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October 8, 2021

***Hand Delivery***
Ms. Luly Massaro, Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

***Re: Providence Water Supply Board – Docket 4994***

Dear Ms. Massaro:

Enclosed herewith please find an original and nine copies of the following document:

1. Direct Testimony of Michael R. Maker on behalf of the Bristol County Water Authority.

Please be advised that an electronic copy of this document has been sent to the service list. Thank you for your attention to this matter.

Sincerely,

Joseph A. Keough, Jr.

JAK/kf
Enclosures

cc: Service List (via email)

STATE OF RHODE ISLAND

PUBLIC UTILITIES COMMISSION

# DIRECT
# TESTIMONY
# of

MICHAEL R. MAKER

NEWGEN STRATETGIES AND SOLUTIONS, LLC

ON BEHALF OF

THE BRISTOL COUNTY WATER AUTHORITY

IN RE:

PROVIDENCE WATER SUPPLY BOARD

COST OF SERVICE STUDY COMPLIANCE FILING

DOCKET 4994

OCTOBER 8, 2021

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## I. INTRODUCTION

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

A. My name is Michael R. Maker. My business address is 911-A Commerce Road, Annapolis, Maryland 21401.

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

A. I am an Executive Consultant with NewGen Strategies and Solutions, LLC ("NewGen"), an economic and management consulting firm that focuses on municipal utilities, especially water, wastewater, solid waste, and stormwater.

## II. EXPERIENCE

**Q. Please describe your qualifications and experience.**

A. I have a Bachelor of Arts degree in Economics from the University of Rochester in Rochester, New York and a Master of Business Administration degree in Finance from Loyola University in Baltimore, Maryland. After graduating from the University of Rochester in 2003, I was employed by the Municipal & Financial Services Group, LLC ("MFSG"), a financial and management consulting firm specializing in water and wastewater rate studies. I worked for MFSG until the firm merged with NewGen in July 2019. I also earned my MBA (graduating with honors as a member of the Beta Gamma Sigma Honor Society in 2012) from Loyola University while working at MFSG. Over my 18 plus year career, I have developed more than 100 cost of service study ("COSS") and rate study models on both cash flow and utility bases involving rate and fee design, performed organizational and staffing reviews and conducted benchmarking and customer impact analyses for water, wastewater, stormwater, and solid waste utilities. My resume is attached hereto as Exhibit 1.

**Q. Do you belong to any professional organizations or committees?**

A. Yes, I am a member of the American Water Works Association (AWWA), the Chesapeake chapter of the American Water Works Association (CSAWWA), the Virginia chapter of the American Water Works Association (VA AWWA), the Water Environment Federation (WEF) and the Government Finance Officers Association (GFOA). I am a current member of AWWA's Finance, Accounting and Management Controls (FAMC) Committee and AWWA's Workforce Strategies Committee (as well as a member of the Committee's Veterans Affairs subcommittee). I have also presented papers at various conferences, including the AWWA Annual Conference & Exposition (ACE), the Chesapeake AWWA Tri-Association Conference (Tri-Con), the Virginia AWWA WaterJAM Conference, the Water Asset Management Conference, the Maryland GFOA Conference, the New York State GFOA Conference, the Long Island Water Conference and the Virginia Lakes and Watersheds Association. I am also a contributing author and editor for the upcoming 5th edition of AWWA's Manual M29, *Water Utility Capital Financing* and 4th edition of AWWA's Manual M5, *Water Utility Management.*

**Q. Are you the same Michael Maker who provided direct and surrebuttal testimonies on behalf of the Bristol County Water Authority in this Docket?**

A. Yes, I am.

## III. SUMMARY

**Q. On whose behalf are you testifying?**

A. I am testifying on behalf of the Bristol County Water Authority ("BCWA") regarding the April 1, 2021 compliance filing submitted to the Rhode Island Public Utilities Commission ("Commission") by the Providence Water Supply Board ("Providence") in

Docket 4994. This compliance filing addresses the cost of service study approved by the Commission in Docket 4994 (referred to in Harold Smith's testimony as the Amended Settlement Agreement Cost of Service Study or "ASA COSS"). As part of the Commission's Order in this Docket, Providence was required to submit a revised cost of service study ("Revised COSS") to the Commission for further review.

**Q. What is the purpose of your testimony in this case?**

A. The purpose of my testimony is to provide my opinion of, and suggested amendments to, the Revised COSS submitted by Providence and to recommend certain changes. My testimony will primarily focus on issues with the methodology, assumptions and analysis used in the Revised COSS and the impact of these issues on the proposed wholesale rates for the BCWA and other wholesale customers.

**Q. Can you provide an overview of your direct testimony?**

A. Yes. In Docket 4994, the BCWA advocated for individual wholesale rates, which Providence opposed. After a contested hearing, the Commission ordered the implementation of individual wholesale rates. (See Order No. 23928). In its Order, the Commission directed Providence to implement individual wholesale rates while employing the principle of "gradualism." In particular, the Commission's Order stated:

"3. Providence Water Supply Board's proposal for uniform wholesale rates is rejected.

4. Providence Water Supply Board is ordered to implement individual wholesale rates in year one which are determined by inputting the individual peaking factors used in the Amended Settlement Agreement to establish the revenue requirement, but

moving only one-third of the way from the Settlement rates, as amended by the Commission at Open Meeting on August 18, 2020, to the results of that calculation."

In addition, the Commission ordered Providence to do the following in the Revised COSS:

- Address the Transmission & Distribution Labor, Central Operations and Non-Revenue Water Allocations with data that firmly supports the allocators chosen.

- Apply cost allocations for pumping and unidirectional flushing costs based upon the benefits received by each wholesale customer.

While changes to the model have been made to address each of the five issues, the BCWA questions the validity of some of the methodologies employed. In particular, Providence changed the rate units to address some of these issues, which was not ordered by the Commission.

In the ASA COSS, certain costs were allocated between CTA ("Common to All") and Retail Only based on percentage of pipe classified as CTA and Retail by Inch-Miles (40% of Inch-Miles were allocated to Transmission [pipes with diameters greater than 12 inches] and 60% of Inch-Miles were allocated to Distribution [pipes with diameters 12 inches or less]), and then Providence incorporated the volume of water used in hundred cubic feet ("HCF"). In the revised COSS, Providence continues to use HCF and peaking factors for all cost allocations and the units "CTA - Supply, Treatment & Low Service" and "High Service & Retail." However, the units for "CTA – Transmission & Distribution" are based on data from the hydraulic model. Thus, in the Revised COSS, the allocation of units that used to be classified as CTA [allocated based on HCF] was split into the following:

- "CTA - Transmission & Distribution" [allocated based on Inch-Miles]

- "CTA - Supply, Treatment & Low Service" [allocated based on HCF]
- "High Service & Retail" [allocated based on HCF]

Essentially, to calculate T&D unit rates, Providence replaced the Retail and Wholesale customer units of volume of water (HCF) and peaking factors with "draw rates" and "inch miles" of pipes used from the hydraulic model. The Commission did not order Providence to make this change in its Docket 4994 Order.

As explained in more detail below, the use of hydraulic modelling data is not specifically set forth in the American Water Works Association (AWWA) Manual M1, *Principles of Water Rates, Fees, and Charges (*7th Edition) ("M1 Manual") as a means to calculate T&D unit costs in the manner Providence has used this data. Furthermore, it does not appear that hydraulic modeling data has ever been used to calculate T&D unit costs in this jurisdiction. As such, the BCWA continues to advocate for individual wholesale rates using the Base-Extra Capacity methodology set forth in the M1 manual based on readily available and undisputed peaking factors.

## IV. DOCKET 4994 AND PROVIDENCE'S COST OF SERVICE STUDY HISTORY

**Q. Can you provide an overview of Providence's recent history in developing a cost of service study?**

A. Yes. In 2017, the Commission ordered Providence to "complete and submit a new cost of service study conducted without reference to previously used Commission allocators" in its next general rate filing. (See Docket 4618, Order No. 23666) Providence submitted its next general rate filing to the Commission on December 2, 2019 (Docket 4994). In that filing, Providence requested a multi-year increase over a three year period. The cost of service study Providence submitted with its Docket

4994 rate filing contained a single wholesale rate charged to each of Providence's seven wholesale customers. Despite the Commission's Docket 4618 Order, Providence continued to calculate a single wholesale rate "to be consistent with prior rate filings and Commission approvals." (See Docket 4994, Providence Response to DIV. 4-5). As the Commission ultimately found, Providence's Docket 4994 COSS "was not consistent with the intent of the Commission's directive" in Docket 4618. (See Docket 4994 Order, p. 28)

**Q. Did the BCWA agree that a single wholesale rate should be implemented as part of Providence's cost of service study in Docket 4994?**

A. No. As noted in my Docket 4994 direct testimony, historically, and as acknowledged by Providence, the single wholesale rate had not been based on the cost of providing wholesale service. As far back as 2007, Harold Smith testified:

"The disparity between the increases to wholesale rates and retail rates is most likely due to the fact that the wholesale rate increases that were agreed to by the parties to Providence Water's recent abbreviated filings were not based on a complete cost of service study and did not reflect the true cost associated with providing wholesale service." (Harold Smith Direct Testimony, Docket 3832, p. 8-9)

**Q. What methodology did Providence use in its Docket 4994 COSS?**

A. Providence used the Base-Extra Capacity Method, which is set forth in the M1 Manual. As Harold Smith stated in his Docket 4994 direct testimony:

"Under this approach, costs are primarily allocated on peak demand, both on a maximum day and maximum hour basis…The Base Extra-Capacity Method assigns costs to users in proportion to both their average day demands and their extra capacity demands. For example, costs which are incurred to provide maximum day service are allocated to users in proportion to their maximum day usage above and beyond their average day usage. This approach recovers extra capacity costs from customers whose extra capacity demands drive the need for a large water system." (Harold Smith Docket 4994 Direct, p. 14 -15)

**Q. Did the BCWA object to this methodology?**

A. No. The M1 Manual sets the industry standard for generally accepted ratemaking principles, and the Base-Extra Capacity method is one of two of the most widely recognized and accepted methods of allocating water utility costs to customers (the other being the Commodity-Demand Method).

**Q. Then why did the BCWA object to Providence's original COSS in Docket 4994?**

A. The BCWA objected because Providence's original COSS did not follow the M1 principles for calculating individual wholesale rates.

**Q. How so?**

A. As Harold Smith stated in Docket 4618, the standard M1 Base-Extra Capacity method allocates certain costs to the wholesale customers based on their individual peaking characteristics.

> "It is important to note that the use of the standard approach would dictate the need for separate and different rates for each wholesale customer since it is likely the peaking characteristics of each individual wholesale customer are different than the peaking characteristics of the class as a whole." (See Docket 4618, Providence Response to Division 4-5)

However, Providence did not use each wholesale customer's individual peaking factors to calculate individual wholesale rates. Rather, it used average peaking factors for the entire wholesale customer group to calculate a single wholesale rate.

**Q. Can you describe the peaking factors you are referencing?**

A. Yes. The M1 Manual defines a peaking factor as "the ratio of the peak rate of demand over a specified period of time (hour, day, etc.) to the average annual rate of demand for a particular customer, customer class, or system." (See p. 405) For

example, in Docket 4994, Providence provided an Excel spreadsheet in response to a data request from the Division of Public Utilities and Carriers ("Division") called "DIV 2-2 and 2-7 Wholesale Dmd and Class Demand Factors", which set forth peaking factors for each of the wholesale customers. This spreadsheet showed that the BCWA's average-day demand in FY 2019 was 3.07 MGD (average of all 365 daily usages from July 2018 through June 2019), while the BCWA's maximum-day demand in FY 2019 was 4.81 MGD (the highest daily usage of all 365 daily usages from July 2018 through June 2019). This resulted in a FY 2019 maximum-day peaking factor of 1.57. The spreadsheet also showed that the BCWA's maximum-hour demand in FY 2019 was 5.76 MGD (the highest hourly usage of all 8,760 hourly usages [24 hourly usages x 365 days] from July 2018 through June 2019). This resulted in a FY 2019 maximum-hour peaking factor of 1.88.

**Q. What role do peaking factors play in a cost of service study, and why are they important?**

A. The predominant role of a cost of service study is to allocate a utility's costs to the customers who cause those costs to be incurred. In order to meet peak demand, a utility must incur costs beyond what it would need to just meet average demand. Peaking factors equitably allocate the costs of additional capacity to those customers with peak demand. Furthermore, a customer with a high peaking factor is a less efficient customer and one that requires the utility to invest in excess capacity.

The M1 Manual states that "Rate-making endeavors to assign costs to classes of customers in a nondiscriminatory, cost-responsive manner so that rates can be designed to closely meet the cost of providing service to such customer classes." (p. 73) In order to equitably distribute the extra cost components related to peak

demand to the utility's various customers as part of a cost of service study, it is especially important to assign those costs using diverse peaking factors.

As I pointed out in my Docket 4994 testimony, each of Providence's wholesale customers should be treated individually because each has different usage and peaking characteristics, like that of a retail customer class (e.g., residential, commercial, and industrial).

**Q. How do peaking factors affect rates?**

A. Peaking factors allocate units of service to the additional costs required to serve peak demands that are in excess of average day demands. Dividing calculated costs by units of service results in a unit rate. All things being equal, a customer with a higher peaking factor would equitably pay a higher rate than one with a lower peaking factor.

**Q. Do all utilities have the type of data required to calculate peaking factors?**

A. No. As set forth in AWWA M1 Manual, p. 365:

"Customer class demand data are extremely beneficial to the rate practitioner in cost-of-service allocations and in designing rates. Very few water utilities have this type of information. To develop maximum-day and maximum-hour demand data on a customer or customer class basis can require significant financial resources."

Providence *does* have this data, and as set forth in my original Docket 4994 testimony, it should be used to calculate individual rates for the wholesale customers as set forth in the M1 Manual.

**Q. How did the Commission's Order address the BCWA's request for individual wholesale rates in Docket 4994?**

A. The Commission ordered Providence to implement individual wholesale rates by incorporating each individual wholesale customer's peaking factors into Mr. Smith's Base-Extra Capacity COSS rate model. However, the Commission was mindful that individual wholesale rates would impact some customers more significantly than others. As such, the Commission ordered that the individual wholesale rates produced by Mr. Smith's COSS rate model, using individual peaking factors, be implemented "based upon the principle of gradualism…" (Docket 4994 Order, p. 32)

> "Specifically, Providence Water shall move to individual wholesale rates in two steps. The first step occurs in year one, followed by a second step for year two. In year one, individual wholesale rates shall be calculated by allocating costs to each wholesale customer based upon the individual peaking factors used in the Amended Settlement. However, the rate shall be established by moving only one-third of the way from the Amended Settlement rates, using the first-year revenue requirement as established by the Commission by this order." *Id.*

In addition, because Providence argued that the implementation of individual wholesale rates would miss "nuances" that should be addressed, the Commission ordered Providence to submit a revised COSS by February 18, 2021. This deadline was later extended to April 1, 2021.

**Q. Did the BCWA have any other objections to Providence's proposal for a single wholesale rate?**

A. Yes. As the BCWA pointed out, a single wholesale rate was inconsistent with previous Base-Extra Capacity cost of service studies prepared by Harold Smith. In particular, Mr. Smith had prepared cost of service studies using the Base-Extra Capacity method for the City of Newport, Utilities Department, Water Division ("Newport Water").

These cost of service studies calculated individual rates for Newport Water's wholesale customers – the Portsmouth Water and Fire District and the U.S. Navy – using those customers' peaking factors.

**Q. Did the BCWA have any other objections to Providence's COSS in Docket 4994?**

A. Yes, the BCWA had the following additional objections:

1. The BCWA objected to the allocation of Transmission and Distribution Labor Costs because the BCWA is supplied by 30" and larger transmission mains and work on pipes of this size is usually performed by third party contractors, not Providence's employees. In fact, Providence confirmed during Docket 4994 that its employees only spent five percent of their time on large transmission mains in FY2019.

2. The BCWA objected to Providence allocating 10% of Commercial Services to Wholesale Customers at the Central Operations Facility ("COF") because there was no evidence to support this allocation.

3. The BCWA objected to the allocation of Non-Revenue Water to the wholesale customers. Providence's initial filing did not assign any non-revenue water for Water Quality and Other Testing to wholesale customers. Then, in response to a Division data request, Providence indicated it would assign a portion of this non-revenue water to the wholesale customers. In Providence's rebuttal testimony, it assigned 47.4% of this non-revenue water to wholesale customers. However, Providence did not provide any rationale for this allocation.

4. The BCWA objected to pumping costs being allocated to the BCWA because it is gravity fed (as are East Providence, Warwick, and the Kent County Water Authority ("KCWA")), which does not require Providence to pump water. Only Greenville, Lincoln, and Smithfield require the use of pumps.

5. The BCWA objected to the allocation of unidirectional flushing costs. Providence allocated these costs to all wholesale customers because it flushes all mains in the system that are 12 inches and below, and some wholesale customers are fed by 8 inch and 12 inch mains. As stated earlier, BCWA is fed by a 30" and larger transmission main. BCWA does not take at the level of service related to unidirectional flushing and should not be allocated any of these costs.

**Q. Did the Commission's Docket 4994 Order address these five objections?**

A. Yes, with respect to issues 1 through 3, the Commission ordered that Providence's Revised COSS "must address these allocations with data that firmly supports the allocators chosen" and for issues 4 and 5, the allocations must be based upon the benefits received by each wholesale customer.

## V. PROVIDENCE'S REVISED COSS – BCWA'S FIVE ISSUES

**Q. Does Providence's Revised COSS address the five issues raised by the BCWA regarding cost allocations?**

A. Yes. According to Mr. Smith, Providence revised four of the allocations – T&D Labor, COF, Non-Revenue Water, and Unidirectional Flushing – with data from a hydraulic model prepared by Pare Corporation ("Pare"). For the reallocation of Pumping Costs, Providence did not use the hydraulic model data.

**Q. Let's start with the Pumping Costs Allocation, which does not incorporate the hydraulic modelling data. Is this revision reasonable?**

A. Yes, it appears to be. Mr. Smith distinguished between wholesale customers who do not require pumping, which he refers to as "low service customers" (BCWA, East Providence, KCWA, and Warwick), and customers who require pumping, which he refers to as "high service customers" (Retail, Fire Protection, Greenville, Lincoln, and Smithfield). Pumping costs are only assigned to the high service customers, which the BCWA finds reasonable.

**Q. You indicated that the remaining four allocators were revised with data from a hydraulic model. Can you explain how this was done?**

A. Yes. Providence revised the allocation of T&D Labor, COF, Non-Revenue Water and Unidirectional Flushing costs as follows:

**Transmission and Distribution Labor Cost Allocation**

Providence's Revised COSS did not just change the allocation of T&D Labor costs. Rather, Providence revised the way it allocates T&D unit costs using hydraulic modeling data as set forth in more detail in the next section of my testimony. This appears to be a drastic measure for addressing this issue, and it results in a drastic recalculation of wholesale rates.

