BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

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

BPU Docket No. WR1709____

DIRECT TESTIMONY OF

KEVIN KIRWAN

Exhibit PT-2

NEW JERSEY-AMERICAN WATER COMPANY, INC.

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NEW JERSEY-AMERICAN WATER COMPANY, INC.

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

A. My name is Kevin Kirwan, and my business address is 1025 Laurel Oak Road, Voorhees, New Jersey.

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

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

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

A. My responsibilities focus on the programs, standards, and management of capital investment, project delivery, environmental compliance, central laboratory operations, health and safety, physical and operational security, business continuity and event management, purchasing and materials inventory.

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

A. I hold a Bachelor of Science degree in Education & Technology from the State University of New York. I worked in the pump industry from 1981 until 1985. From 1981 to 1984 I was employed by the Worthington Pump Corporation in their research and development department. From 1984 to 1985 I worked at the Johnston Pump Company prior to joining the former Monmouth Consolidated Water Company in 1985, which subsequently was merged with and into the current NJAWC. I have held various operational positions with NJAWC, progressing in responsibility in NJAWC's Production, Maintenance, SCADA, Construction,

Transmission and Distribution ("T&D"), Field Operations and Administration departments throughout my career.

5. Q. Please describe your business experience in the water utility industry.

A. I have thirty six (36) years' experience in the field of Utility Operations, Maintenance with thirty-two (32) years of that experience in the water and wastewater utility field and have held the following positions with NJAWC:

Supervisor of Production Maintenance
Assistant Production Superintendent
Production Superintendent
Operations Manager – Monmouth & Ocean County
Director of Maintenance Services - NJAW
Manager of Production - Monmouth & Ocean County
Sr Director Field Operations - NJAW
Sr Director Operations - Coastal Region
Vice President Operations - NJAW

My responsibilities throughout all of these positions have focused on operational efficiency, advancement of technology, budgetary controls, labor relations management, asset planning, capital investment, project delivery, regulatory compliance, health and safety, physical and operational security, business continuity and event management, materials inventory. As noted above, currently I have held the position of Vice President of Operations at NJAWC since April, 2015.

6. Q. Have you previously submitted testimony in regulatory proceedings?

A. Yes, I have previously submitted testimony on behalf of the Company in BPU Docket Nos. WR10040260 and WR11070460.

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

A. The purpose of my testimony is to describe NJAWC's operations, to describe the Company's efforts and investments to improve water efficiency, to summarize the Company's performance measurements and the technological advancements made that are facilitating customer satisfaction and operational efficiencies.

DESCRIPTION OF OPERATIONS

8. Q. Please describe the areas served by NJAWC.

A. As shown in the attached service area map in Schedule KK-1, the blue shaded areas represent the franchise territory served by NJAWC. As of July 1, 2017, NJAWC provides service to approximately 631,000 water and fire service customers and 41,000 sewer service customers in 190 communities in 18 counties throughout the State of New Jersey. The NJAWC customers are served from field operations employees who report to eight Operating Centers located in Short Hills, Shrewsbury, Egg Harbor Township, Delran, Plainfield, Belle Mead, Lakewood, and Washington (Warren County). The operating center locations are also shown on Schedule KK-1. As discussed later in my testimony, these operating centers are organized into four geographically based management areas. Also included on Schedule KK-1 are 25 regulated wastewater systems that are owned by NJAWC.

In addition to providing direct water and wastewater service to its customers throughout the state, NJAWC also provides regional water supply and "sale for resale" water service to approximately 48 other entities throughout the State. As shown on Schedule KK-1, the areas and related water purveyors shaded in grey are served by NJAWC through water sales 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 operations of the Company, including sources of water supply, treatment facilities, pumping equipment and distribution system property.

A. NJAWC currently owns, operates, and provides service to thirty-four (34) separate public community water systems and twenty-five (25) wastewater systems in the areas previously described. Each of the water systems includes its own source of supply, production, treatment, storage and distribution facilities. NJAWC operates seven surface water treatment plants, over 140 groundwater production and treatment facilities, and five raw water reservoirs with a combined capacity of 6.4 billion gallons. The average water production budget for 2017 is 271 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 the following: the Passaic Valley Water Commission ("PVWC"); the Morris County Municipal Utilities Authority ("MCMUA"); the Southeast Morris County Municipal Utilities Authority ("SMCMUA"); the Montclair Water Bureau; the New Jersey Water Supply Authority ("NJWSA"); the Atlantic City Municipal Utilities Authority ("ACMUA"); the City of Wildwood; the Borough of Seaside Heights; the City of Newark; the Township of Maple Shade; the East Windsor Municipal Utilities Authority; and the Marlboro Township Municipal Utilities Authority ("MTMUA"). 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 25 wastewater collection systems, and 20 of these systems also have wastewater treatment. These wastewater treatment facilities incorporate membrane, sequence batch reactor or conventional activated sludge treatment technologies. Five (5) of the collection systems - Lakewood, Howell (Adelphia section), Ocean City, Washington Borough (Port Collden Mall) and Haddonfield - convey collected wastewater to regional wastewater treatment facilities owned and operated by the Ocean County Utilities Authority, Cape May County Municipal Utilities Authority, Washington Borough Municipal Utilities Authority, and the Camden County Municipal Utilities Authority, respectively.

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

A. Field Operations is responsible for operating and maintaining transmission and distribution assets, utility service lines, metering facilities and sewer 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 sewer 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 the Lakewood Operating Center. This team has several responsibilities including the following: operational performance reporting, meter program management, meter testing and meter shop operations, management of customer complaints and liaison for Board of Public Utilities 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 the 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.

14. Q. Please describe NJAWC's plant and property.

A. The Company's utility plant accounts include land and land rights, structures and improvements, collecting and impounding reservoirs, wells, pumping equipment and associated facilities, purification plant and equipment, residuals disposal facilities, transmission and distribution mains, distribution storage facilities, service lines, meters, hydrants, transportation and operating equipment, computers and associated technology, and other facilities.

15. Q. Are all of the facilities that are included in the utility plant accounts of NJAWC in service and reasonably necessary for the provision of safe and reliable water service?

A. Yes.

COMMITMENT TO SAFETY

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

A. Ensuring the health and safety of our employees and protecting our product is a high priority for our Company and is critical to our success. Our colleagues' and customers' safety is the most important thing we focus on every day, and my commitment is to ensure that every NJAWC employee chooses safety in every job, every day. Employee health and safety is the responsibility of every NJAWC employee. A safe workplace increases employee morale, increases our commitment to one another, and makes for a more engaged and productive workforce.

17. Q. Is safety an important part of NJAWC's operational performance?

A. Yes. Safety is both a Value and a Strategy for NJAWC. 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 safe.

18. Q. How do you measure safety performance?

A. The OSHA Occupational Recordable Incident Rate ("ORIR") is a key metric we can use to gauge the effectiveness of our safety program. It considers the number of recordable injuries occurring during a specified time frame (e.g., month, quarter, year) and the total number of hours worked by all employees during that same period. American Water establishes a safety target annually to drive continuous improvement (i.e., reduced injury rates). The target is based on a variety of factors,

including historical performance and rate of improvement and safety performance data for both utility and non-utility industries. The Company is placing a greater emphasis on employee engagement and providing training as well as better tools and personal protective equipment ("PPE") to employees to improve our safety performance. As discussed in more detail below, NJAWC's year-to-date average OSHA ORIR has dropped from an OSHA ORIR of 8.36 in January 2014 to 4.3 in July 2017.

19. Q. What are the components of the Company's Safety Program?

A. The components of the Company's Safety Program are as follows:

- Near Miss Reporting
- Establishment of safety committees
- Peer to Peer work site inspections
- Employee Safety Education and Outreach and Certified Safe Worker Programs.

I will discuss each component in turn.

20. Q. Please describe the purpose behind the Near Miss Reporting Program.

A. In 2015, the Company launched a Near Miss Reporting Program. Near Miss Reporting involves employees reporting a situation that almost resulted in an injury or accident. For example, if a piece of equipment becomes worn outside of a regular maintenance cycle, an employee reports this as a near miss so NJAWC can replace the worn part and avoid a potential injury from an equipment malfunction.

21. Q. Please describe how the "Peer to Peer" work site inspections work.

A. In early 2017, we initiated a "Peer to Peer" worksite inspection program where hourly union employees at NJAWC conduct worksite inspections of their peers. Generally, twice a week, groups of two people go to work areas and evaluate the worksite using a checklist of safety items. The team is also provided with a vehicle equipped with PPE and other equipment to provide employees if they find a deficiency. These worksite inspections are conducted in addition to the safety inspections performed by supervisors and health and safety managers.

22. Q. What is the role of the safety committees within the Company's overall safety program?

A. NJAWC has active safety committees at all levels, including safety committees at each work location and a statewide Safety Culture Council. The Safety Culture Council includes representatives from all operating areas, including union and management, and meets to discuss statewide topics regarding safety practices and culture. In addition, NJAWC also has union and management representatives on a National Safety Council made up of representatives from American Water's utility subsidiaries, which investigates and shares information about good practices and helps to prioritize safety initiatives for the future.

23. Q. Does the Company's priority to maintain a safe work environment extend to its contractors?

A. Yes. NJAWC continually evaluates its contractors, who must submit safety performance information to demonstrate their commitment to a safe work environment. Contractors with poor safety performance or that do not have a safe work program are disqualified from doing business with NJAWC.

24. Q. Please describe how communication fits within NJAWC's safety program.

A. Regularly talking about safety keeps safety top of mind and shows our commitment to safety being a part of everything we do every day. We have implemented several types of communication opportunities in addition to fostering discussions within safety committees and councils discussed above.

- Weekly "tailgate talks" have been and will continue to be a standard part of our safety program.
- Communicating "Safety Alerts" in a timely fashion to all employees. This includes equipment issues, serious injuries within American Water and the industry etc.
- Development of Video Training that includes Bargaining Unit Employees demonstrating proper techniques.
- Utilizing NJAWC's network of video monitors, located at all work sites, that enable the communications department to communicate safety messages and highlight employee successes in the area of safety. The content is updated weekly.
- Near Miss videos that feature examples of safety awareness as told by the employees that recognized it were also added in 2017. It is a great way to share good practices and experiences within NJAWC as well as from around American Water's operations.

25. Q. How did NJAWC perform in the Near Miss Reporting?

A. NJAWC has seen good progress since the program's inception in 2015 with more employees becoming engaged in the process. The majority of Near Miss Reports are now corrected by the individual identifying the issue in the first place by resolving the issue when observed or working with the appropriate people to obtain resources where necessary. In total, approximately 90% of all issues are corrected within 30 days of the report. As of 8/1/2017, NJAWC employees have reported 254 near miss conditions.

