leak detection teams to provide multiple benefits: proactively locating leaks prior to surfacing; pinpointing leaks; and supporting permanent acoustic monitoring efforts. Additionally, leak detection on large-diameter transmission mains (water mains 16 inches in diameter and greater) and other high-risk buried

linear assets, is outsourced to third-party service providers. The result of these activities contributes to the Company's prioritization of pipe rehabilitation.

82. Q. Please describe the way in which NJAWC uses technology to identify leaks.

A. The Company utilizes state of the art active listening technology for leak detection. The EchoShoreDX platform incorporates the latest generation of acoustic sensors that are the result of Echologics' pioneering success with correlating leaks on a variety of pipe materials and large diameter mains. The sensors are built into a standard fire hydrant cap and are capable of identifying extremely faint acoustical noises emitted by leaks before they become detectable by conventional methods. This early detection capability enables the Company to prioritize repairs based on actual need and the most effective allocation of repair crews. The EchoShoreDX is stationary and designed to be deployed as continuous monitoring in an area-wide grid system. Data from the listening nodes is sent directly by cellular communications and uploaded nightly to an internet cloud-based system, processed and graphically displayed on New Jersey-American Water's GIS mapping system. The Company first installed this technology in late 2015 and continues its deployment consistent with district comprehensive planning studies, installing over 9,000 devices (nodes) throughout the state to date.

83. Q. What are apparent losses?

A. Apparent losses are non-physical losses that occur in utility operations due to customer meter inaccuracies, systematic data handling errors in customer billing

systems, and unauthorized consumption. This is water that is consumed, but not properly measured, accounted for, or paid for.

84. Q. What does the Company do to manage apparent losses?

A. An internal team monitors the Company's customer database system and billing system losses. These team members look for inactive accounts/premises with consumption (or vice versa), premise mismatches, and consecutive zero consumptions. These exceptions are processed into work orders that determine and eliminate the issue that caused the exception. Currently in development is the utilization of GIS analytics to allow greater flexibility in reviewing data tables of consumption, rate class, public water system identification number ("PWSID") and pressure gradient. This initiative is in its early stages, and these tools are being customized based upon user experience and results.

85. Q. How does NJAWC's meter program help manage apparent losses?

A. The meter program is managed by our field services teams. We monitor our successful reads on a monthly basis, with a goal of minimizing estimated bills. Additionally, we perform periodic testing of meters in accordance with BPU requirements and engage in meter testing and studies to help manage apparent losses.

86. Q. Please describe how meter testing and meter studies are utilized in managing apparent losses.

A. The Company employs large meter testing and profiling, pressure zone management, and zonal metering studies, which are described below.

Large Meter Testing and Profiling

Large meter testing and profiling is conducted by both our production (bulk sales and inter-district transfers) and distribution (large customer meters) teams. All production meters were tested in 2020 for flow and scaling accuracy. The Company has also analyzed consumption patterns to determine if the customers' meters are still appropriate for their current consumption rates, and if not, the installation of new meters is recommended. Moreover, where feasible, turbine meters are being replaced with more accurate compound meters.

Pressure Zone Management and Zonal Metering Studies

Pressure zone management and zonal metering studies are conducted in conjunction with each district's comprehensive planning study ("CPS"). Pressure management helps ensure that we are providing our customers with appropriate pressures in the distribution system. When distribution system pressures are too high, background leakage occurs at a greater rate. Zonal metering is now universally supported and can help the Company determine whether smaller and very well-defined zones within the distribution system should be created. Additional metering sites connected to the SCADA system have been identified to provide additional data for compilation and analysis of NRW. This data will be utilized in determining zonal consumption patterns. The Company is exploring additional options relative to pressure management and district metering,

including an innovative modulation device for pressure reducing valves ("PRV") in Belvidere, where preliminary results are encouraging. The Belvidere system experienced an improvement of 5% in the NRW volume because of the PRV modulation project. Additional pressure reduction opportunities are being investigated by NJAWC's Asset Planning group in concert with the Service Company engineering team. Those studies are focused on the Central (Raritan) district and are scheduled for implementation through 2025.