**Central Operations Facility Allocation**

In Mr. Smith's Revised COSS, he allocated the Central Operations Facility costs based on the percentage of wholesale customer billing cycles (1) to total billing cycles (15). Mr. Smith claims that "While Providence's wholesale customers only represent a small portion of the total, greater effort is required to test and read their meters, generate bills and process payment." (Smith Compliance Direct, p. 10) Mr. Smith does not explain why this is so, and it seems unreasonable that seven wholesale customers would require greater effort than 78,000 retail customers. This results in a 6.7% allocation of the Commercial Services square footage to Wholesale Customers. He then multiplies this by the total square feet of Commercial Services to get the square feet of Commercial Services attributed to Wholesale. He then divides this number by the percentage of Inch-Miles that are Wholesale to produce the number of square feet that should be CTA. His calculation in the new model actually ends up allocating 5,089 square feet to CTA, whereas the ASA only allocated 2,342 square feet. This

calculation results in more square footage being allocated to CTA than in the ASA, even though Mr. Smith states the allocation is 6.7% as opposed to 10%. However, the dollar difference is minimal. So, while the BCWA does not support the use of hydraulic modeling data, it does not plan to challenge this revised allocation.

**Non-Revenue Water Allocation**

In Mr. Smith's Revised COSS, he allocated the volume (in HCF) required for "Water Quality - Aqueduct Reservoir" to Retail and Wholesale customers based on their individual percentage of total annual sales (in HCF). He allocated the volume required for "Main Flushing/System Maintenance" to Retail and Wholesale customers based on their individual percentage of miles of pipe with a diameter less than or equal to 12 inches from the hydraulic model. He also allocated the volume of "Real Losses (Leakage)" to Retail and Wholesale customers based on their individual percentage of base pipe length (in miles) from the hydraulic model. The remaining Non-Revenue Water volumes were allocated entirely to Retail customers. While the BCWA does not support the use of hydraulic modeling data, it does not plan to challenge this revised allocation.

**Unidirectional Flushing Cost Allocation**

While Mr. Smith does not appear to detail how the unidirectional flushing cost allocation was reallocated in his direct compliance testimony, a review of his schedules indicates that expenses of $1,216,688 and $80,512 within the "Transmission + Dist. Expense" revenue requirement group have been deducted from the Base, Max Day, and Max Hour categories of "CTA - Transmission & Distribution" and added to the Base (Inch-Miles <=12") category. This allocates unidirectional flushing costs to Retail and Wholesale customers based on their individual

percentage of miles of pipe with a diameter less than or equal to 12 inches. While the BCWA does not support the use of hydraulic modeling data, it does not plan to challenge this revised allocation.

**Q. Is the hydraulic modeling data used to revise these four allocations accurate?**

A. I cannot say for certain because hydraulic modeling is not within my area of expertise, but I do have a number of reservations about Providence's use of hydraulic modeling data in its Revised COSS as addressed in more detail below. Further, it is my understanding that Providence has the burden of demonstrating that the hydraulic modeling and resulting data are accurate and appropriate for use in its Revised COSS.

## VI. PROVIDENCE'S REVISED COSS – HYDRAULIC MODELING AND ADDITIONAL CHANGES

**Q. You indicated above that Providence used hydraulic modeling data to calculate T&D unit costs. Can you explain how this was done?**

A. Yes, the hydraulic model appears to have been used as follows:

- Pare Corporation (Pare) modeled three demand scenarios (average day demand [ADD], maximum day demand [MDD], and maximum hour demand - which Pare refers to as peak hour demand [PH]) for Providence's transmission and distribution (T&D) pipe network in order to determine which pipes are utilized by wholesale customers.

- The result of this hydraulic modeling was three tables showing the number of inch-miles of T&D pipe by diameter of pipe and customer (Retail and each Wholesale customer). The three tables can be found on Schedule "HJS-13c Inch-Miles" in the Revised COSS as follows:

- Table one, labeled “Inch-Miles (Base Demand)”, represented average day demand (based on May 24, 2018)
- Table two, labeled “Inch-Miles (Maximum Day Demand)”, represented maximum day demand (based on July 13, 2016)
- Table three, labeled “Inch-Miles (Maximum Hour Demand)”, represented peak hour demand (also based on July 13, 2016).

- The total inch-miles for each customer of these three tables were then linked to Schedule “HJS-16a-c Units”. This resulted in totals for four categories:
  - Base inch-miles
  - Maximum Day inch-miles
  - Maximum Hour inch-miles
  - Base inch-miles for diameters less than or equal to 12 inches (<=12”)

- On Schedule “HJS-16a-c Units” [Customer Class Units of Service], the total inch-miles were allocated as follows:
  - Retail: Total inch-miles were allocated to the Residential, Commercial, Industrial, Private Fire Protection, Public (Providence) Fire Protection, and Public (All Other) Fire Protection subclasses based on the intraclass allocation of demand (Rate Year Sales plus Non-Revenue Water in HCF for base demand and HCF/d for max day demand and max hour demand).
  - Wholesale: Total inch-miles were already broken down for each Wholesale customer, so there was no need to further allocate inch-miles to subclasses (like that of Retail).

- The total inch-miles for each customer (Wholesale and Retail subclasses) were then linked to Schedule “HJS-16d Units” [Summary of Customer Class Units of Service].

- The total inch-miles for each customer (Wholesale and Retail subclasses) from Schedule "HJS-16d Units" were then linked to and used for the following:
  - Schedule "HJS-13g COF" [Central Operations Facility Square Footage for Allocation of COF Net Plant In Service (Factor 27)]: Used to allocate Commercial Services Square Footage.
  - Schedule "HJS-17 Unit Cost" [Unit Cost of Service]: Unit costs of service for "CTA - Transmission & Distribution" (common to all transmission and distribution costs) were calculated by dividing total expenses for various categories (O&M, Capital, City Services, Property Tax, and Net Op Rev Allowance) by total inch-miles for Base, Max Day, and Max Hour and total inch-miles <=12" for Base.
  - Schedule "HJS-18 Class COS" [Customer Class Cost of Service]: The units of service for "CTA - Transmission & Distribution" were multiplied by the total unit cost of service (from Schedule "HJS-17 Unit Cost") to produce total cost of service for each customer (Wholesale and Retail subclasses).
  - Schedule "HJS-19 Volume" [Development of Volumetric Rates]: As done on Schedule "HJS-18 Class COS", the units of service for "CTA - Transmission & Distribution" were multiplied by the total unit cost of service (from Schedule "HJS-17 Unit Cost") to produce total cost of service for each customer (Wholesale and Retail subclasses). These total costs were then divided by rate year sales (from Schedule "HJS-15a Vol.") to produce proposed volumetric rates for FY 2022 for each customer (Wholesale and Retail subclasses).
- The proposed volumetric rates for FY 2022 from Schedule "HJS-19 Volume" were then linked to and summarized on Schedule "HJS-22b RatesMan" (Proposed Rates). They were then used to show proposed revenue for FY 2022, percent change in proposed FY 2022 rates over existing FY 2021 rates and to calculate proposed FY 2023 rates, proposed revenues for FY 2023, and percent change in proposed FY 2023 rates over proposed FY 2022 rates.

**Q. How did this affect individual wholesale rates?**

A. This new methodology dramatically changes the individual wholesale rates that resulted from the ASA COSS methodology approved by the Commission and causes wide disparities for several reasons, including the following:

- The number of Inch-Miles for Base, Max Day, and Max Hour assigned to each wholesale customer. This can be seen on Schedule "HJS-19 Volume":
    - For example, KCWA receives the biggest decrease in its rate because according to the hydraulic modeling data, the water supplied to the KCWA only touches a very small number of inch-miles (average of 28). This results in very low T&D costs.
    - The T&D unit cost for Max Hour is highest ($976 per Inch-Mile), so a wholesale customer with a substantial number of Max Hour Inch-Miles will see a higher cost. The unit cost for Base is next highest ($776 per Inch-Mile), followed by Max Day ($594 per Inch-Mile).
- The percentage of total costs that are related to T&D (Inch-Miles) allocated to each wholesale customer. This is related to the prior bullet. For example, the T&D costs for Smithfield represent 42% of its total costs, with the rate increase for Smithfield projected to be 51%.
- Low sales volume (in HCF) appears to compound the issues in the previous bullets. A large number of Inch-Miles multiplied by high T&D costs results in a high total cost. Dividing that by a low amount of annual volume (per HCF) results in a high volume rate per HCF. For example, the T&D costs for Greenville (which is projected to see a 16% rate increase) represent 26% of its total costs. Greenville's volume is the second lowest of all wholesale customers (behind Smithfield), so this results in a high volume rate per HCF. Providence's PowerPoint presentation at the May 4, 2021 Technical Session seems to confirm this as it noted: "Impacts [are] driven by [the] amount of T&D infrastructure [that is] used relative to [the] amount of water delivered."

- High Service & Retail costs. Greenville, Lincoln, and Smithfield each have High Service & Retail (HSR) costs as they require pumping. This adds costs, but not a great deal.

## VII. RATES BASED ON HYDRAULIC MODELLING DATA

**Q. Should the rates in the Revised COSS based on hydraulic modeling data be implemented?**

A. Not in their entirety. As set forth above, the revised allocations for the Central Operations Facility, Non-Revenue Water, and Unidirectional Flushing are based on hydraulic modeling data. While I do not necessarily accept the methodology or use of hydraulic modeling data, the resulting revisions appear to be within the range of reasonableness, and the BCWA does not plan to challenge the end result. However, I do not believe that T&D unit costs should be reallocated using hydraulic modeling data as proposed by Providence.

**Q. Why not?**

A. There are several reasons, which I will address in more detail below:

1. The hydraulic model is a "snapshot in time" and is based on only two days over a three-year period. As such, it likely does not represent how each individual wholesale customer uses Providence's system during their respective max days and max hours.

2. The use of hydraulic modeling data to allocate T&D units is not specifically set forth in the M1 Manual as a means to calculate T&D unit costs in the manner Providence has used this data.

3. This methodology has never been used in this jurisdiction or any other jurisdiction that I am aware of, and, to my knowledge, Mr. Smith has never previously employed the use of such a methodology.

4. This methodology results in a drastic recalculation of wholesale rates, with much wider disparities between the seven wholesale customers.

5. There may be flaws in the data.

**Hydraulic Model – Snapshot In Time**

**Q. Why did Providence use hydraulic modelling data in the revised COSS?**

A. According to Harold Smith:

"So starting out here we were directed to develop individual wholesale rates for the wholesale customers, and recognized that the primary differentiator between the cost to serve these different wholesale customers is how they use the transmission and distribution system. So we talked to Providence Water and we talked to Pare and said can you do a hydraulic model that tells us which assets, which pieces of pipe each customer uses on an average day, on a max day and on a peak hour because we wanted -- that would allow us to assign the costs associated with the pipe that's used to the customer that's using it. And so Pare did their hydraulic model and told us how many inch-miles of pipe each wholesale customer used on an average day, on a max day and on a max hour and we used those inch-miles to allocate the T&D costs, and I think we need to go to the next slide to -- well, we used the hydraulic -- we used the data from the hydraulic model, the inch-miles of pipe to allocate costs to each customer based on how many inch-miles of pipe they use." (Technical Session Transcript p.107, l.7 to p. 108, l. 8)

**Q. How did Pare choose the average day, max day and max hour?**

A. According to Providence Water's response to BCWA's Data Request 12-17, "For the development of the hydraulic model, Pare reviewed production and consumption records for the years 2016, 2017, and 2018." Given that 2016 was a leap year, this equates to 1,096 days. Of those 1,096 days, Pare ran its hydraulic model based on two days: May 24, 2018 for average day and July 13, 2016 for both maximum day and maximum hour.

The problem is these dates represent the average day, max day, and max hours for Providence's *entire* system. They are not the average day, max day, and max hours for each individual wholesale customer. As such, it is not evident that two days of Providence Water's entire system demand equates to how each individual wholesale

customer uses the system under each wholesale customer's actual average day, max day, and max hour. If Pare were to run its model on each wholesale customer's average and max day and max hour, the pipes that each customer touches and the amount of water attributable to each wholesale customer could change. For example, it is possible that Bristol County and Lincoln could respectively use 30% and 20% of a specific pipe segment one day and then vice versa the next day.

**Q. Why is this a problem?**

A. As set forth in my testimony above, the predominant role of a cost of service study is to allocate a utility's costs to the customers who cause those costs to be incurred. In order to meet peak demand, a utility must incur costs beyond what it would need to just meet average demand. Individual peaking factors that represent each wholesale customer's average day, max day, and max hour equitably allocate the costs of additional capacity to those customers with peak demand. The hydraulic modeling data is not derived from each wholesale customer's average day, max day, and max hour. The hydraulic modeling data is derived from the average day, max day, and max hour of Providence's system as a whole.

**Q. Were these issues addressed at the May 4, 2021 Technical Session in this matter?**

A. Yes, and as the Technical Session made clear, the average day, max day, and max hour for Providence's entire system may not match the average day, max day, and max hour for each wholesale customer's system:

"MR. NAULT: Mr. Thies, this is Alan again. I think I do. What you just explained makes sense to me at a point in time. But let's say for the sake of argument you've got two wholesale customers who are interconnected who are interconnected to the same pipe and at two o'clock in the afternoon let's say Bristol County and East Providence each might be drawing 50 percent of this flow from that

pipe, but an hour from now it could be 60/40, 70/30, so it can vary over time. How does the model take into account those varying flow rates over time?

MR. THIES: So modeling in general is -- utilizes a lot of averaging, okay? So we did this analysis over what's called a steady-state scenario which is essentially a snapshot in time. It's an individual snapshot in time based on sort of average flow rates and average or typical conditions in the model. So this particular analysis, it doesn't look at an hour-by-hour breakdown of the flow in every pipe. It uses more of a typical flow for those three demand scenarios that I talked about, average day, max day and peak hour. It uses what we would consider to be a typical flow rate for that wholesale customer, because you're correct, everybody's demand changes hour to hour, day by day, everybody's demand changes, the flow rates in the pipes change, but what we do is we look at what we consider to be typical flow rates for those wholesalers." (Technical Session Transcript p.39, l. 5 to p. 40, l. 15)

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"DR. BIANCO: This is Todd Bianco. I have a quick question. Did you consider, and, if so, why did you maybe reject just looking at the wholesale customers' non-coincident peak, just their own need to use the system at some given hour and what the system was doing when that happened?

MR. SMITH: Well, we consulted with Pare and basically, we had to decide on one method to use and there are multiple, different ways, and I'm sure there are other hydraulic modelers out there that might recommend a slightly different approach than what Pare took, and there are possibly tweaks. Mr. Guastella has brought up the fire flows. This is not a perfect representation of how each wholesale customer uses the system. We believe it is more accurate than arbitrarily deciding that anything above 12 inches is transmission and anything 12 inches and below is distribution. So we feel that this gives us an understanding of how each wholesale customer actually uses the transmission and distribution system to get water delivered to them from Providence Water." (Technical Session Transcript p.116, l.15 to p. 117 l. 16

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"MR. THIES: We looked at a couple of different scenarios where they had high draw rates and we used -- we used the highest of the ones that we looked at.

MR. KEOUGH: When you say what you looked at, did you look at every day during a year?

MR. THIES: No. We looked at days where Providence Water was using either their -- dates where they were using, like, their average day demand or they were using their max day demand or they were -- we selected a handful of days, we didn't look at every single day for every single wholesaler. We selected a handful of days based on Providence's production and we looked at those dates.

MR. KEOUGH: So you looked at individual dates for wholesale customers, but that was sort of limited by what was going on in Providence's entire system, is that right?

MR. THIES: Correct. So for example, their max day -- Providence Water's max day was a day in July 2016, right? So on that day they -- Providence Water, their entire system, including their wholesalers, used the max amount of water that they had used over that three-year period. So we looked at that day for the wholesalers. We said what are those wholesalers doing on that day. Now, that might not be the wholesaler's max day because they're not always coincident, but there's a day where the wholesaler is using a lot of water. It might not be the absolute max that they ever used, but there's a day that they are using a lot of water.

MR. KEOUGH: I guess that's my point. So that may not reflect each individual wholesale customer's max day or max hour throughout the year.
MR. THIES: Correct. Yes." (Technical Session Transcript p.48, l. 3 to p. 49, l. 17)

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"All customers' demand varies over the course of the day. Hydraulic modeling is premised on trying to understand what typical draw patterns are, what typical usage looks like because we don't model every individual customer, you know." (Technical Session Transcript p.69, ll.14-20, Testimony of Timothy Theis)

**Q. Do you have any other observations about the hydraulic modelling data?**

A. Yes. Some of the results from the hydraulic modeling demand scenario data seem counterintuitive. Let's look at the Lincoln Water Commission, for example. On Schedule "HJS-16d Units", Lincoln's use of Providence Water's T&D system on the day

chosen for Providence's base demand was 304.87 inch-miles, while Lincoln's use of Providence's T&D system on the day chosen for Providence's max day demand was 239.36 inch-miles and for max hour was 138.09 inch-miles. It would seem that a customer would use more of the system during a max day or max hour than a base or average day, as opposed to less.

**M1 Manual**

**Q. Does the M1 Manual support the use of hydraulic modeling data for the allocation of T&D unit costs?**

A. No. Within the M1 Manual, the phrase "draw rate" does not appear at all, and the word "hydraulic" appears exactly once:

> "Another approach to determining distribution versus transmission mains, though less common in practice and more complex to perform, is to use system hydraulic analyses to determine which water mains, by size diameter and location, function as transmission mains." (P. 303)

Nothing in the M1 Manual suggests that T&D unit costs should be calculated based on hydraulic modelling data derived from days that may not be a wholesale customer's average or max day and from hours that may not be a wholesale customer's max hour. The peaking data that the Commission approved in the ASA COSS is more targeted to each individual wholesale customer. It should not be substituted with hydraulic modeling data for the calculation of T&D unit costs.

**Q. How so?**

A. The peaking factors used for HCF and HCF/d were based on each individual wholesale customer's respective average day, max day, and max hour demand. Demand data was analyzed for fiscal years 2017 through 2019, equaling three years for Providence

Water's production and the seven wholesale customers' demands. This equates to 8,760 days of data for the average day and max day analyses and 26,280 hours of data for the max hour analysis, opposed to the two days out of 1,096 days that Pare ran its hydraulic model for its average day, max day, and max hour scenarios.

**Q. If the M1 Manual suggests that hydraulic modelling data can be used to distinguish between transmission and distribution mains, then how should that type of data be used?**

A. As stated in the M1 Manual, it should be used for the limited purpose of "determining distribution versus transmission mains." As Mr. Smith noted in his direct compliance testimony, the ASA COSS separated transmission (12 inches and less) and distribution (12 inches and greater) mains strictly by diameter. So, for instance, in Docket 4944, the BCWA argued that it should not be allocated any unidirectional flushing costs because Providence only flushes mains in the system that are 12 inches and below. The BCWA maintained that it was not served by any mains 12 inches and below. (See Pamela Marchand Docket 4944 Direct Testimony, p. 3) Thus, a hydraulic model would be able to prove or disprove the BCWA's argument on this issue, and it appears that the model was used, in part for this purpose:

"What the new cost of service model does is recognizes that that unidirectional flushing is really only beneficial on the smaller pipes so it only allocates the inch-miles for 12 inches and less from the hydraulic model. So to the extent that a customer doesn't use any pipes that are 12 inches or less, they're not getting any of the unidirectional flushing costs." (Technical Session Transcript p.112, ll. 15-24)

**First Time Use**

**Q. In your experience, have you ever seen a cost of service study that calculates T&D unit costs based on hydraulic modeling data?**

A. No. As set forth above, the M1 Manual does not seem to call for hydraulic modeling data to be used in the manner Providence used it in its Revised COSS. In fact, Mr. Smith stated at the technical session that he has never used hydraulic modeling data in this manner before:

> "And as I said, and it's less common -- as a matter of fact, I never used hydraulic model data to allocate transmission and distribution costs. The M1 manual suggests that it is an acceptable way of determining the difference between transmission mains and distribution mains, and so we took that and we had Pare run the analysis and they gave us the inch-miles and we used that to allocate T&D costs." (Technical Session Transcript p.110, ll.5-14)

**Wholesale Rate Disparities**

**Q. How does the use of hydraulic modelling data affect the difference in rates among the seven wholesale customers?**

A. It creates a much wider disparity in rates between wholesale customers than the ASA COSS that used HCF and peaking factors. Attached to my testimony as Exhibit 2 is "Schedule HJS Amended Settlement-22: Proposed Rates" from the Docket 4994 Amended Settlement Agreement approved by the Commission. This schedule shows the rates that would have resulted from implementing individual wholesale rates using peaking factors without gradualism and the same rates that result from using gradualism as ordered by the Commission.