26. Q. Please explain what the Certified Safe Worker Program is.

A. The "Certified Safe Worker" is a program where employees certify they have completed or demonstrated 6 safety actions in areas such as health screenings, CPR/First Aid training, other safety training, pre-job stretching, stopping an unsafe job, submitting safety improvement suggestions and/or practicing safety at home. To assist workers in achieving some of the criteria, NJAWC has committed to train all employees on CPR/First Aid by the end of 2017. To date, approximately 534 employees have completed the criteria to become a Certified Safe Worker.

27. Q. How does NJAWC utilize training to continue to improve its safety performance?

A. Delivering comprehensive safety training is at the core of NJAWC's plan to improve safety performance. We are implementing a variety of safety initiatives to

enhance employee engagement, improve how we communicate with employees about safety and address particular safety concerns, including:

- Employee engagement is the key to safety and an effective relationship between management and labor. The management team is tasked with engaging employees to develop and deliver training, develop videos, plan work, provide "peer to peer" feedback regarding safety and ergonomics.
- Ensuring all OSHA required training is delivered in accordance with established requirements. We have developed a web-based tracking mechanism to ensure all employees receive the required initial and recurring training based upon their assigned position.
- Skill Training. NJAWC has developed in-depth training, which is delivered by management and the bargaining unit subject matter experts. Utility Mechanic, Foreman, Field Service Representative, and Production Mechanic Training has been developed within includes extensive "hands on" training.

28. Q. How has NJAWC's commitment to safety benefited NJAWC's customers?

A. A strong safety culture is a cornerstone for any high performing organization. A strong safety culture also improves employee morale, as our employees know that we care for them and their families. In turn, NJAWC's safety culture illustrates that our employees are thoughtful in their work, which directly benefits our customers, as safety is one part of our high performing culture. Lastly, strong safety performance reduces safety-related incidents and the attendant costs, which also benefits customers.

29. Q. The Company continues to emphasize improvements to its safety culture. Please describe the results of these efforts.

A. First, let me emphasize that employee safety is the number one priority for NJAWC. NJAWC's year-to-date average OSHA ORIR has trended down from an ORIR of 8.36 in January 2014 to 4.3 in July 2017. As we continue to work hard toward our goal of 2.2, these statistics are encouraging indicators of our efforts to create and sustain a safe work environment for all of our employees.

ORGANIZATIONAL STRUCTURE OF NJAWC'S OPERATIONS

30. Q. Please describe NJAWC's continuing efforts to improve the organizational structure of operations since the Company's last rate case.

A. As part of our dedication to improving water efficiency, the Company continually strives to find more efficient and cost effective ways to operate and maintain its business. As part of that effort, NJAWC uses various operational and efficiency reviews, including reviews performed by our customer service teams, efficiencies developed and implemented through our lean six sigma/process excellence program, and evaluations of our O&M efficiency ratio and performance, that focus on improving customer service and efficiency of production and field operations. For example, the Company has implemented a number of projects and initiatives, including leak detection, supervisory control and data acquisition ("SCADA") computer systems, the Large Energy User Program ("LEUP"), the Automated Meter Reading ("AMR"), Geographic Information System ("GIS") and Computerized Maintenance Management System ("CMMS") programs, and

SAP/GIS/MapCall integration. The specific impact of these projects and initiatives, including benefits, is discussed in more detail, below. NJAWC has negotiated with our labor unions over the years to include defined subcontracting provisions in the collective bargaining agreements. The benefits of these projects and initiatives are tracked and analyzed by the Company through its use of performance measurements, as discussed later in my direct testimony.

In January 2014, we restructured our operations management resources from a functionally aligned organization (Production, Field Operations, etc.) to geographically-based operations. There are now four regions – **Coastal, Southwest, Central and Northern.** In addition to NJAWC selecting this structure from an operational management standpoint, these regions are also geographically aligned with the NJDEP Drought Management Regions within the State. Each region is led by a director who has accountability for utility service to the customers in the region and coordination with community leaders and officials. This accountability includes overall responsibility for the operational, functional areas of Production; Transmission & Distribution; Field Customer Service; and Meter Reading. Each director is responsible for driving performance of the operational area that they lead, including direct management of safety, production, distribution, field customer service, and meter reading. This realignment has resulted in clear accountability for customer service and improved relationships with local officials. It has also improved the cross functional teams, breaking down silos and achieving a one-team approach with better use of resources across the functional roles at the

local level. This is contributing to both improved service and lower costs as evidenced by the Company's customer satisfaction results and overall O&M efficiency ratio. For example, one metric that highlights the improvement in customer satisfaction is the 20% reduction in BPU complaints from 2015 to 2017. Within each region, each of the Regional Directors is proactive in emergency response planning and engaging local municipal officials, county office of emergency management, NJDEP and BPU on a regular basis to participate in a variety of drills.

31. Q. What specific parts of New Jersey does each operational region cover?

A. **North Operations** includes Bergen, Essex, Hudson, Morris, Sussex, Passaic, and Warren Counties. **Central Operations** includes Hunterdon, Mercer, Middlesex, Somerset, and Union Counties. **Coastal Operations** covers Atlantic, Cape May, Monmouth, and Ocean Counties. Finally, **Southwest Operations** includes Burlington, Camden, Cumberland, Gloucester, and Salem Counties. Please see below and Schedule KK-2 for a map of NJAWC's operating regions throughout the state.

EMPLOYEES AND STAFFING

32. Q. How many full-time employees are currently needed to provide and deliver utility service and included in the pro forma labor expense?

A. There are 879.3 full time equivalent ("FTE") employees currently needed to provide water and wastewater services to the areas previously described. Please refer to SIR-18 which shows a detailed breakdown of labor headcount by department and by function and which shows the detail of how the labor expenses were determined. Please note that, consistent with the Company's last base rate case proceeding, a vacancy ratio of 3.0% has been recognized.

33. Q. Are there any seasonal employees needed and included in the pro forma labor expense?

A. Yes, seasonal and/or part-time employees are needed to supplement and assist with the delivery of utility service to our water and wastewater customers. There are 8 part-time employees included in the 879.3 FTE noted above.

34. Q. Please describe how the FTE employees were determined.

A. Staffing levels within each department are based upon our current and projected performance levels to provide and deliver adequate service to customers. On a regular basis, monthly, quarterly and annual performance metrics ranging from safety, customer service, financial, billing, 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 under performing an assessment is conducted to determine if there is a performance or resource issue.

Service needs and related resource requirements are consistent with the following needs: meeting regulatory requirements; meeting tariff requirements; complying with industry standards; meeting service requests; providing support to the business operations; and, ultimately meeting the needs and expectations of our customers.

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

A. Yes, in 2010, American Water initiated 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 an annual assessment 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 "overlapping" staffing to facilitate knowledge transfer and mentoring. Within the bargaining unit we have specifically developed and deliver training for new Utility Mechanics, Foreman, Backhoe Operators, Field Service Representatives, Production Operators and Maintenance Mechanics positions. The aim is to document and effectively transfer knowledge to other and new employees over time in order to avoid a "knowledge vacuum" at the Company when long-termed employees leave the business.

NEW JERSEY-AMERICAN WATER COMPANY, INC.

WATER EFFICIENCY

36. Q. Are you familiar with the term "water efficiency?"

A. Yes.

37. Q. Please explain the concept of 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 automated meter reading and leak detection and repair programs, as well as demand-side strategies, such as rate design and public education programs. From an operations perspective, improving water efficiency requires 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. The Company's focus on providing cost-effective service has resulted in an overall O&M expense remaining relatively stable over the past several years, following substantial reductions in O&M that were returned to customers in the Company's last base rate case in 2015.

38. Q. Can prudent capital spending enhance operational sustainability as well as reduce operating expenses in the short run and long run?

A. Yes it can.

39. Q. Please explain how.

A. Prudent capital spending can enhance operational sustainability as well as reduce operating expenses and promote customer satisfaction. NJAWC strives to identify, evaluate and implement projects that measurably improve system efficiencies.

40. Q. Please provide examples of such investments.

A. The largest capital drivers of operational efficiency are the Company's DSIC program; the AMR; production plant and equipment capital maintenance and replacement; and energy efficiency projects. To illustrate the many ways the Company achieves increased operational efficiency through a variety of projects, the following are a few examples of capital spending of various magnitudes that result in these efficiencies:

- Additional 4 MGD of Membrane Filtration at Swimming River Treatment Plant. The portable Membrane Filtration system which consists of four (4) 1 MGD rated trailer mount systems has increased the "firm capacity" of the Swimming River WTP, which improved our reliability in meeting peak demands. The system is capable of treating raw water directly from the Swimming River Reservoir with the addition of sodium hypochlorite for pre-disinfection. The effluent (finished water) from this process is combined with the combined filter effluent of the (6) purification units for post chemical addition. The addition of these units has enabled NJAWC to meet peak demands within the Coastal North system without impacting customer service.

- **Acoustical Leak Detection (Echoshores)** – Please see the direct testimony of Thomas Shroba for more information about this initiative as well as a description of the Company's efforts to manage and reduce non-revenue water.

- **Cement Cleaning and Lining** – Cement Cleaning and Lining ("CCL") is a method of restoring old cast iron main interior to improve water quality ("WQ") and improve localized fire hydrant flow. While CCL has limited applications to encrusted (*i.e.*, high tuberculation) but otherwise structurally sound mains, when it is appropriate to use, the number of WQ complaints is reduced dramatically, and "reactive" flushing (that is, flushing to address water quality complaints, as opposed to programmed flushing) is essentially eliminated. When using CCL, structurally compromised mains are either replaced or applied a structural lining (i.e., Scotchkote by 3M, a liquid epoxy coating). Most cleaning and lining projects are eligible for the DSIC program, and the Company has utilized its DSIC program accordingly in order to implement CCL in the most efficient manner possible. Please see the Direct Testimony of Mr. Shields, Exhibit PT-3, for further discussion of the water main cleaning and lining programs.

CCL also resulted in reduced power consumption within the Passaic Basin system even though the primary reason CCL is used there is to improve local water quality and hydrant flows. Because of the Passaic's unique topography, more transfers were facilitated from a lower gradient (CB) into an adjacent (WO Low) gradient instead. When CCL was employed, transfers from previously fed (WO High)

gradient were reduced. The estimated power cost saving in this situation is about $30K annually.