87. Q. How does the Company work to reduce unauthorized consumption?

A. Unauthorized consumption may be determined in a variety of ways. In addition to the approaches discussed above, the Company has continued its Theft of Service ("TOS") program whereby our employees are educated and encouraged to spot and report any potential water consumption that is not authorized. The TOS program enables us to find unmetered irrigation systems, bypasses, upstream (of the metering point) connections and unauthorized hydrant use, all of which contribute to NRW. Since inception of the program in July of 2008, there have been 1,980 reports of TOS that have been successfully investigated and resolved.

88. Q. Has the Company employed other efforts in managing NRW?

A. Yes. In 2016, the Company realigned internal resources to align the water loss team, SCADA, and work management team into an instrumentation and controls group. A team of information technologists was also assigned to work with this team. Using a third-party integrator, a web-based tool was developed to pull data

from multiple sources to provide one view of NRW and automatically calculate, on a monthly basis, the NRW metrics noted previously. By automating the process, the teams are now focusing on improved analytics to provide targeted guidance on asset management and NRW management. The tool has integrated system delivery, both raw and refined, consumption data, both raw (meter reads) and refined (billed consumption), pressure data, work management data (leaks) and internal and external GIS information.

The development of this tool leads to the preparation of an auditing process for system delivery, which follows the water from source, through the metering and data delivery stream, to the data storage database. This has standardized the data process for system delivery, thus improving the quality of the system delivery database. The data now meets the highest level of criteria required in the water audit grading process.

89. Q. What has been the result of the Company's efforts?

A. The Company has reduced levels of NRW through its targeted and enhanced efforts at managing real and apparent losses. The focused efforts have yielded positive results, reducing statewide NRW from 17.3% to 16.4% between year-end 2019 and December 2021. In our Essex/Passaic District in particular, we've been able to reduce NRW from 19.4% to 17.5% over the same period.

EMPLOYEE LEVELS AND EMPLOYEE COMPENSATION

Employee Levels

90. Q. What is NJAWC's proposed staffing level in this case?

A. The Company has identified approximately 899 full time equivalent ("FTE") employees as the appropriate staffing level for the Company's water and wastewater operations, which includes part-time employees. The number of employees is based upon each department's and functional area's plans to continue providing safe, adequate, reliable and affordable service to our customers. On a regular basis, monthly, quarterly, and annual performance metrics ranging from safety, customer service, financial, asset creation, asset maintenance and regulatory compliance is reviewed to ensure desired service levels and performance is achieved within each region/department. If an area is underperforming, an assessment is conducted to determine if there is a performance or resource issue. Service needs and related resource requirements are consistent with meeting regulatory requirements, tariff requirements, industry standards, service requests, customer needs, and providing support to the business operations in the most cost-effective way to best serve the long-term interests of our customers. The Direct Testimony of Jamie Hawn explains how the Company's labor and labor-related costs were quantified, including the vacancy ratio applied to the approximately 899 FTEs. As Ms. Hawn notes, the Company's 2020 vacancy rate was higher than historical averages due the temporary suspension of hiring activities as a result of businesses and employees adapting to work from home mandates.

91. Q. What is the basis for the Company's proposed staffing level?

A. The additional employees will support the increased capital investment in aging infrastructure, systems added through acquisitions, compliance with increasing water quality regulations, with a focus on employee and contractor safety. Specifically, 9 field employees were added to support the acquisitions of Long Hill Township Wastewater, Bound Brook Boro Wastewater, and Egg Harbor City Water and Wastewater; 2 water quality technicians were added to comply with water quality regulations; 2 employees were added to manage our safety program; and 1 employee to enhance major account management and regulatory matters.

The Company's requested employee complement balances near term cost control with a staffing level that, over time, provides more cost-effective water and wastewater service to our customers. This means rather than simply doing what needs to be done to keep the water flowing and to collect and treat sewage, the Company will have the ability to provide safe, reliable and affordable service in the most cost-effective way to best serve the long-term interests of our customers.

92. Q. Is the Company undertaking any initiatives aimed at ensuring that it is attracting and retaining highly qualified and motivated employees?