Without using gradualism, the percentage increases in wholesale rates ranged from 10.03% to 35.97%, or 25.94%. (See Exhibit 2) The rate difference ranged from

$1.486330 to $1.836764, or $0.35. (Id.) In Providence's Revised COSS, the percentage increases range from -27.29% to 50.61%, or 77.89%. (See HJS-22: Proposed Rates) The rate difference ranges from $1.142768 to $2.498941, or $1.36. (Id.)

In addition, it should be noted that Warwick, which has the highest peaking factors among the seven wholesale customers, would see its percentage increase go from 35.97% in the ASA COSS (without gradualism) to -6.33% in the Revised COSS.

**Potentially Flawed Data**

**Q. Are there any other reasons that the hydraulic modelling data should not be used to allocate T&D costs?**

A. As I indicated at the beginning of my testimony, hydraulic modeling is not within my area of expertise, so I cannot evaluate the accuracy of the data, but some pieces of data seem curious to me. In response to Greenville/Lincoln Data Request 1-11, Providence produced an excel file entitled "GWD-LWD 1-11 Wholesale Eval Summary v8.xlsx." The column "Label" appears to be a unique identifier for pipe segments. The length of the segment for each unique "Label" sometimes varies, which seems erroneous. Below are examples from tables within the excel file:

- Label 790 is 100 feet for BCWA but 69 feet for others.
- Label 5733 is 100 feet for BCWA but 10 feet for others.
- Label 13617 is 78 feet for BCWA but 21 feet for others
- Label 19792 is 78 feet for BCWA but 26 feet for others.
- Label 24176 is 126 for Smithfield but 100 feet for others.

While minor, these discrepancies appear to primarily affect the BCWA. In addition, within that same excel file are tables that total units by pipe diameter. Some of these

totals appear to be incorrectly linked to other spreadsheets within the excel file, resulting in summation errors.

## VIII. BCWA SCHEDULES

**Q. Have you prepared schedules that document the BCWA's position in this matter?**

A. Yes, and they are attached to my testimony as Exhibit 3. The changes I made on each are as follows:

- Schedule HJS-13d: T&D Labor Allocation (Factor 21) (Amended by Michael R. Maker) – This schedule calculates "Factor 21 - As T&D Work/Service Orders". I replaced the cost allocations for this factor (which were not split between CTA and Retail Only) with those from the ASA model (which were split between CTA and Retail Only).
- Schedule HJS-13e: T&D Contract Services Allocation (Factor 22) (Amended by Michael R. Maker) - This schedule calculates "Factor 22 - As T&D Contract Services". I replaced the cost allocations for this factor (which were not split between CTA and Retail Only) with those from the ASA model (which were split between CTA and Retail Only).
- Schedule HJS-13f: Net Plant In Service (Factors 23, 24, 25, 26) (Amended by Michael R. Maker) – This schedule calculates four factors:
  - Factor 23 - As T&D Plant Excl. M&S, Land, Structures
  - Factor 24 - As Total Plant Excl. General Plant
  - Factor 25 - As Total Plant Excl. Land, COF
  - Factor 26 - As Total Plant Excl. Land

  I did not replace any factors, but I put the split between "Transmission Mains" (40% CTA) and "Distribution Mains" (60% Retail Only) back in from the ASA model.

- Schedule HJS-16d: Summary of Customer Class Units of Service (Amended by Michael R. Maker) – I replaced the Demand in Inch-Miles with Demand in HCF (as was included in the ASA).
- Schedule HJS-17: Unit Cost of Service (Amended by Michael R. Maker) – The common to all (base, max day, and max hour) units of service were linked from Schedule HJS-16d: Summary of Customer Class Units of Service (Amended by Michael R. Maker).
- Schedule HJS-18: Customer Class Cost of Service (Amended by Michael R. Maker) – The common to all (base, max day, and max hour) units of service were linked from Schedule HJS-16d: Summary of Customer Class Units of Service (Amended by Michael R. Maker).
- Schedule HJS-19: Development of Volumetric Rates (Amended by Michael R. Maker) – The unit costs and units were linked from Schedule HJS-17: Unit Cost of Service (Amended by Michael R. Maker) and Schedule HJS-16d: Summary of Customer Class Units of Service (Amended by Michael R. Maker), respectively, to calculate rates.
- Schedule HJS-22: Proposed Rates (Amended by Michael R. Maker) – The rates from Schedule HJS-19: Development of Volumetric Rates (Amended by Michael R. Maker) were linked to provide a summary of rates, revenue, and percent change.

**Q. By making these changes, aren't the T&D Labor and COF allocations based on the same methodology initially used in Docket 4994, which the BCWA argued against?**

A. To some extent, yes. As set forth above, the BCWA believed that Providence had not properly justified these allocations, and the Commission's Order stated that Providence "must address these allocations with data that firmly supports the

allocators chosen." However, and for the reasons set forth above, I don't believe that the hydraulic modeling data firmly supports the changes Providence seeks to make.

In addition, the changes I propose result in the wholesale class contributing more to Providence's overall revenue requirement ($20,004,859) than in Providence's Revised COSS ($17,648,767). However, the disparity among the wholesale rates is reduced. The percentage increases in wholesale rates under my proposal range from -3.76% (a decrease) to 20.04%, or 23.80%, and the rate difference ranges from $1.512512 to $2.026780, or $0.51 (See Exhibit 3, Schedule HJS-22: Proposed Rates (Amended by Michael R. Maker)). Again, in Providence's Revised COSS, the percentage increases range from -27.29% to 50.61%, or 77.89%, and the rate difference ranges from $1.142768 to $2.498941, or $1.36. (See HJS-22: Proposed Rates)

## IX. CONCLUSION

**Q. Do you have any additional issues you would like to address?**

A. Not currently, but I reserve the right to address any further changes Providence makes or issues, or which the Division or other intervenors raise in this filing. Also, to the extent that any further issues are raised through ongoing data requests, I reserve the right to address these issues as well. Finally, if I discover or otherwise learn of additional issues that could impact the wholesale rates, I reserve the right to address those issues.

**Q. To the extent you have not addressed Providence's position on a particular issue within your testimony, does that indicate that you agree with Providence's position?**

A. No. My silence on a particular issue does not necessarily indicate my agreement with Providence's position, and my failure to address a particular topic should not be construed as my tacit agreement with Providence's stated position.

**Q. With these exceptions, does this conclude your direct testimony?**

A. Yes, It does.

**CERTIFICATION**

I hereby certify that on October 8, 2021, I sent a copy of the within to all parties set forth on the attached Service List by electronic mail and copies to Luly Massaro, Commission Clerk, by electronic mail and hand delivery.

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***EXHIBIT 1***

NewGen Strategies & Solutions

**Michael Maker**
Deputy Director of Water and Wastewater Practice
mmaker@newgenstrategies.net

Bringing 18 years of experience, Mr. Maker is Deputy Director of NewGen's Water and Wastewater Practice and Executive Consultant applying management, financial and technical experience. He has served as either Project Manager or Lead Analyst for over 100 financial and management studies. Day-to-day responsibilities include managing client projects, developing analytical financial models and compiling comprehensive reports and presentations.

## EDUCATION

- Master of Business Administration in Finance, Loyola University (Beta Gamma Sigma Honor Society)
- Bachelor of Arts in Economics, University of Rochester, Minor: Electrical Engineering

## PROFESSIONAL MEMBERSHIPS

- American Water Works Association (AWWA) – active member of the following:
  - Workforce Strategies Committee
  - Finance, Accounting & Management Controls Committee
  - Chesapeake AWWA Utilities Committee
- Coauthor of AWWA *Manual M29 Water Utility Capital Financing*
- Coauthor of AWWA *Manual M5 Water Utility Management*
- Water Environment Federation (WEF)
- Government Finance Officers Association (GFOA)

## KEY EXPERTISE

- Rate and Fee Design
- Financial Modeling
- Cost of Service Analyses
- Operational Audits
- Management Studies
- Efficiency and Effectiveness Studies
- Demand/Usage Projections
- Benchmarking/Comparative Analyses
- Research and Data Analyses
- Process/Workflow Mapping

## SELECT FINANCIAL AND MANAGEMENT EXPERIENCE

### Water and Sewer Services Comprehensive Business Process Review: Baltimore City and County

Led a multi-firm project team to provide a comprehensive review of the interconnected water and sewerage systems of the City of Baltimore and Baltimore County. The project team performed the review based upon a comprehensive scope of services grouped into six major tasks: Evaluate City-County Existing Service Agreements for Water/Sewer Services; Review the City and County Organizational Structure and Governance Models; Review Staffing; Evaluate Water and Sewer System Planning and Management; Assess Meter to Cash Operations; and Review Field Operations. The study focused on improving the intergovernmental coordination of processes and policies to ensure effective delivery of high quality and sustainable water and sewer services to City and County customers.

### Water Rate Study: Bristol County Water Authority, RI

Performed a rate study for the water system, resulting in a financial plan and implementation of meter-based fixed charges, 3-tier inclining residential block consumption charges, unit rate non-residential consumption charge, fire service base charges, other miscellaneous fees and charges.

# Michael Maker

Deputy Director of Water and Wastewater Practice

## Performance Measurement Analysis: Washington Suburban Sanitary Commission, MD

Assessed and analyzed key performance indicators in specific operational areas within the utility and engaged Commission staff and managers in a continuous effort to improve service delivery and operational effectiveness. Led or participated in the following efforts: review of performance on street and paving restoration, review of water line rehabilitation activity, evaluation of property damage claims processing, review of overtime utilization across the Commission, assessment of customer billing operations, development of new key performance indicators (KPI's) for all of WSSC's major operations, creation of an internal survey of customer service, operational review of the SLMBE (Small, Local and Minority Business Enterprises) Office, development of an economic benefit analysis for the Office of Communications to estimate the direct and indirect economic impact of WSSC's capital construction program on the local economies of Prince George's and Montgomery Counties, assistance to the Fleet Management Division on the development of a cost-benefit analysis for automatic vehicle location (AVL) technology.

## Rate Analysis and Design Services Study: Suffolk County Water Authority, NY

Developed a financial plan and provided water rate design analysis, resulting in the following recommendations: consolidation of several rate schedules; development of a two-tier inclining rate design and an infrastructure charge; review and update of fire protection charges, wholesale rates and tapping fees; creation of a manual meter read fee.

## Water and Sewer Utility Rate Review Study: Albemarle County Service Authority, VA

Performed a cost of service/rate study and developed a financial model to project water and sewer fees over a five-year period. The study included projecting operating and capital expenses, with the largest coming from the Rivanna Water and Sewer Authority (RWSA) for water and sewer treatment service. As part of the study, system development fees were developed to offset the cost of providing water and sewer infrastructure solely within the ACSA system to serve new customers and capacity fees were developed to offset ACSA's share of annual debt service on capacity in RWSA's facilities.

## Water and Wastewater Management Analysis: Maryland Environmental Service (MES)

Provided a comprehensive management study that evaluated the Water and Wastewater Group on six attributes: product quality, customer satisfaction, employee and leadership development, operational optimization, financial viability and operational resiliency.

## Water Rate Study & Water Audit: City of Rochester, NY Water Bureau

Performed a rate study and audit of the water system, resulting in a financial plan and implementation of the following rates and fees: meter-based fixed charges; 5-tier declining block consumption charges; fire service charges and other miscellaneous fees and charges.

## Stormwater Financial Analysis: Norfolk, VA

Performed a financial analysis of the City's stormwater system. The study included the following: development of a stormwater financial model; identification of the City's stormwater-related costs; review of databases used for allocation and billing of costs and billing mechanisms employed to issue stormwater utility bills; calculation of stormwater rates per equivalent unit, square foot of impervious acre, etc. for residential and non-residential customer classes; review of criteria and methodologies for quantifying on-site and site-specific stormwater management activities that qualify for credits; calculation of bill impacts for each customer class based on the rates developed.

### Newport, RI Water Division Review: Rhode Island Public Utilities Commission

Studied the organization and management of the Newport Water Division, as requested by the Rhode Island Public Utilities Commission (RI PUC). The study involved assessing the policies, procedures and organizational structure of the Division and a benchmarking analysis of PUC-regulated water utilities. Recommendations were made for all sections of the Division, including Management, Finance, Water Quality Treatment, Collection & Distribution and Meter.

## COST OF SERVICE AND RATE DESIGN

Mr. Maker prepares cost of service and rate studies for water, wastewater, stormwater and solid waste utilities. His responsibilities included the development of cost of service cash flow model, rate design, fee design and customer impact analysis. Mr. Maker completed cost of service and rate studies for the following clients (sorted alphabetically by state abbreviation and utility):

Branford, CT
Cheshire, CT
Manchester, CT
Montville, CT
Stratford, CT
Watertown, CT
Milton, DE
Glenview, IL
Morton Grove, IL
Orland Park, IL
Auburn, MA
Barnstable, MA
Anne Arundel County, MD
Baltimore, MD
Baltimore County, MD
Calvert County, MD
Cecil County, MD
Elkton, MD
Frederick, MD
Frederick County, MD
Frostburg, MD
Garrett County, MD
Hagerstown, MD
Harford County, MD
Kent County, MD
Rockville, MD
Washington Sub. San. Comm., MD
Westminster, MD
Cape Fear Public Utilities Auth., NC
Holly Springs, NC
Claremont, NH
Exeter, NH
Camden, NJ
Evesham Municipal Utilities Auth., NJ
Albertson Water District, NY
Beacon, NY
Fishers Island, NY
Fishkill (Town), NY
Fishkill (Village), NY
Hicksville Water District, NY
Jericho Water District, NY
Mohawk Valley Water Authority, NY
Plainview Water District, NY
Port Washington Water District, NY
Rochester, NY
Suffolk County Water Authority, NY
Tivoli, NY
Water Auth. of Great Neck North, NY
Canton, OH
Clermont County, OH
Cleveland, OH
Dublin, OH
Perrysburg, OH
Summit County, OH
Tallmadge, OH
North Middleton Township, PA
Pittsburgh Water/Sewer Auth., PA
Bristol County Water Authority, RI
North Kingstown, RI
Highland Park, TX
Sharyland Water Supply Corporation, TX
Tyler, TX
Westlake, TX
Albemarle County, VA
Charlottesville, VA
Chincoteague, VA
Fauquier County, VA
Franklin, VA
Hampton, VA
Herndon, VA
James City Service Authority, VA
Leesburg, VA
Lexington, VA
Lovettsville, VA
Newport News, VA
Norfolk, VA
Portsmouth, VA
Purcellville, VA
Richmond, VA
Rivanna Water & Sewer Authority, VA
Southampton County, VA
Stafford County, VA
Warrenton, VA

## Michael Maker

Deputy Director of Water and Wastewater Practice

# PRESENTATIONS AND PUBLICATIONS

Mr. Maker has given numerous presentations and participated in training and workshops.

- "System Development Charges: Funding Growth in Maryland"; 2021 Chesapeake AWWA Tri-Association Conference
- "Setting Water and Sewer Rates in New York State"; New York GFOA Northeast Holiday Seminar (2020)
- "Vision Beyond 2020: Preparing and Paying for Growth in the Commonwealth"; 2020 Virginia AWWA WaterJAM
- "Setting Water Rates: State of the Industry"; Long Island Water Conference (2019)
- "EPA's Definition of Affordability"; 2017 Tri-Association Conference (CSAWWA, CWEA, WWOA)
- "Setting Water and Sewer Rates"; 2017 New York State GFOA 38th Annual Conference
- "Defining Affordability"; 2016 AWWA Annual Conference & Exposition (ACE)
- "A World without Crystal Balls: Attempting to Forecast Operating Expenses"; 2015 Water Asset Management Conference
- "Stormwater Utility Financial Analysis: A Case Study of the City of Hampton"; Virginia Lakes and Watersheds Association 2013 Virginia Water Conference
- "LEED Certified Water Efficient Buildings and Water and Sewer Capacity Fees"; 2012 CSAWWA Tri-Association Conference
- "Stormwater Utilities in Virginia"; 2013 Brown Edwards Conference
- "Creating Sustainable Infrastructure"; Maryland GFOA 2009 Spring Conference

