WATER SUPPLY SYSTEM MANAGEMENT PLAN
FOR
SOUTH KINGSTOWN PUBLIC SERVICES DEPARTMENT

VOLUME 1

PREPARED FOR:

TOWN OF SOUTH KINGSTOWN, RI
509 COMMODORE PERRY HIGHWAY
WAKEFIELD, RHODE ISLAND 02879

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Preface

In 1991, Rhode Island enacted the "Water Supply Management Act." This required that all Rhode Island Water Purveyors, that deliver more than 50 million gallons of potable water per year, complete and file a detailed Water Supply Management Plan (WSMP) no later than July 1, 1992. Subsequent revisions to the law delayed implementation of the Act pending enactment of rules and regulations by the newly formed Rhode Island Department of Environmental Management (RIDEM), Division of Water Supply Management. These rules and regulations, along with a general guidance document, were developed by RIDEM in August 1992 and October 2002, respectively. The "Rules and Regulations for Water Supply Management Planning," dated August 17, 1992 (updated October 2002) specified a submission schedule and guideline by which the WSMPs were to be prepared and submitted for approval.

The South Kingstown Public Services Department, Water Division (SKWD), in accordance with the regulations, completed and filed a WSMP. This plan, originally prepared by Camp Dresser & McKee, in May 1994, met the requirements of the Water Supply Management Regulations, as they existed at that time, and was subsequently approved.

In the years subsequent to promulgation of the Water Supply Management Legislation, reorganization at RIDEM eliminated the Division of Water Supply Management. This resulted in the administrative duties associated with this legislation being brought under the auspices of the State of Rhode Island and Providence Plantations Water Resources Board (RIWRB).

The RIWRB subsequently promulgated regulation amendments for preparation and update of WSMPs. The regulations titled "Rules and Procedures for Water Supply Systems Management Planning," of October 1998, were promulgated pursuant to the requirements and provisions of Chapter 42-35 and pursuant to Chapter 46-15.3 of the Rhode Island General Laws, as amended. The new regulations are largely premised on the original regulations with significant changes occurring in the Water Quality Protection Component portion of the Plan. In 2018, the WRB updated the Regulations to meet the new format for the searchable R.I. Code of Regulations and went into effect on 4 January 2022. This update did not include substantive content-related changes. Under the new Regulations, the South Kingstown, Public Services Department, Water Division (SKWD) is mandated to prepare and submit the most recent updated Water Supply System Management Plan (WSSMP) to the RIWRB, for review and approval.

Executive Summary

Introduction

This Water Supply System Management Plan (WSSMP) Executive Summary for the Town of South Kingstown, Public Services Department, Water Division (SKWD) has been developed in compliance with the regulatory and guidance documents pertaining to water supply planning, of the State of Rhode Island. The *Rules and Procedures for Water Supply System Management Planning (490RICR-00-00-2) [Rules.SOS.RI.gov/Regulations/Part 490-00-00-2], and Water Use & Efficiency Rules for Major Water Suppliers (490 RICR-00-00-1) [Rules. SOS.RI.gov/Regulations/Part 490-00-00-1]* were promulgated pursuant to the requirements and provisions of Rhode Island (RI) General Laws Title 46 Waters & Navigation Chapter 46-15.3 Public Drinking Water Supply System Protection.

This WSSMP maintains consistency with the goals and policies of the approved Comprehensive Plan of the Town of South Kingstown, September 15, 2021. Additional plans that have been incorporated into the update include the following:

- Water Resources Board (WRB) Strategic Plan
- State Guide Plan Element 721, Report 115, Rhode Island Water 2030
- Rhode Island State Land Use Policies and Plan – Land Use 2025

Common goals expressed in these plans such as water source protection and control of land development, have been reviewed as part of the development of this WSSMP and the goal of this WSSMP is to comply with the provisions of the Water Supply Planning Regulations referenced previously, by developing a comprehensive water-supply management plan for the SKWD water-supply system. The report is also intended to achieve effective and efficient conservation, development, utilization, and protection of the water-system's resources. These objectives should be achieved in ways that satisfy the present and future needs of the SKWD customer base.

This WSSMP contains a detailed description of the water system and includes the policies and procedures related to the general function, operation, and management of the water system. Significant improvements completed since the prior WSSMP update include the addition of a supplemental chlorination system at the Mautucket Road Tank for increased public health protection and construction of an additional transmission main pipe loop within the South Shore System for improved system resiliency.

Background

The Town of South Kingstown owns and operates two public water systems (PWS): the South Shore System PWS #1615623 and the Middlebridge System PWS #1000015. The South Shore system serves the southern area of Town south of US Route 1 from the Charlestown Town line to East Matunuck. This area includes Matunuck, East Matunuck, Snug Harbor, Green Hill, Ocean Ridge and a small portion of Perryville. The Middlebridge system consists of one major

transmission main that extends along Middlebridge Road, south from Radial Drive, over the Middlebridge Bridge, and terminates in Narragansett. Water system management and operations are the responsibility of the Town of South Kingstown, Public Services Department, Water Division.

General System Information

The SKWD owns and operates two (2) separate water systems: the South Shore System and the Middlebridge System. Both water systems service primarily residential water customers.

The South Shore system is comprised of approximately 48 miles of water transmission and distribution mains, hydrants, meters, a booster pump station, two (2) elevated water storage tanks, system interconnection, wells, and appurtenances that serve 2,861 service accounts (e.g. residential, commercial, and governmental) as of spring 2022.

The Middlebridge system is comprised of approximately 3.6 miles of water transmission and distribution main, hydrants, meters, system interconnection, and appurtenances that serve 289 service accounts (e.g. residential) as of spring 2022.

Water Supply

Currently, water supply to the South Shore System and Middlebridge System is from interconnections with Veolia (formerly SUEZ, United Water RI, Wakefield Water).

The SKWD owns and operates three (3) wells located in the southern area of Town. The wells are currently exercised and maintained by the Town but not pumped into the water system due to elevated levels of iron and its associated aesthetic concerns. The RI Department of Health (Health) continues to sample the wells to maintain their active status to provide a standby source of water supply for the South Shore distribution system.

Water Storage

South Shore

The South Shore water system has two zones each controlled by the water elevation within its respective water storage tank. The overflow elevation at each of the water storage tanks is Elevation 210 feet Mean Sea Level (MSL). Water is received from the East Matunuck interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water), which in turn fills the Victoria Lane storage tank. A SCADA system controls an altitude valve in the interconnection meter pit such that it is deactivated when the tank reaches overflow elevation and it is activated when the water drops to a preset level in the tank.

Middlebridge

The Middlebridge system has water storage as provided through Veolia's (formerly SUEZ, United Water RI, Wakefield Water) hydraulic gradient and water storage facilities.

Booster Pumping

South Shore

An in-line booster pump station is located on Card's Pond Road which boosts service to the south-central and southwestern regions of SKWD. The booster pump station works on radio telemetry with the Mautucket Road storage tank and boosts water from the system to replenish this tank. The hydraulic grade of the South Shore system is maintained by the water level in the water storage facilities (i.e. 210 feet MSL).

Middlebridge

There is no booster station for the Middlebridge system, which relies on Veolia's (formerly SUEZ, United Water RI, Wakefield Water) hydraulic gradient to maintain adequate water pressure.

Water Distribution

South Shore

The transmission and distribution system water mains range in size from 6 to 14 inches, with installation dates from the 1960s to the present. New and replacement mains consist predominantly of cement-lined ductile iron (DI) pipe. The majority of the transmission and distribution system at present is comprised of asbestos-cement water mains.

Middlebridge

The Middlebridge water system was constructed in the mid-1970s and comprised of asbestos-cement pipe.

Water Meters

The water supply and distribution system are 100% metered. The Middlebridge master meters are located at the two (2) wholesale interconnections to Veolia (formerly SUEZ, United Water RI, Wakefield Water) (Middlebridge Road and Torry Road). The South Shore master meter is located near the intersection of Post Road and Kettle Pond Drive. There is also a meter pit at the Narragansett / South Kingstown Town line interconnection. These meter 100% of the water purchased via wholesale interconnections. The master meter located downstream of the South Shore wells meters 100% of the SKWD water production whenever the well field is in use. Finally, every service connection within the water distribution system is metered at the point of sale,

thus providing 100% distribution system metering. The master meter for Veolia (formerly SUEZ, United Water RI, Wakefield Water) for the South Shore area is located off of Route 1 near the intersection with Kettle Pond Drive.

Recent System Improvements

The SKWD maintains an ongoing Capital Improvements Program (CIP) in order to provide its customers with a safe and reliable supply of potable water. The following list identifies the major system improvements that have taken place in the years since the prior WSSMP update.

- Construction of the Matunuck Beach Revetment Wall to protect the major water transmission main in the South Shore.

Water Demand Projection

Anticipated future demands were estimated based on anticipated population growth, historic water use trends, ongoing water conservation efforts and future intended use for the service area. **Table 1** presents the estimated future water demands for the South Shore and Middlebridge Systems.

Table 1. Estimated Future Water Demands

Year	South Shore System			Middlebridge System		
	Annual (MG)	Average Day (GD)	Maximum Day (GD)	Annual (MG)	Average Day (GD)	Maximum Day (GD)
2023	123.26	337,774	861,324	13.258	36,046	91,919
2028	125.317	373,335	875,505	13.387	36,679	93,531
2033	126.945	347,794	886,875	13.522	37,048	94,472
2038	128.608	352,353	858,500	13.657	37,417	95,413
2043	130.233	356,912	910,126	13.791	37,785	96,354

MG = Million Gallons

GD = Gallons per Day

Water Availability

The Rhode Island Water Resources Board (RIWRB) developed a Strategic Plan (2018) regarding its responsibility to regulate the proper development, protection, conservation and use of the water resources of the State. The Plan includes state-wide initiatives for meeting water needs given the available resources. The SKWD acknowledges the goals and initiatives outlined in this plan. An overall objective of the SKWD is to ensure the availability of an adequate supply of potable water to meet the existing and future needs of its customers.

Water supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water) to the South Shore and Middlebridge systems is from groundwater. Veolia (formerly SUEZ, United Water RI, Wakefield Water) developed their own WSSMP and in that plan state that demands are considered to be sustainable by the local ground-water resources.

The SKWD also maintains backup supply wells within the South Shore system. Groundwater underlying these sources is part of a sub-basin of the South Coastal Drainage Basin system.

Currently the South Shore System and Middlebridge System receive supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The wholesale water purchase agreement for the South Shore System dated September 7, 2005 states that up to a maximum flow of 1.3 MGD would be provided. This is comfortably above the anticipated future maximum day demand of 0.910 MGD. The agreement established in 1975 for water supply to the Middlebridge System states that up to a maximum of 0.3 MGD would be provided. This value is well above the projected maximum day demand of 0.096 MGD.

Should the Town decide to implement iron removal treatment for the Factory Pond Wells, the treated water would also have the capacity to provide for the maximum day demand of the South Shore System since the wells can provide 1.15 MGD.

Demand Management and Water Conservation

Demand management and water conservation are the primary goals of the SKWD. The State of Rhode Island Water Use and Efficiency Act includes targets for public water suppliers to improve water efficiency and demand management. These targets include (1) a residential average annual water use of 65 gallons per capita per day (GPCD), (2) efficient outdoor water use, (3) efficient indoor water use, (4) full accounting of non-billed water, (5) leakage of no more than 10% of the withdrawals and/or purchased water measured as an annual average, and (6) accurate metering and billing to account for all water supplied.

The SKWD meters 100% of supply and consumption by customers. Wholesale interconnection supply meters are owned by Veolia (formerly SUEZ, United Water RI, Wakefield Water) and tested/ calibrated annually on an as needed basis. Customer water meters for the South Shore and Middlebridge were replaced over a three-year period (2019 – 2022) with meters capable of data logging and remote reporting. Representative samplings of customer meters are tested for accuracy as they are replaced or questions on usage arise.

The residential per capita demands of both the South Shore and Middlebridge Systems are approximately 52 GPCD respectively, well below the State's goal of 65 GPCD. Water saving conservation retrofit kits are available to water customers.

The unaccounted-for water for the two systems fluctuates above and below the State's goal of 10% allowable leakage and 15% for non-accounted water. The SKWD continues to work toward lowering the non-accounted for water to meet this goal. Leak detection and repair are conducted on an ongoing basis.

The Town has implemented a rate structure to encourage water conservation. The Town's Water Division adopted a conservation "tier-type" rate structure in 2014 and now issues water bills on a quarterly basis.

Water Quality Protection

The SKWD collects charges associated with the water quality protection program and issues them to the Rhode Island Water Resources Board as required in accordance with the Public Drinking Water Protection Program (RIGL 46-15.3). This program distributes funds that are used for land acquisitions and to purchase development rights within the supply watershed areas to help protect water quality.

The Town has ongoing strategies for protection of the Factory Pond Wells. The Town owns and controls a sufficient land area around each well to help minimize the potential for water contamination. The Town has a Wellhead Protection Program which has identified a well protection area around their well fields. The Rhode Island Department of Health's Drinking Water Assessment Results report indicates that the Town's wells have a Low Susceptibility to Contamination based on land use features and existing water quality.

Veolia (formerly SUEZ, United Water RI, Wakefield Water) also owns and controls a sufficient land area around each of their wells to help minimize the potential for water contamination. Veolia (formerly SUEZ, United Water RI, Wakefield Water) has a Wellhead Protection Program which has identified a well protection area around their well fields. The Rhode Island Department of Health's Drinking Water Assessment Results report indicates that the Veolia (formerly SUEZ, United Water RI, Wakefield Water) wells have a Low Susceptibility to Contamination based on land use features and existing water quality.

Water quality within the South Shore and Middlebridge systems has been in compliance with required standards with the exception of periodic total coliform detections within the westerly end of the South Shore system. In response to this, a chlorination system was installed at the Mautucket Tank to provide supplemental chlorination.

Emergency Management

An updated Emergency Response Plan (ERP) was prepared as part of the WSSMP. The ERP establishes the responsibilities and authority within the SKWD for responding to most probable emergencies and outlines specific tasks for carrying out functional and constructive solutions based on a review of the potential emergencies and risks. The procedures outlined are consistent with the goals of the State Emergency Water Supply System Management Plan. It is also intended that this document provide guidance to ensure that the primary aspects of recovery from an emergency are addressed in an organized manner to aid in an efficient response and in maintaining drinking water quality and quantity.

Coordination

The SKWD maintains close working relationships with Veolia (formerly SUEZ, United Water RI, Wakefield Water) and the Town of Narragansett in regard to the interconnections and the potential need for additional emergency supply, specifically in times of drought or seasonal, summertime high demand periods. The SKWD also coordinates with the Town of South Kingstown Fire Department on water use and reporting. This WSSMP was developed in conjunction with the Town of South Kingstown Comprehensive Community Plan and is consistent with the aspects of that plan.

Financial Management and Capital Planning

The SKWD continues to focus its efforts on supplying safe and reliable drinking water to its customers. The SKWD has a pro-active capital improvement plan that is updated on an annual basis. The current capital improvement plan includes water storage tank cleaning and maintenance, water supply management planning and maintenance, leak detection, water main replacement and general equipment maintenance. The SKWD currently operates as an Enterprise Fund on annual revenues and does not have any existing debt. A significant future capital project would be implementation of a water filtration facility at the Factory Pond Wells and a project of this magnitude would require special bonds and/or funding through State programs.

1.0
Goals Statement

The goal of this Plan is to comply with the provisions of the Water Supply System Management Planning Act referenced previously, by developing a comprehensive Water Supply System Management Plan (WSSMP) for the SKWD water supply distribution system. It is also intended to apply the components of the plan to successful execution for the purpose of achieving the effective and efficient conservation, development, utilization, and protection of the water system's resources in ways that satisfy the present and future needs of the Town of South Kingstown.

The Town of South Kingstown Comprehensive Plan (most recently updated on September 15, 2021) includes among its goals control of land development, preservation of environmental quality, and providing the Town with basic public services in a prompt and efficient manner. The Town Planner has issued a letter stating this plan is consistent with the Town's comprehensive goals as they relate to water supply issues.

The goal of this plan is furthermore consistent with the overall goal of the State Guide Plan Nos. 721: RI Water 2030 which is to develop a long range program to improve the quantity and quality of water required by the state's citizens in the most cost effective and environmentally sound manner.

The Town has prepared and submitted a WSSMP to the Rhode Island Water Resources Board (Board) in accordance with the Board's Rules and Regulations governing the preparation of such plans. The WSSMP was filed with and subsequently approved by the Board.

This update will provide status with respect to the Town's implementation and description of the progress of specific milestones and tasks that were outlined in the approved WSSMP Update.

2.0
System Description

2.1 Organization

South Shore Water System

The South Kingstown Water Division (SKWD) South Shore water system continues to provide potable water and fire protection service for the geographic area to the south of U.S. Route 1 from the Charlestown Town line to East Matunuck including a portion of the Perryville area of Town. Beginning in the Fall of 2002, the SKWD began purchasing all of its water on a wholesale basis from neighboring Veolia (formerly SUEZ, United Water RI, Wakefield Water) as a result of ongoing iron discoloration problems associated with the SKWD's primary groundwater supply well field in the South Shore system at Factory Pond. These wells previously provided the sole source of water supply for the South Shore system.

The transition to the Veolia (formerly SUEZ, United Water RI, Wakefield Water) system on a full time basis was implemented in February 2003 via a temporary interconnection with the Town of Narragansett through the Jerusalem portion of the Narragansett water system. This was accomplished through retrofit of a meter pit through which the SKWD previously supplied the Jerusalem area of Narragansett. This underground concrete vault, which is located at the South Kingstown/Narragansett Town line off Succotash Road, was retrofitted with a booster pump that was designed to boost water from the Veolia (formerly SUEZ, United Water RI, Wakefield Water) water system via the Narragansett water system to the Town's South Shore water system. Narragansett purchases all of its water on a wholesale basis from Veolia (formerly SUEZ, United Water RI, Wakefield Water) via an interconnection located in the Town of Narragansett..