- **Aquifer Storage and Recovery ("ASR")** – is the direct injection of finished water into an aquifer for later recovery and use. ASR's reduce the need for additional plant expansion and assist in meeting peak customer demand in the summer months. We have completed an ASR project at the Aberdeen Station, where an underutilized well and treatment station has been repurposed and converted into an ASR facility. NJAWC proposes to store upwards of 100 MG annually during low demand periods by recharging distribution water produced by surface water plants during a period when excess capacity is available. It would recover this water during high demand periods with minimal treatment (pH adjustment and disinfection). In 2016, the facility became fully operational with water being recharged for recovery (pump back) during summer peak demand periods (June – August).

- **Absecon Iron Filtration Plant –** NJAWC also installed iron removal treatment at Green Street in Mt. Holly and Absecon Station in Atlantic County. Rehabilitating Green Street increased the reliability of the facility with a significant reduction in the iron level entering the system. Absecon Station is a supply that has historically had an elevated level of naturally occurring iron. The new treatment plant now produces treated water with iron levels below the EPA secondary maximum contaminant level (smcl). Having the new Absecon Station will reduce iron deposition within the distribution system and will significantly reduce the

number of WQ complaints and the need for spot flushing in response to customer complaints. While we have three other well stations with currently marginal iron levels within the Atlantic County system, we anticipate that these well stations will need attention in the near future.

- **SCADA Upgrades –** The planned replacement and upgrades to our automation and control systems (also known as SCADA) is ongoing and is being phased in by operating area. NJAWC strives to maintain its control systems up to date, which requires replacement of older components that are no longer supported by the manufacturer, which in turn limits spare part availability. Further, it is essential that critical production assets' performance and output from water quality instrumentation is captured continuously. As a result, we have embarked on an effort to do so, particularly the continuous and totalized volumes pumped in and out of a pressure zone. This allows for better evaluation of supply and distribution capacity for the identification of non-revenue water ("NRW") issues that are either existing or quickly identified in the future as they occur and for dispatching resources to identify the issue. Mr. Shroba describes additional efforts to reduce NRW in his direct testimony. This effort will enable NJAWC to maintain sustainable water supply and identify critical supply and delivery issues so that they are manageable. The continuous monitoring and control of the water treatment process is essential to insure that our water quality meets all applicable standards across a range of source water quality conditions. Data from these systems is used to calibrate our hydraulic models, which are an essential tool for operations, capital

planning, service extensions, fire protection and minimizing service interruptions during planned and unplanned events.

41. Q. Does the Company employ other practices or programs that are aimed at increasing operational efficiencies?

A. Yes. The Company continually strives to find more efficient and cost-effective ways to operate and maintain its business. For example, NJAWC participates in the Large Energy User Program ("LEUP") when this program is available. The Large Energy Users Program is designed to promote self-investment in energy efficiency and combined heat and power projects with incentives up to $4 million for eligible projects in the states' largest commercial and industrial facilities. The Company has primarily used the program to improve pumping efficiency. Currently, this program is expanded to include HVAC efficiency upgrades as well. Listed below are recent projects:

2015 LEUP

5 pump stations completed in 2017

- Project Cost - $1,200,000
- ~$532,333.23 incentive currently anticipated fourth quarter 2017
- Approximately 1,615,000 kWh per year
- Approximate 6 year payback
- Replacement; epoxy coating, and installation of VFD to improve efficiency

2016 LEUP

DRRWTP High Lift #4 and RMWTP (4) low lift pumps to be completed in 2017

- Project Cost - $1,925,000
- ~$284,655 incentive currently anticipated
- Approximately 862,622 kWh per year
- Approximate 17 year payback
- Replacement of inefficient pumps

Additionally, NJAWC continues to review its facilities for future energy conservation measures concerning lighting and HVAC improvements.

42. Q. Does the Company also work to maintain pump efficiency?

A. In addition to participating in the LEUP, NJAWC also has a continuing program to periodically test pump efficiency by conducting wire to water tests of an operating pump (well and pump stations). Where significant deviation from design or manufacturer specifications is identified, a pump replacement, rebuild, or modification is planned and prioritized based on pump condition and energy savings. Depending upon use and duty, a typical pump is likely to lose significant efficiency if more than 5 years old. Such pumps are prioritized for periodic wire to water testing.

43. Q. Is this the extent of the key investments to improve water efficiency that NJAWC has made since its last rate case?

A. No. The foundational technology investments over the past several years enable us to leverage the size and scale of American Water to improve transactional efficiencies, increase automation, and adopt more effective business processes so that we can work smarter and more efficiently. The Automated Meter Reading ("AMR"), Geographic Information System ("GIS") and Computerized Maintenance Management System ("CMMS") programs have helped to increase efficiencies in our plant operations. A notable example undertaken and advanced since the Company's last base rate case proceeding is discussed below.

44. Q. Please describe the High Accuracy GPS Buried Asset Location Project.

A. This project is a part of the Company's broader GIS system, discussed in more detail in the next section of my direct testimony. With this specific project, NJAWC is implementing a sub-foot accuracy location program for its buried assets that covers customer control points (e.g., meter box and curb valve) as well as transmission and distribution valves. While the need for this accuracy was first identified for resiliency purposes after a major storm event and first piloted in the "Barrier Island" portion of the Coastal North service territory (e.g., Bay Head, Mantoloking, Ortley Beach and coastal sections of Toms River) before Super Storm Sandy, it was evident how valuable the high accuracy GPS pilot was to the Company during the recovery from the destruction of Super Storm Sandy. A business case has been made to expand the program from the Barrier Island to Statewide for two reasons: resilience and operational efficiency. Through the operational efficiency, it is estimated that on average the sub-foot accuracy location will reduce the time to locate an asset by an average of 10 min. This time savings equates to a simple payback period of less than 1 year when completed, after which time the productivity gains will be applied to higher value work or allow more routine work to be completed in less time. Having GPS coordinates for buried assets will also reduce the safety risk to our employees in the field when they are required to locate assets in or adjacent to roadways and will increase customer satisfaction through reduced times for service interruptions for both planned and unplanned events.

GEOGRAPHIC INFORMATION SYSTEM ("GIS")

45. Q. Please provide an overview of NJAWC's GIS system and its importance to the Company in its capital and operational planning efforts.

A. GIS was instituted by statewide regulatory mandate in 2006. We recognized the benefit of outfitting all our field crews with digital maps that update weekly with the most current information, and, as discussed earlier, updating the spatial accuracy of the maps to show assets within 1-foot of their location would save tremendous field time, and so we began developing the system to do this.

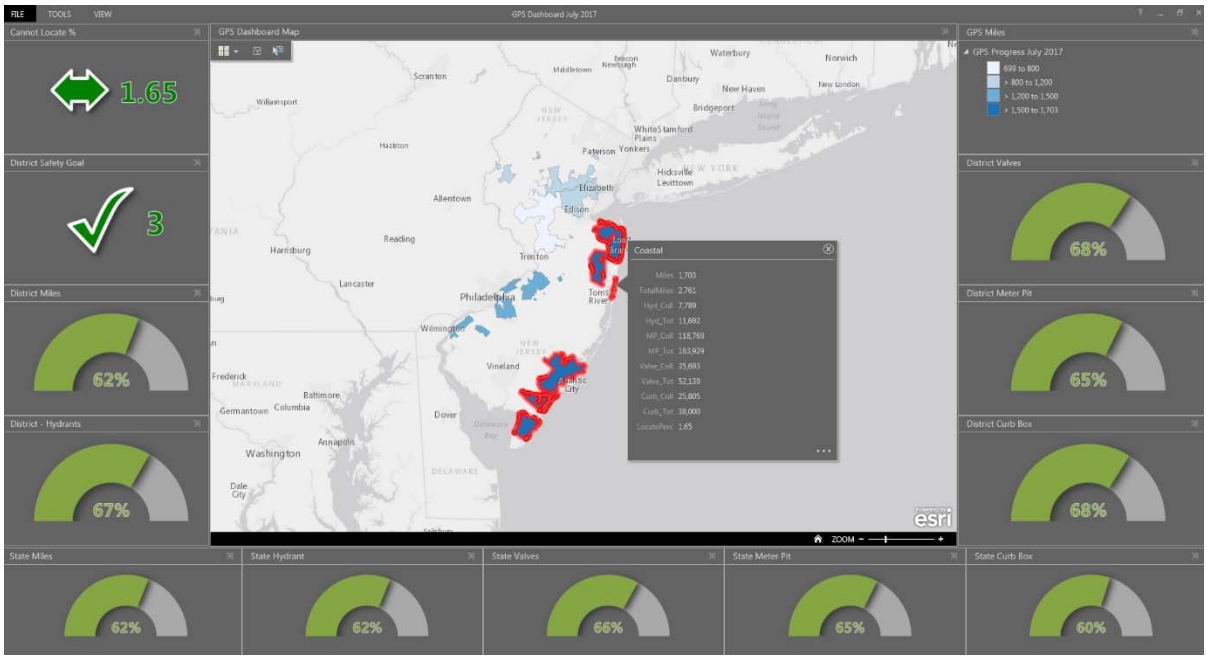
46. Q. What information does the Company's GIS contain?

A. There are nearly 200,000 valves, 9,000+ miles of main, 45,000 hydrants, and 650,000 customer locations in GIS. Combined, there are roughly 900,000 service line valves and meter pits that will be GPS located as well, in addition to the customer location. As of July 2017, approximately 64% of all field assets have been located to a sub foot accuracy level. The percent complete is tracked in real-time and visible via a dashboard. By the end of 2019, every one of these points in GIS will have high-precision GPS accuracy capable of navigating a field worker to within 1 foot of the target asset. Our GIS has between 60 and 100 miles of main added to it each year, and is updated nightly.

47. Q. Please explain why it is important that GIS can present multiple layers of information at one time.

A. GIS is capable of "overlaying" and interacting with thousands of government and proprietary 'layers', producing actionable information via spatial relationships that

traditional database analysis cannot produce. This feature has proven to be important in making project planning more efficient. For example, engineers can automatically prioritize mains for replacement or rehab based on a GIS scoring model that objectively looks at dozens of various weighted consequence and condition variables to analyze thousands of mains in a few seconds and produce replacement project plans. Another example relates to municipal road reconstruction, sanitary sewer or storm sewer projects: our GIS system allows us to coordinate our work with those municipalities that are using maps to plan these programs, in order to minimize both cost and disruption to the community. Below is a screen capture of our "on-line" GIS dashboard that depicts the status of our progress locating field assets to a sub-foot level.