***EXHIBIT 2***

## Schedule HJS Amended Settlement-22: Proposed Rates

Providence Water Supply Board
Docket # 4994
Request for General Rate Relief
Amended Settlement Proposal
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | Existing Rates | | | Proposed FY 2021 (Peaking Factors) | | | Proposed FY 2021 (Gradualism) | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | Units | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment[2] | Rates[3] | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Wholesale Charges** | | | | | | | | | | | | | | | | | | |
| Bristol County | 1,494,845 | $ 1.350858 | $ 2,019,323 | 10.55% | $ 1.493360 | $ 2,232,342 | 16.51% | $ 1.614196 | $(0.120836) | $(0.0402787) | $ 1.573918 | $ 2,352,763 | 4.02% | $ 1.637161 | $ 2,447,301 | 2.84% | $ 1.683733 | $ 2,516,919 |
| East Providence | 1,822,773 | $ 1.350858 | $ 2,462,307 | 18.35% | $ 1.598720 | $ 2,914,103 | 19.11% | $ 1.614196 | $(0.015476) | $(0.0051587) | $ 1.609038 | $ 2,932,911 | 4.02% | $ 1.673692 | $ 3,050,760 | 2.84% | $ 1.721303 | $ 3,137,544 |
| Greenville | 421,521 | $ 1.350858 | $ 569,415 | 27.86% | $ 1.727270 | $ 728,081 | 22.28% | $ 1.614196 | $ 0.113074 | $ 0.0376913 | $ 1.651888 | $ 696,306 | 4.02% | $ 1.718264 | $ 724,285 | 2.84% | $ 1.767143 | $ 744,888 |
| Kent County | 2,727,147 | $ 1.350858 | $ 3,683,989 | 10.03% | $ 1.486330 | $ 4,053,441 | 16.34% | $ 1.614196 | $(0.127866) | $(0.0426220) | $ 1.571574 | $ 4,285,914 | 4.02% | $ 1.634723 | $ 4,458,129 | 2.84% | $ 1.681225 | $ 4,584,948 |
| Lincoln | 1,038,229 | $ 1.350858 | $ 1,402,499 | 21.62% | $ 1.642868 | $ 1,705,673 | 20.20% | $ 1.614196 | $ 0.028672 | $ 0.0095573 | $ 1.623754 | $ 1,685,828 | 4.02% | $ 1.688999 | $ 1,753,567 | 2.84% | $ 1.737046 | $ 1,803,451 |
| Smithfield | 391,600 | $ 1.350858 | $ 528,996 | 29.50% | $ 1.749347 | $ 685,045 | 22.83% | $ 1.614196 | $ 0.135151 | $ 0.0450503 | $ 1.659247 | $ 649,762 | 4.02% | $ 1.725918 | $ 675,870 | 2.84% | $ 1.775015 | $ 695,096 |
| Warwick | 3,466,644 | $ 1.350858 | $ 4,682,944 | 35.97% | $ 1.836764 | $ 6,367,407 | 24.99% | $ 1.614196 | $ 0.222568 | $ 0.0741893 | $ 1.688386 | $ 5,853,034 | 4.02% | $ 1.756228 | $ 6,088,219 | 2.84% | $ 1.806187 | $ 6,261,408 |
| **Total Wholesale Revenue** | **11,362,760** | | **15,349,475** | **21.74%** | | **18,686,092** | **20.24%** | | | | | **18,456,517** | **4.02%** | | **19,198,131** | **2.84%** | | **19,744,255** |
| **Wholesale Charges** | | | | | | | | | | | | | | | | | | |
| Bristol County | 1,118 | $ 1,805.96 | $ 2,019,323 | 10.55% | $ 1,996.47 | $ 2,232,342 | 16.51% | $ 2,158.02 | $ (161.55) | $ (53.85) | $ 2,104.17 | $ 2,352,763 | 4.02% | $ 2,188.72 | $ 2,447,301 | 2.84% | $ 2,250.98 | $ 2,516,919 |
| East Providence | 1,363 | $ 1,805.96 | $ 2,462,307 | 18.35% | $ 2,137.33 | $ 2,914,103 | 19.11% | $ 2,158.02 | $ (20.69) | $ (6.90) | $ 2,151.12 | $ 2,932,911 | 4.02% | $ 2,237.56 | $ 3,050,760 | 2.84% | $ 2,301.21 | $ 3,137,544 |
| Greenville | 315 | $ 1,805.96 | $ 569,415 | 27.86% | $ 2,309.18 | $ 728,081 | 22.28% | $ 2,158.02 | $ 151.17 | $ 50.39 | $ 2,208.41 | $ 696,306 | 4.02% | $ 2,297.14 | $ 724,285 | 2.84% | $ 2,362.49 | $ 744,888 |
| Kent County | 2,040 | $ 1,805.96 | $ 3,683,989 | 10.03% | $ 1,987.07 | $ 4,053,441 | 16.34% | $ 2,158.02 | $ (170.94) | $ (56.98) | $ 2,101.03 | $ 4,285,914 | 4.02% | $ 2,185.46 | $ 4,458,129 | 2.84% | $ 2,247.63 | $ 4,584,948 |
| Lincoln | 777 | $ 1,805.96 | $ 1,402,499 | 21.62% | $ 2,196.35 | $ 1,705,673 | 20.20% | $ 2,158.02 | $ 38.33 | $ 12.78 | $ 2,170.79 | $ 1,685,828 | 4.02% | $ 2,258.02 | $ 1,753,567 | 2.84% | $ 2,322.25 | $ 1,803,451 |
| Smithfield | 293 | $ 1,805.96 | $ 528,996 | 29.50% | $ 2,338.70 | $ 685,045 | 22.83% | $ 2,158.02 | $ 180.68 | $ 60.23 | $ 2,218.24 | $ 649,762 | 4.02% | $ 2,307.38 | $ 675,870 | 2.84% | $ 2,373.01 | $ 695,096 |
| Warwick | 2,593 | $ 1,805.96 | $ 4,682,944 | 35.97% | $ 2,455.57 | $ 6,367,407 | 24.99% | $ 2,158.02 | $ 297.55 | $ 99.18 | $ 2,257.20 | $ 5,853,034 | 4.02% | $ 2,347.90 | $ 6,088,219 | 2.84% | $ 2,414.69 | $ 6,261,408 |
| **Wholesale (per million gallons)** | **8,499** | | **15,349,475** | **21.74%** | | **18,686,092** | **20.24%** | | | | | **18,456,517** | **4.19%** | | **19,198,131** | **4.15%** | | **19,744,255** |

| | Existing Rates | | | Proposed FY 2021 (Peaking Factors) | | | Proposed FY 2021 (Gradualism) | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | Units | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment | Rates | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Private Fire Service Charges** | | | | | | | | | | | | | | | | | | |
| 3/4" | 2 | $ 8.64 | $ 207 | 31.25% | $ 11.34 | $ 272 | 31.25% | $ 11.34 | $ - | $ - | $ 11.34 | $ 272 | 5.50% | $ 11.96 | $ 287 | 4.22% | $ 12.47 | $ 299 |
| 1" | 9 | $ 10.21 | $ 1,103 | 31.24% | $ 13.40 | $ 1,447 | 31.24% | $ 13.40 | $ - | $ - | $ 13.40 | $ 1,447 | 5.50% | $ 14.14 | $ 1,527 | 4.22% | $ 14.73 | $ 1,591 |
| 1-1/2" | 2 | $ 12.57 | $ 302 | 31.26% | $ 16.50 | $ 396 | 31.26% | $ 16.50 | $ - | $ - | $ 16.50 | $ 396 | 5.50% | $ 17.41 | $ 418 | 4.22% | $ 18.14 | $ 435 |
| 2" | 68 | $ 18.64 | $ 15,210 | 31.22% | $ 24.46 | $ 19,959 | 31.22% | $ 24.46 | $ - | $ - | $ 24.46 | $ 19,959 | 5.50% | $ 25.80 | $ 21,057 | 4.22% | $ 26.89 | $ 21,946 |
| 4" | 391 | $ 79.67 | $ 373,812 | 31.20% | $ 104.53 | $ 490,455 | 31.20% | $ 104.53 | $ - | $ - | $ 104.53 | $ 490,455 | 5.50% | $ 110.28 | $ 517,415 | 4.22% | $ 114.93 | $ 539,261 |
| 6" | 1,245 | $ 129.89 | $ 1,940,557 | 31.20% | $ 170.42 | $ 2,546,075 | 31.20% | $ 170.42 | $ - | $ - | $ 170.42 | $ 2,546,075 | 5.50% | $ 179.79 | $ 2,686,034 | 4.22% | $ 187.38 | $ 2,799,441 |
| 8" | 256 | $ 196.73 | $ 604,355 | 31.20% | $ 258.11 | $ 792,914 | 31.20% | $ 258.11 | $ - | $ - | $ 258.11 | $ 792,914 | 5.50% | $ 272.30 | $ 836,501 | 4.22% | $ 283.80 | $ 871,819 |
| 10" | 4 | $ 274.06 | $ 13,155 | 31.20% | $ 359.57 | $ 17,259 | 31.20% | $ 359.57 | $ - | $ - | $ 359.57 | $ 17,259 | 5.50% | $ 379.34 | $ 18,208 | 4.22% | $ 395.35 | $ 18,977 |
| 12" | 18 | $ 367.64 | $ 79,410 | 31.20% | $ 482.35 | $ 104,188 | 31.20% | $ 482.35 | $ - | $ - | $ 482.35 | $ 104,188 | 5.50% | $ 508.87 | $ 109,915 | 4.22% | $ 530.35 | $ 114,556 |
| 16" | - | $ 611.43 | $ - | 23.19% | $ 753.22 | $ - | 23.19% | $ 752.28 | $ - | $ - | $ 753.22 | $ - | 5.50% | $ 794.62 | $ - | 4.22% | $ 828.17 | $ - |
| Total | | $ 3,028,110 | $ 3,028,110 | 31.20% | | $ 3,972,965 | 31.20% | | | | | $ 3,972,965 | 5.50% | | $ 4,191,361 | 4.22% | | $ 4,368,324 |
| | | | | | | | | | | | | $ - | | | | | | |
| Hydrants (Excluding Providence) | 3,318 | $ 454.02 | $1,506,438 | 0.00% | $ 595.68 | $1,976,466 | 31.20% | $ 595.68 | $ - | $ - | $ 595.68 | $1,976,466 | 5.50% | $ 628.42 | $2,085,114 | 4.22% | $ 654.96 | $2,173,149 |
| **Total Fire Protection Charge Revenue** | | | **$4,534,548.24** | | | **$5,949,431.40** | | | | | | **$5,949,431.40** | | | **$6,276,474.78** | | | **$6,541,473.00** |
| **Total Rate Revenues** | | | **$ 71,256,053** | | | **$ 83,454,427** | | | | | | **$ 83,456,144** | | | **$ 87,766,290** | | | **$ 91,203,939** |
| Miscellaneous Revenues | | | $ 1,493,163 | | | $ 1,543,163 | | | | | | $ 1,543,163 | | | $ 1,543,163 | | | $ 1,543,163 |
| **Total Revenues** | | | $ 72,749,216 | | | $ 84,997,590 | 16.84% | | | | | $ 84,999,307 | 5.07% | | $ 89,309,453 | 3.85% | | $ 92,747,102 |
| | | | - | | | | | | | | | | | | | | | 17,140 |

(1) FY 21 Retail volumetric rates adjusted to reflect Wholesale gradualism. Calculated as FY 2021 calculated rate, less increased revenues from wholesale spread proportionally to each retail volumetric class based on unadjusted FY 2021 cost of service, plus rounding.
(2) 1/3 of the difference between the FY 21 **uniform** Wholesale rates in Providence Water's July 3 settlement proposal and the FY 21 **individual** Wholesale rates calculated within these schedules
(3) FY 21 Wholesale rates adjusted by 1/3 of the difference between the FY 21 **uniform** Wholesale rates in Providence Water's July 3 settlement proposal and the FY 21 **individual** Wholesale rates calculated within these schedules for FY 21, plus rounding.

***EXHIBIT 3***

## Schedule HJS-13d: T&D Labor Allocation (Factor 21)

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | Year | Factor | Total | Base | Max Day | Max Hour | Base | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Meters & Services | Billing & Collection | Direct Fire |
| | | | | HCF | HCF/d | HCF/d | HCF | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | 5/8" Eq. | Bills | 6" Eq. |
| Hydrant - Install | 2017 | 17 | $ 189,318 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 189,318 |
| Hydrant - Install Custodian | 2017 | 17 | $ 2,573 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,573 |
| Hydrant - Maintenance | 2017 | 17 | $ 2,525 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,525 |
| Hydrant - Relocate Existing | 2017 | 17 | $ 2,852 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,852 |
| Hydrant - Remove | 2017 | 17 | $ 92,751 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 92,751 |
| Hydrant - Repair | 2017 | 17 | $ 135,902 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 135,902 |
| Service - Curb Box - Adjust to Grade | 2017 | 14 | $ 18,097 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 18,097 | $ - | $ - |
| Service - Curb Box - Check | 2017 | 14 | $ 45,865 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 45,865 | $ - | $ - |
| Service - Curb Box - Dig Up | 2017 | 14 | $ 180,976 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 180,976 | $ - | $ - |
| Service - Curb Stop - Close | 2017 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Curb Stop - Locate | 2017 | 14 | $ 1,168 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,168 | $ - | $ - |
| Service - Curb Stop - Repair | 2017 | 14 | $ 12,022 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 12,022 | $ - | $ - |
| Service - Dig Up For Meter | 2017 | 14 | $ 3,995 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 3,995 | $ - | $ - |
| Service - Install - IFR | 2017 | 14 | $ 134,678 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 134,678 | $ - | $ - |
| Service - Install - T&D | 2017 | 14 | $ 281,647 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 281,647 | $ - | $ - |
| Service - Remove | 2017 | 14 | $ 153,262 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 153,262 | $ - | $ - |
| Service - Repair Leak | 2017 | 14 | $ 178,649 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 178,649 | $ - | $ - |
| TD Misc - Miscellaneous Maint | 2017 | Indirect | $ 3,090 | $ 331 | $ 254 | $ 417 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,536 | $ 0 | $ 552 |
| Valve - Adjust Gate Box | 2017 | 3 | $ 30,476 | $ 10,063 | $ 7,726 | $ 12,687 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Check / Inspect | 2017 | 3 | $ 13,317 | $ 4,397 | $ 3,376 | $ 5,544 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Install | 2017 | 3 | $ 89,979 | $ 29,709 | $ 22,812 | $ 37,458 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Locate | 2017 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Remove | 2017 | 3 | $ 53,742 | $ 17,745 | $ 13,625 | $ 22,373 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Repair / Repack | 2017 | 3 | $ 69,879 | $ 23,073 | $ 17,716 | $ 29,090 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Replace Box Cover | 2017 | 3 | $ 3,204 | $ 1,058 | $ 812 | $ 1,334 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Install | 2017 | 3 | $ 4,846 | $ 1,600 | $ 1,229 | $ 2,017 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Remove | 2017 | 3 | $ 1,129 | $ 373 | $ 286 | $ 470 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Repair Leak | 2017 | 3 | $ 91,906 | $ 30,346 | $ 23,300 | $ 38,260 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Inspect | 2018 | 3 | $ 487 | $ 161 | $ 123 | $ 203 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Install | 2018 | 3 | $ 7,488 | $ 2,472 | $ 1,898 | $ 3,117 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Locate | 2018 | 3 | $ 487 | $ 161 | $ 123 | $ 203 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Remove | 2018 | 3 | $ 2,048 | $ 676 | $ 519 | $ 853 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Repair | 2018 | 3 | $ 9,260 | $ 3,057 | $ 2,348 | $ 3,855 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Hydrant - Check / Inspect | 2018 | 17 | $ 15,350 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 15,350 |
| Hydrant - Close | 2018 | 17 | $ 902 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 902 |
| Hydrant - Flush | 2018 | 17 | $ 406 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 406 |
| Hydrant - Install | 2018 | 17 | $ 162,309 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 162,309 |
| Hydrant - Install Custodian | 2018 | 17 | $ 2,301 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,301 |
| Hydrant - Maintenance | 2018 | 17 | $ 1,980 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,980 |
| Hydrant - Open | 2018 | 17 | $ 51 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 51 |
| Hydrant - Relocate Existing | 2018 | 17 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Hydrant - Remove | 2018 | 17 | $ 63,775 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 63,775 |
| Hydrant - Repair | 2018 | 17 | $ 130,599 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 130,599 |
| Hydrant - Repair/Repack Valve | 2018 | 17 | $ 11,909 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 11,909 |
| Service - Curb Box - Adjust to Grade | 2018 | 14 | $ 23,247 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 23,247 | $ - | $ - |
| Service - Curb Box - Check | 2018 | 14 | $ 46,892 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 46,892 | $ - | $ - |
| Service - Curb Box - Dig Up | 2018 | 14 | $ 179,792 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 179,792 | $ - | $ - |
| Service - Curb Stop - Close | 2018 | 14 | $ 19,119 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 19,119 | $ - | $ - |
| Service - Curb Stop - Locate | 2018 | 14 | $ 4,695 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 4,695 | $ - | $ - |
| Service - Curb Stop - Open | 2018 | 14 | $ 23,311 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 23,311 | $ - | $ - |
| Service - Curb Stop - Repair | 2018 | 14 | $ 10,965 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 10,965 | $ - | $ - |
| Service - Curb Stop - Replace | 2018 | 14 | $ 6,194 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 6,194 | $ - | $ - |
| Service - Dig Up For Meter | 2018 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Install - IFR | 2018 | 14 | $ 64,995 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 64,995 | $ - | $ - |
| Service - Install - T&D | 2018 | 14 | $ 294,119 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 294,119 | $ - | $ - |
| Service - Meter - Bypass Meter | 2018 | 14 | $ 205 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 205 | $ - | $ - |
| Service - Remove | 2018 | 14 | $ 100,614 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 100,614 | $ - | $ - |
| Service - Remove Lead - CS Apps | 2018 | 14 | $ 6,492 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 6,492 | $ - | $ - |
| Service - Remove Lead - TD | 2018 | 14 | $ 25,454 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 25,454 | $ - | $ - |
| Service - Repair Leak | 2018 | 14 | $ 169,990 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 169,990 | $ - | $ - |
| TD Misc - Miscellaneous Maint | 2018 | Indirect | $ 6,000 | $ 643 | $ 493 | $ 810 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,981 | $ 0 | $ 1,072 |
| TD Misc - Pre-Mark for Digup | 2018 | Indirect | $ 335 | $ 36 | $ 28 | $ 45 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 167 | $ 0 | $ 60 |
| TD Misc - Pre-Mark for Saw Cut | 2018 | Indirect | $ 1,024 | $ 110 | $ 84 | $ 138 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 509 | $ 0 | $ 183 |
| TD Misc - Trench Repair | 2018 | Indirect | $ 393 | $ 42 | $ 32 | $ 53 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 195 | $ 0 | $ 70 |
| Trench - Check For Failure | 2018 | 3 | $ 100 | $ 33 | $ 25 | $ 42 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Trench Restoration | 2018 | 3 | $ 257,373 | $ 84,980 | $ 65,250 | $ 107,143 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Adjust Gate Box | 2018 | 3 | $ 30,505 | $ 10,072 | $ 7,734 | $ 12,699 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Check / Inspect | 2018 | 3 | $ 8,958 | $ 2,958 | $ 2,271 | $ 3,729 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Install | 2018 | 3 | $ 75,028 | $ 24,773 | $ 19,021 | $ 31,234 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Locate | 2018 | 3 | $ 2,206 | $ 728 | $ 559 | $ 918 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Raise Gate Box To Grade | 2018 | 3 | $ 489 | $ 161 | $ 124 | $ 203 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Remove | 2018 | 3 | $ 41,701 | $ 13,769 | $ 10,572 | $ 17,360 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Repair / Repack | 2018 | 3 | $ 51,060 | $ 16,859 | $ 12,945 | $ 21,256 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Replace Box Cover | 2018 | 3 | $ 1,122 | $ 371 | $ 285 | $ 467 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Install | 2018 | 3 | $ 9,226 | $ 3,046 | $ 2,339 | $ 3,841 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Remove | 2018 | 3 | $ 6,846 | $ 2,260 | $ 1,736 | $ 2,850 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Repair Leak | 2018 | 3 | $ 137,742 | $ 45,480 | $ 34,921 | $ 57,341 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Pre-Mark | 2018 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Leak Detection | 2018 | 3 | $ 642 | $ 212 | $ 163 | $ 267 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Miscellaneous Work | 2018 | Indirect | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Report Leak | 2018 | 3 | $ 3,424 | $ 1,131 | $ 868 | $ 1,425 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Shut Down Not | 2018 | 15 | $ 299 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 299 | $ - |
| TD Collect Sample | 2018 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