Subsequently, the SKWD constructed a permanent 12-inch water main and interconnection including a master meter vault adjacent to U.S. Route 1 at the intersection with Kettle Pond Drive. This interconnection and master meter vault went into permanent service in the summer of 2005. SKWD relies on Veolia (formerly SUEZ, United Water RI, Wakefield Water) water on an interim basis for its primary source of water supply to the South Shore portion of the water system.

SKWD personnel shall continue to test pump, exercise and routinely monitor the three (3) South Shore wells, which would be available in the event of an emergency or possibly during peak demand periods. The SKWD is considering a project for a water treatment facility at the well field to provide the necessary treatment and conditioning of the raw water supply to render the source water more aesthetically pleasing and palatable to the consumer. At this time, there is no exact date for design and implementation for such a treatment facility.

Middlebridge Water System

It is noted that, as in the past, the SKWD shall continue to rely on Veolia (formerly SUEZ, United Water RI, Wakefield Water) to supply the Middlebridge area of Town. The South Shore and Middlebridge areas operate as two (2) separate systems and are not physically interconnected.

Public Services Department, Water Division

The Town of South Kingstown, Public Services Department, Water Division, operates the SKWD water supply and distribution system. The Organization Chart for the Department is shown on **Figure 2-1**. In addition to the Public Services Director, two staff members (the Water Superintendent and a Water Operator) are assigned to water operations, and staff member(s) are assigned to administration. Additional administrative support staff at the Town Hall is available to assist in billing and collection. These personnel are paid from the water enterprise fund operations budget. The Public Services Director is tasked with the administration, engineering and business function of the water system. This includes managing the operations and staff, maintaining regulatory compliance, maintaining intergovernmental and customer relations, performing engineering analysis and design, coordinating the activities of the Town's professional consultants, advising the Town Council and Town Manager and implementing policy decisions.

The Superintendent and Water Operator are responsible for all of the day-to-day administration, operations and maintenance of the water system, including water customer interaction, meter readings and repair, start-ups and shutdowns, well pump operations, maintenance of the pump stations, and maintaining records. Specialized maintenance and repair is completed by outside contractors.

The full-time staff, as described above, has been determined to be of adequate qualification, experience and number, to effectively and efficiently perform the duties necessary to operate and maintain the current water distribution system.

Section 19, Article III of the South Kingstown Town Code contains regulations pertaining to the water supply, including billing, ownership, maintenance, metering, and other issues.

2.2 Sources of Supply

2.2.1 Wells

The South Shore system currently receives its supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water) on a wholesale basis. However, the SKWD maintains three (3) gravel packed, overburden wells, located near Factory Pond in the southwest region of Town. The following is a description of each supply source.

Table 2-1 presents a summary of the well information.

Figure 2-1. Public Services Department Organization Chart

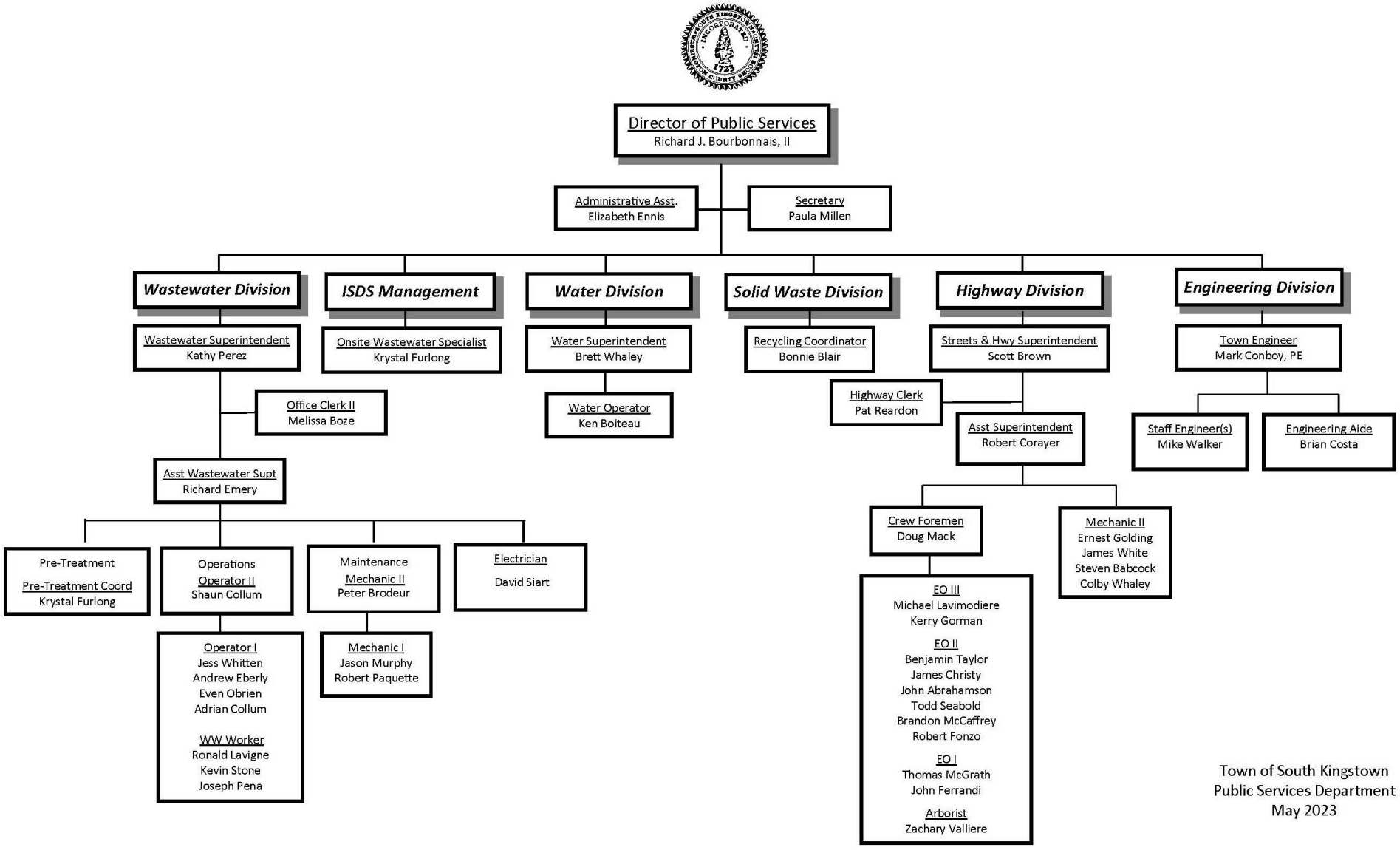


Table 2-1. Well Information

	Well No. 1	Well No. 2	Well No. 3
Well Type	Gravel Packed	Gravel Packed	Gravel Packed
Construction Year	1979	1976	1999
Depth	56 feet	56 feet	47 feet
Pump Type	Vertical Turbine	Vertical Turbine	Vertical Turbine
Pump Design Point Flow	700 gpm at 230 feet	700 gpm at 240 feet	500 gpm at 230 feet
Typical Pumping Rate	800 gpm	500 gpm	500 gpm
Pump Motor (HP)	60 HP @ 1,300 RPM	60 HP @ 1,770 RPM	40 HP @ 1,750 RPM
Pump Installation Year	1970/ 1979	1976	1999

Well Station No. 1

A gravel-packed well originally constructed in 1970 and subsequently reconstructed in 1979 by R.E. Chapman, with an electric motor driven vertical turbine pump. Well depth is 56 feet, with 12 feet, 4 inches of screen installed 11 feet, 8 inches below grade. The rated capacity of the pump is 700 gpm at 230 feet total dynamic head (TDH). The well is typically pumped at 800 gpm. The well station is currently inactive and was last redeveloped in the spring of 1992. Emergency pumping is available via a propane gas-fired, right angle drive motor. The pumping history for fiscal year 2000 (July 1999 through June 2000) indicates that this source was utilized from July through early October 1999. During that span, it produced 65.6 million gallons of water at an approximate rate of 0.65 MGD, with a monthly high of 26.8 million gallons occurring in July.

Well Station No. 2

A gravel-packed well originally constructed in 1976 by R.E. Chapman, with an electric motor driven vertical turbine pump. Well depth is 56 feet, with 15 feet, 8 inches of screen installed 5 feet below grade. The rated capacity of the pump is 700 gpm at 242 feet TDH. The pump tends to cavitate at higher flow rates and subsequently is operated between 450 and 550 gpm. The well station is currently active and was last redeveloped in the fall of 2000.

The pumping history for fiscal year 2000 indicates that this source was utilized from early October 1999 through March 2000. During that span, it produced 48.52 million gallons of water at an approximate rate of 0.28, with a monthly high of 8.825 million gallons occurring in January 2000.

Well Station No. 3

A gravel-packed well originally constructed during the summer of 1999 was placed into service on August 24, 1999. This well augments the water system's highest production well (Well No. 1), which had been plagued with high, naturally occurring iron levels. The well is typically operated at 500 gpm.

The pumping history for fiscal year 2000 indicates that this source was utilized from April through June 2000. During that span, it produced 38.97 million gallons of water at an approximate rate of 0.43 MGD, with a monthly high of 17.026 million gallons occurring in June.

Well Station No. 1 is protected by an 8-foot high chain link fence with two gates. A third building identified as the chemical feed building, is located next to Well Station No. 1 within this fenced enclosure and is used for chemical storage.

The Rhode Island Department of Health (Health) conducts sampling of the Factory Pond wells approximately once every six (6) months. Parameters monitored include physical characteristics, basic chemistry, heavy metals, radioactivity, pesticides, and volatile organic compounds (VOCs).

The wells are not currently in use due to high iron levels. The Town will continue to mitigate water quality risks within the wellhead protection area. If the wells are returned to service or if a new well is developed, then an update to the water quality protection component of this plan will be required.

2.2.2 Veolia (formerly SUEZ, United Water RI, Wakefield Water)

Veolia (formerly SUEZ, United Water RI, Wakefield Water) is the sole source of supply for South Shore and Middlebridge water systems at this time. The transfer of wholesale potable water is made possible via two metered wholesale interconnections – South Shore (Route 1 and Kettle Pond Drive) and Middlebridge (Torrey Road and Middlebridge Road). The meter for the South Shore interconnection is a 10 inch Ultra Mag McCrometer and the meter for the Middlebridge Road interconnection is an 8 inch Ultra Mag UM0608. These are discussed further in Section 2.4 of this plan.

2.3 Treatment, Transmission and Storage Facilities

2.3.1 Water Treatment

In the past, source water from the Factory Pond well field was treated for pH adjustment via potassium hydroxide addition (45% solution). The chemical was added at the header supply main leaving the wellfield. Doses were based on flow rate and there are separate feed pumps for each well. The system was installed in 1992, resulting from a corrosion control study that was done by the Maguire Group, October 1990. The pH was maintained at 8.4 units. In July 1998, the Water Division suspended the pH adjustment due to the oxidation of the high iron levels and the resulting “red” water.

All of the wells discharge to a single 14-inch pipe. The master meter, which records total well production, is located on this pipe. The 14-inch transmission main, approximately 1,850 feet in length, conveys water from the Factory Pond pump station complex to the distribution system at the Green Hill Beach Road water main.

Recently a chlorination system was installed at the Mautucket Road Tank to provide supplemental chlorine to the westerly portion of the system in response to total coliform positive detections. This system consists of a magnetic flow meter on the tank inlet/outlet main, chemical day tank and feed pump, residual chlorine analyzer and SCADA controls.

2.3.2 Distribution / Transmission System

The SKWD consists of two separate distribution systems identified as South Shore and Middlebridge.

South Shore System

The South Shore system serves the southern area of Town from the Charlestown Town line to East Matunuck that lies south of US Route 1. This area includes Matunuck, East Matunuck, Snug Harbor, Green Hill, Ocean Ridge and a small portion of Perryville. The system, originally constructed in the late 1960s, consists of approximately 48 miles of water main. The South Shore water system is a linear type system with primary demand sectors located on the eastern and western sections with 12-inch diameter main connecting the two sections. The system has two zones separated by a booster pumping station but operated on the same hydraulic gradeline. The East Zone is located on the eastern portion of the system and the West Zone is located on the western portion of the system. The interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water) is in the northeast corner of the system in the East Zone. The Victoria Lane Tank is located near the interconnection. A booster pumping station which transfers water from the East Zone to the West Zone is located mid-way between the two sections on Cards Pond Road. The Mautucket Road Tank is located in the northwest area of the system in the West Zone.

Middlebridge System

The Middlebridge system is comprised of approximately 3.6 miles of water transmission and distribution main (asbestos cement), hydrants and meters. The majority of the system was installed in the 1970s and serves a defined area along Middlebridge Road from Radial Drive, over the Middlebridge Bridge, and terminating in Narragansett.

Table 2-2 shows the approximate water main lengths of each diameter of main. It is estimated that 90-95% is asbestos cement pipe, while the remaining sections are cement lined ductile iron (DI) and PVC pipe. Pipe sizes range from 2-inch diameter that serve small, less populated areas, to 14-inch diameter transmission mains, which transport water from the supply sources and storage facilities to the distribution system. Cement lined ductile iron is used for new and replacement mains. The total volume of water contained within the South Shore distribution system piping is approximately 831,000 gallons and approximately 64,000 gallons for the Middlebridge distribution system. The Middlebridge distribution system consists of one major 12-inch transmission main that extends south from Radial Drive, over the Middlebridge Bridge, and terminates in Narragansett. There are 20 lateral mains, ranging in size from 4-inch to 6-inch in diameter, that extend off this main. In total, the system consists of approximately 4 miles of pipe; 95% being asbestos cement and the remainder is PVC.

Table 2-2. Water Main Lengths per Diameter

	South Shore System		Middlebridge System	
Diameter (in)	Approx. Length (ft)[1]	Approx. Length (mi)	Approx. Length (ft)[1]	Approx. Length (mi)
4	14,683	2.8	4,865	0.9
6	81,082	15.4	4,815	0.9
8	67,442	12.8	--	--
10	8,074	1.5	--	--
12	76,950	14.6	9,255	1.8
14	5,124	1.0	--	--
Total	253,355	48	18,935	3.6

[1] Lengths from Town's GIS database.

2.3.3 Storage Facilities

The South Shore distribution system contains two elevated hydrospheriod water storage tanks - the Mautucket Road Tank and the Victoria Lane Tank. Both facilities are of welded steel construction and are spherical in shape. Additionally, each facility has a storage capacity of 400,000 gallons and an overflow elevation of 210 feet above mean sea level (MSL). Note that there are no water storage facilities in the Middlebridge system.

The South Shore water system is essentially operated as two separate zones even though the tanks have the same overflow elevations, due to headlosses as water flows through the system. The overflow elevation at each of the water storage tanks is Elev. 210 feet Mean Sea Level (MSL). The water level in the Victoria Lane storage tank controls the operation of the East Matunuck interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water). A SCADA system controls an altitude valve in the interconnection meter pit such that it is deactivated when the tank reaches a high elevation and it is activated when the water drops to a preset level in the tank. Additional information on these storage facilities can be found on **Table 2-3**.

2.3.4 Booster Pumping

An in-line booster pump station located on Card's Pond Road boosts service to the south-central and southwestern regions of the system. The booster pump station is controlled through SCADA based on the water level in the Mautucket Road storage tank. The Card's Pond Road Pump Station contains two booster pumps. These pumps are vertical in-line pumps. The pump specifics are shown in **Table 2-4**. The pump station is connected to the 12-inch diameter water main on Cards Pond Road via 6-inch diameter suction and discharge lines. Normal operation is through the pump station. There is the ability to bypass the pump station by opening the normally closed 12-inch gate valve located on the main line.

Table 2-3. Water Storage Tank Information

Characteristic	Victoria Lane Tank	Mautucket Road Tank
System	South Shore	South Shore
Tank Type	CBI Elevated Steel (Spheroid)	CBI Elevated Steel (Spheroid)
Volume	400,000 gallons	400,000 gallons
Nominal Head Range	35 feet	35 feet
Height to Overflow	173'-6"	155'-0"
Overflow Elevation	210 feet	210 feet
Ground Elevation	36.5 feet	55 feet
Interior Coating	2007 with TNEMEC epoxy	2005 with TNEMEC epoxy
Last Inspection	2020	2020
Last Cleaned (interior)	2020	2020
Mixing System	None	None
Altitude Valve	No	Yes (not in use)

Table 2-4. Card's Pond Booster Pump Station

Number of Pumps	Two
Pump Type	Vertical In-Line
Pump Manufacturer	Patterson Pump Company
Pump Model	6X6VIP
Impeller Pattern	D-6920
Impeller Diameter	6-inches
Vane Tips	Full
Number of Stages	1
Design Flow	500 gpm
Design Head	20 feet
Rated RPM	1760 RPM
Horsepower	5 HP
Efficiency at Design Point	81.5%
Year Installed	2000

The booster pump station was originally installed to be able to fill the Victoria Lane Tank when the South Shore wells were still the supply sources. At that time the water level in the Mautucket Road Tank controlled the start/stop of the wells. An altitude valve was used to prevent the Mautucket Road Tank from overflowing since it would fill more quickly than the Victoria Lane Tank. At times before the booster pump station was installed, the Victoria Lane was slow to fill and would occasionally empty. The booster pump station was installed to prevent this tank from

emptying completely during times of high demand. When the source of supply was changed to the easterly interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water), the booster pump station was reconfigured to supply water in the reverse direction to prevent the Mautucket Road Tank from emptying completely during times of high demand.

2.4 Interconnections

The South Shore system has two interconnections. The Town's distribution system was previously used to "wheel" water into neighboring Narragansett. However, Narragansett constructed a subaqueous water main under Galilee channel, whereby the Jerusalem section of Narragansett is now supplied by Narragansett from its Galilee interconnection. The Jerusalem wholesale meter pit on Succotash Road in essence, serves as a second emergency interconnection for the South Shore water system and for Narragansett Jerusalem customers. In 2005 a permanent 12-inch water main interconnection was made between Veolia (formerly SUEZ, United Water RI, Wakefield Water) and the South Shore where a master meter vault was installed along U.S. Route 1 at the intersection with Kettle Pond Road. This is now the primary source of water supply until such time that a water treatment facility is constructed at the Factory Pond well field. A 10-inch magnetic flow meter monitors the flow (10-inch McCrometer, Hemet, CA, Ultra Mag SSN UM20040572). An open/close altitude valve controls the flow. A manual gate valve, located upstream of the meter and altitude valve, is mostly closed in order to restrict the flow rate to stay between 600-700 gpm, otherwise the flow rate would exceed the rate authorized by Veolia (formerly SUEZ, United Water RI, Wakefield Water).