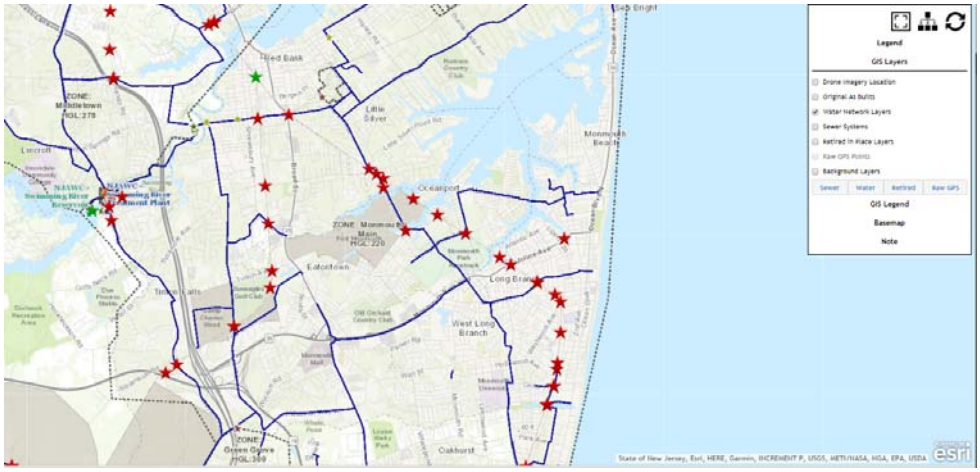
48. Q. How does GIS assist with emergency response?

A. As noted above, one of the great benefits of GIS is the navigational accuracy that the technology provides. Not only does this permit greater efficiency for field operations personnel conducting routine activities, it is invaluable in an emergency situation, and the Company's response to catastrophic events has been effective in minimizing customer impact and expediting full service restoration to the affected service area. For example, during Super Storm Sandy, amidst the extreme and extended statewide disruptions of utility service, the only NJAWC customers who were out of service for an extended period of time were those in the Barrier Island communities that were destroyed by the storm. Part of NJAWC's outstanding response included: restoring fire service to the devastated communities; locating and restoring mains, hydrants and service lines; and assisting the municipalities in identifying the correct locations for streets and buildings even when there was no trace of their original location. GIS and GPS greatly enhances our responsiveness during an event as straightforward as a snowstorm or blizzard. During cold temperatures, it is common for main leaks and breaks to increase and locating line valves to isolate the leaks/breaks can be more difficult when multiple inches of snow are present. GIS/GPS will take our crews directly to the valve locations, which improves responsiveness and their personal safety.

49. Q. Has the Company used GIS in other ways?

A. Yes. NJAWC has implemented a "Critical Crossing" program focused on the inspection of water crossings, railroads, and highways - both elevated and below

grade. The associated isolation valves are linked to the particular crossing and inspected regularly and documented in our work management system (WMS) which is integrated with our core SAP system. The screen capture shown below depicts our GIS Map with the critical crossings denoted with a red star. The crossings are linked to our work management system to effectively manage valve inspections and relate inspections.

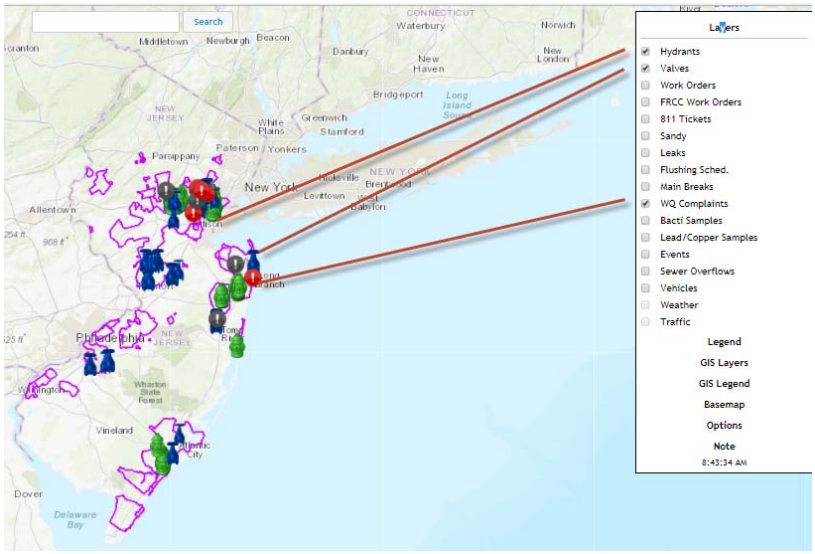


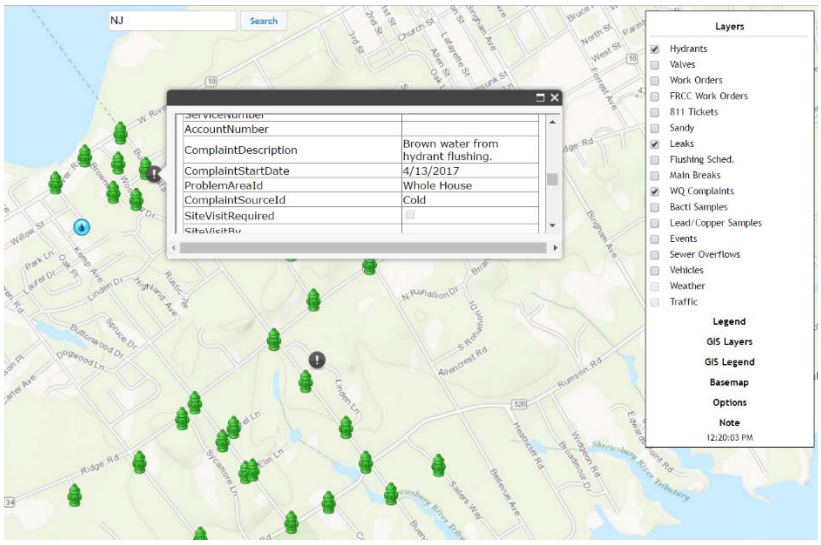
Integrating Technology to Improve the Customer Experience

50. Q. Please provide some examples of how NJAWC utilizes technology to connect people, processes, assets, and industry-based knowledge efficiently.

A. NJAWC has built upon the SAP Platform an enhanced work management system that integrates SAP (EAM/ERP) with our GIS to provide one view of the work activities (Construction, Inspection, Maintenance, Water Quality Bacterial Sampling, Customer Complaints, SCADA) in real time. This capability enables enhanced customer service through the visualization of inter-related work activities, as shown in the illustrations below. Integrating and displaying all work activities

within one system enables enhanced customer service by providing the customer service representative with a complete view of all work that may impact the customer experience. (The illustrations below are also included in Schedule KK-2.)





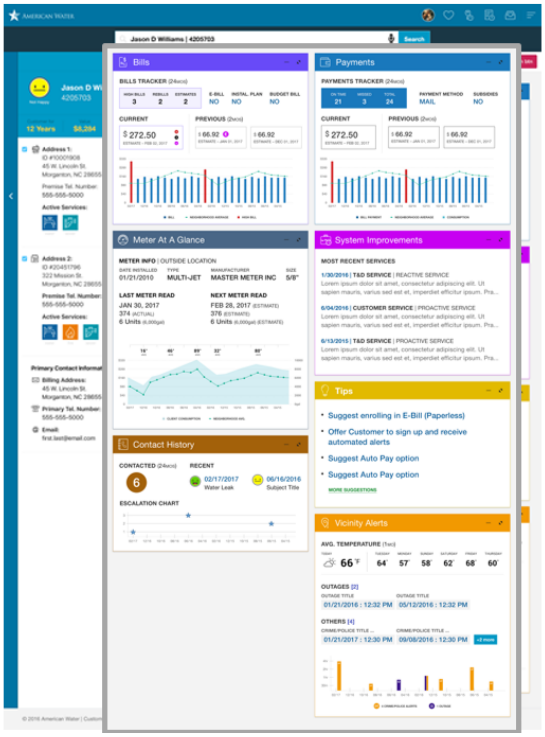
51. Q. Please describe how the Company plans to leverage technology to improve the interaction between NJAWC's Field Service Representatives and customers.

A. Currently, we are in the pilot phase of a newly constructed work management system for the Company's Field Service Representatives (FSR). The current "Service Order" management system only provided the order type to be performed (On, OFF, Meter Change, Leak Investigate, etc.) and was limited on the amount of additional customer information. The new application "C 1 View" (shown below) provides the FSR with an array of customer information so that customer questions can be answered by the FSR in the field instead of referring the customer to the call center, which will save our customers time and the frustration of waiting for an answer. As we continue to integrate all workflows, we anticipate higher customer satisfaction and operational efficiencies as a result. The screen capture below and included in Schedule KK-2 graphically represents customer billing, payments, meter information, system improvements, contact history, water quality information, collection activity, tips and any system alerts within the vicinity of the customer.

NEW JERSEY-AMERICAN WATER COMPANY, INC.

Cue Cards
- Optimal use of real estate to display key information
- Designed for easy comprehension
- Dynamically sorted on relevancy

Phase I
- Bills
- Payments
- Meter At a glance
- System Improvements – Customer + T&D
- Contact History
- Water Quality
- Collections
- Tips
- Vicinity Alerts



52. Q. What are some of the benefits of integrating GIS and SAP / MapCall?

A. Over time, these integrated systems will improve customer service and allow

- Field personnel to access up-to-date mapping through computers in their vehicles and locate Company facilities and equipment (e.g., plants, tanks, boosters, hydrants, valves, and ultimately meters) using a Global Positioning System. The GIS map is embedded into the T&D work management application, providing the field worker with access to accurate maps and scanned legacy documents.;
- Access to archived information concerning a facility. This includes "as built" construction drawings and sketches, flow test data, field maintenance work order information, last date tested, notes concerning operation, etc., field

personnel updates of mapping information allowing quicker more accurate map updates and corrections;

- Management to schedule and track maintenance and capital work performed in the system;
- Better planning for infrastructure upgrades. Leak repair data collected through the CMMS system will track failure occurrences and the cost associated with each occurrence. This allows better prioritization for replacement of facilities as discussed in the pre-filed direct testimony of Company Witness Donald Shields, Vice President of Engineering, Exhibit PT-3.