A. Yes. Since 2010, American Water has deployed a succession / replenishment initiative across the enterprise, including NJAWC. This initiative is a multi-year effort that focuses on where critical business knowledge resides, and the risks regarding retirement and retention of employees who possess that critical knowledge. The program has evolved to include annual assessments of all

management to identify the development requirements for future leaders. Development opportunities include position reassignments, pre-retirement position overlap, continuing education, leadership and skill training. For critical positions, we are cross training our staff to facilitate knowledge transfer and mentoring. Within the bargaining unit we have specifically developed and deliver training for new Utility Mechanics, Backhoe Operators, Field Service Representatives, Maintenance Mechanics positions. The aim is to document and effectively transfer knowledge to other and new employees over time to avoid a "knowledge vacuum" at the Company when long-tenured employees leave the business.

Compensation

93. Q. Please identify the various employee classifications at NJAWC and briefly describe how each group is compensated.

A. There are three classifications of employees at NJAWC: union hourly employees, non-union hourly employees, and exempt employees. As Ms. Hawn discusses in her Direct Testimony, union and non-union hourly employees receive base pay and variable pay in the form of overtime pay (in some cases shift premiums and meals), and are eligible for performance pay. Exempt employees receive base pay and are eligible for performance pay. Each classification of employees' total compensation, therefore, includes fixed pay (base pay) and some form(s) of variable pay (e.g., overtime, shift pay, or performance pay).

94. Q. Does NJAWC have an overall compensation philosophy?

A. Yes. New Jersey-American Water offers compensation that has allowed it to attract and retain committed, dedicated and highly qualified employees. The Company's overall compensation philosophy is to provide employees with a total compensation package that is market based and competitive with those of comparable organizations with jobs of similar responsibility. As part of its compensation philosophy, NJAWC has chosen to make a portion of its compensation variable, driving continued performance across the enterprise. Specifically, the Company targets its total direct compensation (base and variable compensation) for near the market median (50th percentile). By using a combination of fixed and variable compensation, NJAWC satisfies a dual objective of ensuring competitive market-based compensation for our employees, while continuing to motivate employees to achieve goals that improve performance and efficiency for the benefit of our customers.

95. Q. How should NJAWC's employee compensation expense be assessed by the BPU?

A. Employee compensation is a cost of providing utility service, not unlike any other prudently incurred cost of service recoverable in rates. Employee compensation must therefore be assessed through the same lens as all other operating costs of the Company: if it is prudently incurred and reasonable in amount, relative to what the industry pays for the same services, it should be recoverable through rates. If the Company's overall compensation level is in line with or below the

market, regardless of the combination of fixed and variable payments that the employees earn, then the Company's overall compensation expense is reasonable and prudently incurred and should be recoverable.

96. Q. Is the Company's performance compensation program reasonable?

A. Yes. The Company retained the services of Willis Towers Watson ("WTW") to perform a total compensation study to determine if the total direct compensation provided to NJAWC employees, when viewed against the market of talent for employees of similar positions, is at market levels, based on the Company's stated compensation philosophy. The findings of WTW's compensation study are described in the Direct Testimony of Robert V. Mustich. Mr. Mustich and WTW's study reached the following conclusions:

- NJAWC's overall total direct compensation – which includes base compensation and all performance compensation – is within the competitive market range.
- American Water's short-term performance pay program (APP), which is applicable to NJAWC, is comparable to and competitive with plan designs of other utilities.
- American Water's long-term performance pay (LTPP) also applicable to NJAWC, is comparable to and competitive with plan designs of other utilities.
- The various comparative studies performed by WTW show that NJAWC's total direct compensation programs are comparable to and competitive with

market practices of other similarly-sized utilities and therefore represent reasonable, market based total compensation.

- Therefore, on a total direct compensation basis, NJAWC's compensation expense is reasonable.

97. Q. Did Mr. Mustich reach any further conclusions regarding NJAWC's compensation program?

A. Yes. Mr. Mustich further testified that NJAWC, like the companies it competes with for talent, must provide a competitive total direct compensation opportunity delivered via programs that benefit employees, customers and investors. Mr. Mustich found that "NJAWC attempts to achieve this goal with its balanced and competitive base salary and short-term and long-term performance pay programs."