The Middlebridge system has two interconnections with Veolia (formerly SUEZ, United Water RI, Wakefield Water). Veolia (formerly SUEZ, United), as previously mentioned, is the only source of supply for Middlebridge. The Middlebridge interconnection and a meter pit are located at the east bank of the Pettaquamscutt River near the Middlebridge Road Bridge. The Middlebridge interconnection has an 8-inch magnetic flow meter (8-inch Ultra Mag UM0608). This interconnection is a two-way metered facility that is used by Veolia (formerly SUEZ, United Water RI, Wakefield Water)for its Narragansett water customers. The agreement governing use of the interconnections, and water transfers are discussed further in Section 2.7.

2.5 Present Service Area

2.5.1 Geographic Area

The Town of South Kingstown comprises 79.8 square miles, which are occupied by structures (i.e. residential, commercial, industrial) that are serviced by either:

- Private wells
- Potable water via the Town's South Shore or Middlebridge water system
- Potable water by Veolia (formerly SUEZ, United Water RI, Wakefield Water) Water – RI, an investor-owned private water utility that services the Wakefield/ Peace Dale areas of Town

- Potable water by Kingston Water District, a quasi-government water utility that services portions of Kingston and West Kingston
- The University of RI, which has its own source of supply and water system for the Kingston campus

The Town is situated on the southern coast of Rhode Island on the shores of Block Island Sound. The map provided in Appendix F identifies the geographic service area of the water distribution system.

2.5.2 Water Services History

The South Shore System has 2,861 service accounts and the Middlebridge System has 289 service accounts. **Table 2-5** provides a breakdown of the customer account distribution for fiscal years 2018 through 2022 for the SKWD water system. Both the South Shore system and Middlebridge system have increased by nearly 10% with regards to number of accounts over the past six years.

Table 2-5. Number of Services

Fiscal Year	South Shore[1]	Middlebridge[2]
2018	2,537	282
2019	2,543	288
2020	2,558	288
2021	2,568	289
2022	2,861	289

[1] The South Shore System currently has 44 commercial and 8 governmental accounts of the 2,861 total accounts.
[2] The Middlebridge System is all residential.

2.5.3 Present Population Served

The residential service populations were determined to be the number of residential service connections times the average household size for the Town. The 2020 Data U.S. Census states that the average household size for South Kingstown is 2.40. Estimated water system populations are shown in **Table 2-6**.

Table 2-6. Estimated Residential Service Populations*

System Name	South Shore Water System	Middlebridge Water System
PWS ID	PWS # 1615623	PWS # 1000015
Residential Services	2,809	287
Average Household Size	2.40	2.40
Estimated Residential Population	6,742	689

* Service populations based on average household size and does not include seasonal population. Average household size from 2020 U.S. Census.

2.5.4 Population Demographics

A review of the 2021 Town of South Kingstown Comprehensive Plan and 2020 Census data suggests that the Town has experienced rapid growth in the 1960's through 1990. The 2020 Census reports the population increased by 3.8% from the 2010 Census, bringing the total Town population to 31,931 people. Estimated residential populations for each system are shown in **Table 2-6**.

2.6 Source and Distribution Metering

2.6.1 Master Meters

The Factory Pond source of supply (Well Nos. 1, 2 and 3) is metered by a single master meter located on a 14-inch transmission main just downstream of the wellfield. When the wells are operational, the SCADA system automatically switches between wells, and only operates one at a given time, thus necessitating only one (1) meter. When operational, the master meter is tested annually by the SKWD, and calibrated as needed.

Veolia (formerly SUEZ, United Water RI, Wakefield Water) is responsible for maintaining the master meters at the two (2) wholesale interconnections to the Middlebridge water system and the one (1) wholesale connection to the South Shore water system. Similarly, the Narragansett Water Department owns and maintains the master meter at its emergency wholesale interconnection with the South Shore water system (which is currently not being used).

The South Shore interconnection has a 10-inch magnetic flow meter that monitors the flow (10-inch McCrometer, Hemet, CA, Ultra Mag SSN UM20040572). An open/close altitude valve controls the flow. A manual gate valve, located upstream of the meter and altitude valve, is mostly closed in order to restrict the flow rate to stay between 600-700 gpm, otherwise the flow rate would exceed the rate authorized by Veolia (formerly SUEZ, United Water RI, Wakefield Water).

2.6.2 Distribution Meters

Every residential, commercial and government customer serviced by the SKWD is metered, thus providing 100% distribution metering.

Between 2019 and 2022, the SKWD replaced all customer water meters for the South Shore and Middlebridge water systems using third party installation contractor services. The new meter system employs "drive-by" radio reading technology.

The radio reading system allows all customer water meters and each water system's wholesale (or production) meter to be read within a three (3) hour time span. This compressed reading timeframe provides a more accurate analysis of so-called "unaccounted for" water, since the water customer reading (and consumption) period coincides with the same wholesale purchase (or production period).

The water user meters have data logging capabilities. The remote radio reader feature of each meter is powered by a battery, which are now approximately 10 years old. As such, these batteries have been failing at a rate of about 7 per month. The metered data is still retained but Water Division operators have to physically download the data from the unit for water billing purposes.

The Town Code (Sections 19-231 and 19-234 through 19-236) regulates meter setting, meter location, size, testing, and frozen/damaged meters. Meter testing is conducted upon request by the customer, or if it is suspected of malfunctioning.

2.7 System Production Data

The SKWD, since fall of 2002, has relied primarily upon the purchase of wholesale water from Veolia (formerly SUEZ, United Water RI, Wakefield Water) as its primary source of supply. The three (3) wells located at the Factory Pond well field remain off line pending consideration of construction of a water treatment facility to address naturally occurring elevated iron deposits. These well sources are available in the event of an emergency and are routinely test pumped, exercised and maintained in a workable condition. There is also a multi-directional emergency interconnection with the neighboring Town of Narragansett that is maintained.

Total water that was produced and or purchased on a wholesale basis over the past five fiscal years is shown in **Table 2-7**. Minimum Day, Average Day and Maximum Day Demands for the South Shore system are shown in **Table 2-8**.

Table 2-7. Summary of Annual Water Purchase

Fiscal Year	South Shore	Middlebridge	Total
2018	123.73 MG	13.86 MG	137.59 MG
2019	124.04 MG	13.19 MG	137.23 MG
2020	125.23 MG	18.52 MG	143.75 MG
2021	128.66 MG	18.23 MG	146.89 MG
2022	114.59 MG	15.49 MG	130.08 MG

Table 2-8. Summary of Minimum, Average and Maximum Day

	South Shore System, Gallons per Day (GPD)		
Year	Minimum Day	Average Day	Maximum Day
2018	169,342	338,987	707,464
2019	165,599	339,827	800,025
2020	104,303	343,103	872,947
2021	108,260	352,488	797,500
2022	102,290	313,939	872,500

The ratio or multiplier for the maximum day to average day ranges from 2.08 to 2.78. This range is typical for a water system that experiences small change in seasonal population.

2.8 System Water Use

2.8.1 System and Per Capita Use

Water conservation is encouraged and the State recommends a target of 65 gallons per capita per day. **Table 2-9** presents the consumption data for the average of the most recent fiscal year along with the estimated per capita usage. This data shows that the SKWD meets the State's recommended target for water conservation.

Table 2-9. Consumption Use Data

	South Shore System	Middlebridge System
Average FY 2021-2022 Metered Consumption Use	123.26 MG	13.258 MG
Estimated Population	6,742	689
Per Capita Use*	50.1 gpcd	52.7 gpcd

*Current residential per capita use is below the recommended target of 65 gpcd.

2.8.2 Major Users

A major user is defined as any customer that consumes in excess of 3.0 million gallons per year. There are no large users on either water system that exceed 3.0 million gallons per year.

2.8.3 Legal Obligations

Besides the implied legal obligations associated with Town ordinances defining the responsibility of the Public Services Department to furnish potable water to its customers, no additional legal obligations or contract agreements exist regulating the Public Services Department's provision of water. The Town does, however, maintain an agreement with Veolia (formerly SUEZ, United Water RI, Wakefield Water), for the purchase of wholesale water from Veolia (formerly SUEZ, United Water RI, Wakefield Water) for the Town's South Shore and Middlebridge water systems. Copies of the agreement are provided in Appendix A and B of this plan.

2.8.4 Non-Account Water Use

Unaccounted-for water use consists of the difference in the sum of the volume of water metered at the point of supply, and that recorded at all points of sale. Typically, this consists of water consumed for both authorized and unauthorized uses. Authorized uses include water used for fighting fires, water main/storm drain flushing, sewer/street cleaning, landscaping in public areas, construction sites, etc. It also includes water that is metered but not billed, and therefore is not reflected in the recorded volumes of water sold. Unauthorized uses typically include system leaks, malfunctioning meters, meter pit bypasses, water theft, other unmetered public uses, etc. **Table 2-10** summarizes the non-account water use for the most recent and five (5) previous fiscal years.

Table 2-10. Non-Account Water Use

Fiscal Year	South Shore	Middlebridge
2018	5%	13%
2019	11%	20%
2020	9%	30%
2021	8.7%	29.5%
2022	9.8%	28.5%

The State of Rhode Island Water Use and Efficiency Act includes targets for public water suppliers to improve water efficiency and demand management. These targets include (1) a residential average annual water use of 65 gallons per capita per day (GPCD), (2) efficient outdoor water use, (3) efficient indoor water use, (4) full accounting of non-billed water, (5) leakage of no more than 10% of the withdrawals and/or purchased water measured as an annual average, and (6) accurate metering and billing to account for all water supplied.

The SKWD meters 100% of supply and consumption by customers and records estimated usage for authorized non-metered use for system flushing and fire fighting.

A system-wide leak detection survey for the South Shore and Middlebridge water systems was conducted in May of 2017, by Matchpoint Leak Detection services of Wilmington, NC. However, the leak detection consultant was able to find no leaks in either system.

Table 2-10 suggests that the non-account water for the South Shore System has decreased over time to below 10%. However, the Middlebridge System non-account water fluctuates significantly from year to year. A review of the calculation of the non-account water was completed to verify the Town's approach, which is accurate. A comprehensive water audit would provide further analysis of the non-account water and potential methods to consistently maintain it below 10%.

2.8.5 Water Conservation

The SKWD employs a limited water conservation program due to the mainly residential nature of its customer base. The major components of the water conservation program are as follows:

- 100% Distribution Metering
- Residential Retrofit Program
- Seasonal (Summer Time) Outdoor Water Restrictions/ Bans
- Public Education

These components of the water conservation program are discussed further in Section 6.0 - Demand Management of this plan. Since residents prefer to use plumbing fixtures of their own selection and building code requirements include provisions for water saving devices, the Town intends to continue to encourage use of water saving devices but will focus its future water conservation program on seasonal water use restrictions.

2.9 Water System Deficiencies

2.9.1 Recent System Improvements

The SKWD operates with few limiting deficiencies. The following list includes the major system improvements that have taken place in recent years:

Chlorination System at Mautucket Tank
A chlorination system was installed at the Mautucket Tank in response to repeat total coliform positive detections. The tank was cleaned, inside and out, in 2022.

Meter Repair/Replacement Program
All of the customer meters were upgraded between 2019 and 2022.

Water Main Replacement / Upgrade Program
The SKWD added a second pipe loop along the northern section of the system as a backup to a primary barrier beach water main that connects the east (East Matunuck/ Snug Harbor) and west (Matunuck/ Green Hill/ Ocean Ridge) sections of the South Shore system. The SKWD on an annual basis identifies those water mains that are problematic and have experienced leaks and seeks to replace them with ductile iron water mains or upgrade or loop the various pipeline sections. This is part of the Town's Infrastructure Replacement program. At this time and due to the relative "young" age of the water system, there are no immediate plans to initiate a comprehensive pipeline replacement program.

Hydrant Replacement Program
There exist approximately 239 fire hydrants that are owned, operated and maintained by the SKWD. Fifteen (15) of these hydrants are located within the Middlebridge system. The SKWD coordinates new installation and replacement of hydrants with the Town's Fire Department. The majority of the hydrants in the system date back to circa. 1970 and are approximately 50 years in age. Remaining hydrants are located in areas of the system, which were developed in the 1980's and 1990's and are approximately 30 – 40 years in age.

There is currently no comprehensive hydrant replacement program due to the relatively "young" age of the hydrants in the system. It is not anticipated that any system-wide replacement program will be required within the next 20 years.

Residential Service Line Replacement Program
The SKWD owns and maintains that portion of the customer service that lies within the public right-of-way, generally from the corporation stop at the water supply main to a curb stop valve located in the vicinity to the property line of the customer. From the point of the curb stop valve to the internal plumbing system, the customer is responsible for ownership and maintenance of the line. This portion of the service is referred to as the customer service line or service line.

Curb stops were generally installed to the customer's property line at the time of distribution main installation throughout a particular area and as development in an area occurred. The standard material for all curb stops and service lines was type "K" copper tubing. Copper Pipe (tubing) is a widely utilized material for customer service connections in the water services industry and has a useful life of over 75 years. Since the mid – 1980's, any new or replacement service lines consists of Class 160 CTS high-density, polyethylene (HDPE) tubing in lieu of copper service line materials.

The SKWD does not have an active replacement program for copper service lines, but does pursue, through methods of leak detection, any areas of service line failure. There has been a generally low incidence of failure of service lines. The greatest incidence of failure (which is still low) occurs along services, that are directly tapped into the asbestos cement water main. These failures are repaired through use of a saddle fitting connection. It is considered by the SKWD to be more cost effective to identify and target failures through a leak detection program rather than to implement a system wide service line replacement program. The SKWD shall continue with this method of identifying failed residential services.

2.9.2 Water System Deficiencies

The SKWD operates with three (3) major limiting deficiencies. They are listed as follows:

- A highly linear or "skeletonized" distribution system
- Water Quality problems associated with the Factory Pond Wells in South Shore supply system
- Lack of emergency back-up power at the Factory Pond well field and the Card's Pond Road Booster Station

Skeletonized System: The skeletonized distribution system makes it vulnerable should a break occur in a transmission main. The SKWD installed a second pipe loop to connect the east zone (Victoria Lane tank area) with the west zone (Mautucket Road Tank area). The SKWD should continue to loop water mains where, and to the extent practical, to create redundancy in the distribution system, and reduce its vulnerability.

Water Treatment: The Town continues to consider construction of a water filtration facility for the Factory Pond wells. Refer to Section 2.9.3 for more information.

Standby Power: The SK Public Services Wastewater Division maintains a 3-phase standby, trailer mounted generator that can provide standby power during emergency events. The Factory Pond Well #1 has a direct drive standby engine. The Factory Pond chemical feed building/ SCADA system is equipment with a manual generator transfer switch and can be powered by a potable 115/ 230 V, 9,000 KWH generator during power outages. A new generator would be incorporated into a future water filtration plant to ensure that standby power is available for all Factory Pond facilities.

2.9.3 Capital Improvement Program

The SKWD maintains an aggressive 6-Year Capital Improvement Program (CIP) outlining targeted system improvements for fiscal years 2023 through fiscal year 2028. The CIP addresses current deficiencies and desired system improvements, as well as seeking to remain proactive with regard to the ever-increasing responsibilities of the SKWD. The relevant portions of this CIP are included in Appendix C.

2.9.4 Water Filtration Facility – Factory Pond Wells

The Factory Pond Wells contain elevated levels of iron. These wells were previously the primary source of supply for the South Shore system. Elevated levels of iron prompted the SKWD to install a permanent interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water). The wells are maintained as active supplies for future and/or emergency use and are pumped to waste periodically for sampling. Treatment of these wells for iron removal is a future goal for the SKWD.

The plan is to construct a water treatment facility with the capacity for treatment at a design rate of 2 MGD. Since the facility would be located near the Factory Pond Wells, out of view of the public, the SKWD plans on a basic pre-engineered metal building which will help keep capital costs lower.

There are options for the primary treatment process and the SKWD is considering both Pressure Filtration with manganese oxide coated media such as GreensandPlus and Membrane technologies such as the Zenon immersed membrane system. Both technologies have proven success in the treatment of New England waters with similar quality as the Factory Pond Wells. The following provides an overview of these treatment options for removal of arsenic, iron and manganese:

- Oxidation and Pressure Filtration (GreensandPlus)
    - Established conventional process
    - Treats effectively up to 10 mg/L Fe and 2 mg/L Mn (higher levels of Fe and Mn require the use of a pre-treatment process)
    - Chlorine can be used for oxidation and media regeneration or in combination with potassium permanganate
    - Operation and maintenance of this equipment is straight forward
- Membrane Filtration
    - Microfiltration can treat waters with higher levels of Fe and Mn than pressure filtration
    - Need to oxidize the Fe and Mn before the membranes which may require two separate chemicals (with pressure filtration the GreensandPlus media allows for Mn adsorption, so Mn oxidation is not necessary)
    - May provide a smaller equipment footprint than pressure filtration although overall facility footprint may be similar to pressure filtration due to additional chemical systems

- Requires additional chemicals for membrane cleaning such as citric acid
- Higher capital and O&M costs than pressure filtration

Order-of-magnitude costs for an iron and manganese removal treatment facility were developed for planning purposes. The American Association of Cost Engineers (per ANSI Standard Z94.0-1989) has defined levels of accuracy that are commonly used by professional cost estimators. Three categories of accuracy include: (1) order-of- magnitude, (2) budget, and (3) definitive estimates. The estimates of comparative cost presented in this report are considered order-of-magnitude, and were developed with limited engineering detail for early planning purposes. Our cost estimates reflect March 2018 construction costs and are based on work of a similar nature. The costs must be re-evaluated prior to appropriating funds, since construction costs increase steadily each year. Actual project costs may vary from this preliminary estimate as a result of additional engineering detail and other cost-related variables. **Table 2-11** presents the order-of-magnitude costs for the water filtration facility.