53. Q. What can you conclude about the value added by GIS for our workers' and our customers' experiences?

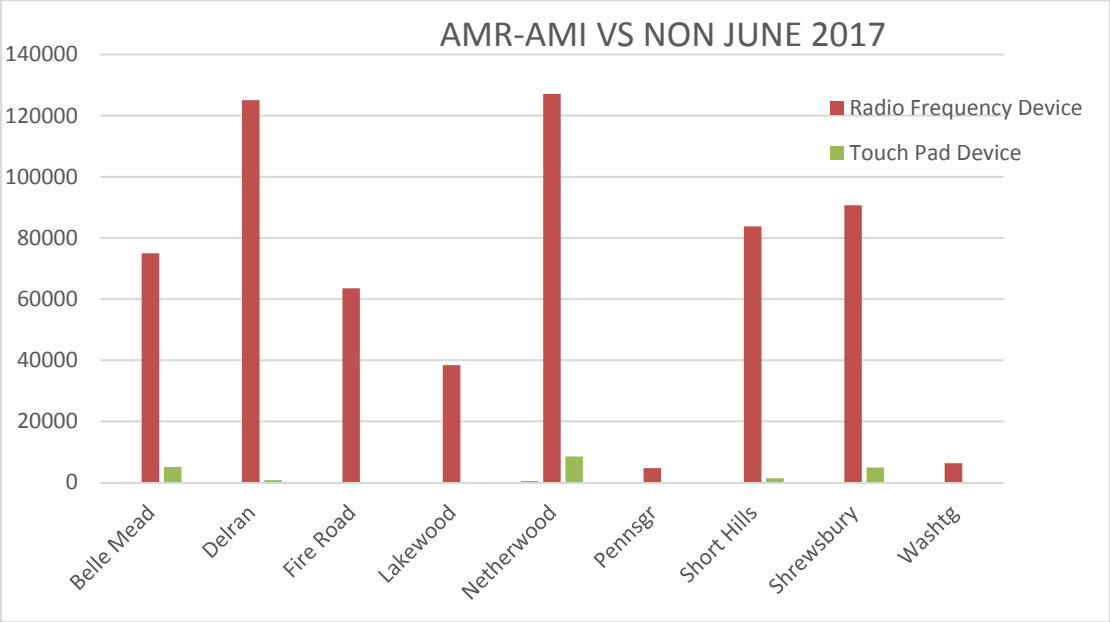
A. GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. The GIS system allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. A GIS helps to answer questions and solve problems by looking at data in a way that is quickly understood and easily shared.

AUTOMATED METER READING

54. Q. Please describe NJAWC's AMR program.

A. In 2007, the Company began upgrading its meter system by implementing low-cost, radio frequency remote meter reading equipment sometimes referred to as mobile or drive by AMR instead of touch pad or manual read meters. As of July

2017, AMR installation is 96.6 % complete. Please see details, broken down by operating area, in the table, below.



55. Q. What is the current deployment status of AMR?

A. Statistically, as of July 2017, AMR has been deployed in the NJAWC Districts as follows:

District	Operating Center	Total % AMR
Central Operations	Belle Mead	93.50%
Central Operations	Netherwood	93.46%
Coastal Operations	Fire Road	99.99%
Coastal Operations	Lakewood	99.50%
Coastal Operations	Shrewsbury	94.87%
North Operations	Short Hills	98.22%
North Operations	Washington	98.90%
Southwest Operations	Delran	99.37%

56. Q. Why did NJAWC decide to implement AMR technology?

A. AMR has improved our meter reading performance as measured by first time meter read success and by a reduction in estimated reads/bills. We strive to achieve 100% first time meter reads and 0% estimated bills, and we currently achieve a 98% to 99% first time read rate with AMR. The radio frequency ("RF") meter reading devices will transmit through snow and ice, and this ability has allowed routes that otherwise would be estimated during inclement or winter conditions to be read. Drive-by meter reading is also safer when compared to requiring a meter reader to travel on foot during bad weather conditions to perform the same task. As I discuss later in my direct testimony, AMR has allowed NJAWC to reduce its meter reading staff, and we have been able to reassign these resources to fill vacant positions or to perform other duties.

57. Q. How does AMR improve customer service?

A. AMR will virtually eliminate manual meter reading and improve customer billing accuracy. AMR improves water meter accuracy and will improve meter reading performance - especially in bad weather. As a result, AMR also will greatly reduce the need for estimated bills due to weather events and other obstacles to accessing customer meters. It is anticipated that the reduction of estimated bills will also result in a reduction of customer inquiries and call center activity. AMR can also provide actual historical water use profiles for responding to inquiries about water usage and educating customers concerning their water use. Furthermore, the AMR data that is transmitted with the consumption data also includes flags for continuous

flow (potential indicator of a plumbing leak on the customers side of the meter) and meter tamper (early indicator of water theft situation) and these flags allow us to be more proactive in notifying the customer of a potential leak or investigating a potential meter tamper situation.

58. Q. How will AMR improve employee and public safety?

A. Some NJAWC employees are still walking meter routes. Having employees in the field reading meters in potentially unsafe environments, inconvenient locations, inclement weather, and while exposed to vehicular traffic, animals and the like, creates an exposure to potential injuries and accidents. Being able to read meters remotely removes this potential liability, both for injuries to our employees and injuries and damage to third-parties and their property.

59. Q. How is AMR reducing costs and promoting efficiency?

A. By virtually eliminating the need for manual meter reading, NJAWC is able to redeploy personnel previously focused on meter reading and reduce employees' exposure to potential injuries and accidents. Through AMR technology, the Company has eliminated twenty-nine full time equivalent positions, twenty-nine fleet vehicles (with associated maintenance, fuel, insurance costs), miscellaneous equipment and associated miscellaneous expenses resulting in a cost savings which were a significant contribution to the Company's overall reduction in O&M expenses.

60. Q. Can AMR help the Company identify and reduce NRW?

A. Yes, AMR will allow NJAWC to reduce the amount of NRW through improved detection of leaks and theft and assisting with right-sizing large meters. For example, AMR can reduce NRW through large meters by permitting the Company to view historical water use profiles. In large customer meters, changes in the customer's use over time can render the original meter size inappropriate for the customer's new use profile, thereby resulting in non-detection of flow during periods of the customer's use. AMR will enable the Company to detect these circumstances sooner so that the Company can resize the meter for the benefit of all stakeholders. Acoustic leak detection devices can also be interfaced with AMR technology to help detect leaks and occurrences of theft. (For additional information about the Company's efforts to manage NRW, see Company Witness Shroba's direct testimony, Exhibit. PT-11.) Additionally, AMR's ability to view historical flow profiles can help the Company monitor and ensure good water quality in the distribution system and provide information that can help the Company identify failed backflow protection devices more quickly. Detection and correction of backflow helps to protect public health and safety.

61. Q. What are some of the potential conservation and related capital benefits of AMR?

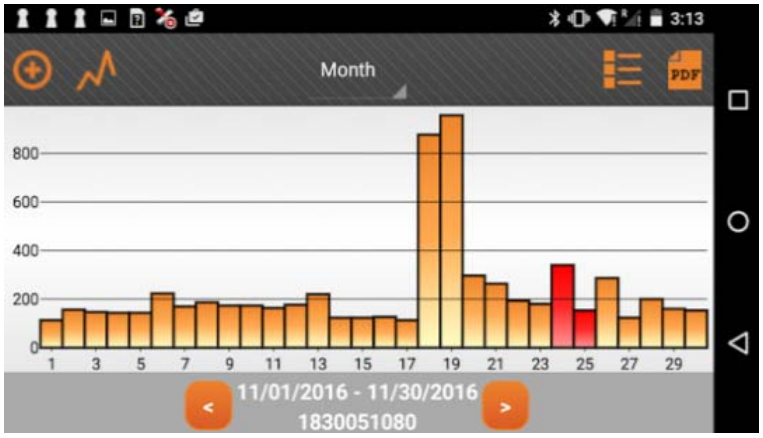
A. Reductions in NRW can reduce production related expenses, such as energy, chemicals and waste disposal. A significant reduction in the number of Company fleet vehicles and monthly meter reading routes also reduces the Company's

emissions and overall carbon footprint. AMR also can provide actual water use profiles for auditing with customers. With appropriate cost of service driven rate designs, and periodic updating of cost of service studies, AMR-enabled water use profiles can educate customers about how their use profile affects the price of water service. This information has the potential to change customer use profiles and encourage more efficient water use, which, in turn, may enable the Company to defer future capital investments, potentially mitigating, to some extent, a need for rate increases, and also improving customer satisfaction. Conservation of water can occur as well, as a result of identifying a leaking service line that needs repair.

62. Q. What is a smart meter?

A. By definition, a smart meter is an electronic device that records consumption in intervals of an hour or less and communicates that information at least daily back to the utility for monitoring and billing. Smart meters enable two-way communication between the meter and the central system. The Neptune R900 meters that are currently being installed have the capability of storing 96 days of hourly consumption interval data. The data stored in the register can be accessed via Neptune's NGO Bluetooth application that operates on an Android device. The hourly consumption data can be accessed in the field and presented to the homeowner. This capability is beneficial when investigating high bill complaints or leaks. The installation of these meters positions the Company to deploy a fixed base system. The American Water meter team is developing a fixed based meter reading system that will accept meter reads into the SAP billing process from a variety of

meter manufactures. The screen capture below is a graphical representation of the historical meter consumption data from the Neptune Meter NGO application.



COMMITMENT TO WATER QUALITY

63. Q. Please discuss NJAWC's commitment to water quality.

A. NJAWC is acutely aware that water is the only utility product 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 to do so in a way that strives to create operational efficiencies that also benefit our customers.

64. Q. Please discuss NJAWC's efforts with respect to water quality.

A. The Company's participation in The Partnership for Safe Water (the "Partnership") program is one demonstration of NJAWC's commitment to the health and safety of our customers through the delivery of clean, safe, aesthetically pleasing drinking water. The Partnership is an unprecedented alliance of six prestigious drinking water organizations. The Partnership's mission is to improve the quality of water delivered to customers by optimizing water system operations. The Partnership offers self-assessment and optimization programs so that operators, managers and administrators have the tools to improve performance above and beyond even proposed regulatory levels.

65. Q. Has NJAWC been recognized for its optimization and water quality achievements?

A. Yes. NJAWC is a participant in the Partnership's water treatment plant optimization program and has repeatedly been recognized for its optimization and water quality achievements. NJAWC's six (6) water treatment plants have received Phase III Directors Awards.

66. Q. Please describe other ways in which the Company is demonstrating its commitment to water quality.

A. The Company has enhanced its source water protection program by taking an integrated approach to monitoring its source water quality and evaluating risks to that source using innovative technologies, which support the Company's ability to

make more informed decisions regarding treatment and when responding to potential source water contamination events. The integrated approach includes source water quality monitoring panels and a map-based information gathering tool called WaterSuite.

67. Q. Please describe NJAWC's source water quality monitoring panels.

A. The Company installed an online, multi-panel source water quality monitoring device at each of its surface water treatment plants as an effective tool for optimizing treatment decisions and aiding in the detection of potential source water contamination. The sensors in each panel monitor parameters in the source water that include turbidity, pH, oxygen reduction potential, temperature, conductivity and dissolved oxygen,. This equipment will establish baseline water quality data for each parameter and alert water plant operators to certain changes in water characteristics. The Company can use this information to better understand the characteristics of its source water. In addition, a change in the baseline characteristics may indicate an issue that warrants additional investigation.