98. Q. Is the totality of the Company's market based total compensation a prudently incurred expense?

A. Yes. As Mr. Mustich has demonstrated in his Direct Testimony, NJAWC's overall total direct compensation – which includes base compensation and all performance compensation – is within the competitive market range. Therefore, NJAWC's total compensation expense is reasonable and prudently incurred.

99. Q. Is providing market based, competitive compensation to employees critical to the Company's ability to continue to provide safe and reliable utility service?

A. Yes, it is. Recruitment of skilled workers, as well as the retention of existing trained workers, is critical to continuing to provide safe and reliable water and wastewater service for the benefit of all NJAWC customers. Competition among companies to attract and retain the best and highest performing employees is keen. In recruiting new employees or retaining existing employees, both the Company and American Water compete with general industry in surrounding regions and nationally. Without the ability to provide competitive compensation and benefits, the Company would be hampered in its efforts to attract new employees and retain existing employees, particularly when competing with other utilities and other industries for this same pool of talent. This is especially true with respect to employee retention, where the loss of skilled employees imposes a real and added cost on a company which must then recruit and train replacements.

The risk of attracting new talent and the resulting cost of doing so is further compounded by the fact that the utility industry as a whole is experiencing a disproportionate impact of our nation's aging workforce. The soon-to-retire "Baby Boomer" generation holds a wealth of knowledge and experience necessary to support the continuation of utility services, while the next generation of qualified talent is diminished in size. This presents a far greater challenge to NJAWC in recruiting replacement, qualified personnel, if its total compensation is not competitive. Therefore, the Company's compensation program must

provide employees with a total compensation package on par with those offered by companies with which it competes for employees.

Performance Compensation Plans

100. Q. How is performance compensation provided to NJAWC employees?

A. Performance pay may be awarded under two plans – the Annual Performance Plan ("APP") and the Long-Term Performance Plan ("LTPP"). All full-time employees participate in the APP. Eligibility for the LTPP is limited to certain exempt employees.

101. Q. You say all full-time employees participate in the APP; does that include union employees?

A. Yes, it does. Our bargaining unit employees became eligible for APP in 2018, with their first payments in 2019.

102. Q. Please describe the key performance objectives underlying the APP.

A. Management and hourly non-union employees' APP pay is based on a combination of individual performance and achievement of plan goals. Union employees' performance pay was established through collective bargaining and is based on the achievement of plan goals. For 2021, the APP goals are as follows:

Annual Performance Plan for 2021

STRATEGY	GOAL	TARGET	WEIGHT
SAFETY & PEOPLE	OSHA Recordable Incident Rate	0.79	10%
	DART Rate (Days Away Restricted or Transferred)	0.5	10%
CUSTOMER	Customer Satisfaction Survey	Top half of benchmarking survey	15%
ENVIRONMENTAL LEADERSHIP	Drinking Water Compliance (based on total NOVs)	20x better than industry average	7.5%
	Drinking Water Quality (based on MCL NOV subset)	10x better than industry average	7.5%
GROWTH	Financial/Earnings Per Share	$4.18 - $4.28	50%

103. Q. Please describe the LTPP.

A. American Water provides restricted stock units ("RSUs") and performance stock units ("PSUs") as long-term variable compensation under the LTPP. American Water's RSUs and PSUs are based on three-year vesting periods. RSUs are based on time-based vesting and PSUs are based on performance vesting conditions.[3]

104. Q. How do New Jersey-American Water's performance compensation plans benefit customers?

A. The Company's performance compensation plans align the interests of our customers, employees, and investors. The plans emphasize customer service, environmental compliance, a safe work environment, and other operational goals, as well as certain financial goals. All of the APP and LTPP Plans' performance

[3] American Water uses a combination of compounded EPS growth and relative total shareholder return ("TSR") ranking over a three-year performance period as the basis for measuring performance for PSU awards. For the portion of American Water's PSUs that are contingent on relative TSR percentile performance, American Water compares performance to its peer group.

objectives – both operational and financial – focus employees' efforts in ways that benefit customers.