The capital and the annual operation and maintenance (O&M) costs are both involved in the facility life-cycle cost which is needed for comparison with the cost of continued purchase of water from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The annual O&M Costs are shown in **Table 2-12**.

The following provides a step-by-step approach to obtain the anticipated total Present Worth Cost using an Engineering Economic Analysis for comparison with ongoing purchase of water from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The present day construction cost was estimated as described above. Using the annual O&M costs, the present worth of the 20-year O&M costs was calculated. This was accomplished by estimating the anticipated O&M costs in present day dollars and applying Engineering Economics tables and equations to obtain the future value of those repeated costs, then converting that future value to the Present Worth Cost. This analysis is helpful in determining the true cost for each alternative based upon 20-year planning horizons. Note that the annual escalation in water rate for water purchased from Veolia (formerly SUEZ, United Water RI, Wakefield Water) was assumed to be the industry average of 4% per year. This rate does not account for major rate increases that may occur due to large capital projects that Veolia (formerly SUEZ, United Water RI, Wakefield Water) may require within its own water system. Future water purchase costs also include increase in demand in proportion to future water demands presented in Section 3 of this report (averages 1% increase per year). **Table 2-13** presents the present worth costs for the two alternatives for the 20-year planning horizon.

Since water filtration facilities are constructed to remain in service more than 20 years, the 25-year and 30-year present worth costs were also estimated to observe when this facility would have a lower present worth cost than the continued purchase of water from Veolia (formerly SUEZ, United Water RI, Wakefield Water). **Table 2-14** presents the present worth costs for the two alternatives for the 20-year, 25-year and 30-year planning horizons. Based on this analysis the water filtration facility could be appreciably more cost effective than continued purchase of water by the 25-Year planning period.

Table 2-11. Water Filtration Facility Order-of-Magnitude Cost Estimate

Task Description	Estimated Cost[1,2,3,4,5,6,7,]	
	Low Range	High Range
Preliminary Design Phase Engineering including Pilot Testing for both Pressure Filtration and Membranes	$100,000	$150,000
Engineering - Design, Permitting, Bid and Construction Phase	$480,000	$600,000
On-site Resident Engineer (full time)	$360,000	$470,000
Construction	$3,200,000	$4,000,000
Construction Contingency (15%)	$480,000	$600,000
Total	$4,620,000	$5,820,000

1. Cost estimates for planning purposes only. Detailed cost estimates for each phase need to be determined for appropriation purposes as the project moves forward.
2. Cost estimate does not include any land acquisition costs.
3. Cost estimate does not include any environmental remediation work or legal fees.
4. Construction cost estimated for March 2022.
5. Pilot testing would include two weeks of on-site field work per treatment process for pressure filtration and immersed membrane comparison.
6. Costs assume:
    a. Structure is a pre-engineered metal building for treatment systems only (space for control room but no administration area) approximate total facility area 4,000 square feet
    b. Treatment capacity design rate of 2 MGD
    c. Water quality requires treatment for removal of iron and manganese and adjustment of pH for filtration and corrosion control. Comprehensive water quality sampling will be required to verify the needed treatment requirements.
    d. Primary process to utilize pressure filtration with GreensandPlus or immersed membrane system such as Zenon
    e. Chemical systems would include hydroxide (pH adjustment), sodium hypochlorite (oxidation and disinfection), potassium permanganate (manganese oxidation for membrane system), citric acid (membrane system)
    f. Below facility clearwell and finished water pumps included
    g. Process residuals handled using on-site lagoons or below facility basins.
    h. Limited length of water transmission main would be required to connect the treatment facility to the wells and distribution system
7. Cost estimate does not include any O&M costs.

Table 2-12. Water Filtration Facility Annual O&M Costs

Task Description	Estimated Annual O&M Cost[1]	
	Low Range	High Range
Annual O&M	$110,000	$145,000

1. Annual O&M Costs include:
    a. Additional Labor costs needed at the facility for normal conditions.
    b. Chemical costs for those treatment chemicals identified above.
    c. Electric costs about $0.10 per kwh.
    d. Media replacement annual set aside for future replacement after about 10 years.
    e. Residuals disposal

Table 2-13. Present Worth Costs Based on 20 Year Planning Horizon

Item	Continue to Purchase Water from Veolia[1]	Construct New Water Filtration Facility	
		Low Range	High Range
Present Day Capital Costs[2]	NA	$4,620,000	$5,820,000
Present Value of 20 Year O&M Costs[3,4]	$8,320,000	$2,960,000	$3,900,000
Present Worth Costs (Capital & O&M)[5]	$8,320,000	$7,580,000	$9,720,000

1. Water purchase cost to increase 4% each year on average from current annual cost of $251,511 for the South Shore System. This rate does not account for major rate increases that may occur due to large capital projects that Veolia (formerly SUEZ, United Water RI, Wakefield Water) may require within its own water system. Future water purchase costs also include an increase in demand in proportion to future water demands presented in Section 3 of this report (averages 1% increase per year).
2. Present Day Capital Costs for construction in 2022.
3. Present Value of the 20-Year O&M Costs assumes increase in costs by 3% each year.
4. Present Value of the 20-Year O&M Costs does not include loan payment since this cost is in the capital cost.
5. Present worth costs include present day capital costs and present value of the 20-year operation and maintenance costs.

Table 2-14. Present Worth Costs Comparing 20, 25 and 30 Year Planning Horizon

Item	Continue to Purchase Water from Veolia[1]	Construct New Water Filtration Facility	
		Low Range	High Range
20-Year Present Worth Costs (Capital & O&M)[2,3,4,5]	$8,320,000	$7,580,000	$9,720,000
25-Year Present Worth Costs (Capital & O&M)[2,3,4,5]	$12,000,000	$8,630,000	$11,110,000
30-Year Present Worth Costs (Capital & O&M)[2,3,4,5]	$16,710,000	$9,850,000	$11,520,000

1. Water purchase cost to increase 4% each year on average from current annual cost of $251,511 for the South Shore System. This rate does not account for major rate increases that may occur due to large capital projects that Veolia (formerly SUEZ, United Water RI, Wakefield Water) may require within its own water system. Future water purchase costs also include an increase in demand in proportion to future water demands presented in Section 3 of this report (averages 1% increase per year).
2. Present Day Capital Costs for construction in 2018.
3. Present Value of the O&M Costs assumes increase in costs by 3% each year.
4. Present Value of the O&M Costs does not include loan payment since this cost is in the capital cost.
5. Present worth costs include present day capital costs and present value of the operation and maintenance costs.

3.0
Anticipated Future Demands

3.1 Growth In Demand

The intent of this section is to project the future water demands on the SKWD as a whole, for the 5- and 20-year planning periods. To best project future water use, several factors must be considered and evaluated; some of which include population density, industrial and commercial water use and development, wholesale of water to adjacent systems, economic development, changes in service area, land use, water quality, water use rates, and conservation measures.

On the basis of data previously developed in this plan relating water demand on a per capital basis, it would be reasonable to correlate expected future demand with projected changes in population, at least in terms of the residential portion of the population. However, since water use is mainly residential (90%), and given the fact that there are no industrial customers, a generalized per capita demand would suffice to project total system demand.

The most recent Town-wide population projections by the 2020 U.S. Census are presented in the following **Table 3-1**. The Town experienced a 4.2% growth since the 2010 U.S. Census.

Table 3-1. South Kingstown Population Projections (2020-2040)

Year	Projection[1]
2020	31,931
2025	34,204
2030	35,556
2035	36,732
2040	37,684

[1] Source: 2020 U.S. Census

It is noted that much of the land in the South Shore area is encumbered with development rights and has only limited in-fill capabilities. Water main extensions beyond the existing service area prohibited by CRMC Assent (refer to Appendix F). Expansion of the Middlebridge system also requires CRMC approval for any main extension beyond the existing service area. Therefore, the water demands in these areas are restricted within the existing water system without the potential beyond the current infrastructure

The Town's GIS database was used to conduct a buildout analysis of the South Shore and Middlebridge systems. The service areas were overlaid on the developable parcels which were then used to estimate the number of units each of the developable parcels could have within the provisions of the zoning restrictions. A map showing the service areas with developable parcels highlighted is provided in Appendix G. This resulted in an additional number of potential household units of 437 in the South Shore system and 32 in the Middlebridge system. For the

purposes of this analysis, it is assumed buildout could occur by the end of the 20-Year planning period. Based on this the 20-Year growth percentage, when compared with the 2020 population, is approximately 5.4% in the South Shore system and 4.6% in the Middlebridge system as compared with 15.3% Town-wide. The projected populations are shown in **Table 3-2.**

Table 3-2. Projected Population

Year	Town Population Projection[1]	South Shore System Population Projection[2]	Middlebridge System Population Projection[3]
2020	31,931	6,742	684
2025	34,204	6,853	696
2030	35,556	6,942	703
2035	36,732	7,033	710
2040	37,684	7,124	717

[1] Source: 2020 U.S. Census

[2] Buildout for the South Shore system is estimated to be 7,124.

[3] Buildout for the Middlebridge system is estimated to be 717.

3.2 Projected Water Demand

The projected water demands for the 5- and 20-year planning periods were assumed to be directly proportional to the population change for the two water systems. **Table 3-3** shows the estimated future water demands. The maximum day demands are assumed to continue to be a similar ratio of 2.55 to average day demands as they have been over the past 5-years.

Table 3-3. Estimated Future Water Demands

Year	South Shore System			Middlebridge System		
	Annual (MG)	Average Day (GD)	Maximum Day (GD)	Annual (MG)	Average Day (GD)	Maximum Day (GD)
2023	123.26	337,774	861,324	13.258	36,046	91,919
2028	125.317	373,335	875,505	13.387	36,679	93,531
2033	126.945	347,794	886,875	13.522	37,048	94,472
2038	128.608	352,353	858,500	13.657	37,417	95,413
2043	130.233	356,912	910,126	13.791	37,785	96,354

3.3 Major Users Future Demand

As previously mentioned in Section 2.8.2, the SKWD has no large water users that consume in excess of 3.0 million gallons per year. No future major users are anticipated at this time, due to

the nature of the service area. As such, no provisions for estimating future water use by major users are made in this plan. The projected water use, as previously presented, accounts for industrial and commercial development at the same rate that has occurred in the past decade. This growth is automatically included in the projections presented in **Table 3-3**.

3.4 Non-Account Water Use

Available data on the historic and current volumes of non-account water was presented previously in Section 2.8.4 of this plan. It has been conservatively assumed for the planning periods, that non-account water will be 10-15% of total system production, respectively. The overall goal is to have this value below 10%.

3.5 Non-Potable Water Use

Facilities such as golf courses, nurseries and industrial facilities have the potential to utilize non-potable water sources for irrigation and cooling water applications. In addition, businesses such as the local marinas (biggest seasonal commercial water users) are likely suitable applications for the use of recycling and should be investigated for such.

However, due to the nature of the customer base (no industrial users or golf courses), it is not anticipated that any facilities at this time have the potential to utilize non-potable water sources for these types of applications. Should the customer base of the SKWD grow to include such types of industrial customers, the SKWD will consider using water use audits to evaluate the viability of such options. This will also quantify the extent of backflow prevention and cross-connection control measures necessary to accompany such revisions.

4.0
Water Availability

4.1 General

An overall objective of the SKWD to ensure the availability of an adequate supply of potable water to meet the existing and future needs of its customers. This section will focus on presenting the quantities of potable water available to the water supply system at present, and at the projected 5- and 20-year planning periods. The information will then be used to compare available water with average and maximum day demand for existing and expected future system needs including as necessary, identification of timing and quantity of additional supplies and associated facilities.

The SKWD receives its supply from water purchased from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The SKWD also maintains its groundwater wells as emergency supplies. Should iron and manganese removal treatment be provided, the SKWD would rely on these wells for supply once again.

4.2 Watershed and Aquifer

Water supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water) to the South Shore and Middlebridge systems is from groundwater. Veolia (formerly SUEZ, United Water RI, Wakefield Water) developed their own WSSMP and in that plan state that demands are considered to be sustainable by the local ground-water resources.

The SKWD also maintains backup supply wells within the South Shore system. Groundwater underlying these sources is part of the South Coastal basin system.

The Rhode Island Water Resources Board (RIWRB) developed a Strategic Plan (2012) regarding its responsibility to regulate the proper development, protection, conservation and use of the water resources of the State. The Plan includes state-wide initiatives for meeting water needs given the available resources. The SKWD acknowledges the goals and initiatives outlined in this plan.

4.3 Safe Yield

Safe yield of the Factory Pond wells, serving the South Shore water system, has not been determined. Normal system operation entails SCADA automatic switching between Wells No. 1, 2, and 3. The wells are never operated simultaneously. Therefore, the maximum pumping capacity of the wells is taken as the maximum pumping rate of the largest production well at the wellfield - Well No. 1. The maximum pumping rate of this source is approximately 700 gpm (1.08 MGD). This source could provide up to 394 million gallons annually for the South Shore system, once a water treatment facility is constructed. Refer to Section 2.2.1 for more information.

4.4 Available Water Analysis

The intent of this section is to compare available water supplies, as previously developed, with the current system average and maximum day demand, to determine the adequacy of the available supply. In addition, a comparison of available water supplies with the projected average day and maximum day demands for the 5- and 20-year planning horizons will also be conducted in order to evaluate the adequacy of the available supply in terms of future water supply needs.

4.4.1 Existing Demand Analysis

System demands for average and maximum day were previously developed in Section 2.7 of this plan. The current average day and maximum day demands were determined to be 0.337 MGD and 0.861 MGD, respectively. The available yield of the existing Factory Pond wells was determined to be 1.08 MGD. This is sufficiently adequate to meet current Average Day Demand and the Maximum Day Demand.

4.4.2 Future Demand Analysis

South Shore System

Currently the South Shore System receives supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The wholesale water purchase agreement dated September 7, 2005 states that up to a maximum flow of 1.3 MGD would be provided. **Table 4-1** details the total water supply in relation to the existing supply and projected average and maximum day system demands for the South Shore System. This analysis assumes supply from the Factory Pond Wells would be active and have treatment. Note that the development of future projections conservatively assumed non-account water would be maintained at 10-15% for the planning period. Through continued efforts in the capital improvement and infrastructure replacement programs, the SKWD should be able to reduce the rate of unaccounted-for water to below 10% by the 20-year horizon.

Table 4-1. Demand Supply Analysis – South Shore System

Year	Maximum Day (MGD)	Well Supply Capacity[1] (MGD)	Veolia Supply Maximum (MGD)	Demand met by Supply?
2023	0.861	1.08	1.3	Yes
2028	0.875	1.08	1.3	Yes
2033	0.886	1.08	1.3	Yes
2038	0.898	1.08	1.3	Yes
2043	0.910	1.08	1.3	Yes

[1] Analysis assumes supply by Factory Pond Wells and treatment facility would be constructed for iron/manganese removal to treat the full capacity of the wells.

Middlebridge System

It is assumed that the Middlebridge System would continue to receive water supply from Veolia (formerly SUEZ, United Water RI, Wakefield Water). The agreement established in 1975 for water supply to the Middlebridge System states that up to a maximum of 300,000 gallons per day would be provided. This value is well above the projected future maximum day demand of 96,400 gallons per day as shown in **Table 4-2**.

Table 4-2. Demand Supply Analysis – Middlebridge System

Year	Maximum Day (MGD)	Veolia Supply Maximum (MGD)	Demand met by Supply?
2023	0.092	0.3	Yes
2028	0.094	0.3	Yes
2033	0.095	0.3	Yes
2038	0.095	0.3	Yes
2043	0.096	0.3	Yes

5.0
Supply Management

5.1 General

The objective of this section is to detail and describe the measures necessary for the protection of present and future sources of drinking water supply in adequate quantity and quality to meet existing and projected demands for the 5- and 20-year planning horizons.

5.2 Water Quality Protection

The South Kingstown Public Services Department maintains three active wells in the South Shore Wellhead Protection Area (WHPA), an irregular shaped region located along the boundary between South Kingstown and Charlestown, Rhode Island (Figure 5-1). The South Shore WHPA consists of three active wells (Gravel Packed Well #1: 1615623-01, Gravel Packed Well #2: 1615623-02 and Gravel Packed Well #3: 1615623-03.

Initially the South Shore Well System was designed to service the southern area of Town, including Matunuck, East Matunuck, Snug Harbor, Green Hill and Ocean Ridge. In 2005, the SKWD entered into an agreement to purchase water via a wholesale connection from Veolia Water. The SKWD continues to sample the three wells and maintains a Wellhead Protection Area as defined by RIDOH as a backup supply for the South Shore System.