68. Q. Please describe WaterSuite.

A. WaterSuite is a map-based tool that collects information about potential sources of contamination from various sources[1] and pulls it into a database for a defined area of concern. The database is updated on a regular basis to include the latest available information and has search and reporting capabilities, which provides a significant

[1] Data sources may include publically available regulatory databases, aerial imagery analyses, and local knowledge.

advantage over standard static contaminant assessments. This gives the Company a dynamic tool it can continue to use over time rather than a paper-based equivalent that captures only the circumstances present at a point in time. The database provides a larger set of data that is automatically updated on a periodic basis without requiring manual work by NJAWC. As a result, NJAWC can access more information more efficiently than in the past. The Company can use the monitoring panels and WaterSuite together to better inform its response to a potential contamination event.

69. Q. Does the Company encourage its customers to use water wisely?

A. Yes. In addition to the environmental grants that the Company awards for projects demonstrating an emphasis on water efficiency and environmental sustainability, discussed below, the Company regularly provides bills inserts and Facebook postings that contain ways in which customers can use water wisely.

The Company has also explored other ways to use water wisely. For example, together with Rachio and Water DM, in 2016, NJAWC participated in a Peak Water Demand Management Study ("Study") This Study explored the viability of using remotely controlled irrigation systems to manage peak water demands. In the Study, fifteen NJAWC customers, equipped with Rachio irrigation controllers, agreed to have their irrigation remotely interrupted on two separate dates in August 2016. Irrigation programs were successfully interrupted and resumed normal operation the following day, demonstrating the ability to precisely target specific sites and dates to shave peak demands. Based upon the historic use records of the study

participants, an estimated 84,000 gallons of peak demand reduction occurred on each day of interruption.

Further analysis of historic irrigation patterns was undertaken to extrapolate the potential peak reduction that could be experienced if this approach was implemented on a larger scale. The results of the analysis suggest that 1 MGD of irrigation can be achieved with approximately 500 to 1,700 participants; reductions of 5 MGD can be achieved with approximately 2,500 to 8,600 participants; and a 10 MGD reduction can be achieved with approximately 5,000 to 17,300 participants. Variability in landscape size, character and irrigation system outpout necessitates a broad range estimate, especially when extrapolating from a small sample. Future research will refine these estimates.

NON-REVENUE WATER

70. Q. What is NRW?

A. NRW is the difference between system delivery and water sales. The level of NRW as of July 2017 is as follows:

District	% NRW	As of
Essex Passaic	21.00%	7/1/2017
Hunterdon Warren	22.00%	7/1/2017
Raritan	20.50%	7/1/2017
Coastal North	13.40%	7/1/2017
Atlantic Cape May	6.70%	7/1/2017
Burlington Camden	4.80%	7/1/2017
STATE	**15.90%**	7/1/2017

Note: These values represent a 3.8 % reduction of NRW since 2014, which equates to a reduction of NRW of approximately 10.2 MGD, a testament to the Company's increased efforts to reduce NRW.

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

A. Please see the direct testimony of Thomas Shroba, Exhibit PT-11, for more detailed information on NRW.

PERFORMANCE MEASUREMENTS

72. Q. How does NJAWC measure its efforts to improve water efficiency?

A. NJAWC continually strives to deliver steady or improved levels of water service to its customers while mitigating cost increases. The Company monitors a variety of metrics to measure its progress at improving water efficiency, including customer satisfaction, water quality complaints, customer complaints, OSHA reportable incident rate (ORIR), Operations & Maintenance (O&M) costs, operating efficiency ratio, NRW, Meter to Cash, KWH's per MG, and chemical dosages.

73. Q. What are the benefits of performance measurements and operating metrics?

A. Performance measurements and operating metrics[2] are a valuable tool to monitor and manage performance over time within a company. Tracking performance measurements can provide NJAWC's management with critical feedback over time on whether the Company's practices and investments are positively or negatively affecting the desired outcomes. By objectively measuring data, NJAWC can

[2] For the purposes of this testimony, performance measurements and operating metrics are considered one and the same.

develop a framework for making rational business decisions to improve performance and eliminate waste.

74. Q. What do NJAWC's performance measurements reveal?

A. The results of the Company's most recent performance measurements indicate that our customers are satisfied with the water service that we provide them, and that NJAWC is operating more efficiently while providing high levels of service quality. Based on the most recent year to date survey results, the percentage of customers who are "very satisfied" or "extremely satisfied" with the services of field service representatives was at 96%. Year to date, NJAWC has resolved 74% of customer inquiries with one contact and 84% of customers reported being satisfied with the quality of their service contact. We have accomplished these service improvements while at the same time developing more efficient ways to work. We have also reduced our ORIR, which I discuss in more detail, below. These results demonstrate a solid and sustained improvement in water efficiency that is of tremendous benefit to our customers. They are a result of the hard work, discipline, and dedication of our employees, and the management and cost controls that have been implemented.

75. Q. How does NJAWC manage and track progress on its customer service metrics?

A. Customer focus is a business goal. We measure this goal with the following targets:

- Service Quality Rating on our surveyed customer's calls: As noted above, 84% are "very satisfied" or "extremely satisfied"

- Overall Customer Satisfaction Survey Rating: 90% are "extremely satisfied", "very satisfied" or "somewhat satisfied". NJAWC performs root cause analysis of complaints by category to identify opportunities for process improvements. Provide suggestions for improvement to associated functional or regional areas in the business.

- First Call Resolution using Customer Service Center metric - This metric is a measure of the commitment of all American Water employees to resolve a customer's request completely with only one contact.

76. Q. What process does the Company use to manage customer contacts that are not resolved on the first call?

A. An Account Resolution Team at the national call center takes escalated calls in which the customer has called previously regarding the same issue or has requested to speak with a management team member. Should additional customer support be needed, the customer is routed to the local NJAWC Customer Advocacy Team. This team handles customers who have encountered difficulty in having their issues resolved at the call center level. The local team works closely with the Company's operating centers in New Jersey to resolve the issue.

The New Jersey based Customer Advocacy Team is also responsible for researching, responding to and resolving inquiries and complaints submitted to the BPU, as well as all escalated complaints/inquiries that are directed to the management team.

77. Q. What is the role of the New Jersey Customer Service Steering Committee?

A. The New Jersey Customer Service Steering Committee discusses the monthly Service Quality Survey with the purpose of driving improvements in customer satisfaction, and improving operating efficiency in customer service-related work, by recommending and implementing initiatives and programs focused on improving customers' resulting experiences of NJAWC.

78. Q. Please explain how the Company, based upon its experiences with customer inquiries, works to improve service and reduce BPU customer complaints.

A. The Company conducts a root cause analysis on all complaints to track causes and trends and provide feedback to impacted parties. The Customer Advocacy Team, Customer Service Liaison, and CSC supervisors participate in a monthly root cause analysis of certain BPU complaints. The Company implements the team's recommended business process improvements to meet customer's expectations with the goal of having fewer unresolved customer issues.

79. Q. Has the Company experienced a change in the number of customer complaints filed at the BPU?

A. Yes. Our initiatives have reduced BPU complaints by 20% over the past three years.

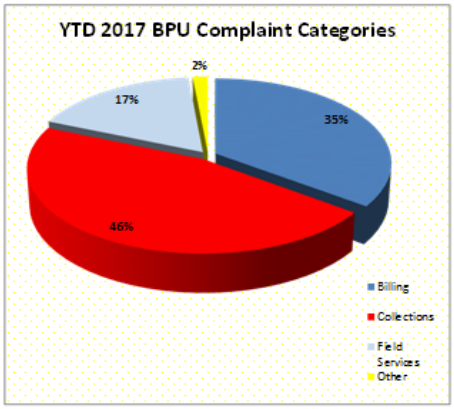
80. Q. What is the Company's 2017 customer satisfaction target?

A. For 2017, NJAWC has raised the Overall Customer Satisfaction target to 87%. See the tables below and provided in Schedule KK-2 for additional information.

NEW JERSEY-AMERICAN WATER COMPANY, INC.

June 2017

# of NJBPU Complaints	Year To Date		
	2017	2016	2015
New Jersey American Water	262	330	321
Central Operations	66	102	96
Belle Mead	16	24	20
Plainfield	50	78	76
North Operations	48	47	40
Short Hills	45	44	36
Washington	3	3	4
Southwest Operations	39	51	55
Delran	39	51	55
Coastal Operations	109	130	130
Fire Road	46	48	45
Lakewood	23	34	35
Shrewsbury	40	48	50
Statewide Sewer	0	0	0



CUSTOMER OUTREACH AND EDUCATION

81. Q. Please describe NJAWC's outreach efforts in the communities it serves.

A. NJAWC customer outreach serves multiple purposes: to provide our customers and community stakeholders important information about their water service, including information about construction projects and main repairs; to educate our customers and community stakeholders about the importance of smart water use and the resulting impact on their communities and environments; and finally, to provide community support, and where appropriate, stewardship, through active involvement in various community-based activities.

In addition to its call center, the Company uses numerous media to inform its customers about their water services, including Facebook, Twitter and the NJAWC website. The virtually instantaneous nature of Facebook and Twitter allows the Company to provide close-to-real time information about work performed in our service territory, so that our communities are informed about the status of local

projects and can plan accordingly. Through these interactive media, NJAWC can also receive information from our customers about the water service in their area and if necessary respond appropriately to this information.

In 2017, NJAWC initiated a "Major Customer" initiative. The essence of the program is to make personal, regular contact with 80 of our largest users to ensure their satisfaction and to provide a single point of contact for issues resolution.

Additionally, we are currently conducting research on the awareness of Legionella within a certain grouping of customers. We are contacting approximately 20 Hospitals and Colleges to survey them and to educate them on the hazards of the Legionella bacteria. Legionella is waterborne microbe that can potentially grow in their plumbing system. In addition to education, we are providing them with actions they can take to minimize the health risk.[3]

82. Q. Please describe NJAWC's community involvement.

A. Throughout its service territory, NJAWC is considered a responsible corporate citizen, known for its volunteerism. Employees are encouraged to actively volunteer in the communities in which they serve. Such activism is focused in the areas of water and the environment; water and healthy living; environmental

[3] The water delivered from our treatment facilities is disinfected to meet all federal and state standards for public health. Legionella can, however, begin to grow within a building's cooling system/towers, water fountains or features, water reservoirs or tanks, water heaters, or spas and pools if the disinfectant dissipates. Legionella becomes a health risk when it proliferates in warm, wet environments, and is then dispersed in water droplets.

education; and community sustainability. These activities have included the following:

- Participating in local beach and river clean ups
- Serving water at local community events and races
- Providing classroom talks and educational tours of facilities about the water treatment and delivery process
- Volunteering at local shelters and soup kitchens to cook, serve and clean up after meals
- Serving on Boards of charitable organizations that provide benefit to our customers that have special financial, physical and support needs.