## Schedule HJS-13d: T&D Labor Allocation (Factor 21)

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | Year | Factor | Total | Base | Max Day | Max Hour | Base | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Meters & Services | Billing & Collection | Direct Fire |
| | | | | HCF | HCF/d | HCF/d | HCF | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | 5/8" Eq. | Bills | 6" Eq. |
| Trench - Check | 2018 | 3 | $ 4,632 | $ 1,529 | $ 1,174 | $ 1,928 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Pressure | 2018 | 3 | $ 25 | $ 8 | $ 6 | $ 11 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Quality Issue | 2018 | 3 | $ 95 | $ 31 | $ 24 | $ 39 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Blasting | 2018 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Emergency | 2018 | 3 | $ 1,162 | $ 384 | $ 295 | $ 484 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Freeform | 2018 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Regular | 2018 | 3 | $ 2,849 | $ 941 | $ 722 | $ 1,186 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Violation | 2018 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Inspect | 2019 | 3 | $ 79 | $ 26 | $ 20 | $ 33 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Install | 2019 | 3 | $ 15,186 | $ 5,014 | $ 3,850 | $ 6,322 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Locate | 2019 | 3 | $ 79 | $ 26 | $ 20 | $ 33 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Remove | 2019 | 3 | $ 6,165 | $ 2,035 | $ 1,563 | $ 2,566 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Blowoff - Repair | 2019 | 3 | $ 7,612 | $ 2,513 | $ 1,930 | $ 3,169 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Hydrant - Check / Inspect | 2019 | 17 | $ 18,086 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 18,086 |
| Hydrant - Close | 2019 | 17 | $ 3,592 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 3,592 |
| Hydrant - Flush | 2019 | 17 | $ 75 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 75 |
| Hydrant - Gate Box Adjust / Replace | 2019 | 17 | $ 1,943 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,943 |
| Hydrant - Install | 2019 | 17 | $ 104,475 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 104,475 |
| Hydrant - Install - TD | 2019 | 17 | $ 18,592 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 18,592 |
| Hydrant - Install Custodian | 2019 | 17 | $ 1,748 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,748 |
| Hydrant - Maintenance | 2019 | 17 | $ 3,485 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 3,485 |
| Hydrant - Open | 2019 | 17 | $ 113 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 113 |
| Hydrant - Relocate Existing | 2019 | 17 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Hydrant - Remove | 2019 | 17 | $ 34,757 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 34,757 |
| Hydrant - Remove - TD | 2019 | 17 | $ 4,678 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 4,678 |
| Hydrant - Repair | 2019 | 17 | $ 94,220 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 94,220 |
| Hydrant - Repair/Repack Valve | 2019 | 17 | $ 10,469 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 10,469 |
| Sampling Station - Install | 2019 | 3 | $ 6,817 | $ 2,251 | $ 1,728 | $ 2,838 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Sampling Station - Remove | 2019 | 3 | $ 1,330 | $ 439 | $ 337 | $ 554 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Curb Box - Adjust to Grade | 2019 | 14 | $ 18,893 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 18,893 | $ - | $ - |
| Service - Curb Box - Check | 2019 | 14 | $ 37,952 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 37,952 | $ - | $ - |
| Service - Curb Box - Dig Up | 2019 | 14 | $ 122,415 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 122,415 | $ - | $ - |
| Service - Curb Stop - Close | 2019 | 14 | $ 47,417 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 47,417 | $ - | $ - |
| Service - Curb Stop - Locate | 2019 | 14 | $ 13,968 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 13,968 | $ - | $ - |
| Service - Curb Stop - Open | 2019 | 14 | $ 56,932 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 56,932 | $ - | $ - |
| Service - Curb Stop - Repair | 2019 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Curb Stop - Replace | 2019 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Curb Stop - Replace / Repair | 2019 | 14 | $ 25,813 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 25,813 | $ - | $ - |
| Service - Dig Up For Meter | 2019 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Field Asset Measurement | 2019 | 14 | $ 10,028 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 10,028 | $ - | $ - |
| Service - Install - IFR | 2019 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Install - T&D | 2019 | 14 | $ 473,668 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 473,668 | $ - | $ - |
| Service - Meter - Bypass Meter | 2019 | 14 | $ 1,554 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,554 | $ - | $ - |
| Service - MLOG Leak Investigation | 2019 | 14 | $ 276 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 276 | $ - | $ - |
| Service - Reconnect | 2019 | 14 | $ 2,096 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,096 | $ - | $ - |
| Service - Remove | 2019 | 14 | $ 42,450 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 42,450 | $ - | $ - |
| Service - Remove Lead - CS Apps | 2019 | 14 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Service - Remove Lead - TD | 2019 | 14 | $ 116,483 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 116,483 | $ - | $ - |
| Service - Repair Leak | 2019 | 14 | $ 136,350 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 136,350 | $ - | $ - |
| TD Misc - Miscellaneous Maint | 2019 | Indirect | $ 226 | $ 24 | $ 19 | $ 31 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 113 | $ 0 | $ 40 |
| TD Misc - Pre-Mark for Digup | 2019 | Indirect | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| TD Misc - Pre-Mark for Saw Cut | 2019 | Indirect | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| TD Misc - Trench Repair | 2019 | Indirect | $ 17,844 | $ 1,911 | $ 1,467 | $ 2,410 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 8,867 | $ 1 | $ 3,187 |
| Trench - Check For Failure | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Trench Restoration | 2019 | 3 | $ 747,233 | $ 246,722 | $ 189,441 | $ 311,070 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Adjust Gate Box | 2019 | 3 | $ 5,989 | $ 1,977 | $ 1,518 | $ 2,493 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Check / Inspect | 2019 | 3 | $ 5,836 | $ 1,927 | $ 1,479 | $ 2,429 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Install | 2019 | 3 | $ 17,734 | $ 5,855 | $ 4,496 | $ 7,383 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Install - TD | 2019 | 3 | $ 13,701 | $ 4,524 | $ 3,473 | $ 5,703 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Locate | 2019 | 3 | $ 741 | $ 245 | $ 188 | $ 309 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Raise Gate Box To Grade | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Remove | 2019 | 3 | $ 6,774 | $ 2,236 | $ 1,717 | $ 2,820 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Remove - TD | 2019 | 3 | $ 755 | $ 249 | $ 191 | $ 314 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Repair / Repack | 2019 | 3 | $ 28,008 | $ 9,248 | $ 7,101 | $ 11,660 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Valve - Replace Box Cover | 2019 | 3 | $ 2,329 | $ 769 | $ 590 | $ 969 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Install | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Remove | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Main - Repair Leak | 2019 | 3 | $ 115,527 | $ 38,145 | $ 29,289 | $ 48,093 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Pre-Mark | 2019 | 3 | $ 398 | $ 131 | $ 101 | $ 165 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Leak Detection | 2019 | 3 | $ 477 | $ 157 | $ 121 | $ 199 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Miscellaneous Work | 2019 | Indirect | $ 2,630 | $ 282 | $ 216 | $ 355 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,307 | $ 0 | $ 470 |
| Report Leak | 2019 | 3 | $ 9,774 | $ 3,227 | $ 2,478 | $ 4,069 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Shut Down Not | 2019 | 15 | $ 22 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 22 | $ - |
| TD Collect Sample | 2019 | 3 | $ 142 | $ 47 | $ 36 | $ 59 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Trench - Check | 2019 | 3 | $ 5,914 | $ 1,953 | $ 1,499 | $ 2,462 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Pressure | 2019 | 3 | $ 279 | $ 92 | $ 71 | $ 116 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Water Quality Issue | 2019 | 3 | $ 47 | $ 16 | $ 12 | $ 20 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Blasting | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Emergency | 2019 | 3 | $ 5,209 | $ 1,720 | $ 1,321 | $ 2,168 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Freeform | 2019 | 3 | $ 107 | $ 35 | $ 27 | $ 45 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Regular | 2019 | 3 | $ 1,128 | $ 372 | $ 286 | $ 469 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| DigSafe - Violation | 2019 | 3 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

## Schedule HJS-13d: T&D Labor Allocation (Factor 21)

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Year** | **Factor** | **Total** | **Base** | **Max Day** | **Max Hour** | **Base** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Meters & Services** | **Billing & Collection** | **Direct Fire** |
| | | | | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *5/8" Eq.* | *Bills* | *6" Eq.* |
| 3-Year Total (Direct Allocations) | | | $6,223,596 | $666,570 | $511,813 | $840,418 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $3,092,737 | $321 | $1,111,735 |
| Indirect Allocation % | | | 100.00% | 10.71% | 8.22% | 13.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 49.69% | 0.01% | 17.86% |
| 3-Year Total (All Allocations) | | | $6,255,138 | $ 669,949 | $ 514,407 | $ 844,678 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 3,108,412 | $ 323 | $ 1,117,370 |
| **Factor 21 - As T&D Work/Service Orders** | | | **100.00%** | **4.25%** | **3.26%** | **5.36%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **6.46%** | **4.96%** | **8.15%** | **49.69%** | **0.01%** | **17.86%** |

## Schedule HJS-13e: T&D Contract Services Allocation (Factor 22)

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Year** | **Factor** | **Total** | **Base** | **Max Day** | **Max Hour** | **Base** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Meters & Services** | **Billing & Collection** | **Direct Fire** |
| | | | | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *5/8" Eq.* | *Bills* | *6" Eq.* |
| Uniforms | 2017 | Indirect | $ 25,500 | $ 7,729 | $ 5,935 | $ 9,745 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,091 | $ - | $ - |
| Markouts/Dig Safe | 2017 | 3 | $ 31,727 | $ 10,476 | $ 8,044 | $ 13,208 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Switchboard Monitoring | 2017 | Indirect | $ 2,929 | $ 888 | $ 682 | $ 1,119 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 240 | $ - | $ - |
| Service Repair | 2017 | 14 | $ 93,580 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 93,580 | $ - | $ - |
| Police Details | 2017 | 3 | $ 174,132 | $ 57,495 | $ 44,147 | $ 72,490 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| T&D Contractor | 2017 | 3 | $ 47,871 | $ 15,806 | $ 12,136 | $ 19,928 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Repair Leak on Service | 2017 | 14 | $ 47,130 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 47,130 | $ - | $ - |
| Road Restoration - Contractor | 2017 | 3 | $ 590,536 | $ 194,984 | $ 149,715 | $ 245,838 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Telephone | 2017 | Indirect | $ 8,719 | $ 2,643 | $ 2,029 | $ 3,332 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 715 | $ - | $ - |
| Uniforms | 2018 | Indirect | $ 7,100 | $ 2,152 | $ 1,652 | $ 2,713 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 582 | $ - | $ - |
| Markouts/Dig Safe | 2018 | 3 | $ 32,903 | $ 10,864 | $ 8,342 | $ 13,697 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Switchboard Monitoring | 2018 | Indirect | $ 3,373 | $ 1,023 | $ 785 | $ 1,289 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 277 | $ - | $ - |
| Police Details | 2018 | 3 | $ 124,242 | $ 41,022 | $ 31,498 | $ 51,721 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| T&D Contractor | 2018 | 3 | $ 143,850 | $ 47,497 | $ 36,469 | $ 59,884 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Repair Leak on Service | 2018 | 14 | $ 44,813 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 44,813 | $ - | $ - |
| Road Restoration - Contractor | 2018 | 3 | $ 538,228 | $ 177,713 | $ 136,453 | $ 224,062 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Telephone | 2018 | Indirect | $ 10,860 | $ 3,292 | $ 2,528 | $ 4,150 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 890 | $ - | $ - |
| Markouts/Dig Safe | 2019 | 3 | $ 31,113 | $ 10,273 | $ 7,888 | $ 12,952 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Switchboard Monitoring | 2019 | Indirect | $ 3,000 | $ 909 | $ 698 | $ 1,147 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 246 | $ - | $ - |
| Police Details | 2019 | 3 | $ 150,299 | $ 49,626 | $ 38,104 | $ 62,569 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| T&D Contractor | 2019 | 3 | $ 120,574 | $ 39,811 | $ 30,568 | $ 50,194 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Repair Leak on Service | 2019 | 14 | $ 47,278 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 47,278 | $ - | $ - |
| Road Restoration - Contractor | 2019 | 3 | $ 620,956 | $ 205,028 | $ 157,427 | $ 258,501 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Misc. Expenses | 2019 | Indirect | $ 9,767 | $ 2,960 | $ 2,273 | $ 3,732 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 801 | $ - | $ - |
| 3-Year Total (Direct Allocations) | | | $ 2,839,230 | $860,594 | $660,790 | $1,085,045 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $232,800 | $0 | $0 |
| Indirect Allocation % | | | 100.00% | 30.31% | 23.27% | 38.22% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.20% | 0.00% | 0.00% |
| 3-Year Total | | | $ 2,910,479 | $ 882,190 | $ 677,372 | $ 1,112,274 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 238,642 | $ - | $ - |
| **Factor 22 - As T&D Contract Services** | | | **100.00%** | **12.08%** | **9.27%** | **15.23%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **18.23%** | **14.00%** | **22.99%** | **8.20%** | **0.00%** | **0.00%** |