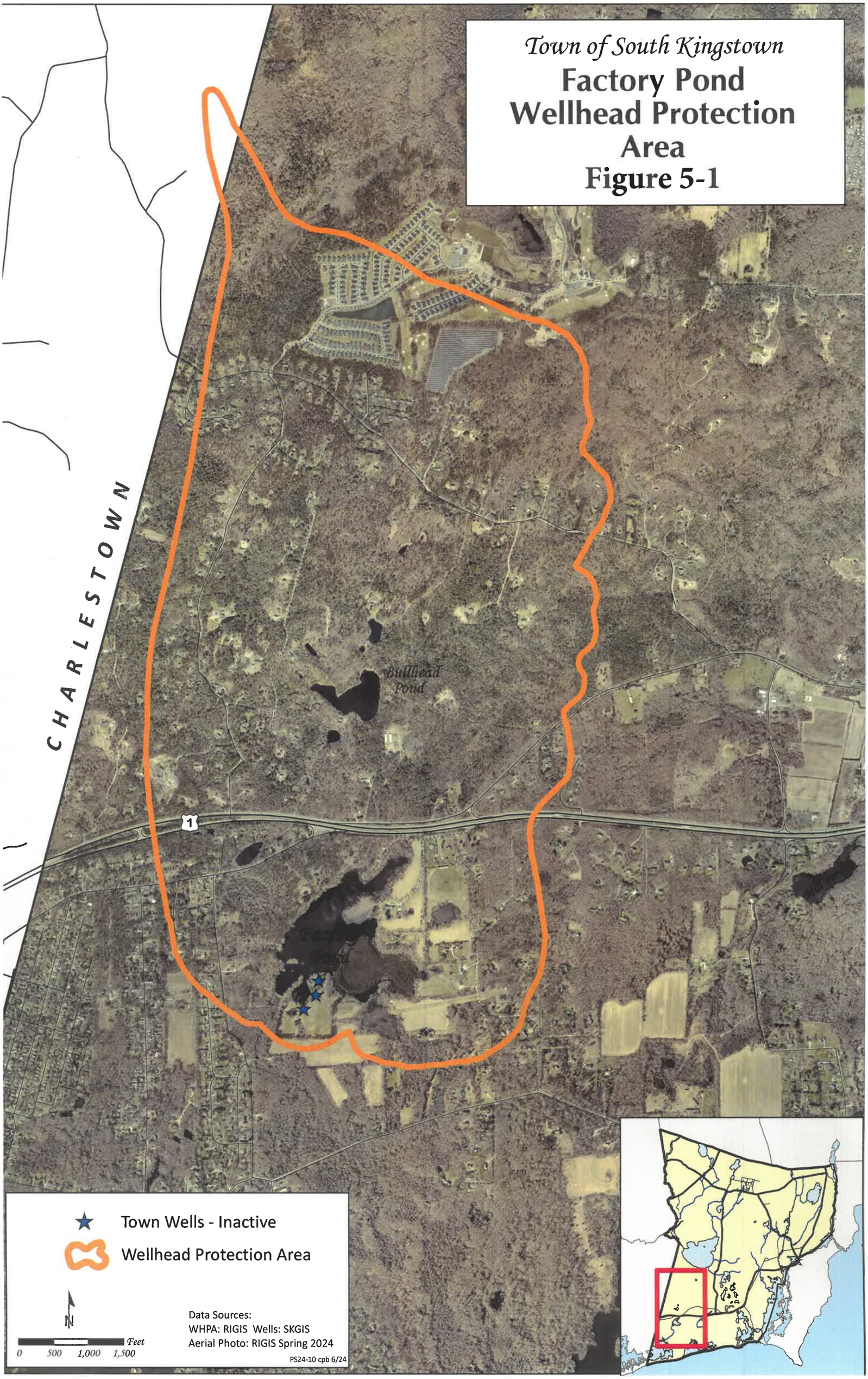
The South Shore WHPA covers approximately 1,426 acres and consists of mainly forested land as presented in **Table 5-1**.

Risk Factor 1: High Intensity Land Use

High intensity land use was determined using Rhode Island GIS (RIGIS) land use data (2020 data). Land use within the WHPA was calculated using ESRI Arc GIS v 10.3 and then aggregated based on land use categories (Figure 5-2). The percentage of high intensity land use in the WHPA under study is then compared to the rating scale for Riss Indicator 1, High intensity land use (**Table 5-2**). A summary of all land uses found within the South Shore WHPA reveals that 5% of the WHPA is considered to be developed as high intensity land use, corresponding with a risk rating of low.

Risk Factors 2 and 3: Pollution Sources Within Inner Protective Radius and Per Acre Throughout the WHPA

Information on the presence or absence of pollution sources within the inner protective radius of the well can usually be obtained through the Rhode Island Department of Health (RIDOH) Sanitary Surveys and Waivers. The Waiver does not provide an analysis of pollution sources within the inner protective radius nor a per acre count of potential sources throughout the WHPA. Therefore, Risk Factor 2 – Pollution Sources Within Inner Protective Radius and Risk Factor 3 – Pollution Sources per Acre Throughout the WHPA were both set at Medium (see **Table 5-3**). The Waiver is included as an attachment.


Town of South Kingstown
Factory Pond
Wellhead Protection
Area
Figure 5-1
CHARLESTOWN
Bullhead
Pond
1
Town Wells - Inactive
Wellhead Protection Area
N
0
500
1,000
1,500
Feet
Data Sources:
WHPA: RIGIS Wells: SKGIS
Aerial Photo: RIGIS Spring 2024
PS24-10 cpb 6/24

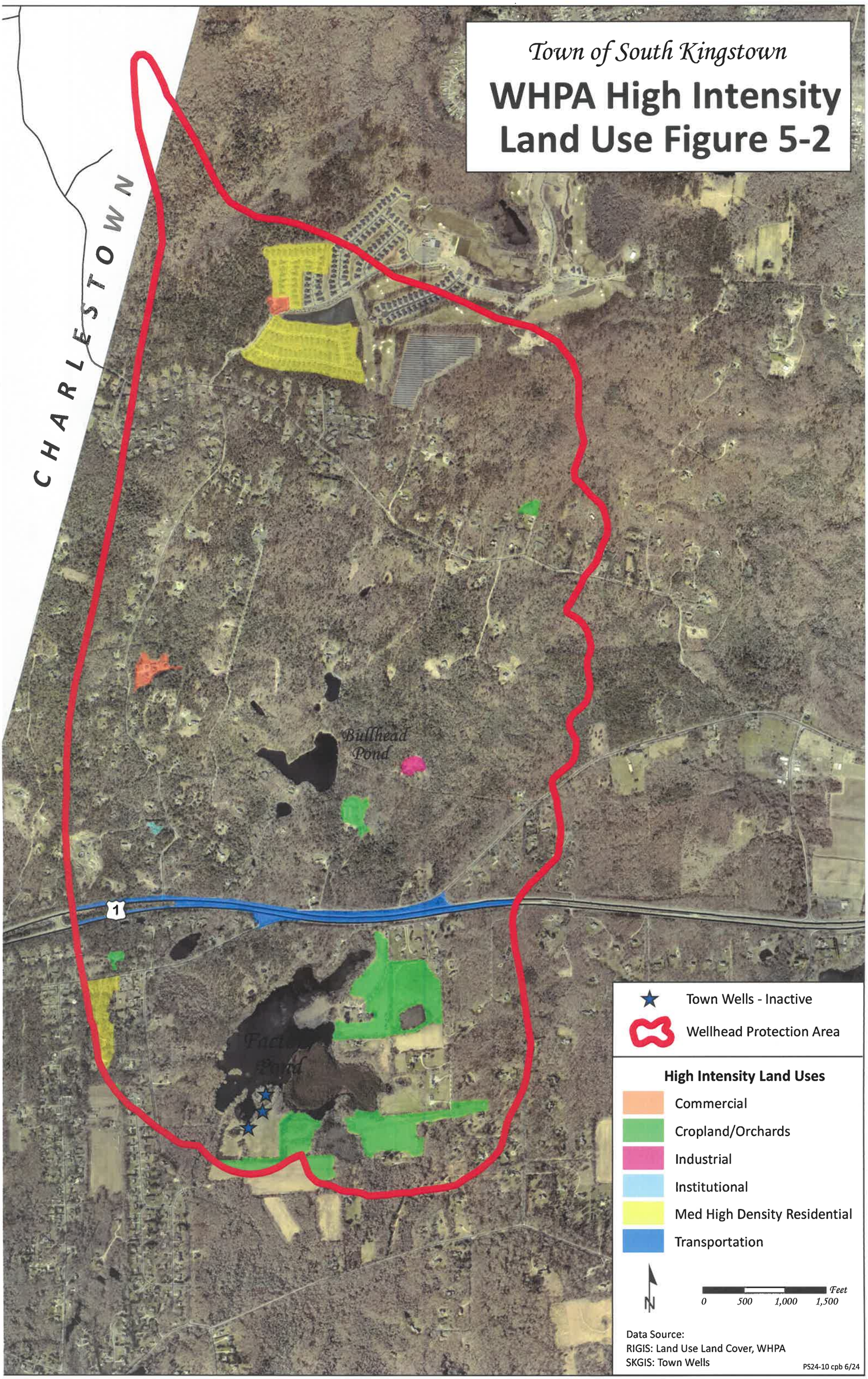

Town of South Kingstown
WHPA High Intensity Land Use Figure 5-2
CHARLESTOWN
Bullhead Pond
Factory Pond
1
Town Wells - Inactive
Wellhead Protection Area
High Intensity Land Uses
Commercial
Cropland/Orchards
Industrial
Institutional
Med High Density Residential
Transportation
N
0
500
1,000
1,500
Feet
Data Source:
RIGIS: Land Use Land Cover, WHPA
SKGIS: Town Wells
PS24-10 cpb 6/24

TABLE 5-1
SOUTH KINGSTOWN SOUTH SHORE WHPA / WELLS 1, 2, 3

RIGIS 2020 Land Use/Land Cover Land Use Code	RIGIS 2020 Land Use/Land Cover Land Use Description	Total Area (acres)	% of Total Land Use
Land	Medium High Density Residential (1/4 to 1/8 acre lots)	33.13	2.32%
113	Medium Density Residential (1 to ¼ acre lots)	124.24	8.72%
114	Medium Low Density Residential (1 to 2 acre lots)	65.92	4.62%
115	Low Density Residential (>2 acre lots)	10.42	0.73%
120	Commercial (sale of products and services)	2.78	0.19%
130	Industrial (manufacturing, design, assembly, etc.)	1.17	0.08%
141	Roads (divided highways >200' plus related facilities	15.27	1.07%
152	Commercial/Industrial Mixed	1.09	0.08%
162	Vacant Land	0.47	0.03%
170	Institutional (schools, hospitals, churches, etc.)	0.40	0.03%
210	Pasture (agricultural not suitable for tillage)	30.91	2.17%
220	Cropland (tillable)	40.67	2.85%
230	Orchards, Groves, Nurseries	3.82	0.27%
300	Brushland (shrub and brush areas, reforestation)	2.26	0.16%
410	Deciduous Forest (>80% hardwood)	118.00	8.28%
420	Softwood Forest (>80% softwood)	220.81	15.49%
430	Mixed Forest	655.51	45.99%
500	Water	51.19	3.59%
600	Wetland	22.73	1.59%
750	Transitional Areas (urban open)	24.62	1.73%
	Totals	**1,425.40**	**100.0%**
	High Intensity Land Uses	**98.34**	**6.90%**

TABLE 5-2
HIGH INTENSITY LAND USE (RISK FACTOR 1)

Risk Indicator	Rating (Score)			
	Low (0)	**Medium (5)**	**High (10)**	**Extreme (25)**
1. High intensity land use	<10%	10 - 24%	23 - 50%	>40%

TABLE 5-3
HIGH INTENSITY LAND USE (RISK FACTORS 2 AND 3)

Risk Indicator	Rating (Score)			
	Low (0)	**Medium (5)**	**High (10)**	**Extreme (25)**
2. Pollution sources within inner protective radius (400 ft. f 200 ft. of well)	0	**1 (set by default)**	2 - 3	>3
3. Pollution sources per acre throughout WHPA, excluding inner protective radius (multiply by 10)	<0.1	**0.1 - 0.5 (set by default)**	0.5 - 1	>1

Risk Factors 4, 5 and 6: History of Contaminant, Bacteria and Nitrate-Nitrogen Detections

Laboratory results for samples collected from the three active wells in the South Shore WHPA (Gravel Packed Well #1, Gravel Packed Well #2 and Gravel Packed Well #3) were obtained from Rhode Island Department of Health (RIDOH) and used to determine risk factors 4, 5 and 6. As wells are less than 1,000 ft. apart, the wells were assessed as one for the purposes of this analysis and only one risk rating score is provided for risk factors 4, 5 and 6.

Risk Factor 4 - History of contaminant detections within the last 5 years were determined by reviewing all contaminant detections in the laboratory records (excluding bacterial nitrogen, sodium, calcium and magnesium). A risk rating for each contaminant above the detection limit was then assigned based on the Maximum Contaminant Level (MCL). The MCL is based on either Rhode Island or EPA drinking water standards and advisory levels. The highest risk rating observed was used to set the total risk rating for the WHPA. Risk factor 4 for South Shore Wells 1, 2 and 3 was set at **medium**; no violations of the standards for regulated contaminants (excluding bacterial and nitrates) have been identified. However, there have been detections below levels considered acceptable by USEPA. This indicates the need for continued monitoring.

Although the risk rating is set at medium for the WHPA, low level detections of unregulated contaminant chloroform have occurred, suggesting that the water supply is susceptible to contamination.

Additionally, sodium levels have exceeded 20 mg/l in all three South Shore wells. Sodium levels in Well #1 ranged from 18.6 to 30.1 mg/l, Well #2 ranged from 17.2 to 25.5 mg/l; and Well #3 ranged from 18.0 to 26.1% during the monitoring period. Calcium, sodium and magnesium data are not analyzed as contaminants (risk factor 4) as they are naturally occurring. However, sodium is reviewed when levels consistently approach or exceed 20 mg/l, because sodium and chloride are indicators of contamination from road salt and can also indicate the presence of other runoff pollutants. The EPA listed sodium on the "drinking water advisory" list with 20 mg/l as the guidance level for those on a restricted sodium diet (EPA 822-R-09-011, 2009 Edition of the Drinking Water Standards and Health Advisories, October 2009). This is not an official contamination level; however, sodium concentrations approaching or exceeding 20 mg/l should be reported.

Risk Factor 5 - Source Water Bacteria Detections within the last 5 years was determined by viewing all available bacteria data for each well. The number of bacteria sample detections was used to determine the risk rating. Risk factor 5 for South Shore Wells 1, 2 and 3 was set at **low** – Fecal coliform bacteria were not detected.

Risk Factor 6 - Maximum nitrate-nitrogen (NO3-N) concentration in the last 5 years was determined by viewing all detections of nitrate-nitrogen in the laboratory record for all the wells in the WHPA. The maximum observed nitrate-nitrogen value was 1.26 mg/l NO3-N. This nitrate-nitrogen value corresponds with a risk factor of **medium** – nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.

The yearly maximum and average nitrogen values for the WHPA were plotted and the data reviewed for trends. There does not appear to be an observable upward or downward trend in nitrate-nitrogen values in the WHPA.

TABLE 5-4
HIGH INTENSITY LAND USE (RISK FACTORS 4, 5 AND 6)

Risk Indicator	Rating (Score)			
	Low (0)	**Medium (5)**	**High (10)**	**Extreme (25)**
4. History of contaminant detections within the last 5 years	Trace (Maximum value is less than 10% of MCL)	**Less than ½ MCL**	Greater than ½ MCL	Greater than MCL (violation)
5. Source water bacteria detections within the last 5 years	**Less than 5% of samples have detected coliform**	Greater than 5% of samples have detected total coliform	One or more Fecal coliform samples exhibit a detection	One or more Fecal coliform samples is above water quality standards*
6. Maximum nitrate-nitrogen (N03-N) concentration in the last 5 years	<0.5 mg/l NO3-N	**0.5 - 2 mg/l NO3-N**	2 - 5 mg/l NO3-N	>5 mg/l NO3-N

Table 5-5 provides a summary of the Pollution Risk Results for the South Shore WHPA.

TABLE 5-5
SUMMARY OF POLLUTION RISK

Risk Indicator	Calculated Value - Risk Rating (score)	Explanation
Wellhead Protection Area Land Use		
1. High Intensity Land Use	5% - Low (0)	
Existing or Potential Pollution Sources		
2. Pollution Sources within inner protective radius (400' to 200') of well	No data - Medium[1] (5)	
3. Pollution sources per acre throughout WHPA, excluding inner protective radius	No data - Medium[1] (5)	
Water Quality		
4. History of Contaminant Detects within the last 5 years	≤ ½ MCL - Medium (5)	No violations of the standards for regulated contaminants (excluding bacteria and nitrates) have been identified. However, there have been detections below levels considered acceptable by USEPA. This indicates the need for continued monitoring. Low level detections of unregulated contaminant chloroform have occurred, suggesting that the water supply is susceptible to contamination.
5. Source Water Bacteria Detects within the last 5 years.	0 - None Detected	

6. Maximum nitrate-nitrogen (NO_3-N) concentration in the last 5 years	0.86 mg/l - Medium (5)	Nitrate levels in groundwater are somewhat higher than background levels, which may indicate from human activity.
Overall Rating	20 - Moderate	**Moderate** **Note: A ranking of MODERATE means that the water could become contaminated one day. Protection efforts are important to assure continued water quality**

Notes:

[1] No data is present for this risk indicator. Therefore, the risk rating of moderate is automatically assigned although data are not available, there may still be pollution sources present.

5.3 Alternative Water Supply Sources

The SKWD has been aware of the potential for future need of additional water sources. In the past, two potential alternatives to increase supply to the South Shore system were identified as: (1) additional well on the Town-owned wellfield property, and (2) the establishment of a wholesale interconnection to the Veolia (formerly SUEZ, United Water RI, Wakefield Water) distribution system. Given the recent construction of a 12-inch new interconnection with Veolia (formerly SUEZ, United Water RI, Wakefield Water), the only remaining potential source of new supply would be an additional well at the Factory Pond well field. However, this alternative will not be considered until such time that a water treatment facility for iron and manganese removal is constructed and operational.

5.4 Supply Augmentation

The purpose of a supply augmentation study is to investigate and recommend alternative water supply sources due to anticipated shortfalls in the quality and/or quantity of existing supplies to meet 90% of current, or 100% of future demands. The Town recognizes the need to seek alternative sources of raw water supply. In the past, the Town has contracted with a consultant to address the issue of supply augmentation. The Town will continue to seek funding to investigate future water supply obligations. The SKWD considers this work as required planning in an effort to ensure accommodation of the domestic and fire flow demands of its present and future customers over the next twenty (20) years.

6.0
Demand Management

6.1 General

Demand management consists of those conservation measures that achieve long term water savings by providing incentives and technical assistance to consumers as a means of improving efficiency of water use and reducing waste. Such water conservation measures, whereby suppliers and/or local water utilities and government work to influence water consumption, is the most fundamental approach to water conservation, since the ability to conserve water lies primarily with the water user. Consequently, the success of these measures is highly dependent upon consumer participation and cooperation.

The demand management program proposed herein will therefore focus predominantly on those measures and approaches that achieve permanent long term water savings without requiring major user habit changes. The five (5) basic demand management techniques are as follows:

- Installation of water conserving, low-flow plumbing devices (retrofit) and revision of plumbing code regulations.
- Promotion of water recycling and efficient use and reuse; provision of technical assistance to industrial, commercial, and governmental users.
- Public education on water conservation and water supply issues.
- Appropriate use of fees, rates, and charges.
- Water use regulations and restrictions.