83. Q. In what other activities has NJAWC partnered locally?

A. NJAWC is environmentally focused and annually offers environmental grants to selected applicants. The Company has administered this program for several years.

In 2017, NJAWC awarded a total of $29,000 to four (4) Environmental Grant winners. The winning projects are as follows:

- The design and construction of a rain park based on the premise of a rain garden that will capture storm water runoff that normally flows directly into the East Branch of the Rahway River.
- Funding Our Water is a class at New Jersey's only TechTrek Camp for girls, in which fifteen (15) students entering 8th grade will participate in a weeklong hands-on environmental science curriculum. It features take-home watershed protection projects that each girl can bring back to her home

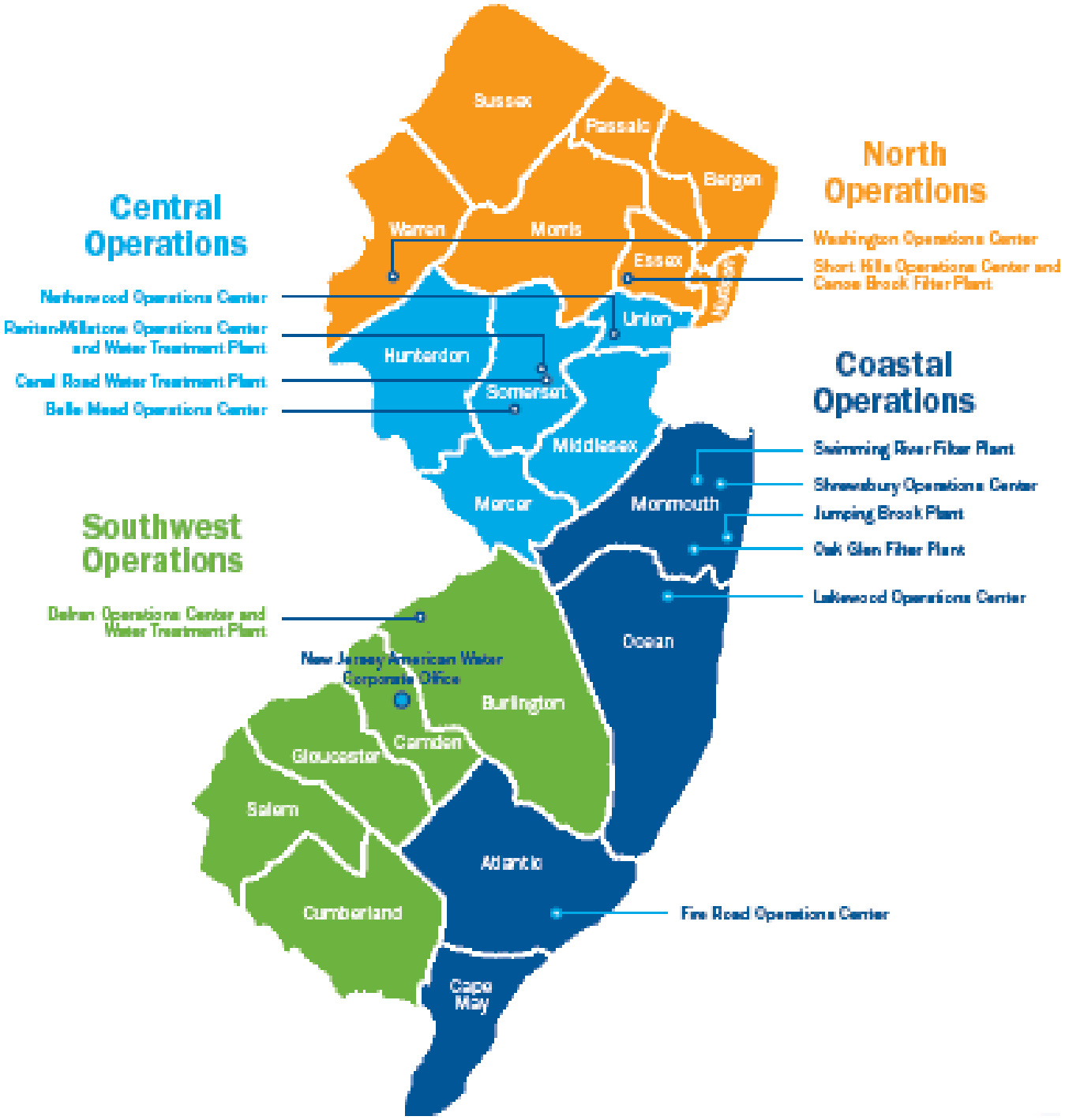
watershed management area, as well as hands-on workshops that will feature a smaller scale take-home project for their watershed management area.

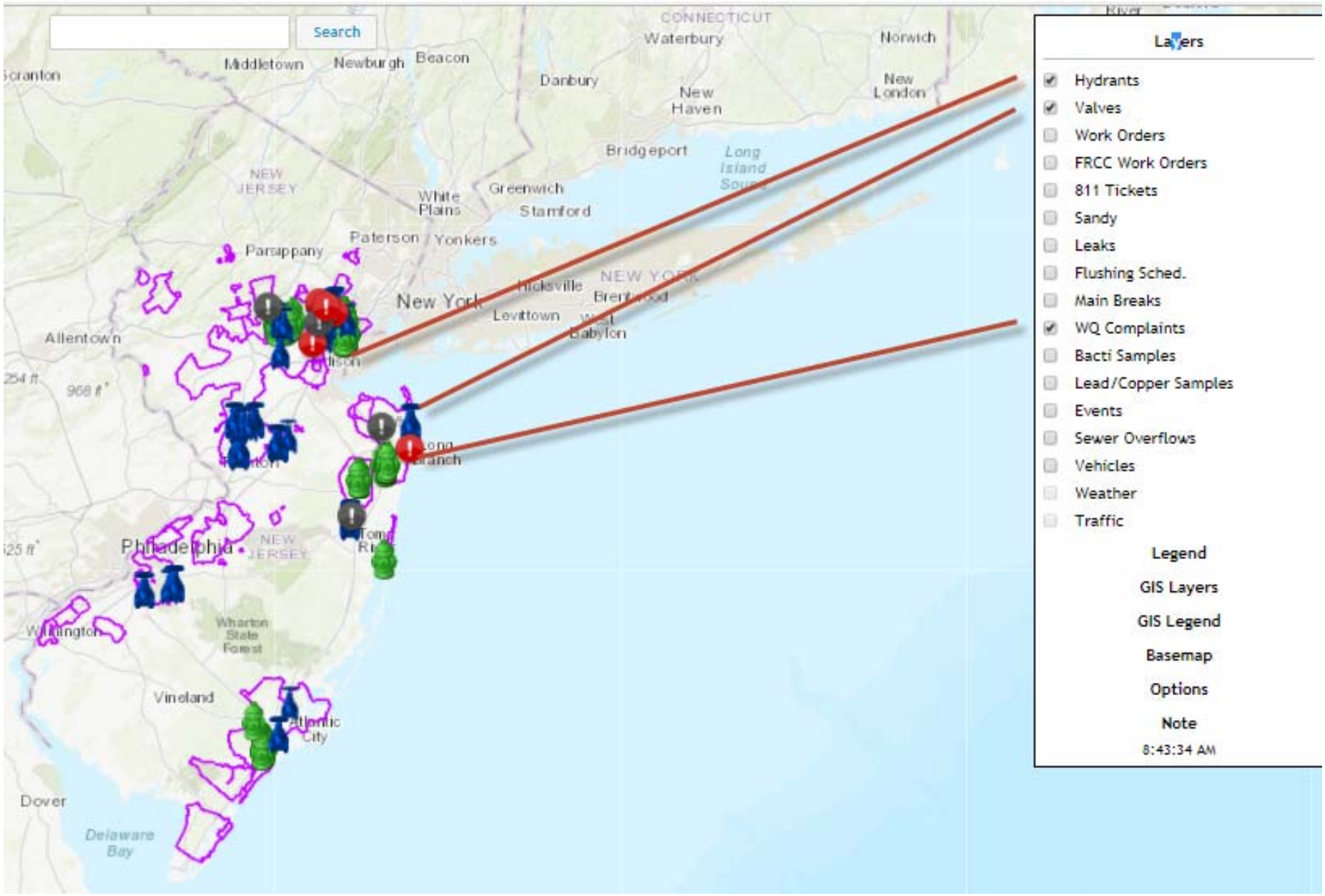
- A year round project aimed at enhancing environmental awareness and stewardship on keeping beaches, parks, coastal waterways and estuaries litter free. This project will label all waste cans on the Manasquan Beach front and beach entrances with "Leave Only Your Footprints" signage.