## Schedule HJS-13f: Net Plant In Service (Factors 23, 24, 25, 26)

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | | | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | Allocation Factor | Plant in Service | Accumulated Depreciation | Net Book Value | Base | Max Day | Max Hour | Base | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Base | Max Day | Max Hour | Meters & Services | Billing & Collection | Direct Fire |
| | | | | | HCF | HCF/d | HCF/d | HCF | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | HCF | HCF/d | HCF/d | 5/8" Eq. | Bills | 6" Eq. |
| **Source of Supply & Pumping** | | | | | | | | | | | | | | | | | | | | |
| Land and Land Rights | 4 | $ 38,927,814 | $ - | $ 38,927,814 | $ - | $ - | $ - | $ - | $ 38,733,175 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 194,639 |
| Structures and Improvements | 4 | 22,401,415 | 16,642,333 | 5,759,082 | - | - | - | - | 5,730,287 | - | - | - | - | - | - | - | - | - | - | 28,795 |
| Collecting & Impounding Reservoirs | 4 | 13,373,233 | 8,994,270 | 4,378,962 | - | - | - | - | 4,357,068 | - | - | - | - | - | - | - | - | - | - | 21,895 |
| Land & Impounding Reservoirs | 4 | 4,306,409 | - | 4,306,409 | - | - | - | - | 4,284,877 | - | - | - | - | - | - | - | - | - | - | 21,532 |
| Supply Mains | 4 | 22,350,197 | 6,939,341 | 15,410,856 | - | - | - | - | 15,333,801 | - | - | - | - | - | - | - | - | - | - | 77,054 |
| Other Water Source Plant | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Power Production Equipment | 4 | 459,318 | 408,911 | 50,407 | - | - | - | - | 50,154 | - | - | - | - | - | - | - | - | - | - | 252 |
| Electric Pumping Equipment | 18 | 1,709,401 | 1,395,416 | 313,985 | - | - | - | - | - | - | - | 64,413 | 49,458 | 81,212 | 39,259 | 30,145 | 49,499 | - | - | - |
| Hydraulic Pumping Equipment | 18 | 107,721 | 62,678 | 45,043 | - | - | - | - | - | - | - | 9,240 | 7,095 | 11,650 | 5,632 | 4,324 | 7,101 | - | - | - |
| Other Plant & Miscellaneous Equipme | 18 | 1,150,739 | 1,150,739 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***Total Source of Supply & Pumping Plant*** | | $ 104,786,247 | $ 35,593,689 | $ 69,192,558 | $ - | $ - | $ - | $ - | $ 68,489,362 | $ - | $ - | $ 73,653 | $ 56,553 | $ 92,862 | $ 44,891 | $ 34,469 | $ 56,599 | $ - | $ - | $ 344,168 |
| **Water Treatment Plant** | | | | | | | | | | | | | | | | | | | | |
| Land and Land Rights | 5 | $ 29,994 | $ - | $ 29,994 | $ - | $ - | $ - | $ - | $ 16,967 | $ 13,027 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Structures and Improvements | 5 | 64,787,943 | 54,483,966 | 10,303,977 | - | - | - | - | 5,828,601 | 4,475,376 | - | - | - | - | - | - | - | - | - | - |
| Water Treatment Equipment | 5 | 13,736,209 | 13,116,332 | 619,878 | - | - | - | - | 350,643 | 269,234 | - | - | - | - | - | - | - | - | - | - |
| Other Plant & Miscellaneous Equipme | 5 | 27,674,487 | 20,360,815 | 7,313,672 | - | - | - | - | 4,137,089 | 3,176,583 | - | - | - | - | - | - | - | - | - | - |
| ***Total Water Treatment Plant*** | | $ 106,228,633 | $ 87,961,113 | $ 18,267,521 | $ - | $ - | $ - | $ - | $ 10,333,300 | $ 7,934,221 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Transmission & Distribution Plant** | | | | | | | | | | | | | | | | | | | | |
| Land and Land Rights | 23 | $ 614,902 | $ - | $ 614,902 | $ - | $ - | $ - | $ - | $ 71,623 | $ 54,995 | $ 90,303 | $ 20,799 | $ 15,970 | $ 26,224 | $ 7,967 | $ 6,118 | $ 10,045 | $ - | $ - | $ 310,857 |
| Structures and Improvements | 23 | 204,660 | 204,660 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Distribution Reservoirs & Standpipes | 20 | 18,722,912 | 12,104,381 | 6,618,531 | - | - | - | - | 1,559,113 | 1,197,135 | 1,965,745 | 452,764 | 347,646 | 570,849 | 173,438 | 133,171 | 218,672 | - | - | - |
| Transmission Mains[1] | 2 | 82,274,598 | 12,825,029 | 69,449,569 | 39,285,201 | 30,164,368 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Distribution Mains[1] | 12 | 124,218,289 | 19,363,244 | 104,855,046 | - | - | - | - | - | - | - | - | - | - | 34,621,168 | 26,583,182 | 43,650,695 | - | - | - |
| T&D Services | 14 | 73,240,742 | 19,756,961 | 53,483,781 | - | - | - | - | - | - | - | - | - | - | - | - | - | 53,483,781 | - | - |
| Meters & Meter Installation | 14 | 31,296,939 | 24,361,180 | 6,935,760 | - | - | - | - | - | - | - | - | - | - | - | - | - | 6,935,760 | - | - |
| Hydrants | 17 | 11,546,412 | 4,779,609 | 6,766,803 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6,766,803 |
| Other Plant & Miscellaneous Equipme | 2 | 7,834,658 | 7,834,658 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***Total Transmission & Distribution Plant*** | | $ 349,954,113 | $ 101,229,721 | $ 248,724,392 | $ 39,285,201 | $ 30,164,368 | $ - | $ - | $ 1,630,737 | $ 1,252,129 | $ 2,056,048 | $ 473,563 | $ 363,616 | $ 597,073 | $ 34,802,574 | $ 26,722,471 | $ 43,879,412 | $ 60,419,541 | $ - | $ 7,077,660 |
| **General Plant** | | | | | | | | | | | | | | | | | | | | |
| Land and Land Rights | 24 | $ 23,380 | $ - | $ 23,380 | $ 2,732 | $ 2,098 | $ - | $ - | $ 5,595 | $ 639 | $ 143 | $ 38 | $ 29 | $ 48 | $ 2,423 | $ 1,861 | $ 3,056 | $ 4,202 | $ - | $ 516 |
| Structures and Improvements[1] | 24 | 5,690,927 | 5,648,798 | 42,129 | $ 4,923 | $ 3,780 | $ - | $ - | $ 10,082 | $ 1,151 | $ 258 | $ 69 | $ 53 | $ 86 | $ 4,367 | $ 3,353 | $ 5,506 | $ 7,571 | $ - | $ 930 |
| Central Operations Facility | 27 | 29,637,233 | 995,351 | 28,641,882 | $ 5,931,867 | $ 2,460,738 | $ 2,541,801 | $ - | $ 1,734,692 | $ 275,974 | $ 59,551 | $ 15,945 | $ 12,243 | $ 20,103 | $ 2,432,737 | $ 1,199,784 | $ 1,970,096 | $ 7,051,241 | $ 1,313,311 | $ 1,621,799 |
| Office Furniture & Equipment | 24 | 620,787 | 595,641 | 25,146 | $ 2,939 | $ 2,256 | $ - | $ - | $ 6,018 | $ 687 | $ 154 | $ 41 | $ 31 | $ 52 | $ 2,607 | $ 2,001 | $ 3,286 | $ 4,519 | $ - | $ 555 |
| Transportation Equipment | 24 | 8,897,148 | 7,866,240 | 1,030,909 | $ 120,468 | $ 92,499 | $ - | $ - | $ 246,710 | $ 28,170 | $ 6,305 | $ 1,678 | $ 1,288 | $ 2,116 | $ 106,860 | $ 82,050 | $ 134,730 | $ 185,276 | $ - | $ 22,759 |
| Computer Equipment | 24 | 11,690,744 | 4,739,235 | 6,951,508 | $ 812,326 | $ 623,729 | $ - | $ - | $ 1,663,588 | $ 189,952 | $ 42,514 | $ 11,315 | $ 8,688 | $ 14,266 | $ 720,564 | $ 553,271 | $ 908,494 | $ 1,249,335 | $ - | $ 153,466 |
| Tools, Shop & Garage Equipment | 24 | 846,649 | 657,232 | 189,417 | $ 22,134 | $ 16,996 | $ - | $ - | $ 45,330 | $ 5,176 | $ 1,158 | $ 308 | $ 237 | $ 389 | $ 19,634 | $ 15,076 | $ 24,755 | $ 34,042 | $ - | $ 4,182 |
| Laboratory Equipment | 1 | 198,137 | 196,548 | 1,589 | $ 1,581 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 8 |
| Power Operated Equipment | 24 | 497,025 | 384,436 | 112,589 | $ 13,157 | $ 10,102 | $ - | $ - | $ 26,944 | $ 3,077 | $ 689 | $ 183 | $ 141 | $ 231 | $ 11,670 | $ 8,961 | $ 14,714 | $ 20,235 | $ - | $ 2,486 |
| Communication Equipment | 24 | 1,138,195 | 1,133,547 | 4,648 | $ 543 | $ 417 | $ - | $ - | $ 1,112 | $ 127 | $ 28 | $ 8 | $ 6 | $ 10 | $ 482 | $ 370 | $ 607 | $ 835 | $ - | $ 103 |
| Miscellaneous Equipment | 24 | 697,209 | 696,132 | 1,077 | $ 126 | $ 97 | $ - | $ - | $ 258 | $ 29 | $ 7 | $ 2 | $ 1 | $ 2 | $ 112 | $ 86 | $ 141 | $ 193 | $ - | $ 24 |
| Other Tangible Plant | 24 | 117,627 | 80,638 | 36,989 | $ 4,322 | $ 3,319 | $ - | $ - | $ 8,852 | $ 1,011 | $ 226 | $ 60 | $ 46 | $ 76 | $ 3,834 | $ 2,944 | $ 4,834 | $ 6,648 | $ - | $ 817 |
| ***Total General Plant*** | | $ 60,055,059 | $ 22,993,797 | $ 37,061,262 | $ 6,917,118 | $ 3,216,030 | $ 2,541,801 | $ - | $ 3,749,181 | $ 505,993 | $ 111,033 | $ 29,647 | $ 22,764 | $ 37,379 | $ 3,305,289 | $ 1,869,757 | $ 3,070,219 | $ 8,564,098 | $ 1,313,311 | $ 1,807,643 |
| Total Plant | | $ 621,024,052 | $ 247,778,320 | $ 373,245,732 | $ 46,202,319 | $ 33,380,398 | $ 2,541,801 | $ - | $ 84,202,580 | $ 9,692,343 | $ 2,167,081 | $ 576,862 | $ 442,932 | $ 727,314 | $ 38,152,754 | $ 28,626,696 | $ 47,006,230 | $ 68,983,638 | $ 1,313,311 | $ 9,229,471 |
| Construction Work in Progress | 24 | | | $ 53,315,917 | $ 6,230,289 | $ 4,783,805 | $ - | $ - | $ 12,759,205 | $ 1,456,875 | $ 326,071 | $ 86,784 | $ 66,635 | $ 109,418 | $ 5,526,503 | $ 4,243,417 | $ 6,967,867 | $ 9,582,011 | $ - | $ 1,177,037 |
| **Total Plant Investment** | | $ 621,024,052 | $ 247,778,320 | $ 426,561,649 | $ 52,432,609 | $ 38,164,203 | $ 2,541,801 | $ - | $ 96,961,786 | $ 11,149,218 | $ 2,493,152 | $ 663,646 | $ 509,568 | $ 836,731 | $ 43,679,258 | $ 32,870,113 | $ 53,974,098 | $ 78,565,649 | $ 1,313,311 | $ 10,406,507 |
| (1) Net of Central Operations Facility | T&D Plant Excl. M&S, Land, Structures | | | $ 13,385,334 | $ - | $ - | $ - | $ - | $ 1,559,113 | $ 1,197,135 | $ 1,965,745 | $ 452,764 | $ 347,646 | $ 570,849 | $ 173,438 | $ 133,171 | $ 218,672 | $ - | $ - | $ 6,766,803 |
| **Factor 23 - As T&D Plant Excl. M&S, Land, Structures** | | | | **100.00%** | **0.00%** | **0.00%** | **0.00%** | **0.00%** | **11.65%** | **8.94%** | **14.69%** | **3.38%** | **2.60%** | **4.26%** | **1.30%** | **0.99%** | **1.63%** | **0.00%** | **0.00%** | **50.55%** |
| Total Plant Excl. General Plant | | | | $ 336,184,470 | $ 39,285,201 | $ 30,164,368 | $ - | $ - | $ 80,453,399 | $ 9,186,350 | $ 2,056,048 | $ 547,216 | $ 420,169 | $ 689,935 | $ 34,847,465 | $ 26,756,939 | $ 43,936,012 | $ 60,419,541 | $ - | $ 7,421,827 |
| **Factor 24 - As Total Plant Excl. General Plant** | | | | **100.00%** | **11.69%** | **8.97%** | **0.00%** | **0.00%** | **23.93%** | **2.73%** | **0.61%** | **0.16%** | **0.12%** | **0.21%** | **10.37%** | **7.96%** | **13.07%** | **17.97%** | **0.00%** | **2.21%** |
| Total Plant Excl. Land, COF | | | | **$ 305,007,760** | **$ 40,267,721** | **$ 30,917,562** | **$ -** | **$ -** | **$ 43,640,528** | **$ 9,347,708** | **$ 2,017,084** | **$ 540,080** | **$ 414,690** | **$ 680,938** | **$ 35,709,627** | **$ 27,418,933** | **$ 45,023,033** | **$ 61,928,196** | **$ -** | **$ 7,101,660** |
| **Factor 25 - As Total Plant Excl. Land, COF** | | | | **100.00%** | **13.20%** | **10.14%** | **0.00%** | **0.00%** | **14.31%** | **3.06%** | **0.66%** | **0.18%** | **0.14%** | **0.22%** | **11.71%** | **8.99%** | **14.76%** | **20.30%** | **0.00%** | **2.33%** |
| Total Plant Excl. Land | | | | $ 333,649,642 | $ 46,199,587 | $ 33,378,300 | $ 2,541,801 | $ - | $ 45,375,220 | $ 9,623,682 | $ 2,076,635 | $ 556,025 | $ 426,933 | $ 701,042 | $ 38,142,363 | $ 28,618,718 | $ 46,993,129 | $ 68,979,436 | $ 1,313,311 | $ 8,723,459 |
| **Factor 26 - As Total Plant Excl. Land** | | | | **100.00%** | **13.85%** | **10.00%** | **0.76%** | **0.00%** | **13.60%** | **2.88%** | **0.62%** | **0.17%** | **0.13%** | **0.21%** | **11.43%** | **8.58%** | **14.08%** | **20.67%** | **0.39%** | **2.61%** |

## Schedule HJS-16d: Summary of Customer Class Units of Service

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| Customer Class | Demand | | | | Demand | | | Billing | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Base | Maximum Day Extra | Maximum Hour Extra | Base | Base | Maximum Day Extra | Maximum Hour Extra | Meters & Services | Monthly Bills | Direct Fire |
| | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF* | *HCF/d* | *HCF/d* | *5/8" Eq.* | *Bills* | *6" Eq.* |
| **Retail** | | | | | | | | | | |
| Residential | 10,712,750 | 12,954 | 35,958 | 10,712,750 | 10,712,750 | 12,954 | 35,958 | | | |
| Commercial | 5,156,794 | 7,571 | 18,644 | 5,156,794 | 5,156,794 | 7,571 | 18,644 | | | |
| Industrial | 238,832 | 228 | 741 | 238,832 | 238,832 | 228 | 741 | | | |
| Sub-total Retail | 16,108,376 | 20,753 | 55,343 | 16,108,376 | 16,108,376 | 20,753 | 55,343 | 88,313 | 931,056 | |
| **Fire Protection** | | | | | | | | | | |
| Private | - | 690 | 2,070 | - | | 690 | 2,070 | 40,187 | 23,940 | |
| Public (Providence) | 69,188 | 1,085 | 3,254 | 69,188 | 69,188 | 1,085 | 3,254 | | | 3,232 |
| Public (All Other) | 71,029 | 1,113 | 3,340 | 71,029 | 71,029 | 1,113 | 3,340 | | | 3,318 |
| Subtotal Fire Protection | 140,217 | 2,888 | 8,663 | 140,217 | 140,217 | 2,888 | 8,663 | 40,187 | 23,940 | 6,550 |
| **Wholesale** | | | | | | | | | | |
| Bristol County | 1,574,775 | 2,096 | 1,238 | 1,574,775 | 1,574,775 | 2,096 | 1,238 | | | |
| East Providence | 1,910,247 | 3,323 | 5,480 | 1,910,247 | 1,910,247 | 3,323 | 5,480 | | | |
| Greenville | 448,469 | 1,168 | 1,202 | 448,469 | 448,469 | 1,168 | 1,202 | | | |
| Kent County | 2,849,950 | 3,166 | 5,622 | 2,849,950 | 2,849,950 | 3,166 | 5,622 | | | |
| Lincoln | 1,108,770 | 2,557 | 952 | 1,108,770 | 1,108,770 | 2,557 | 952 | | | |
| Smithfield | 415,430 | 1,255 | 419 | 415,430 | 415,430 | 1,255 | 419 | | | |
| Warwick | 3,626,433 | 13,254 | 3,941 | 3,626,433 | 3,626,433 | 13,254 | 3,941 | | | |
| **Wholesale** | 11,934,074 | 26,821 | 18,855 | 11,934,074 | 11,934,074 | 26,821 | 18,855 | - | - | - |
| **Grand Total** | 28,182,668 | 50,462 | 82,860 | 28,182,668 | 28,182,668 | 50,462 | 82,860 | 128,499 | 954,996 | 6,550 |

## Schedule HJS-17: Unit Cost of Service

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Total** | **Base** | **Max Day** | **Max Hour** | **Base** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Meters & Services** | **Billing & Collection** | **Direct Fire** |
| | | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *5/8" Eq.* | *Bills* | *6" Eq.* |
| **Total Units of Service** | | | | | | | | | | | | | | | | | |
| Retail | | 16,108,376 | 20,753 | 55,343 | 16,108,376 | 16,108,376 | 20,753 | 55,343 | 16,108,376 | 20,753 | 55,343 | 16,108,376 | 20,753 | 55,343 | 88,313 | 931,056 | - |
| Fire Protection | | 140,217 | 2,888 | 8,663 | 140,217 | 140,217 | 2,888 | 8,663 | 140,217 | 2,888 | 8,663 | 140,217 | 2,888 | 8,663 | 40,187 | 23,940 | 6,550 |
| Bristol County | | 1,574,775 | 2,096 | 1,238 | 1,574,775 | 1,574,775 | 2,096 | 1,238 | | | | | | | | | |
| East Providence | | 1,910,247 | 3,323 | 5,480 | 1,910,247 | 1,910,247 | 3,323 | 5,480 | | | | | | | | | |
| Greenville | | 448,469 | 1,168 | 1,202 | 448,469 | 448,469 | 1,168 | 1,202 | 448,469 | 1,168 | 1,202 | | | | | | |
| Kent County | | 2,849,950 | 3,166 | 5,622 | 2,849,950 | 2,849,950 | 3,166 | 5,622 | | | | | | | | | |
| Lincoln | | 1,108,770 | 2,557 | 952 | 1,108,770 | 1,108,770 | 2,557 | 952 | 1,108,770 | 2,557 | 952 | | | | | | |
| Smithfield | | 415,430 | 1,255 | 419 | 415,430 | 415,430 | 1,255 | 419 | 415,430 | 1,255 | 419 | | | | | | |
| Warwick | | 3,626,433 | 13,254 | 3,941 | 3,626,433 | 3,626,433 | 13,254 | 3,941 | | | | | | | | | |
| Total | | 28,182,668 | 50,462 | 82,860 | 28,182,668 | 28,182,668 | 50,462 | 82,860 | 18,221,263 | 28,622 | 66,579 | 16,248,593 | 23,641 | 64,006 | 128,499 | 954,996 | 6,550 |
| **Unit Cost of Service** | | | | | | | | | | | | | | | | | |
| O&M Expense | $ 39,207,946 | $ 446,733 | $ 343,023 | $ 887,100 | $ 2,255,246 | $ 15,978,157 | $ 1,713,613 | $ (12,867) | $ 230,863 | $ 177,264 | $ 291,075 | $ 967,972 | $ 743,247 | $ 1,220,442 | $ 4,337,024 | $ 7,850,951 | $ 1,778,103 |
| Unit Cost ($/Unit) | | $ 0.02 | $ 6.80 | $ 10.71 | $ 0.08 | $ 0.57 | $ 33.96 | $ (0.16) | $ 0.01 | $ 6.19 | $ 4.37 | $ 0.06 | $ 31.44 | $ 19.07 | $ 33.75 | $ 8.22 | $ 271.47 |
| Capital Expense | $ 37,967,000 | $ 4,624,840 | $ 3,537,605 | $ 16,204 | $ - | $ 4,982,291 | $ 1,066,587 | $ 230,152 | $ 61,624 | $ 47,317 | $ 77,696 | $ 4,096,514 | $ 3,141,168 | $ 5,157,929 | $ 8,099,390 | $ 2,008,372 | $ 819,312 |
| Unit Cost ($/Unit) | | $ 0.16 | $ 70.10 | $ 0.20 | $ - | $ 0.18 | $ 21.14 | $ 2.78 | $ 0.00 | $ 1.65 | $ 1.17 | $ 0.25 | $ 132.87 | $ 80.59 | $ 63.03 | $ 2.10 | $ 125.09 |
| City Services Expense | $ 839,167 | $ 14,049 | $ 10,787 | $ 17,713 | $ 50,885 | $ 306,003 | $ 18,801 | $ - | $ 3,870 | $ 2,971 | $ 4,879 | $ 24,615 | $ 18,899 | $ 31,033 | $ 114,937 | $ 178,533 | $ 41,189 |
| Unit Cost ($/Unit) | | $ 0.00 | $ 0.21 | $ 0.21 | $ 0.00 | $ 0.01 | $ 0.37 | $ - | $ 0.00 | $ 0.10 | $ 0.07 | $ 0.00 | $ 0.80 | $ 0.48 | $ 0.89 | $ 0.19 | $ 6.29 |
| Property Tax Expense | $ 7,934,311 | $ - | $ - | $ - | $ - | $ 4,445,430 | $ 3,098,233 | $ 72,874 | $ 104,242 | $ 80,040 | $ 131,429 | $ - | $ - | $ - | $ - | $ - | $ 2,062 |
| Unit Cost ($/Unit) | | $ - | $ - | $ - | $ - | $ 0.16 | $ 61.40 | $ 0.88 | $ 0.01 | $ 2.80 | $ 1.97 | $ - | $ - | $ - | $ - | $ - | $ 0.31 |
| Net Op Rev Allowance | $ 1,718,968 | $ 101,712 | $ 77,828 | $ 18,420 | $ 46,123 | $ 514,238 | $ 117,945 | $ 5,803 | $ 8,012 | $ 6,152 | $ 10,102 | $ 101,782 | $ 78,066 | $ 128,188 | $ 251,027 | $ 200,757 | $ 52,813 |
| Unit Cost ($/Unit) | | $ 0.00 | $ 1.54 | $ 0.22 | $ 0.00 | $ 0.02 | $ 2.34 | $ 0.07 | $ 0.00 | $ 0.21 | $ 0.15 | $ 0.01 | $ 3.30 | $ 2.00 | $ 1.95 | $ 0.21 | $ 8.06 |
| Total Cost of Service | $ 87,667,393 | $ 5,187,335 | $ 3,969,244 | $ 939,438 | $ 2,352,254 | $ 26,226,118 | $ 6,015,179 | $ 295,963 | $ 408,611 | $ 313,744 | $ 515,181 | $ 5,190,882 | $ 3,981,380 | $ 6,537,592 | $ 12,802,378 | $ 10,238,613 | $ 2,693,479 |
| Unit Cost ($/Unit) | | $ 0.18 | $ 78.66 | $ 11.34 | $ 0.08 | $ 0.93 | $ 119.20 | $ 3.57 | $ 0.02 | $ 10.96 | $ 7.74 | $ 0.32 | $ 168.41 | $ 102.14 | $ 99.63 | $ 10.72 | $ 411.22 |