The purpose of this section of the plan is to outline the efforts to be made within the following areas for the purpose of reducing inefficient water use throughout the SKWD water distribution system, utilizing the Residential Retrofit Program (RRP), public education and information efforts, pressure reduction, and appropriate use of fees, rates, and charges.

6.2 Goals

The demand management goals of the SKWD are divided into short term and long term goals, as follows:

Short Term Goals

1. Minimize peak demand use requirements
2. Closely monitor water user consumption, especially during periods of outdoor water restrictions, by utilizing the new water meter technology, which incorporates data logging for each water meter

Long Term Goals

1. Minimize average demand use requirements
2. Provide water-use audit services to all major users

6.3 Residential Retrofit Program (RRP)

The Town has offered leak detection kits and water saving showerheads. However, the Town has learned that the majority of residents prefer to use showerheads of their own selection. Note that the current building code requirements have provisions for water saving devices including low flow toilets.

In order to comply with State requirements, since August 1992, the SKWD has made residential retrofit kits (RRKs) available to its customers at low cost. To date, only a limited number of water users have purchased the retrofit kits. The SKWD reimburses the water customer the cost of the RRK upon completion of a post-installation survey by the water user. The SKWD will continue to periodically advertise and encourage the use of these kits by maintaining their availability.

SKWD staff is available to provide water users guidance with regard to RRK installation and effectiveness. For reasons of liability, SKWD staff cannot assist with RRK device installation or suggestions for use that are contrary to RRK manufacturer protocol.

The SKWD approach to public education shall focus on two (2) main goals; the first being the education of its users into becoming well informed about the SKWD water supply system. Public education to water users is primarily achieved through the annual Consumer Confidence Report (CCR). In addition, the SKWD will update the Town's website to include water conservation information, including links to various websites (i.e., USEPA, AWWA, etc.).

Direct bulk mail water conservation pamphlets are another means of providing water conservation information to water users. In the past, flyers have developed in-house based upon generally accepted water conservation methods, tips and recommendations. The SKWD can also consider using pre-printed water conservation brochures as prepared by the American Water Works Association (AWWA) the USEPA or similar organizations.

Additional initiatives such as presenting articles or advertisements on local cable television stations or in the local newspaper, as well as exhibiting posters and public displays, should further reinforce customer awareness and acceptance of the retrofit program.

In-school programs are also an effective means of educating the water-using public, as the programs provide an important and successful means of teaching water awareness and developing an ethic of individual responsibility for resource conservation among young people.

It should be noted that revisions to plumbing codes are generally accepted by the public. It is likely that they will become self-enforcing over a period of time because local suppliers will tend not to carry non-conforming fixtures, as there will be little demand for them.

SKWD will review RRK post installation customer surveys and associated water user consumption to determine the effectiveness of the program. Unfortunately, it would be difficult, if not impossible, to correlate the success of non-RRK related water conservation measures (i.e.: outdoor watering methods), since numerous variables (i.e. wet weather, fire protection) can affect annual gross water production/ wholesale purchase and the respective user consumption.

6.4 Major Users Technical Assistance Program (MUTAP)

Neither the South Shore nor Middlebridge distribution systems have any major users that consume in excess of 3.0 million gallons per year. There are several large public users (i.e., the school) and several commercial users (i.e., marinas), but these do not comprise a significant proportion of water consumption. In keeping with the purpose of the MUTAP, the Public Services Department is willing, upon request, to aid any customer in identifying potential conservation or demand control measures. However, no formal MUTAP is planned at this time.

6.5 Fee Schedule

6.5.1 General

Conservation oriented pricing is usually regarded as an essential element of a broad municipal water conservation program and is considered critical to the effective implementation of regulations and devices aimed at outdoor watering use, sanitary devices, cooling systems, recycling, etc. The Town has implemented a rate structure to encourage water conservation. As noted in Section 6.5.2 below, the Town's Water Division adopted a conservation "tier-type" rate structure in July 2021, and now issues water bills on a quarterly basis.

6.5.2 Current Rate Structure

The current Water Rate Schedule, effective July 1, 2014, is shown in **Table 6-1**, below. Bills are issued quarterly. Minimum charges are assessed based on meter size as listed in the table. The minimum charge includes up to 1,250 cubic feet; 1,250 to 2,500 cubic feet rate of $3.50 per 100 cubic feet; and over 2,501 cubic feet rate of $4.00 per 100 cubic feet is assessed.

For customers with multiple dwellings or units on the same parcel with one meter, the minimum charge is $55 for up to 1,250 cubic feet, with an additional charge of $27.50 for each additional unit allowing for 500 cubic feet. Excess water use over the allowances is charged at the commodity rate.

Fees are also assessed for turn on and turn off, damage, service installations, and fire protection. For most customers, this rate structure represents a flat rate.

Table 6-1. Water Rate Schedule

Meter Size (in.)	Quarterly Minimum Charge [1]
5/8	$55.00
1	$75.00
1¼, 1½	$115.00
2	$160.00
3	$258.00
4	$401.00
6, 8	$802.00

[1] Minimum charges are assessed based on meter size as listed in the table. The minimum charge includes up to 1,250 cubic feet; 1,250 to 2,500 cubic feet rate of $3.50 per 100 cubic feet; and over 2,501 cubic feet rate of $4.00 per 100 cubic feet is assessed.

6.5.3 Alternative Rate Structures

Revisions to the current water use rate structure, if properly designed, may earn extra revenues even as consumption drops. This approach is most effective for addressing long-term, low percentage, average and peak goals when all users are metered. To date, water rate revision in other water supply systems has been shown to be most effective in encouraging reduction of residential peak use and of non-residential average use. The response to a rate revision usually diminishes as users become accustomed to paying more. As price levels increase for water, however, user's response is likely to increase. The percent of reduction in use will vary, but it can be expected to produce more of a reduction in peak use than average use.

The cost of implementing an alternate rate structure program is primarily a one-time cost. It may be necessary to perform a cost of service study and to set up a revised billing system; however, revisions to the current rate structure should prove cost-effective, and when implemented with other programs and in conjunction with upgrading of the water distribution system, can be expected to contribute significantly to conservation of water by residential and non-residential users.

The American Water Works Association (AWWA) Manual of Water Supply Practices, M1, Principles of Water Rates, Fees and Charges is a useful resource when considering alternative rate structures. The following presents a brief discussion of some of these alternatives as they may apply to the SKWD water system:

1) Seasonal Adjustments

   Seasonally increased rate structures are generally used to encourage conservation during the period of greatest outdoor use. In such circumstances, summer rates are higher than non-summer rates.

2) Metered Increasing Block Structure for Each Class

Inclining block rates are based on the assumption that heavy users are responsible for increasing the need for expansion of a system and should therefore pay a higher unit price. Water is priced on blocks of consumption with the unit price increasing as the use enters increasing volume blocks. In this case, the system users are divided into different classes and a separate block rate structure is applied to each. Although large consumers of water, such as commercial, industrial, nurseries and residences with large lawns, will likely resist an increasing rate structure, such a structure will promote conservation of water if rates are high enough in the higher priced blocks.

6.6 Public Education

Public education and information programs constitute a critical and necessary component of demand, and supply management oriented water conservation programs.

It is important to remember that the average customer knows very little about water supply; where it comes from, how much he or she uses, or what costs are involved. As such, public education programs need to be specifically designed in order to effectively transmit water conservation information and encourage users to conserve. The selected program can be designed from a number of methods; the important element being whether the chosen methods can effectively impart conservation information to the system users. Typically, several methods are used in combination to ensure that all users are exposed to the information.

To date, South Kingstown has employed an adequate system-wide public education program. Expanding past endeavors in an effort to maximize consumer response to the management initiatives presented in this plan is necessary to effectively implement these initiatives. The majority of the public education efforts will coincide with the specific management initiative being applied. For example, as presented in other parts of this plan, specific actions are discussed for Demand Management (Residential Retrofit Program, Water Use Audits) initiatives.

As a lead-in to these efforts, the South Kingstown Public Services Department should consider the need to educate some or all of its users into becoming well informed about the municipal water supply and distribution system, its day-to-day operations, the occasional problem in meeting demand for water, and the costs associated with the delivery of such water. A number of effective methods are utilized for general public education. The most common being the following:

- Media/Publicity:
  - Town web-site information
  - News releases and public service announcements;
  - Photographs, posters, billboards;
  - Media kits and fact sheets;
  - Films and videos available to the public;
  - Public notification of Safe Drinking Water Act requirements and violations;
  - Conservation bumper stickers for utility vehicles.

- Community Activities:
  Public forums and meetings (attend, sponsor);
  Workshops for plumbers and contractors;
  Presentations and exhibits;
  Xeriscape projects.

- Printed Material:
  Consumer Confidence Report (CCR)
  Bill messages;
  Pamphlets, newsletters;
  Specific information for target audiences;
  Logos, stickers, buttons and other promotional items.

- Special Events:
  Open house;
  Drinking water week;
  Poster competitions, art exhibits.

- In-House Education:
  Awareness training for employees in the field;
  Successful retrofit in use;
  Customer assistance.

- School Programs and Curricula

New fliers could be developed in-house or with assistance from the regulatory authorities of either State. Guidance may also be available from the American Water Works Association (AWWA).

In-school programs are also an effective means of educating the water-using public, as the programs provide an important and successful means of teaching water awareness and developing an ethic of individual responsibility for resource conservation among young people. School programs also have the ability to often reach beyond the classroom as conservation information is disseminated to parents and families through enthusiastic students. The Public Services Department, working in-conjunction with the RI Water Works Association (RIWWA), should also continue to offer water conservation presentations at local schools, and sponsor special events and activities such as declaration of a water awareness week, poster contests, field trips to water supply facilities, science fair projects or special awards, use of water conservation films and videos, and distribution of promotional items (logo stickers, pencils, etc.).

Water conservation public education efforts should also include solicitation of assistance from local officials and organizations in the Town to effectuate changes which would enhance water conservation (i.e., review and comment on local ordinances). Local interest groups, plumbing suppliers and contractors should also be targeted to promote acceptance of the water

conservation programs. In addition, the local Fire Department should be advised on the proper utilization of hydrants for sanitation, firefighting, street cleaning, etc.

It would likely prove beneficial to the Town to coordinate such initiatives as news releases, newspaper advertisements, etc., with the efforts of neighboring water utilities, specifically those within the Town of South Kingstown (e.g. Veolia (formerly SUEZ, United Water RI, Wakefield Water), and thereby pursue a more regionalized approach to public education.

Implementation of the majority of the foregoing initiatives will generally coincide with the implementation schedules presented for the specific demand initiatives discussed throughout the plan.

7.0
System Management

7.1 General

Water conservation practices involving system management initiatives are directed at improving the efficiency of and eliminating waste in the production and distribution of water within a supply system. Such practices are necessary to ensure that the physical components of the water system are properly operated and maintained, and include the following:

- Meter Management
- Leak Detection and Repair
- Preventive Maintenance

It is essential for water utilities such as South Kingstown's to continually look ahead in order to prepare for needed capital improvements and treatment upgrades. The development of criteria for service area extensions, analysis of Safe Drinking Water Act requirements, and the identification of necessary system rehabilitation projects will help ensure the future success of the system management program.

System management practices are generally considered by utility personnel, to be more desirable than demand management practices because they are almost entirely non-dependent upon user cooperation. Such practices are under the direct control of the purveyor and are relatively straightforward to develop. In addition, implementation of such programs typically results in the reduction of utility operating costs and the recovery of lost revenues due to the decrease in lost and unaccounted for water.

System management practices, however, tend to be labor intensive and require long lead time for implementation. These water conservation methods are in most cases, expensive, but in general, they are cost-effective due to the recovery of lost revenues and the relaxing or delaying of the need for new source development. The following discusses these practices as they pertain to the South Kingstown water system.

7.2 Goals

The system management goals for the SKWD water system are:

1. To continue to reduce the current level of non-account water to remain below the State goal; and
2. To improve the overall efficiency of the water supply system.
3. Perform master meter calibration.
4. To continue to assess the water losses in the Middlebridge Area.

7.3 Meter Installation, Maintenance and Replacement (MIMR) Plan

As a general rule, metering in and of itself is not considered a water conservation measure; however, it does provide an accurate accounting of all water uses throughout the system, and indeed, several other water conservation programs discussed in this plan, such as water audits, leak detection and repair, pricing, etc., are dependent upon appropriate system metering.

As referenced earlier in this plan, every residential, commercial, industrial and government customer serviced by the Water Division is metered, thus providing 100% distribution metering. The wholesale production supply meter from Veolia (formerly SUEZ, United Water RI, Wakefield Water) is read weekly and the SKWD is billed monthly. All residential, commercial, and industrial distribution meters are read and billed on an annual basis each July.

Based on the description of the Meter Replacement Program, provided earlier in this report, it would appear that the current meter replacement program complies with the intent of the Rules and Procedures for Water Supply System Management Planning, and this approach should be maintained. Likewise, the SKWD's current practices with regard to meter testing, calibration, and replacement also adhere to suggested AWWA guidelines, and State of Rhode Island Plumbing Code. These practices will continue to be maintained. South Kingstown should consider reviewing current practices with respect to general conformance with American Water Works Association publication Water Meters - Selection, Installation, Testing, and Maintenance (AWWA M6), recommendations of the meter manufacturer, and good engineering practice.

Ranges of meter accuracy should be in line with the latest revisions of the AWWA standards (C700 series) and State Plumbing Code. Where an AWWA standard for a meter is not available, the SKWD shall demonstrate to the satisfaction of the RI Water Resources Board that the meter is capable of measuring not less than 95% and not more than 105% of the water that passes through the meter.

In 2007-2008, the SKWD replaced all customer water meters for the South Shore and Middlebridge water systems using third party installation contractor services.

The new meter system (manufactured by Master Meter) employs "drive-by" radio reading technology, whereby all water meters can be read within a three (3) hour period as compared to an eight (8) to ten (10) week reading period with the former "walk-by" technology.

Even though the SKWD bills water customers on a quarterly basis, the SKWD reads all meters on monthly basis. During the monthly meter reading cycle, the water meter technology used by the SKWD has the ability to issue a "leak alert" or "backwards meter". If an alert is received during monthly meter reading, written letters are then sent each month to water customers that had a "reading alert" advising them of a suspect leak or backwards meter.

7.4 Leak Detection and Repair (LDR) Plan

7.4.1 General

A common and unavoidable fact in the water supply industry is that all water supply systems lose water due to leaks. Detection of such leaks can be determined by the systematic method of using listening equipment to survey a water distribution system, identifying leak sounds and pinpointing the exact locations of hidden underground leaks. Leak detection and repair thus involves the analysis of unaccounted-for water. Leaking sources of unaccounted-for water include defective hydrants, abandoned services, leaking meters, illegal hookups, and leaks in mains and services.

Unavoidable leakage is inherent in every system. Leakage exceeding this rate, in most cases, represents recoverable loss that is cost effective to address through leak detection and repair, break analysis and repair/replacement programs. The American Water Works Association, Manual of Water Supply Practices M36, Water Audits and Loss Control Programs defines unavoidable leakage as the lowest loss technically achievable in a water utility based on its key characteristics. This manual presents a calculation for unavoidable real loss that was developed based on leakage data gathered from well-maintained and well-managed systems. The unavoidable losses are determined as a function of the water systems length of water mains, number of service connections, total length of private pipe (customer pipe) and average pressure in the system.

7.4.2 Existing Program

In addition to performing timely repairs to distribution system leaks, the SKWD has utilized leak detection services in the past. Although this rate is at times above the State goal of 15% for non-accounted water and 10% for leakage, the SKWD believes that the time period between the customer meter reading and the master meter reading accounts for a differential in the actual water consumption. The new meter system employs “drive-by” radio reading technology, whereby all water meters can be read within a three (3) hour period as compared to an eight (8) to ten (10) week reading period with the former “walk-by” technology. Should the rate increase such that it becomes unacceptable (greater than 10%), the SKWD implements the LDR program.

A system-wide leak detection survey for the South Shore and Middlebridge water systems was conducted in May of 2017, by Matchpoint Leak Detection services of Wilmington, NC. However, the leak detection consultant was unable to find leaks in either system. The next leak detection survey is budgeted to be undertaken in the FY 2026 Budget.

7.5 Preventive Maintenance (PM) Plan

The SKWD maintains an aggressive PM program. The water distribution systems are flushed for two weeks and all hydrants are exercised once per year. Once each year, all valves are exercised. When the well field is in operation, one of the wells is rehabilitated each year on an alternating basis. Any valves or hydrants that are found to be inoperative are immediately replaced. Every

four to five years, the storage tanks are inspected for structural soundness and overall condition. Additionally, the SKWD also identifies and plans for future maintenance and repair of its infrastructure.

The SKWD also maintains accurate record keeping of inspections and routine maintenance, in addition to a spare parts inventory, and names and locations of manufacturers and distributors of critical components.

Other significant programs, which fall under system infrastructure repair, maintenance and management, are as detailed below. These programs fall under the general category of a Preventive Maintenance Plan (PMP) and are as detailed below.

Water Main Flushing Program
Water main or hydrant flushing is performed at minimum once per year in the spring or fall and as manpower permits is performed twice per year, during non-peak demand periods. The intent is to start at a tank or interconnection and progressively work outward into the distribution system. The intent of this program is to flush the water mains in order to remove any loose or tuberculated sediments and maintain water quality. It should be noted that the severity of water drought conditions and any use restrictions might impact this program.

Valve Maintenance Program
There is a maintenance program in place whereby the SKWD ensures the functionality of the valve. A valve is replaced when it is found to be inoperable, leaking or otherwise malfunctioning. The Infrastructure Plan allows for the replacement of two (2) system valves per year.

Hydrant Maintenance Program
Each hydrant in the water system is operated at least once per year during water main flushing activities. All hydrants are maintained on a periodic basis. Hydrants that are found to be inoperable or malfunctioning are replaced.

Backflow / Cross Connection Program
All commercial users are required to have an operable and testable backflow device at the point of sale (water meter). Town licensures are withheld until the commercial water customer provides written documentation that the testable backflow device was tested and passed. Failure to provide the annual certification will result in Town licensure being withheld and legal action by Town police and/ or legal counsel. This program is ongoing and is considered critical in maintaining water quality and thereby reducing the threat of cross contamination.