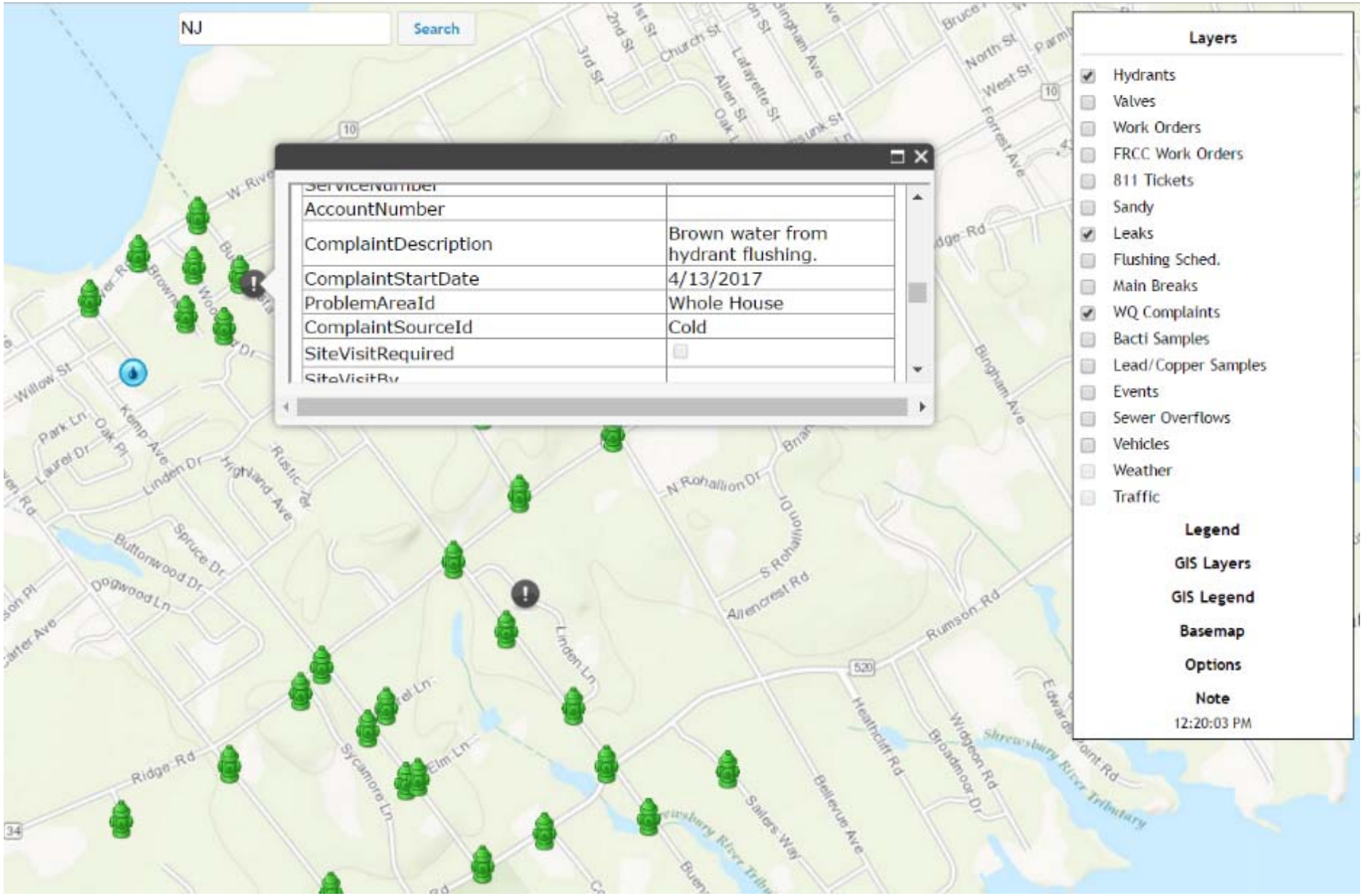
- Installation of a demonstrative native plant garden with bee-friendly habitat and bee-friendly water bath at the Bridgewater Library. Signage posted at the demonstration garden to educate the public. Native bee nests will be integrated into the garden and attendees to the event will have an opportunity to build their own nests and install them at their own homes.

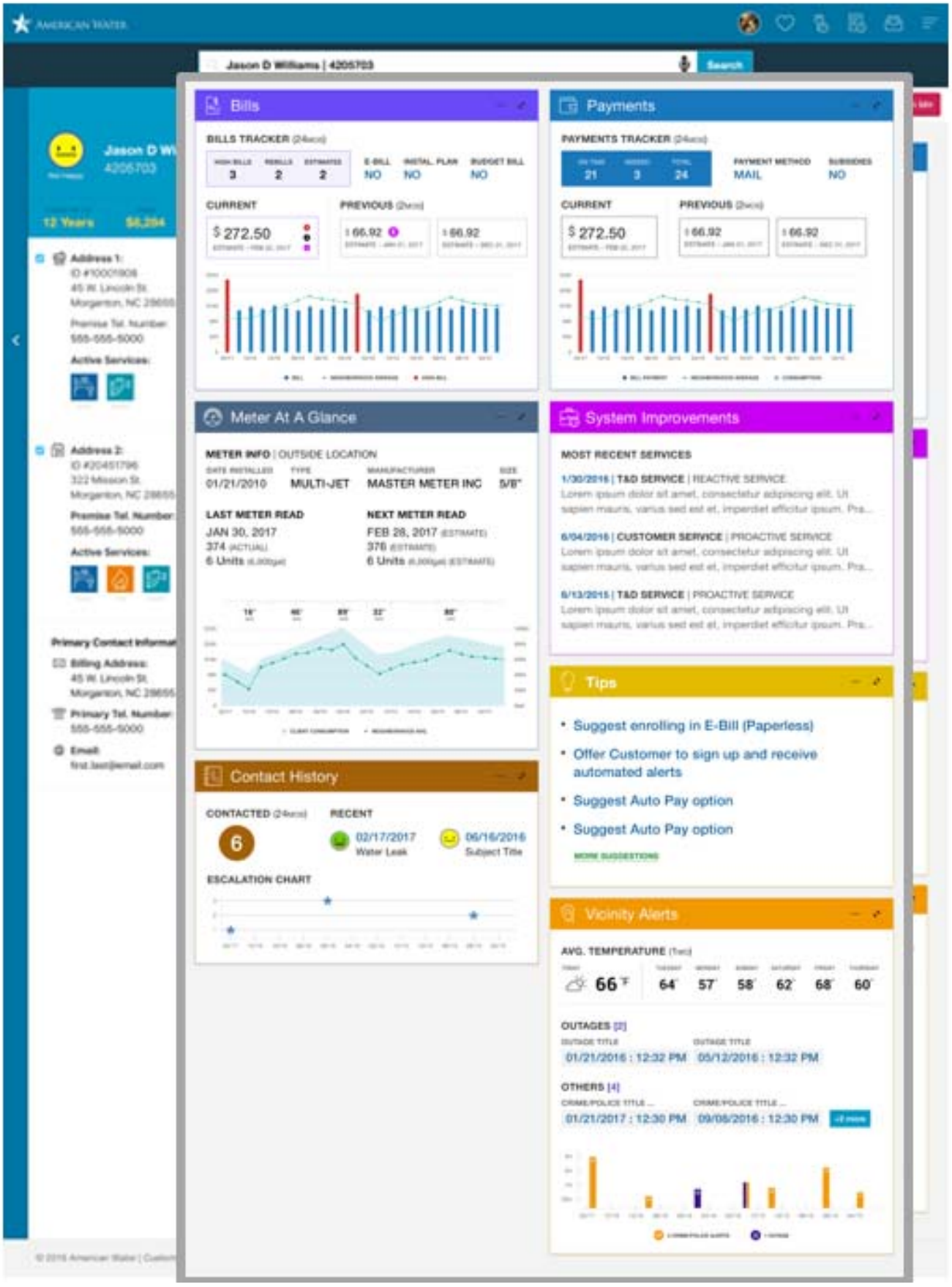
84. Q. Does this conclude your direct testimony?

A. Yes, it does.


North Operations
Washington Operations Center
Short Hills Operations Center and Canoe Brook Filter Plant
Central Operations
Northwood Operations Center
Raritan-Millstone Operations Center and Water Treatment Plant
Canal Road Water Treatment Plant
Belle Mead Operations Center
Coastal Operations
Swimming River Filter Plant
Shrewsbury Operations Center
Jumping Brook Plant
Oak Glen Filter Plant
Lakewood Operations Center
Southwest Operations
Delran Operations Center and Water Treatment Plant
New Jersey American Water Corporate Office
Fire Road Operations Center
Sussex
Passaic
Bergen
Warren
Morris
Essex
Hudson
Union
Hunterdon
Somerset
Middlesex
Mercer
Monmouth
Ocean
Burlington
Camden
Gloucester
Salem
Atlantic
Cumberland
Cape May


Search
Middletown
Newburgh
Beacon
Waterbury
Norwich
Danbury
New Haven
New London
Bridgeport
Long Island Sound
NEW JERSEY
White Plains
Greenwich
Stamford
Paterson
Yonkers
Parsippany
New York
Hicksville
NEW YORK
Levittown
West Babylon
Allentown
Philadelphia
Wharton State Forest
Vineland
Atlantic City
Dover
Delaware Bay
Layers
Hydrants
Valves
Work Orders
FRCC Work Orders
811 Tickets
Sandy
Leaks
Flushing Sched.
Main Breaks
WQ Complaints
Bacti Samples
Lead/Copper Samples
Events
Sewer Overflows
Vehicles
Weather
Traffic
Legend
GIS Layers
GIS Legend
Basemap
Options
Note
8:43:34 AM


NJ
Search
Layers
Hydrants
Valves
Work Orders
FRCC Work Orders
811 Tickets
Sandy
Leaks
Flushing Sched.
Main Breaks
WQ Complaints
Bacti Samples
Lead/Copper Samples
Events
Sewer Overflows
Vehicles
Weather
Traffic
Legend
GIS Layers
GIS Legend
Basemap
Options
Note
12:20:03 PM
AccountNumber
ComplaintDescription
Brown water from hydrant flushing.
ComplaintStartDate
4/13/2017
ProblemAreaId
Whole House
ComplaintSourceId
Cold
SiteVisitRequired
Willow St
Park Ln
Laurel Dr
Oak Pl
Kemp Ave
Linden Dr
Highland Ave
Rustic Ter
Buttonwood Dr
Spruce Dr
Dogwood Ln
Ridge Rd
Sycamore Ln
Elm Ln
Linden Ln
N Rohallion Dr
S Rohallion Dr
Allencrest Rd
Rumson Rd
Bingham Ave
Forest Ave
West St
North St
Church St
Heathcliff Rd
Broadmoor Dr
Widgeon Rd
Bellevue Ave
Sailers Way
Shrewsbury River Tributary


Bills
BILLS TRACKER
CURRENT
PREVIOUS
$ 272.50
Payments
PAYMENTS TRACKER
PAYMENT METHOD
MAIL
SUBSIDIES
NO
Meter At A Glance
METER INFO | OUTSIDE LOCATION
MULTI-JET
MASTER METER INC
LAST METER READ
JAN 30, 2017
NEXT METER READ
FEB 28, 2017
System Improvements
MOST RECENT SERVICES
Tips
Suggest enrolling in E-Bill (Paperless)
Offer Customer to sign up and receive automated alerts
Suggest Auto Pay option
Suggest Auto Pay option
Contact History
CONTACTED
RECENT
02/17/2017
Water Leak
05/16/2016
Subject Title
ESCALATION CHART
Vicinity Alerts
AVG. TEMPERATURE
66 °F
OUTAGES
01/21/2016 : 12:32 PM
05/12/2016 : 12:32 PM
OTHERS
01/21/2017 : 12:30 PM
09/06/2016 : 12:30 PM

June 2017

# of NJBPU Complaints	Year To Date		
	2017	2016	2015
New Jersey American Water	262	330	321
Central Operations	66	102	96
Belle Mead	16	24	20
Plainfield	50	78	76
North Operations	48	47	40
Short Hills	45	44	36
Washington	3	3	4
Southwest Operations	39	51	55
Delran	39	51	55
Coastal Operations	109	130	130
Fire Road	46	48	45
Lakewood	23	34	35
Shrewsbury	40	48	50
Statewide Sewer	0	0	0