## Schedule HJS-18: Customer Class Cost of Service

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| | | CTA - Transmission & Distribution | | | | CTA - Supply, Treatment & Low Service | | | High Service & Retail | | | Retail Only | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Total** | **Base** | **Max Day** | **Max Hour** | **Base** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Base** | **Max Day** | **Max Hour** | **Meters & Services** | **Billing & Collection** | **Direct Fire** |
| | | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *HCF* | *HCF/d* | *HCF/d* | *5/8" Eq.* | *Bills* | *6" Eq.* |
| Unit Cost of Service ($/Unit) | | $ 0.18 | $ 78.66 | $ 11.34 | $ 0.08 | $ 0.93 | $ 119.20 | $ 3.57 | $ 0.02 | $ 10.96 | $ 7.74 | $ 0.32 | $ 168.41 | $ 102.14 | $ 99.63 | $ 10.72 | $ 411.22 |
| **Retail Service:** | | | | | | | | | | | | | | | | | |
| Residential Volume | | | | | | | | | | | | | | | | | |
| Units of Service | | 10,712,750 | 12,954 | 35,958 | 10,712,750 | 10,712,750 | 12,954 | 35,958 | 10,712,750 | 12,954 | 35,958 | 10,712,750 | 12,954 | 35,958 | - | - | - |
| Cost of Service | $ 25,871,427 | $ 1,971,802 | $ 1,018,968 | $ 407,673 | $ 894,135 | $ 9,969,030 | $ 1,544,192 | $ 128,434 | $ 240,233 | $ 142,001 | $ 278,235 | $ 3,422,366 | $ 2,181,624 | $ 3,672,734 | $ - | $ - | $ - |
| Commercial Volume | | | | | | | | | | | | | | | | | |
| Units of Service | | 5,156,794 | 7,571 | 18,644 | 5,156,794 | 5,156,794 | 7,571 | 18,644 | 5,156,794 | 7,571 | 18,644 | 5,156,794 | 7,571 | 18,644 | - | - | - |
| Cost of Service | $ 13,124,162 | $ 949,166 | $ 595,548 | $ 211,383 | $ 430,410 | $ 4,798,789 | $ 902,521 | $ 66,594 | $ 115,641 | $ 82,994 | $ 144,268 | $ 1,647,423 | $ 1,275,076 | $ 1,904,351 | $ - | $ - | $ - |
| Industrial Volume Charge | | | | | | | | | | | | | | | | | |
| Units of Service | | 238,832 | 228 | 741 | 238,832 | 238,832 | 228 | 741 | 238,832 | 228 | 741 | 238,832 | 228 | 741 | - | - | - |
| Cost of Service | $ 546,163 | $ 43,960 | $ 17,920 | $ 8,397 | $ 19,934 | $ 222,252 | $ 27,156 | $ 2,645 | $ 5,356 | $ 2,497 | $ 5,731 | $ 76,299 | $ 38,366 | $ 75,651 | $ - | $ - | $ - |
| Meter Service Charge | | | | | | | | | | | | | | | | | |
| Units of Service | | - | - | - | - | - | - | - | - | - | - | - | - | - | 88,313 | 931,056 | - |
| Cost of Service | $ 18,780,533 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 8,798,583 | $ 9,981,950 | $ - |
| **Fire Protection:** | | | | | | | | | | | | | | | | | |
| Private Fire Lines | | | | | | | | | | | | | | | | | |
| Units of Service | | - | 690 | 2,070 | - | - | 690 | 2,070 | - | 690 | 2,070 | - | 690 | 2,070 | 40,187 | 23,940 | - |
| Cost of Service | $ 4,778,936 | $ - | $ 54,261 | $ 23,463 | $ - | $ - | $ 82,230 | $ 7,392 | $ - | $ 7,562 | $ 16,014 | $ - | $ 116,174 | $ 211,381 | $ 4,003,795 | $ 256,663 | $ - |
| Public Fire (Providence) | | | | | | | | | | | | | | | | | |
| Units of Service | | 69,188 | 1,085 | 3,254 | 69,188 | 69,188 | 1,085 | 3,254 | 69,188 | 1,085 | 3,254 | 69,188 | 1,085 | 3,254 | - | - | 3,232 |
| Cost of Service | $ 2,250,715 | $ 12,735 | $ 85,305 | $ 36,887 | $ 5,775 | $ 64,385 | $ 129,276 | $ 11,621 | $ 1,552 | $ 11,888 | $ 25,175 | $ 22,103 | $ 182,640 | $ 332,316 | $ - | $ - | $ 1,329,057 |
| Public Fire (All Other) | | | | | | | | | | | | | | | | | |
| Units of Service | | 71,029 | 1,113 | 3,340 | 71,029 | 71,029 | 1,113 | 3,340 | 71,029 | 1,113 | 3,340 | 71,029 | 1,113 | 3,340 | - | - | 3,318 |
| Cost of Service | $ 2,310,604 | $ 13,074 | $ 87,575 | $ 37,869 | $ 5,928 | $ 66,098 | $ 132,716 | $ 11,930 | $ 1,593 | $ 12,204 | $ 25,845 | $ 22,691 | $ 187,500 | $ 341,159 | $ - | $ - | $ 1,364,422 |
| **Wholesale Service:** | | | | | | | | | | | | | | | | | |
| Units of Service | | | | | | | | | | | | - | - | - | - | - | - |
| Bristol County | | 1,574,775 | 2,096 | 1,238 | 1,574,775 | 1,574,775 | 2,096 | 1,238 | | | | | | | | | |
| East Providence | | 1,910,247 | 3,323 | 5,480 | 1,910,247 | 1,910,247 | 3,323 | 5,480 | | | | | | | | | |
| Greenville | | 448,469 | 1,168 | 1,202 | 448,469 | 448,469 | 1,168 | 1,202 | 448,469 | 1,168 | 1,202 | | | | | | |
| Kent County | | 2,849,950 | 3,166 | 5,622 | 2,849,950 | 2,849,950 | 3,166 | 5,622 | | | | | | | | | |
| Lincoln | | 1,108,770 | 2,557 | 952 | 1,108,770 | 1,108,770 | 2,557 | 952 | 1,108,770 | 2,557 | 952 | | | | | | |
| Smithfield | | 415,430 | 1,255 | 419 | 415,430 | 415,430 | 1,255 | 419 | 415,430 | 1,255 | 419 | | | | | | |
| Warwick | | 3,626,433 | 13,254 | 3,941 | 3,626,433 | 3,626,433 | 13,254 | 3,941 | | | | | | | | | |
| | | 11,934,074 | 26,821 | 18,855 | 11,934,074 | 11,934,074 | 26,821 | 18,855 | 1,972,669 | 4,981 | 2,574 | - | - | - | - | - | - |
| Cost of Service | | | | | | | | | | | | | | | | | |
| Bristol County | $ 2,319,887 | $ 289,855 | $ 164,858 | $ 14,033 | $ 131,438 | $ 1,465,448 | $ 249,834 | $ 4,421 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| East Providen | $ 3,027,932 | $ 351,602 | $ 261,410 | $ 62,125 | $ 159,438 | $ 1,777,630 | $ 396,153 | $ 19,572 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Greenville | $ 818,534 | $ 82,546 | $ 91,886 | $ 13,631 | $ 37,431 | $ 417,335 | $ 139,248 | $ 4,294 | $ 10,057 | $ 12,805 | $ 9,303 | $ - | $ - | $ - | $ - | $ - | $ - |
| Kent County | $ 4,124,843 | $ 524,565 | $ 249,056 | $ 63,744 | $ 237,870 | $ 2,652,095 | $ 377,431 | $ 20,082 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Lincoln | $ 1,908,894 | $ 204,081 | $ 201,162 | $ 10,796 | $ 92,543 | $ 1,031,795 | $ 304,850 | $ 3,401 | $ 24,864 | $ 28,033 | $ 7,368 | $ - | $ - | $ - | $ - | $ - | $ - |
| Smithfield | $ 778,640 | $ 76,465 | $ 98,729 | $ 4,751 | $ 34,674 | $ 386,590 | $ 149,618 | $ 1,497 | $ 9,316 | $ 13,759 | $ 3,243 | $ - | $ - | $ - | $ - | $ - | $ - |
| Warwick | $ 7,026,122 | $ 667,486 | $ 1,042,567 | $ 44,686 | $ 302,679 | $ 3,374,672 | $ 1,579,954 | $ 14,078 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | $ 20,004,853 | $ 2,196,600 | $ 2,109,667 | $ 213,767 | $ 996,072 | $ 11,105,565 | $ 3,197,088 | $ 67,346 | $ 44,237 | $ 54,597 | $ 19,914 | $ - | $ - | $ - | $ - | $ - | $ - |
| Total Cost of Service | $ 87,667,393 | $ 5,187,335 | $ 3,969,244 | $ 939,438 | $ 2,352,254 | $ 26,226,118 | $ 6,015,179 | $ 295,963 | $ 408,611 | $ 313,744 | $ 515,181 | $ 5,190,882 | $ 3,981,380 | $ 6,537,592 | $ 12,802,378 | $ 10,238,613 | $ 2,693,479 |

# Schedule HJS-19: Development of Volumetric Rates

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| Description | Units | Residential | Commercial | Industrial | Bristol County | East Providence | Greenville | Kent County | Lincoln | Smithfield | Warwick |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unit Cost** | | | | | | | | | | | |
| CTA Base - T&D | HCF | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 | $ 0.18 |
| CTA Max Day - T&D | HCF/d | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 | $ 78.66 |
| CTA Max Hour - T&D | HCF/d | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 | $ 11.34 |
| CTA Base - T&D <=12" | HCF | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 |
| CTA Base - SOS, WTP, LS | $/HCF | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 | $ 0.93 |
| CTA Max Day - SOS, WTP, LS | $/HCF/d | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 | $ 119.20 |
| CTA Max Hour - SOS, WTP, LS | $/HCF/d | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 | $ 3.57 |
| HSR Base | $/HCF | $ 0.02 | $ 0.02 | $ 0.02 | | | $ 0.02 | | $ 0.02 | $ 0.02 | |
| HSR Max Day | $/HCF/d | $ 10.96 | $ 10.96 | $ 10.96 | | | $ 10.96 | | $ 10.96 | $ 10.96 | |
| HSR Max Hour | $/HCF/d | $ 7.74 | $ 7.74 | $ 7.74 | | | $ 7.74 | | $ 7.74 | $ 7.74 | |
| Retail Only Base | $/HCF | $ 0.32 | $ 0.32 | $ 0.32 | | | | | | | |
| Retail Only Max Day | $/HCF/d | $ 168.41 | $ 168.41 | $ 168.41 | | | | | | | |
| Retail Only Max Hour | $/HCF/d | $ 102.14 | $ 102.14 | $ 102.14 | | | | | | | |
| **Units** | | | | | | | | | | | |
| Base | HCF | 10,712,750 | 5,156,794 | 238,832 | 1,574,775 | 1,910,247 | 448,469 | 2,849,950 | 1,108,770 | 415,430 | 3,626,433 |
| Maximum Day | HCF/d | 12,954 | 7,571 | 228 | 2,096 | 3,323 | 1,168 | 3,166 | 2,557 | 1,255 | 13,254 |
| Maximum Hour | HCF/d | 35,958 | 18,644 | 741 | 1,238 | 5,480 | 1,202 | 5,622 | 952 | 419 | 3,941 |
| Base | HCF | 10,712,750 | 5,156,794 | 238,832 | 1,574,775 | 1,910,247 | 448,469 | 2,849,950 | 1,108,770 | 415,430 | 3,626,433 |
| Base | HCF | 10,712,750 | 5,156,794 | 238,832 | 1,574,775 | 1,910,247 | 448,469 | 2,849,950 | 1,108,770 | 415,430 | 3,626,433 |
| Maximum Day | HCF/d | 12,954 | 7,571 | 228 | 2,096 | 3,323 | 1,168 | 3,166 | 2,557 | 1,255 | 13,254 |
| Maximum Hour | HCF/d | 35,958 | 18,644 | 741 | 1,238 | 5,480 | 1,202 | 5,622 | 952 | 419 | 3,941 |

## Schedule HJS-19: Development of Volumetric Rates

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| Description | Units | Residential | Commercial | Industrial | Bristol County | East Providence | Greenville | Kent County | Lincoln | Smithfield | Warwick |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Cost** | | | | | | | | | | | |
| CTA Base - T&D | | $ 1,971,802 | $ 949,166 | $ 43,960 | $ 289,855 | $ 351,602 | $ 82,546 | $ 524,565 | $ 204,081 | $ 76,465 | $ 667,486 |
| CTA Max Day - T&D | | $ 1,018,968 | $ 595,548 | $ 17,920 | $ 164,858 | $ 261,410 | $ 91,886 | $ 249,056 | $ 201,162 | $ 98,729 | $ 1,042,567 |
| CTA Max Hour - T&D | | $ 407,673 | $ 211,383 | $ 8,397 | $ 14,033 | $ 62,125 | $ 13,631 | $ 63,744 | $ 10,796 | $ 4,751 | $ 44,686 |
| CTA Base - T&D <=12" | | $ 894,135 | $ 430,410 | $ 19,934 | $ 131,438 | $ 159,438 | $ 37,431 | $ 237,870 | $ 92,543 | $ 34,674 | $ 302,679 |
| CTA Base - SOS, WTP, LS | | $ 9,969,030 | $ 4,798,789 | $ 222,252 | $ 1,465,448 | $ 1,777,630 | $ 417,335 | $ 2,652,095 | $ 1,031,795 | $ 386,590 | $ 3,374,672 |
| CTA Max Day - SOS, WTP, LS | | $ 1,544,192 | $ 902,521 | $ 27,156 | $ 249,834 | $ 396,153 | $ 139,248 | $ 377,431 | $ 304,850 | $ 149,618 | $ 1,579,954 |
| CTA Max Hour - SOS, WTP, LS | | $ 128,434 | $ 66,594 | $ 2,645 | $ 4,421 | $ 19,572 | $ 4,294 | $ 20,082 | $ 3,401 | $ 1,497 | $ 14,078 |
| HSR Base | | $ 240,233 | $ 115,641 | $ 5,356 | $ - | $ - | $ 10,057 | $ - | $ 24,864 | $ 9,316 | $ - |
| HSR Maximum Day | | $ 142,001 | $ 82,994 | $ 2,497 | $ - | $ - | $ 12,805 | $ - | $ 28,033 | $ 13,759 | $ - |
| HSR Maximum Hour | | $ 278,235 | $ 144,268 | $ 5,731 | $ - | $ - | $ 9,303 | $ - | $ 7,368 | $ 3,243 | $ - |
| Retail Only Base | | $ 3,422,366 | $ 1,647,423 | $ 76,299 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Retail Only Max Day | | $ 2,181,624 | $ 1,275,076 | $ 38,366 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Retail Only Max Hour | | $ 3,672,734 | $ 1,904,351 | $ 75,651 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| PLUS: | | | | | | | | | | | |
| Retail Service Charge Costs | | $ 5,112,809 | $ 2,593,647 | $ 107,935 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Retail Fire Protection Costs | | $ 127,020 | $ 64,435 | $ 2,681 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Private Fire Line Costs | | $ 295,501 | $ 149,903 | $ 6,238 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Public Fire Costs | | $ 101,630 | $ 51,555 | $ 2,145 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **Total Rate Year Revenue Requirement** | | $ 31,508,387 | $ 15,983,702 | $ 665,163 | $ 2,319,887 | $ 3,027,932 | $ 818,534 | $ 4,124,843 | $ 1,908,894 | $ 778,640 | $ 7,026,122 |
| **Rate Year Sales** | HCF | 8,396,176 | 4,041,665 | 187,186 | 1,494,845 | 1,822,773 | 421,521 | 2,727,147 | 1,038,229 | 391,600 | 3,466,644 |
| **Volumetric Rate Build-Up** | | | | | | | | | | | |
| Base | $/HCF | $ 1.964890 | $ 1.964890 | $ 1.964890 | $ 1.262165 | $ 1.255598 | $ 1.298556 | $ 1.252052 | $ 1.303454 | $ 1.294800 | $ 1.253326 |
| Maximum Day | $/HCF | $ 0.582025 | $ 0.706674 | $ 0.459109 | $ 0.277415 | $ 0.360749 | $ 0.578709 | $ 0.229722 | $ 0.514381 | $ 0.669320 | $ 0.756501 |
| Maximum Hour | $/HCF | $ 0.534419 | $ 0.575653 | $ 0.493758 | $ 0.012345 | $ 0.044820 | $ 0.064593 | $ 0.030738 | $ 0.020772 | $ 0.024235 | $ 0.016951 |
| Service Charge | $/HCF | $ 0.608945 | $ 0.641727 | $ 0.576618 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Retail Fire | $/HCF | $ 0.015128 | $ 0.015943 | $ 0.014325 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Private Fire | $/HCF | $ 0.035195 | $ 0.037089 | $ 0.033326 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Public Fire | $/HCF | $ 0.012104 | $ 0.012756 | $ 0.011462 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Total | $/HCF | $ 3.752707 | $ 3.954732 | $ 3.553489 | $ 1.551925 | $ 1.661168 | $ 1.941858 | $ 1.512512 | $ 1.838607 | $ 1.988355 | $ 2.026779 |
| Rounded | $/HCF | $ 3.753000 | $ 3.955000 | $ 3.554000 | $ 1.551925 | $ 1.661169 | $ 1.941858 | $ 1.512512 | $ 1.838607 | $ 1.988355 | $ 2.026780 |
| Revenues | | $ 31,510,849 | $ 15,984,785 | $ 665,259 | $ 2,319,887 | $ 3,027,934 | $ 818,534 | $ 4,124,843 | $ 1,908,894 | $ 778,640 | $ 7,026,125 |
| COS | | $ 31,508,387 | $ 15,983,702 | $ 665,163 | $ 2,319,887 | $ 3,027,932 | $ 818,534 | $ 4,124,843 | $ 1,908,894 | $ 778,640 | $ 7,026,122 |
| Variance due to Rounding | | $ 2,462 | $ 1,083 | $ 96 | $ 0 | $ 2 | $ 0 | $ 0 | $ 0 | $ 0 | $ 3 |