Meter Installation, Maintenance and Replacement Plan
This is an ongoing program with a high success rate.

Water Tank Inspection
A certified tank inspection company inspects existing storage tank structures on a routine basis and roughly at five-year intervals. This includes both a structural and coatings inspection of both

the interior and exterior. Improvements and maintenance will be completed in accordance with the recommendations of these inspections. The Mautucket Road water tank was repainted in 2005, followed by Victoria Lane repainting in 2006. Both tank paint systems included full exterior abrasive blasting to white metal and full tank encapsulation to capture blasted media and paint debris.

General Infrastructure Components

Remaining infrastructure components such as pumps, piping, building structures, etc. are routinely inspected and maintained. A written record of maintenance and improvements is maintained for each component.

8.0
Emergency Management

8.1 General

The Emergency Management section for the South Kingstown water supply and distribution system is detailed in Volume II of this WSSMP.

9.0
Plan Implementation

9.1 General

The purpose of this WSSMP as a whole is to outline the goals of the water supply management planning process for the SKWD water system, and to serve as a guide for the Public Services Department's decision-making procedures. The purpose of this section is to catalog actions necessary for the implementation of the Plan's recommendations in a timely fashion, and for identification of the individuals responsible for taking those actions. The implementation section will therefore serve to link those recommendations resulting from comprehensive study to policy and financial decisions required for actual improvement of the water supply system.

A detailed schedule outlining the individuals responsible, timing, and costs associated with recommendations outlined, has been developed and is presented in **Table 9-1**. Where work can be accomplished by SKWD staff, the responsibility has been designated as "In-House." It is intended that where outside consultants and/or contractors are required, the Public Services Department shall take the necessary steps to advertise for, and contract with, such resources. The costs developed for each recommendation include an estimate of the capital, operating and maintenance costs associated with each implementation.

In addition, the Public Services Department maintains a 6-year CIP. In conjunction with the preparation of this report, the SKWD is updating its CIP to cover through fiscal year 2028/2029. Some CIP supplemental items are included in **Table 9-1**. This list is provided in supplement to the 6-Year CIP provided in the appendices.

Table 9-1. CIP Supplement
South Kingstown Water Supply System Management Plan

ACTIONS	RESPONSIBILITY	TIMING	COST	FUNDING
1. Residential Retrofit Program	In-House	Ongoing	$1,000 per year	Annual Budget
2. Supply Augmentation Studies	Outside Consultant	Ongoing	$20,000	
3. Design Water Filtration Facility engineering	Outside Consultant	To be determined	$500,000	Capital Reserve Fund (CIP)
4. Construction of Water Filtration Facility	Outside Contractor	To be determined	$15,000,000	General Obligation Bond, User Assessments, CIP, Investment Income
5. Update WSSMP	Outside Consultant	Every 5 years	$50,000	CIP
6. Water Main Looping	Outside Contractor	As required	$40,000	CIP
7. Well Redevelopment	Outside Contractor	Every other year when wells are active	$16,000 per well	CIP
8. Formal Leak Detection Survey	In-House	Ongoing	$50,000	Annual Budget
9. Preventive Maintenance Plan	In-House	Ongoing	---	Annual Budget
10. Public Education Program (bill stuffers, school programs, etc.)	In-House	Ongoing	$1,500 per year	Annual Budget

*List provided in supplement to CIP. Refer to Appendix C for 6-Year CIP list.

10.0
Financial Management

10.1 General Policies

As provided in the South Kingstown Town Code, Article III, Division 7, the SKWD is operated as an enterprise system. Accordingly, a Water Enterprise Fund is established as a depository for all SKWD revenue and for payment of all SKWD expenditures.

The system's revenues include water sales, fees, charges, and assessments. Expenditures can include operating costs, extensions, improvements, supplies, services, and taxes. The Finance Director for the Town is responsible for maintaining financial records of the SKWD in compliance with generally accepted accounting principles.

10.2 Current Financial Management Practices

A summary of the operating income and expenses for South Kingstown is presented in the appendices.

10.3 Future Revenue Sources

As discussed previously, the Town has numerous options for financing SKWD projects. The Town will seek the most cost-effective manner of financing future capital needs including implementation of the WSSMP. The primary options for Town consideration are as follows.

10.3.1 General Obligation Bonds

The need for a water filtration facility has previously been described in this plan. Given the magnitude of this project, a general obligation bond will be required to finance the improvements. Debt service on the bond will be paid via a special water quality treatment assessment levied on South Shore water customers.

10.3.2 Rhode Island Infrastructure Bank

The Rhode Island General Assembly established the Clean Water Finance Agency in 1989. The program continues today in an expanded format under the Rhode Island Infrastructure Bank.

The RI Infrastructure Bank has grant and loan programs available for implementing various water system projects through the Drinking Water State Revolving Fund (DWSRF). The DWSRF is a financing program that provides below-market interest rate loans to community public water systems, nonprofit noncommunity public water systems, privately organized water suppliers and local governmental units to complete water infrastructure projects.

The Town will evaluate the feasibility and cost-effectiveness of using this method to finance capital projects including the implementation of the WSSMP.

The programs described above provide the Town of South Kingstown with a range of options for financing the capital needs of the Public Services Department, Water Division. As each project evolves, including projects associated with the implementation of this plan, the Town will identify the most feasible and cost-effective method of financing the improvements.

10.3.3 Rhode Island Water Resources Board

The Rhode Island Water Resources Board (RIWRB) periodically offers grant and loan programs available for implementing various water system projects. The Town will evaluate the feasibility and cost-effectiveness of using this program to finance capital projects including the implementation of the WSSMP.

10.3.4 Other Income

Revenue from cell antenna lease currently provides $250,000 per year. This revenue is retained in the Water Enterprise Fund for future capital projects since the antenna arrays are located on the Victoria Lane and Mautucket Road water storage tanks.

10.4 Assessment of Rates

The Town has established a billing frequency, a rate structure and water rates that are designed to:

- Recover all capital and operating costs for complete operations of the water system
- Quarterly billing to provide the customer with information on the cost of using water
- Reimburse the Town for administrative services provided to the SKWD

The SKWD, with the assistance of the Town Finance Department develops an annual budget designed to include all costs of operating the water system and all anticipated revenues, for approval by the Town Council. In the development of anticipated revenue, the water rates are evaluated to determine the capability of the rates to recover sufficient funds to cover all anticipated costs. Adjustments are made to the rates if necessary to assure that the expected revenue accommodates the operating costs. The proposed budget is presented to the Town Council for approval.

The SKWD attempts to operate and maintain the water system such that non-account water is maintained at a rate of less than 10 percent. SKWD staff reviews non-account water and takes immediate action to repair leaks, identify inaccurate meters and generally identify all non-accounted for water to meet this goal. The SKWD recognizes the fact that any change in the

amount of non-account water will likely have a noticeable impact on the system's operating expenses, while having an insignificant effect upon water revenue.

10.5 Billing

Beginning in 2014, the Town of South Kingstown bills its retail water customers (i.e. residential, commercial, and industrial users) on a quarterly basis each July, October, January and April in a given year. As previously mentioned, revenues generated through the collection of bills are intended to offset all capital and operating costs, and to reimburse the Town for administrative services provided to the SKWD.

11.0
Coordination

11.1 General Policies

This Water Supply System Management Plan is intended to be consistent with the goals and policies of the Town of South Kingstown Comprehensive Plan, as it pertains to water supply and management. Conversely, the South Kingstown Public Services Department, with the Town's Engineering personnel shall promote consistency between the contents of this plan and the policies of these documents. Also, new developments, which will expand municipal water service, require approval from the local planning board.

Future land uses, zoning requirements, growth projections and other areas of mutual interest, with regard to service area expansion, shall be consistent with the ability of the water supply system to accommodate the expected potable water requirements of the system.

Finally, the Public Services Department shall continue to pursue the accommodation of the current and future needs of its water supply system through the coordination of its efforts with those of its neighboring water supply utilities, specifically the Veolia (formerly SUEZ, United Water RI, Wakefield Water) and the Town of Narragansett. In the case of an emergency, joint efforts will be employed to allow each utility to help one another. Future endeavors shall include efforts in regard to regional cooperation with respect to additional system interconnections, service area expansion, capabilities to assist in the response to water supply emergencies, the potential for regionalization, etc.

APPENDIX A

MIDDLEBRIDGE AGREEMENT - VEOLIA (FORMERLY SUEZ, UWRI AND WAKEFIELD WATER COMPANY) AND AND TOWN OF SOUTH KINGSTOWN

AGREEMENT

THIS AGREEMENT, made and entered into this 15th day of December 1975, by and between WAKEFIELD WATER COMPANY, a Rhode Island corporation (hereinafter referred to as "Wakefield") and TOWN OF SOUTH KINGSTOWN, South Kingstown, Rhode Island (hereinafter referred to as "Customer").

W I T N E S S E T H :

WHEREAS, Customer intends to purchase water from Wakefield Water Company for its Middlebridge System for a period of ten years, and

WHEREAS, both Customer and Wakefield are desirous that the terms and conditions under which Wakefield will furnish water to Customer will be set forth herein:

NOW, THEREFORE, in consideration of the premises and of the covenants and agreements hereinafter set forth, and for other good and valuable consideration, receipt whereof is hereby acknowledged, and intending to be legally bound, the parties hereto covenant and agree as follows:

1. Wakefield agrees to furnish a meter that will meet the requirements of the National Board of Fire Underwriters for fire flow for residential areas and a meter pit to be located on the east bank of the Pettaquamscutt River near the "Middlebridge" so called. Wakefield Water Company agrees to have the meter tested annually for accuracy by a qualified person and a report of the test furnished to the Customer.

2. Wakefield agrees to furnish and deliver to the Customer a maximum of 300,000 gallons per day.

3. Wakefield agrees that it will install equipment as necessary so that the pressure shall be sufficient without additional pumping by the customer to provide for normal domestic service for not to exceed 500 customers and residential fire flow elevation 100 above Mean Sea Level.

4. Wakefield shall install from its mains on Boston Neck Road to a point within 100 feet of the east abutment of Middlebridge pipelines as necessary to have a continuous line of 12" minimum size.

5. Customer will pay for all water consumed at the rate for sales to municipalities at wholesale set forth in Wakefield's Rates, Rules and Regulations on file with the Office of the Public Utility Administrator for the State of Rhode Island, a copy of which is attached hereto as Exhibit A. It is understood that the rate schedule of Wakefield is subject to amendment and that this Agreement shall be subject to any amendments as though such amendments were already incorporated in Exhibit A.

Wakefield will render bills monthly in arrears and such bills are due and payable when rendered. Quantity of water sold to Customer shall be ascertained by meter readings made on a monthly basis.

6. Upon the execution and delivery of this Agreement, Customer will pay to Wakefield the sum of Eighty-six thousand Dollars ($86,000.00), hereinafter called the "Deposit": being the estimated cost of the main extension and system improvement required to serve Customer; $38,000.00 of the deposit shall be considered a non-refundable contribution toward the installation of a booster station to be constructed with the Wakefield distribution system. The remainder of the deposit is the estimated cost of the 12" main extension required in Middlebridge Road and the 12" main installation required in Old Boston Neck Road, and is subject to refunds as stated below. The main extensions required are more fully shown and described on Exhibit B attached hereto and made a part hereof.

7. Upon the completion of the construction and installation by Wakefield of the said extensions and system improvements, Wakefield shall furnish to Customer a statement of the actual cost (including necessary overhead) of making said extensions and, if requested by Customer, shall make available to him its books of accounts and records so far as may be necessary to enable Customer to check the accuracy of said statement. Within thirty days after the receipt of the said statement, Wakefield shall return to Customer any excess of the Deposit over the actual cost of the construction and installation of said extensions, or Customer shall pay to Wakefield any excess of said cost over and above said amount of Deposit.

8. The Deposit, adjusted in the manner above stated, shall be retained by Wakefield but a portion of the deposit is subject to repayment or refund, without interest, to Customer in the manner and at the time as follows:

For each bona fide customer connected to said main extension occupying a permanent residence or place of business, Wakefield will refund (3) three times the revenue received during the first full billing year.

This Agreement will be reviewed at the end of each calendar year and refunds will be made at that time. Provided, however, that only one refund will be made for each permanent residence or place of business so connected; further provided, that no refund shall be made by reason of this Agreement for customers connected to any future main extensions beyond the terminus of or any future main extensions laterally connected to the main extensions described herein, and further provided that no refund shall be made to the Customer by reason of this Agreement for customers connected to the above described main extensions after the 15th day of December, 1925. Any unrefunded portion of the said deposit then remaining shall then become the property of Wakefield absolutely, subject to no further refunds. It being also provided that when the total amount of the refundable portion of the Deposit, as adjusted above, has been refunded to Customer by Wakefield all obligations for further refunds shall cease, whether or not additional customers are connected to said above described main extensions.

9. Customer agrees that it will make no claims against Wakefield for damages due either to the pressure or quantity of water furnished hereunder in the event that Wakefield should be prevented from furnishing the same for any reason due to civil disturbances, laws or Government regulations, acts of God or any other circumstances or conditions beyond control of the company. In the event of fire in the area served by Customer hereunder is to receive only such supply of water as shall then be available. Customer agrees that Wakefield should not be considered in any manner an insurer of property or persons as to have undertaken to extinguish fires or to protect any persons or property

against loss or damage by fire or otherwise, and that it shall be free and exempt from any and all claims by Customer or any third party or property owner for damages on account of any injury to property or persons by reason of fire, water or failure to supply water or pressure in case of fire or other catastrophy.

10. Customer and Wakefield agree this contract shall remain in full force and effect for ten (10) years from the date hereof, and shall automatically be renewable from year-to-year, unless cancelled by either party upon one (1) years' notice in writing.

11. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the parties hereto by notification to the other party that such an assignment is to be made.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the day and year first above written.

ATTEST:

WAKEFIELD WATER COMPANY

By _____

ATTEST:

THE TOWN OF SOUTH KINGSTOWN, RHODE ISLAND

By _____
Town Manager

APPENDIX B

SOUTH SHORE AGREEMENT – VEOLIA (FORMERLY SUEZ, UWRI AND WAKEFIELD WATER COMPANY) AND TOWN OF SOUTH KINGSTOWN

Witness: South Kingstown Town Clerk

BK L1206 P=551 #11
09-12-2005 @ 10:39a

WHOLESALE WATER PURCHASE AGREEMENT

THIS AGREEMENT ("Agreement") is made as of the 7th day of September, 2005, by and between **UNITED WATER RHODE ISLAND** ("United Water"), a public utility corporation organized and existing pursuant to the laws of the State of Rhode Island, having its principal office at 1 Arnold Street, Wakefield, RI 02879, and the **Town of South Kingstown** ("Customer"), a municipality organized and existing pursuant to the laws of the State of Rhode Island, having its principal office at 180 High Street, Wakefield, RI 02879.

WITNESSETH:

WHEREAS, each of the parties operates a system for the supply of water to the public; and

WHEREAS, United Water desires to sell, and Customer desires to purchase, water under the terms hereinafter provided; and

NOW, THEREFORE, in consideration of the premises and of the agreements herein contained, the parties hereto agree as follows:

1. **Amount Supplied**: For the term of this Agreement, United Water agrees to sell and Customer agrees to purchase up to 1,300,000 gallons per day, with a maximum flow rate no less than 1,000 gallons per minute, in accord with the terms of this Agreement.

2. **Regulatory Approval:**
   (a) The sale of water hereunder will be subject to United Water's prior fulfillment of its obligations for the bulk supply of water to current municipal corporations and contract entities and subject to the events outlined in Sections 1, 3, 4, 5, 10 and 11 hereof.
   (b) United Water will seek all required regulatory approvals necessary for the transaction herein. Customer agrees to cooperate with United Water in obtaining such approvals, including writing any necessary letters of support therefor.

3. **Interconnection:** United Water agrees to supply and construct a permanent interconnection to the intersection of Jerry Brown Farm Road and US Route 1 on or before September 1, 2005.

4. **Metering:** Water to be supplied by United Water shall be continuously measured by one or more meters located at or adjacent to the East Matunuck interconnection at US Route 1. The meter or meters will be supplied by United Water and installed, owned and maintained by United Water or under its supervision, at United Water's sole cost and expense. Both parties shall have the right of access to such meter or meters to inspect and test same; however, if Customer wishes to inspect and/or test the meter or meters, it must be accompanied by an authorized representative of United Water. Customer will provide United Water with notice of its intention to test and/or inspect the meter, and the parties will decide upon a mutually acceptable and reasonably expeditious time to do so.

5. **Rate:** United Water agrees to sell and Customer agrees to buy water delivered pursuant to this Agreement at United Water's wholesale tariff rate. The current rate is as set forth in the tariff sheet annexed hereto and made a part hereof as Exhibit A. In the event that such wholesale tariff rate is increased or reduced during the term of this Agreement, United Water agrees to sell and Customer agrees to buy water delivered pursuant to this Agreement at the new rate from the date that said new rate shall become effective.

6. **Payment:** The charge for the amount of water supplied shall be determined by the combined total quantity supplied through the meter or meters for each reading period multiplied by the applicable rate. Meter reading and verifications shall be made by United Water on a monthly basis. Customer shall remit payment for all sums due to United Water on or before the thirtieth (30^{th}) day after a bill is sent to Customer.

7. **Minimum Payment:** Notwithstanding any other provision of this Agreement, Customer agrees to a monthly payment based upon the purchase of a minimum quantity of fifty thousand (50,000) gallons per day. Actual usage shall be determined on a monthly basis such that Customer must purchase, or pay, for fifty thousand (50,000) gallons per day multiplied by the amount of days in any given month. This requirement shall not be subject to offset or reconciliation such that the purchase of more than the monthly minimum amount in any given month would allow Customer to "bank" gallons, or to apply the excess to any month in which it purchased less than the allotted amount.

8. **Commencement Date:** The monthly payment which is to be based on the minimum purchase as set forth in Section 7 above shall commence upon the completion of any necessary construction and installation of the meter at the East Matunuck meter pit (interim); Jerry Brown Farm Road (long-term) interconnection(s), provided all required approvals, as set forth in Section 2 have been received. The parties hereto shall use their best efforts to have all long-term interconnection work necessary for this Agreement to take effect completed by September 1, 2005.