105. Q. How do the operational goals of the APP benefit customers?

A. The operational goals of the APP are designed to focus plan participants on the performance results that can most directly influence customer satisfaction, health and safety, and environmental performance. Customers benefit from the plan goals because operational performance is improved by controlling costs, capturing efficiencies, promoting effective safety and risk management practices, and enhancing customer service. Performance is determined by goals that directly benefit customers by creating a more productive workforce that is focused on customer satisfaction and achieving efficiency, environmental and safety goals.

106. Q. How do the financial goals of the APP and the LTPP benefit customers?

A. The financial goals of the APP and LTPP are complementary to the operational goals and benefit customers in many ways. Importantly, to achieve performance pay financial goals, such as targeted earnings per share ("EPS") performance, demands attention to operating efficiency. That is, unless the utility controls its operating costs, it likely will not achieve a targeted EPS. Financial goal-based performance pay ensures that employees at all levels of the organization, and not just the upper ranks, remain focused on increasing efficiency, decreasing waste, and boosting overall productivity. As a result, incentivizing employees to control operating costs unquestionably benefits customers. Consequently, when

financial performance is achieved through efficiency, as is the case for New Jersey-American Water, the interests of customers, employees and investors are aligned.

107. Q. Does incentivizing employees to control and reduce operating costs provide other customer benefits?

A. Yes. Where NJAWC can reduce operating expenses, it can increase investment in infrastructure without increasing rates, because every dollar of operating expenses saved can fund over $8 of investment. Therefore, customers also benefit from NJAWC's enhanced ability to invest in the infrastructure that it needs to meet its service obligations to customers.

108. Q. Is there other evidence of the tangible benefit to customers from NJAWC's performance pay programs?

A. Yes. Again, it is important to consider the impact a utility's financial health has on its access to capital at reasonable rates. NJAWC's customers have benefitted from the Company's access to capital at favorable rates. Because utilities are capital intensive and must routinely and consistently access the capital markets, customers ultimately benefit when their utility has the financial health to do so at reasonable rates. Simply put, a financially healthy utility benefits customers because it enables the utility to meet its service obligations at reasonable financing costs.

109. Q. How have NJAWC's customers benefited from NJAWC's achievement of the safety, customer satisfaction and environmental leadership goals under its performance pay program from the years of 2019 to date?

A. NJAWC's performance in these areas over the last several years, incentivized by its short-term variable pay plans, makes clear the operational improvements that benefit customers. For example, 2021 year to date results compared to 2019 numbers demonstrate improvement in each of the following operational metrics:

Operational Metric	2019	2021
OSHA Recordable Incident Rate	1.40	1.06
OSHA Days Away/Restricted or Job Transfer Rate	0.82	0.47
JD Power Customer Satisfaction	Top Tier	#1
BPU Inquiries	568	307
Water Quality orders	3,449	3,015

Reducing OSHA incidents increases safety—customer safety and employee safety. No one can credibly dispute the benefits of improved safety. Further, reduced accidents reduce the attendant costs—workers' compensation, damage repair, etc.—which mitigates the operating costs that customers pay through rates. NJAWC continues to improve its performance in reporting near misses, another illustration of the Company's high-performing safety culture. Exceptional safety performance reflects an engaged workforce that is focused on providing safe, reliable and affordable service to NJAWC's customers.

Maintaining and improving high quality customer satisfaction and service quality also provide customer benefits. NJAWC's customer satisfaction performance goals measure customer contacts at NJAWC's call centers and in the field. They

are benchmarked against other utilities' performance, as reported by third-party customer satisfaction surveys. In 2021, NJAWC ranked first in the Northeast Region for customer satisfaction in J.D. Power's Water Utility Residential Customer Satisfaction Study. J.D. Power's Overall Water Utility Satisfaction Index measures key performance indicators in six areas: delivery (including quality), price, conservation, billing and payment, communications, and customer service.

Customer satisfaction often goes hand-in-hand with reducing customer complaints. NJAWC's BPU inquiries for 2021 are down by approximately 46% as compared to 2019 levels.

110. Q. Please summarize why the costs of the Company's market based total compensation, including performance-based compensation should be recoverable in rates.