## Schedule HJS-22: Proposed Rates

**AMENDED BY MICHAEL R. MAKER**

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| Description | Units | Existing Rates | | Proposed FY 2021 (Peaking Factors) | | | Existing FY 2021 | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment | Rates | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Service Charges** | | | | | | | | | | | | | | | | | | |
| 5/8" | 57,812 | $ 7.56 | $ 5,244,705 | 31.22% | $ 9.92 | $ 6,881,940 | 31.22% | $ 9.92 | $ - | $ - | $ 9.92 | $ 6,881,940 | 9.07% | $ 10.82 | $ 7,506,310 | 4.24% | $ 11.28 | $ 7,824,466 |
| 3/4" | 11,326 | $ 8.05 | $ 1,094,092 | 31.30% | $ 10.57 | $ 1,436,590 | 31.30% | $ 10.57 | $ - | $ - | $ 10.57 | $ 1,436,590 | 9.08% | $ 11.53 | $ 1,567,065 | 4.24% | $ 12.02 | $ 1,633,486 |
| 1" | 5,335 | $ 9.50 | $ 608,190 | 31.26% | $ 12.47 | $ 798,329 | 31.26% | $ 12.47 | $ - | $ - | $ 12.47 | $ 798,329 | 9.06% | $ 13.60 | $ 870,672 | 4.24% | $ 14.18 | $ 907,576 |
| 1.5" | 1,547 | $ 11.43 | $ 212,187 | 31.23% | $ 15.00 | $ 278,460 | 31.23% | $ 15.00 | $ - | $ - | $ 15.00 | $ 278,460 | 9.07% | $ 16.36 | $ 303,707 | 4.24% | $ 17.05 | $ 316,580 |
| 2" | 1,357 | $ 16.76 | $ 272,920 | 31.21% | $ 21.99 | $ 358,085 | 31.21% | $ 21.99 | $ - | $ - | $ 21.99 | $ 358,085 | 9.05% | $ 23.98 | $ 390,490 | 4.24% | $ 25.00 | $ 407,041 |
| 3" | 73 | $ 56.01 | $ 49,065 | 31.21% | $ 73.49 | $ 64,377 | 31.21% | $ 73.49 | $ - | $ - | $ 73.49 | $ 64,377 | 9.05% | $ 80.14 | $ 70,203 | 4.24% | $ 83.54 | $ 73,178 |
| 4" | 35 | $ 70.55 | $ 29,631 | 31.21% | $ 92.57 | $ 38,879 | 31.21% | $ 92.57 | $ - | $ - | $ 92.57 | $ 38,879 | 9.05% | $ 100.95 | $ 42,399 | 4.24% | $ 105.23 | $ 44,196 |
| 6" | 57 | $ 104.47 | $ 71,457 | 31.21% | $ 137.07 | $ 93,756 | 31.21% | $ 137.07 | $ - | $ - | $ 137.07 | $ 93,756 | 9.05% | $ 149.48 | $ 102,244 | 4.24% | $ 155.82 | $ 106,578 |
| 8" | 42 | $ 143.23 | $ 72,188 | 31.20% | $ 187.92 | $ 94,712 | 31.20% | $ 187.92 | $ - | $ - | $ 187.92 | $ 94,712 | 9.05% | $ 204.93 | $ 103,285 | 4.24% | $ 213.62 | $ 107,662 |
| 10" | 4 | $ 178.36 | $ 8,561 | 31.20% | $ 234.01 | $ 11,232 | 31.20% | $ 234.01 | $ - | $ - | $ 234.01 | $ 11,232 | 9.05% | $ 255.19 | $ 12,249 | 4.24% | $ 266.01 | $ 12,768 |
| 12" | - | $ 213.49 | $ - | 31.20% | $ 280.10 | $ - | 31.20% | $ 280.10 | $ - | $ - | $ 280.10 | $ - | 9.05% | $ 305.45 | $ - | 4.24% | $ 318.40 | $ - |
| Total Service Charge | 77,588 | | $ 7,662,995 | 31.23% | | $ 10,056,362 | 31.23% | | | | | $ 10,056,362 | 9.07% | | $ 10,968,625 | 4.24% | | $ 11,433,531 |
| | | | | | | | | | | | | $ - | | | | | | |
| **Retail Fire Protection Service Charges (Providence Only)** | | | | | | | | | | | | | | | | | | |
| 5/8" | 25,954 | $ 1.38 | $ 429,798 | 31.88% | $ 1.82 | $ 566,835 | 31.88% | $ 1.82 | $ - | $ - | $ 1.82 | $ 566,835 | 9.34% | $ 1.99 | $ 619,782 | 4.24% | $ 2.07 | $ 646,051 |
| 3/4" | 4,580 | $ 2.07 | $ 113,767 | 31.40% | $ 2.72 | $ 149,491 | 31.40% | $ 2.72 | $ - | $ - | $ 2.72 | $ 149,491 | 9.19% | $ 2.97 | $ 163,231 | 4.24% | $ 3.10 | $ 170,150 |
| 1" | 2,091 | $ 5.15 | $ 129,224 | 31.26% | $ 6.76 | $ 169,622 | 31.26% | $ 6.76 | $ - | $ - | $ 6.76 | $ 169,622 | 9.17% | $ 7.38 | $ 185,179 | 4.24% | $ 7.69 | $ 193,028 |
| 1.5" | 902 | $ 13.74 | $ 148,722 | 31.22% | $ 18.03 | $ 195,157 | 31.22% | $ 18.03 | $ - | $ - | $ 18.03 | $ 195,157 | 9.10% | $ 19.67 | $ 212,908 | 4.24% | $ 20.50 | $ 221,932 |
| 2" | 792 | $ 32.96 | $ 313,252 | 31.22% | $ 43.25 | $ 411,048 | 31.22% | $ 43.25 | $ - | $ - | $ 43.25 | $ 411,048 | 9.06% | $ 47.17 | $ 448,304 | 4.24% | $ 49.17 | $ 467,305 |
| 3" | 55 | $ 89.26 | $ 58,912 | 31.20% | $ 117.11 | $ 77,293 | 31.20% | $ 117.11 | $ - | $ - | $ 117.11 | $ 77,293 | 9.05% | $ 127.71 | $ 84,289 | 4.24% | $ 133.12 | $ 87,861 |
| 4" | 20 | $ 151.05 | $ 36,252 | 31.20% | $ 198.18 | $ 47,563 | 31.20% | $ 198.18 | $ - | $ - | $ 198.18 | $ 47,563 | 9.05% | $ 216.11 | $ 51,866 | 4.24% | $ 225.27 | $ 54,065 |
| 6" | 28 | $ 308.97 | $ 103,814 | 31.20% | $ 405.37 | $ 136,204 | 31.20% | $ 405.37 | $ - | $ - | $ 405.37 | $ 136,204 | 9.05% | $ 442.05 | $ 148,529 | 4.24% | $ 460.79 | $ 154,824 |
| 8" | 15 | $ 466.89 | $ 84,040 | 31.20% | $ 612.56 | $ 110,261 | 31.20% | $ 612.56 | $ - | $ - | $ 612.56 | $ 110,261 | 9.05% | $ 667.98 | $ 120,236 | 4.24% | $ 696.29 | $ 125,333 |
| 10" | 2 | $ 714.07 | $ 17,138 | 31.20% | $ 936.86 | $ 22,485 | 31.20% | $ 936.86 | $ - | $ - | $ 936.86 | $ 22,485 | 9.05% | $ 1,021.62 | $ 24,519 | 4.24% | $ 1,064.92 | $ 25,558 |
| 12" | - | $ 1,180.95 | $ - | 31.20% | $ 1,549.41 | $ - | 31.20% | $ 1,549.41 | $ - | $ - | $ 1,549.41 | $ - | 9.05% | $ 1,689.59 | $ - | 4.24% | $ 1,761.20 | $ - |
| Total Retail FPSC (Providence Only) | 34,439 | | $ 1,434,918 | 31.43% | | $ 1,885,959 | 31.43% | | | | | $ 1,885,959 | 9.17% | | $ 2,058,843 | 4.24% | | $ 2,146,107 |
| Total Retail Service Charge Revenue | | | $ 9,097,913 | | | $ 11,942,320 | 31.26% | | | | | $ 11,942,320 | 9.09% | | $ 13,027,467 | 4.24% | | $ 13,579,638 |

| Description | Units | Existing Rates | | Proposed FY 2021 (Peaking Factors) | | | Existing FY 2021 | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment | Rates | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Retail Consumption Charges** | | | | | | | | | | | | | | | | | | |
| Residential | 8,396,176 | $ 3.403 | $ 28,572,187 | 7.35% | $ 3.653 | $ 30,671,231 | 7.88% | $ 3.684 | | ($0.013) | $ 3.671 | $ 30,822,362 | 2.23% | $ 3.753 | $ 31,510,849 | 4.24% | $ 3.912 | $ 32,846,439 |
| Commercial | 4,041,665 | $ 3.223 | $ 13,026,286 | 18.77% | $ 3.828 | $ 15,471,494 | 19.36% | $ 3.859 | | ($0.012) | $ 3.847 | $ 15,548,285 | 2.81% | $ 3.955 | $ 15,984,785 | 4.24% | $ 4.123 | $ 16,662,302 |
| Industrial | 187,186 | $ 3.169 | $ 593,192 | 9.81% | $ 3.480 | $ 651,407 | 10.38% | $ 3.512 | | ($0.014) | $ 3.498 | $ 654,777 | 1.60% | $ 3.554 | $ 665,259 | 4.24% | $ 3.705 | $ 693,456 |
| Total Retail Consumption Charge | 12,625,027 | | $ 42,191,666 | 10.91% | | $ 46,794,132 | 11.46% | | | | | $ 47,025,424 | 2.41% | | $ 48,160,893 | 4.24% | | $ 50,202,197 |
| East Smithfield Debt Surcharge | 235,576 | $ 0.35 | $ 82,451 | 0.00% | $ 0.350 | $ 82,451 | 0.00% | $ 0.350 | | | $ 0.350 | $ 82,451 | 0.00% | $ 0.350 | $ 82,451 | 0.00% | $ 0.350 | $ 82,451 |
| Total Retail Volume Charge Revenue | | | $ 42,274,117 | | | $ 46,876,583 | 11.43% | | | | | $ 47,107,875 | 2.41% | | $ 48,243,344 | 4.23% | | $ 50,284,648 |
| **Total Retail Revenue** | | | **$ 51,372,030** | | | **$ 58,818,904** | **14.95%** | | | | | **$ 59,050,196** | **3.76%** | | **$ 61,270,811** | **4.23%** | | **$ 63,864,286** |

## Schedule HJS-22: Proposed Rates

Providence Water Supply Board
Docket # 4994
Individual Wholesale Cost of Service Study
Per RIPUC Report and Order No. 23928
Test Year Ending June 30, 2019
Rate Years Ending June 30, 2021 through 2023

| Description | Units | Existing Rates | | Proposed FY 2021 (Peaking Factors) | | | Existing FY 2021 | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment | Rates | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Wholesale Charges** | | | | | | | | | | | | | | | | | | |
| Bristol County | 1,494,845 | $ 1.350858 | $ 2,019,323 | 10.55% | $ 1.493360 | $ 2,232,342 | 16.51% | $ 1.614196 | $ (0.120836) | $ (0.0402787) | $ 1.573918 | $ 2,352,763 | -1.40% | $ 1.551925 | $ 2,319,887 | 2.84% | $ 1.596072 | $ 2,385,880 |
| East Providence | 1,822,773 | $ 1.350858 | $ 2,462,307 | 18.35% | $ 1.598720 | $ 2,914,103 | 19.11% | $ 1.614196 | $ (0.015476) | $ (0.0051587) | $ 1.609038 | $ 2,932,911 | 3.24% | $ 1.661169 | $ 3,027,934 | 2.84% | $ 1.708424 | $ 3,114,068 |
| Greenville | 421,521 | $ 1.350858 | $ 569,415 | 27.86% | $ 1.727270 | $ 728,081 | 22.28% | $ 1.614196 | $ 0.113074 | $ 0.0376913 | $ 1.651888 | $ 696,306 | 17.55% | $ 1.941858 | $ 818,534 | 2.84% | $ 1.997097 | $ 841,819 |
| Kent County | 2,727,147 | $ 1.350858 | $ 3,683,989 | 10.03% | $ 1.486330 | $ 4,053,441 | 16.34% | $ 1.614196 | $ (0.127866) | $ (0.0426220) | $ 1.571574 | $ 4,285,914 | -3.76% | $ 1.512512 | $ 4,124,843 | 2.84% | $ 1.555538 | $ 4,242,181 |
| Lincoln | 1,038,229 | $ 1.350858 | $ 1,402,499 | 21.62% | $ 1.642868 | $ 1,705,673 | 20.20% | $ 1.614196 | $ 0.028672 | $ 0.0095573 | $ 1.623754 | $ 1,685,828 | 13.23% | $ 1.838607 | $ 1,908,894 | 2.84% | $ 1.890909 | $ 1,963,196 |
| Smithfield | 391,600 | $ 1.350858 | $ 528,996 | 29.50% | $ 1.749347 | $ 685,045 | 22.83% | $ 1.614196 | $ 0.135151 | $ 0.0450503 | $ 1.659247 | $ 649,762 | 19.83% | $ 1.988355 | $ 778,640 | 2.84% | $ 2.044917 | $ 800,790 |
| Warwick | 3,466,644 | $ 1.350858 | $ 4,682,944 | 35.97% | $ 1.836764 | $ 6,367,407 | 24.99% | $ 1.614196 | $ 0.222568 | $ 0.0741893 | $ 1.688386 | $ 5,853,034 | 20.04% | $ 2.026780 | $ 7,026,125 | 2.84% | $ 2.084435 | $ 7,225,995 |
| **Total Wholesale Revenue** | **11,362,760** | | **15,349,475** | **21.74%** | | **18,686,092** | **20.24%** | | | | | **18,456,517** | **8.39%** | | **20,004,859** | **2.84%** | | **20,573,931** |
| **Wholesale Charges** | | | | | | | | | | | | | | | | | | |
| Bristol County | 1,118 | $ 1,805.96 | $ 2,019,323 | 10.55% | $ 1,996.47 | $ 2,232,342 | 16.51% | $ 2,158.02 | $ (161.55) | $ (53.85) | $ 2,104.17 | $ 2,352,763 | -1.40% | $ 2,074.77 | $ 2,319,887 | 2.84% | $ 2,133.79 | $ 2,385,880 |
| East Providence | 1,363 | $ 1,805.96 | $ 2,462,307 | 18.35% | $ 2,137.33 | $ 2,914,103 | 19.11% | $ 2,158.02 | $ (20.69) | $ (6.90) | $ 2,151.12 | $ 2,932,911 | 3.24% | $ 2,220.81 | $ 3,027,934 | 2.84% | $ 2,283.99 | $ 3,114,068 |
| Greenville | 315 | $ 1,805.96 | $ 569,415 | 27.86% | $ 2,309.18 | $ 728,081 | 22.28% | $ 2,158.02 | $ 151.17 | $ 50.39 | $ 2,208.41 | $ 696,306 | 17.55% | $ 2,596.07 | $ 818,534 | 2.84% | $ 2,669.92 | $ 841,819 |
| Kent County | 2,040 | $ 1,805.96 | $ 3,683,989 | 10.03% | $ 1,987.07 | $ 4,053,441 | 16.34% | $ 2,158.02 | $ (170.94) | $ (56.98) | $ 2,101.03 | $ 4,285,914 | -3.76% | $ 2,022.07 | $ 4,124,843 | 2.84% | $ 2,079.60 | $ 4,242,181 |
| Lincoln | 777 | $ 1,805.96 | $ 1,402,499 | 21.62% | $ 2,196.35 | $ 1,705,673 | 20.20% | $ 2,158.02 | $ 38.33 | $ 12.78 | $ 2,170.79 | $ 1,685,828 | 13.23% | $ 2,458.03 | $ 1,908,894 | 2.84% | $ 2,527.95 | $ 1,963,196 |
| Smithfield | 293 | $ 1,805.96 | $ 528,996 | 29.50% | $ 2,338.70 | $ 685,045 | 22.83% | $ 2,158.02 | $ 180.68 | $ 60.23 | $ 2,218.24 | $ 649,762 | 19.83% | $ 2,658.23 | $ 778,640 | 2.84% | $ 2,733.85 | $ 800,790 |
| Warwick | 2,593 | $ 1,805.96 | $ 4,682,944 | 35.97% | $ 2,455.57 | $ 6,367,407 | 24.99% | $ 2,158.02 | $ 297.55 | $ 99.18 | $ 2,257.20 | $ 5,853,034 | 20.04% | $ 2,709.60 | $ 7,026,125 | 2.84% | $ 2,786.68 | $ 7,225,995 |
| **Wholesale (per million gallons)** | **8,499** | | **15,349,475** | **21.74%** | | **18,686,092** | **20.24%** | | | | | **18,456,517** | **8.39%** | | **20,004,859** | **2.84%** | | **20,573,931** |

| Description | Units | Existing Rates | | Proposed FY 2021 (Peaking Factors) | | | Existing FY 2021 | | | | | | Proposed FY 2022 | | | Proposed FY 2023 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rates | Revenue | % Change | Rates | Revenue | % Change | Jul 3 Rates | Differential | Adjustment | Rates | Revenue | % Change | Rates | Revenue | % Change | Rates | Revenue |
| **Private Fire Service Charges** | | | | | | | | | | | | | | | | | | |
| 3/4" | 2 | $ 8.64 | $ 207 | 31.25% | $ 11.34 | $ 272 | 31.25% | $ 11.34 | $ - | $ - | $ 11.34 | $ 272 | 9.08% | $ 12.37 | $ 297 | 4.24% | $ 12.89 | $ 309 |
| 1" | 9 | $ 10.21 | $ 1,103 | 31.24% | $ 13.40 | $ 1,447 | 31.24% | $ 13.40 | $ - | $ - | $ 13.40 | $ 1,447 | 9.10% | $ 14.62 | $ 1,579 | 4.24% | $ 15.24 | $ 1,646 |
| 1-1/2" | 2 | $ 12.57 | $ 302 | 31.26% | $ 16.50 | $ 396 | 31.26% | $ 16.50 | $ - | $ - | $ 16.50 | $ 396 | 9.09% | $ 18.00 | $ 432 | 4.24% | $ 18.76 | $ 450 |
| 2" | 68 | $ 18.64 | $ 15,210 | 31.22% | $ 24.46 | $ 19,959 | 31.22% | $ 24.46 | $ - | $ - | $ 24.46 | $ 19,959 | 9.08% | $ 26.68 | $ 21,771 | 4.24% | $ 27.81 | $ 22,694 |
| 4" | 391 | $ 79.67 | $ 373,812 | 31.20% | $ 104.53 | $ 490,455 | 31.20% | $ 104.53 | $ - | $ - | $ 104.53 | $ 490,455 | 9.05% | $ 113.99 | $ 534,841 | 4.24% | $ 118.82 | $ 557,510 |
| 6" | 1,245 | $ 129.89 | $ 1,940,557 | 31.20% | $ 170.42 | $ 2,546,075 | 31.20% | $ 170.42 | $ - | $ - | $ 170.42 | $ 2,546,075 | 9.05% | $ 185.84 | $ 2,776,450 | 4.24% | $ 193.72 | $ 2,894,130 |
| 8" | 256 | $ 196.73 | $ 604,355 | 31.20% | $ 258.11 | $ 792,914 | 31.20% | $ 258.11 | $ - | $ - | $ 258.11 | $ 792,914 | 9.05% | $ 281.47 | $ 864,676 | 4.24% | $ 293.40 | $ 901,325 |
| 10" | 4 | $ 274.06 | $ 13,155 | 31.20% | $ 359.57 | $ 17,259 | 31.20% | $ 359.57 | $ - | $ - | $ 359.57 | $ 17,259 | 9.05% | $ 392.10 | $ 18,821 | 4.24% | $ 408.72 | $ 19,619 |
| 12" | 18 | $ 367.64 | $ 79,410 | 31.20% | $ 482.35 | $ 104,188 | 31.20% | $ 482.35 | $ - | $ - | $ 482.35 | $ 104,188 | 4.07% | $ 501.98 | $ 108,428 | 4.24% | $ 523.26 | $ 113,023 |
| 16" | - | $ 611.43 | $ - | 23.19% | $ 753.22 | $ - | 23.19% | $ 752.28 | $ - | $ - | $ 753.22 | $ - | 2.16% | $ 769.51 | $ - | 4.24% | $ 802.13 | $ - |
| Total | | $ 3,028,110 | $ 3,028,110 | 31.20% | | $ 3,972,965 | 31.20% | | | | | $ 3,972,965 | 8.92% | | $ 4,327,294 | 4.24% | | $ 4,510,706 |
| | | | | | | | | | | | | $ - | | | | | | |
| Hydrants (Excluding Providence) | 3,318 | $ 454.02 | $1,506,438 | 0.00% | $ 595.68 | $1,976,466 | 31.20% | $ 595.68 | $ - | $ - | $ 595.68 | $1,976,466 | 9.05% | $ 649.58 | $2,155,306 | 4.24% | $ 677.11 | $2,246,659 |
| **Total Fire Protection Charge Revenue** | | | **4,534,548** | | | **5,949,431** | | | | | | **5,949,431** | | | **6,482,600** | | | **6,757,366** |
| **Total Rate Revenues** | | | **71,256,053** | | | **83,454,427** | | | | | | **83,456,144** | | | **87,758,270** | | | **91,195,582** |
| **Miscellaneous Revenues** | | | **1,493,163** | | | **1,543,163** | | | | | | **1,543,163** | | | **1,543,163** | | | **1,543,163** |
| **Total Revenues** | | | $ 72,749,216 | | | $ 84,997,590 | 16.84% | | | | | $ 84,999,307 | 5.06% | | $ 89,301,433 | 3.85% | | $ 92,738,745 |
| | | | - | | | | | | | | | | | | | | | |