A. The Company's performance compensation plans align the interests of our customers, employees, and investors. The market based total compensation philosophy that NJAWC has adopted will allow it to attract and retain its workforce and continue to provide safe and reliable service. The plans contain tangible goals that are designed to do several things, i.e., measure and compensate employees for performance based on delivering clean, safe, reliable and affordable water and wastewater service and providing good customer service when doing so. The operational components measure performance that can most directly influence customer satisfaction, safety, and environmental leadership.

Customers derive a direct benefit from our focus on these key measures in the plan. Further, the plans' well-grounded financial measures keep the organization focused on improved performance at all levels of the organization, particularly in increasing efficiency, decreasing waste, and boosting overall productivity. As discussed earlier, the Company has demonstrated that its overall compensation levels are in line with the market, and thus, are a reasonable and prudently incurred cost of service that is appropriate for inclusion in rates.

111. Q. Does this conclude your direct testimony?

A. Yes, it does.

NEW JERSEY-AMERICAN WATER COMPANY, INC.

Appendix A

Q. Please describe your educational background and professional associations.

A. I hold a Bachelor of Science degree from the New Jersey Institute of Technology, W-2, T-2, and professional engineering licenses. I am a member of the American Water Works Association ("AWWA").

Q. What has been your business experience?

A. I have 33 years of experience in the water industry. I joined American Water as an Engineering Technician in 1988 inspecting the construction of tanks, booster stations and transmission mains. I also worked with developers and engineers to extend the water system in our system development department. In 1997, I joined the Operations department as a Distribution Supervisor. I have held progressively responsible positions in the operations group including superintendent, manager, director and Sr. Director until being promoted to my current position as VP of operations in November of 2018.

New Jersey American Water Service Area

Schedule TS-1

NJAW WATER SYSTEMS

REGION	DISTRICT	KEY	COUNTY(IES)	WATER SYSTEM	PWSID #
NORTH	PASSAIC	1	WARREN	WASHINGTON OXFORD MANSFIELD	2121001
		2	WARREN	BELVIDERE	2103001
		3	MORRIS	ITC COUNTRY OAKS	1427017
		4	MORRIS	WEST JERSEY	1427009
		7	MORRIS ESSEX SOMERSET UNION	PASSAIC BASIN	0712001
		8	MORRIS	FOUR SEASONS	1407001
		9	PASSAIC	LITTLE FALLS	1605001
		10	SOMERSET	TWIN LAKES	1803002
		33	MORRIS	ROXBURY	1436002
CENTRAL	RARITAN	11	HUNTERDON	FRENCHTOWN	1011001
		12	HUNTERDON MIDDLESEX MERCER SOMERSET UNION	RARITAN	2004002
		13	HUNTERDON	CROSSROADS	1024001
COASTAL	COASTAL NORTH	14	OCEAN MONMOUTH	COASTAL NORTH	1345001
		14A	MONMOUTH	SHORELANDS	1339001
		15	MONMOUTH	UNION BEACH	1350001
		16	OCEAN	ORTLEY BEACH	1507007
		17	OCEAN	PELICAN ISLAND	1507008
		18	OCEAN	NEW EGYPT	1523003
		19	OCEAN	DEEP RUN	1523002
SOUTH	COASTAL SOUTH	20	ATLANTIC	ATLANTIC COUNTY	0119002
		21	CAPE MAY	OCEAN CITY	0508001
		22	CAPE MAY	STRATHMERE	0511001
		23	CAPE MAY	CAPE MAY CH	0506010
	SOUTHWEST	24	CAMDEN BURLINGTON	WESTERN	0327001
		25	BURLINGTON	SUNBURY	0329006
		26	GLOUCESTER	LOGAN	0809002
		27	BURLINGTON	MT. HOLLY	0323001
		28	BURLINGTON	HOMESTEAD	0318002
		29	BURLINGTON	VINCENTOWN	0333004
		30	GLOUCESTER	HARRISON TWP	0808001
		31	GLOUCESTER	BRIDGEPORT	0809001
		32	SALEM	PENNSGROVE	1707001

AW / NJAW - CONTRACT OPERATIONS

REGION	DISTRICT	KEY	COUNTY(IES)	WATER SYSTEM	PWSID #
NORTH	PASSAIC	40	ESSEX	SOUTH ORANGE	0717001
CENTRAL	RARITAN	41	UNION	LIBERTY	2004002
		42	MIDDLESEX	NORTH BRUNSWICK	1215001
SOUTH	SOUTHWEST	43	CAMDEN	CAMDEN	0408001

NJAW WASTEWATER COLLECTION SYSTEMS

REGION	DISTRICT	KEY	COUNTY(IES)	WASTEWATER SYSTEM	NPDES #
COASTAL	COASTAL NORTH	C1	OCEAN	LAKEWOOD	NJ0265260
		C2	MONMOUTH	ADELPHIA	NJ0538391
SOUTH	COASTAL SOUTH	C3	CAPE MAY	OCEAN CITY	NJ0093880
	SOUTHWEST	C4	CAMDEN	HADDONFIELD	NJ0026182
		C5	GLOUCESTER	ELK	N/A
		C6	CAMDEN	MOUNT EPHRAIM	NJ0026182
NORTH	PASSAIC	C7	MORRIS	LONG HILL TWP	NJ0024465

NJAW STATEWIDE WASTEWATER SYSTEMS (COLLECTION & TREATMENT)

REGION	KEY	COUNTY(IES)	WASTEWATER SYSTEM	NPDES #
NORTH	C15	HUNTERDON	BRASS CASTLE	NJ0068829
	C16	MORRIS	COUNTRY OAKS	NJ0108928
	C17	HUNTERDON	CROSSROADS	NJ0104396
	C18	SOMERSET	EDC	NJ0033995
	C19	HUNTERDON	FAWN RUN	NJ0058246
	C20	MORRIS	FOUR SEASONS	NJ0071013
	C21	HUNTERDON	GLEN MEADOWS	NJ0100528
	C22	WARREN	HAWK POINTE	NJ0136336
	C23	SOMERSET	HILLSBOROUGH CHASE	NJ0146102
	C24	MORRIS	JEFFERSON PEAK	NJ0133558
	C25	HUNTERDON	LOOKOUT POINTE	NJ0140571
	C26	MORRIS	MORRIS CHASE / MORRIS HUNT	NJ0053422
	C27	WARREN	PORT COLDEN MALL*	N/A
	C28	HUNTERDON	POTTERSVILLE	NJ0022781
	C29	BERGEN	RAMAPO RIVER RES.	NJ0080811
	C30	HUNTERDON	VILLAGE SQUARE	NJ0066907
SOUTH	C31	CAPE MAY	AVALON COUNTRY CLUB	NJ0069884
	C32	MONMOUTH	BEACON HILL	NJ0105228
	C33	OCEAN	DEEP RUN	NJ0080055
	C34	BURLINGTON	HOMESTEAD	NJ0098663
	C35	BURLINGTON	MAPLETON	NJ0108120

* COLLECTION ONLY

NEW JERSEY AMERICAN WATER

Long Hill WWTP & Operations Center

EDC WWTP & Operations Center

Washington Operations Center

Canal Road Water Treatment Plant

Belle Mead Operations Center

Raritan-Millstone Water Treatment Plant & Raritan Operations Center

Delaware River Regional Water Treatment Plant & Delran Operations Center

NJ American Corporate Office

Canoe Brook Filter Plant & Short Hills Operations Center

Netherwood Operations Center

Swimming River Filter Plant

Shrewsbury Operations Center

Jumping Brook Filter Plant

Oak Glen Regional Filter Plant

Lakewood Operations Center

Fire Road Operations Center

Legend

- NJAW Water & Wastewater Systems
- AW / NJAW Contract Operations
- NJAW Statewide Wastewater Systems (Collection & Treatment)
- Operations Centers / Treatment Facilities
- Municipal Boundary
- County Boundary

Critical Areas

- Zone 1 - Depleted
- Zone 2 - Depleted
- Zone 1 - Threatened
- Zone 2 - Threatened

NJAW Service Area

- North
- Central
- Coastal
- South
- Water & Sewer Systems
- Contract Ops
- Bulk Sales

0 5 10 20 Miles

Date: 1/11/2022

Document Name: 2022NJAWServiceArea