9. **Term:** The initial term of this Agreement shall be for ten (10) years commencing on January 6, 2003. Thereafter, the Agreement shall renew itself automatically for successive one (1) year periods unless either party serves four months prior written notice of termination upon the other.

10. **Force Majeure; Water Emergencies:**
    (a) The parties agree that United Water shall not be considered in default of any of its obligations hereunder in the event that performance of such obligation is prevented or delayed by reason of war, revolution, terrorism, hostilities, civil commotion, strike, epidemic, accident, fire, wind, drought, flood, or explosion; or by reason of any law, order, proclamation, or regulations of the United States of America or any other government authority; or by reason of any Act of God, whether of the same or of a different nature.

(b) Without limiting the foregoing, and notwithstanding any other provision of this Agreement, the parties agree that United Water's obligation to supply water to Customer shall be limited by and subject to the following conditions: a) a water emergency or drought is proclaimed by the Governor or any regulatory agency or governmental body having jurisdiction; b) the State or any regulatory agency or governmental body having jurisdiction reallocates available resources during a state of emergency or drought emergency or where United Water otherwise fails to supply water as a result of a recommendation from the State agency having jurisdiction over water diversions and allocations; c) there is a breakdown of service due to failure of either parties' equipment or facilities; or d) there is an occurrence of circumstances as outline in Section 10(a) above.

(c) The minimum purchase obligations set forth in Section 7 hereof shall be suspended during any period in which United Water does not supply the minimum purchase obligation, based on the monthly average supplied, for reasons outlined in the Section 10(a) or (b).

(d) The Customer agrees to mirror any water restrictions imposed by United Water on its customers as a result of conditions set forth in Section 10, (a) and (b)

11. **Pressure; Water Quality:** United Water warrants that it will maintain sufficient pressure, although it will endeavor to provide a regular and uninterrupted supply of treated water through the main. United Water does not warrant that it will supply any uniform quality of water for any special purpose including but not limited to manufacturing, laboratories, swimming pools or laundries. All water supplied by United Water to the Customer shall be potable and meet or exceed all provisions of the US Environmental Protection Agency (USEPA) Safe Drinking Water Act and all amendments thereto and the State of Rhode Island Department of Health Division of Drinking Water Quality regulations.

12. This Agreement shall not be modified except by written Agreement duly executed by the parties.

13. This Agreement is subject to the adoption of a resolution or ordinance by the Customer and a resolution of the Board of Directors of United Water Rhode Island, duly authorizing this Agreement as well as receipt of all other necessary approvals and/or permits, if any, by state or local agencies, commissions or boards, as may be required by law including, but not limited to, approval of this Agreement by the RI Public Utilities Commission. Both parties shall diligently apply for and pursue such approvals and/or permits so that the deadline for meter installation may be achieved. Notwithstanding the foregoing, United Water agrees to make application to the RI Public Utilities Commission for any approvals required for this Agreement, with the full cooperation of the Customer.

14. This Agreement shall be binding upon and inure to the benefit of the parties hereto, and neither party shall assign same without the written approval of the other party.

IN WITNESS WHEREOF, the parties hereto have caused these present to be executed on the day and year first written above.

Attest:

Marie A. McCullough
Name: MARIE A. McCULLOUGH
Title: CUST. SERVICE REP.

United Water Rhode Island

S D Knox
Name: STANLEY I. KNOX
Title: VP & GEN MGR

Attest:

Colleen Camp
Name: Colleen Camp
Title: Executive Assistant

Town of South Kingstown

Name: Stephen A. Alfred
Title: Town Manager

APPENDIX C

6-YEAR CAPITAL IMPROVEMENT PROGRAM

DPS CIP Submittal
Water/Wastewater
Fiscal Period 2023-2024 to 2028-2029

Town Manager Proposed
CAPITAL IMPROVEMENT PROGRAM - WATER FUND

Water Fund (702)	Fiscal Year 2022-2023	Fiscal Year 2023-2024	Fiscal Year 2024-2025	Fiscal Year 2025-2026	Fiscal Year 2026-2027	Fiscal Year 2027-2028	Fiscal Year 2028-2029	Six Year Total
Water Storage								
Mautucket Water Tank Cleaning	$ 15,000	$ -	$ 17,000	$ -	$ 19,000	$ -	$ 50,000	$ 86,000
Mautucket Tank Repair	50,000	0	0	30,000	0	0	0	30,000
Victoria Lane Water Tank Cleaning	42,000	0	44,000	0	46,000	0	50,000	140,000
Victoria Lane Tank Repair	50,000	0	0	3,000	0	0	0	3,000
Victoria Lane Stanby Generator	10,000	0	0	0	0	0	0	0
SCADA/Telemetry Upgrades	0	38,000	0	0	0	0	40,000	78,000
Water Supply								
RIDOH Capital Infrastructure Plan	$20,000	$0	$0	$0	$0	$25,000	$0	$25,000
RIDOH Vulnerability Assessment Plan	20,000	0	0	0	0	25,000	0	25,000
Water Supply Mgmt Plan Reaffirmation	30,000	0	0	0	0	25,000	0	25,000
Pump Station Infrastructure	0	0	0	10,000	0	0	0	10,000
Water Treatment Reserve	40,000	20,000	20,000	30,000	0	0	0	70,000
Water Distribution								
Leak Detection Reserve	$0	$0	$0	$25,000	$0	$25,000	$0	$50,000
Water Main Replacement Reserve	0	25,000	25,000	0	25,000	25,000	0	100,000
Valve Exercising Machine	0	25,000	25,000	0	25,000	0	0	75,000
Interconnect & Fac Pond Standby Generator	30,000	0	0	0	0	0	0	0
Equipment & GIS						0	0	
DPS Office Building Contribution	$0	$0	$15,000	$0	$15,000	$0	$0	$30,000
Rolling Stock Equipment Replacement	0	37,000	35,000	45,000	0	47,000	50,000	214,000
GIS Upgrade	0	20,000	0	20,000	20,000	0	20,000	80,000
Metering Services								
Water Fund Total	**$ 307,000**	**$ 165,000**	**$ 181,000**	**$ 163,000**	**$ 150,000**	**$ 172,000**	**$ 210,000**	**$ 1,041,000**

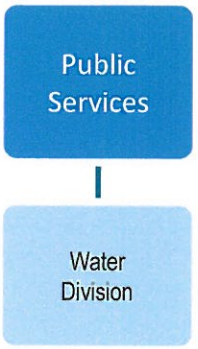
APPENDIX D

SUMMARY OF OPERATING INCOME AND EXPENSES

TAB 17
WATER ENTERPRISE FUND

FISCAL YEAR 2020-2021 PROPOSED
MUNICIPAL BUDGET PROGRAM
TOWN OF SOUTH KINGSTOWN, RHODE ISLAND

Organizational Chart



Mission Statement

The mission of the Water Division, under the Department of Public Services, is to provide continuous municipal water which meets or exceeds requirements of the USEPA Safe Drinking Water Act for the South Shore and Middlebridge water systems, for both domestic use and fire protection.

General Explanation & Work Program

The Water Enterprise Fund was established in 1975. The Town's Water Division is comprised of the South Shore and Middlebridge water systems. The South Shore system services the southerly portion of Town from the Charlestown town line to East Matunuck, south of US Route 1, with the exception of Perryville. The Middlebridge system services the Middlebridge Road area from the Middlebridge bridge at the southerly end to Radial Drive at the northerly end.

Wholesale Water Purchase

The Water Division currently purchases wholesale water from Suez Water RI (formerly known as United Water RI), for the Town's two water systems, South Shore and Middlebridge. The purchase agreement for the South Shore system began in 2002, when it was determined that the South Shore well field needed a water filtration plant and it was found that purchasing water would be a more economical means of providing water. A permanent interconnection between the South Shore system and Suez Water RI was completed and fully operational in August 2005. The Water Division continues to maintain the South Shore well field in active status until such time that a water filtration plant can be funded and constructed. As Suez Water RI provides pH and corrosion control adjusted water, the South Shore and Middlebridge water systems comply with the USEPA Safe Drinking Water Act lead and copper rule. As such, reduced lead and copper sampling protocols are in effect for both water systems on a three year cycle.

A summary of past rate increases granted by the Public Utilities Commission (PUC) to United Water for wholesale customers are as follows:

Effective Date	Admin Fee (per month)	Consumption Fee (per 1.0 MG)	Wholesale Rate % Increase
January 12, 2014	$64.25	$1,124.00	18.31%
May 13, 2014	$81.88	$1,490.00	32.56%
October 4, 2018	$375.88	$1,630.00	9.39%

The October 2018 rate increase recovered capital costs associated with Suez's replacement 'Sherman' elevated water tank located off of South Road and various distribution system upgrades. The PUC also granted SUEZ a Distribution System Infrastructure Charge (DSIC) mechanism in October 2018, whereby SUEZ will have the ability to recover distribution system capital related expense each year up with a not to exceed increase of 2.5% in a given year. Once the sum total of yearly DSIC increases equals 7.5%, Suez would have to file for an overall rate increase with the PUC to be eligible for any additional rate payer funding. Given the recent significant rate increases by Suez, the Water Division will need to evaluate the cost to construct and operate a water filtration plant for its South Shore water system in comparison to the cost of continued wholesale water purchase.

Water Distribution System

The Town's water pumping and distribution system that is used to provide water purchased through United Water to the South Shore and Middlebridge water systems remains in good operating condition due to continued proactive maintenance by Water Division personnel. As a result of higher than expected unaccounted for water readings, the Water Division contracted with Matchpoint, Inc. in the Spring of 2017 for comprehensive system-wide leak detection services. However, no leaks were found in either the South Shore or Middlebridge water systems. Further, Suez Water – RI calibrated all three of their wholesale water meters in June 2017. Given the fact that no leaks were found, leak detection and elimination continues to be a challenging and ongoing effort to ensure water is used efficiently and in compliance with State regulatory requirements. There is new leak detection technology, (i.e. helium injection) that will be considered during the next system wide leak detection survey, in lieu of traditional acoustic technology.

Water Demand

Variation in water demand is primarily attributed to seasonal weather conditions and associated outside water use demand. Seasonal water user demands can vary by a factor of four when comparing summer versus winter daily demand. This substantial change in consumption is due to the seasonal influx of summer residents, combined with high outside use of water in the warmer months. The Town Council adopted a new user rate structure in May 2014 in accordance with amendments to RIGL § 45-39.1-5 and § 46-15.8-4, which included a new quarterly water user billing format, replacing the rate structure that had previously been in effect since July 2012. The user rate structure incorporates an inclining block rate structure for excess water consumption, intended to promote water conservation.

Functions

This section incorporates multiple accounts, each of which fall under the purview of the Water Enterprise Fund, and include the following:

Acct Number	Acct Description
70294100	Source of Supply
70294200	Pumping Expenses
70294400	Transmission & Distribution
70294600	Personnel Services
70294700	Admin & General Expense
70294800	Other Expenses

Duties of the Water Division include, but are not limited to:

- Ensure water quality meets or exceeds USEPA's Safe Drinking Water Act requirements
- Ongoing review of disinfection treatment performance and associated disinfection by-product levels
- Monthly water meter readings of all units for customer leak detection purposes
- Biannual fire hydrant flushing and operations check
- Distribution system leak detection and elimination efforts
- Respond to water customer inquiries and complaints
- Oversee Cross Connection Control Plan (CCCP) compliance
- Perform water utility inspections for new customers
- Perform 'turn-on & turn-off' services on an as-need basis
- Assist other Town departments on an as need basis with support services

FY 2019-2020 Priorities

Priorities	Town Council Goals & Objs
Install additional coliform sampling stations for summer sampling sites	PCSF
Mautucket Road and Victoria Lane water tank exterior cleanings	PCSF
Complete Middlebridge and South Shore water system-wide meter replacement program	PCSF
Daily water meter leak alerts now available for leak detection purposes, with fixed based meter reading system	SENR
Continue ongoing distribution system leak detection and repair efforts	SENR
Maintain an unaccounted for water percentage in both the Middlebridge and South Shore water systems below the 10% State goal	SENR
Continue water quality testing to ensure potable water meets or exceeds water quality standards	SENR
Work with Suez Water RI to ensure adequate disinfection residuals for purchased water	PCSF
Review disinfection by-product levels and possible solutions, should exceedances continue	PCSF

FY 2020-2021 Goals & Objectives

Goals & Objectives	Town Council Goals & Objs
Interior water tank inspection and cleaning on an as needed basis	PCSF
Complete system-wide water meter replacement program	PCSF
Remain vigilant to identify and repair any distribution system leaks	PCSF
Remain vigilant to minimize 'unaccounted for' water to achieve State goal of 10%	SENR
Continue working with Suez Water RI to ensure adequate disinfection residual levels are maintained for purchased water	PSCF
Ensure continued compliance with Cross Control Connection Plan (CCCP)	PCSF

Specific Performance Measurements

A summary of the South Shore Water and Middlebridge Water systems customer base and system wide volume sales is as follows:

Description	FY 2018-2019 Actual	FY 2019-2020 Projected	FY 2020-2021 Anticipated	Town Council Goals & Objs
South Shore purchased water	16,582,444	15,984,828	16,364,943	PCSF
Middlebridge purchased water	2,227,273	2,279,858	2,217,261	PCSF
Total Purchased Water ft³	**18,809,717**	**18,264,687**	**18,582,205**	**PCSF**
South Shore water sales	14,692,645	13,881,679	13,881,679	PCSF
Middlebridge water sales	1,764,032	1,710,288	1,710,288	PCSF
Total Water Sales ft³	**16,456,677**	**15,591,967**	**15,591,967**	**PCSF**
South Shore water accounts	2,551	2,555	2,561	PCSF
Middlebridge water accounts	288	289	289	PCSF
Combined Water Accounts	2,839	2,844	2,850	PCSF
Additional Units	600	599	602	PCSF
Total Water Units	**3,439**	**3,443**	**3,452**	**PCSF**

A summary of water user rates and income generated is as follows:

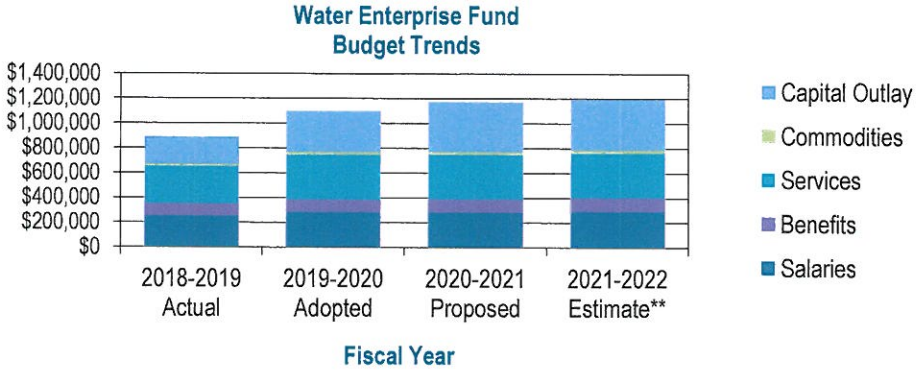
User Rates	FY 2018-2019 Actual	FY 2019-2020 Projected	FY 2020-2021 Anticipated	Town Council Goals & Objs
Min in Advance/Qtr (w/ 1,250 ft³ allowance)	$48	$48	$48	BDFM
Additional Unit charge per quarter	$22	$22	$22	BDFM
Excess Charge 1st Step per 100 ft³ (1,251-2,500)	$3.25	$3.25	$3.25	BDFM
Excess Charge 2nd Step (over 2,501)	$3.75	$3.75	$3.75	BDFM

Revenue Summary	FY 2018-2019 Actual	FY 2019-2020 Projected	FY 2020-2021 Anticipated	Town Council Goals & Objs
Excess Revenue 1st Step	$101,450	$106,186	$106,181	BDFM
Excess Revenue 2nd Step	$144,260	$172,602	$172,601	BDFM
Combined Excess Revenue	$245,710	$278,788	$278,782	BDFM
Minimum Revenue	$559,532	$562,160	$563,360	BDFM
Total Revenue	**$805,242**	**$840,948**	**$842,142**	**BDFM**

FY 2020-2021 Funding Comparison

Water Enterprise Fund	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Increase Over Prior Year
Personnel FTE*	**3.31**	**3.31**	**3.31**	**3.31**	**0.00**
Salaries	$253,067	$285,453	$285,453	$286,240	$787
Benefits	99,812	97,564	105,813	104,975	7,411
Subtotal Personnel Expenditures*	**$352,880**	**$383,017**	**$391,266**	**$391,215**	**$8,198**
Services	$302,376	$363,290	$351,971	$358,138	($5,152)
Commodities	13,783	22,994	17,690	22,426	(568)
Capital Outlay/Depreciation	219,553	332,054	332,054	403,256	71,202
Subtotal Operating Expenditures	**$535,712**	**$718,338**	**$701,715**	**$783,820**	**$65,482**
Total Expenditures	**$888,592**	**$1,101,355**	**$1,092,981**	**$1,175,035**	**$73,680**

**Please note personnel FTE and expenditure figures shown above represent only the personnel FTE and expenditures allocated to these accounts; some positions are allocated across additional accounts.*



***FY 2021-2022 is estimated based on the following assumptions: 1% increase in Services and Commodities, 2% increase in Capital Outlay, 6% increase in Benefits, and 2% increase in Salaries.*

FY 2020-2021 Expenditure Statements

70294100		Water Enterprise Fund Source of Supply	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294100	530072	Analysis Of Wells	$7,884	$8,690	$8,690	$11,784	35.60%
70294100	532020	Purchased Water - Middlebridge	26,776	35,417	32,461	32,486	-8.28%
70294100	532022	Purchased Water - South Shore	182,262	212,848	200,480	210,269	-1.21%
70294100	534022	Maintenance Of Public Wells	0	200	100	200	0.00%
70294100		**Subtotal Services**	**$216,923**	**$257,155**	**$241,731**	**$254,739**	**-0.94%**
70294100		**Total Source Of Supply**	**$216,923**	**$257,155**	**$241,731**	**$254,739**	**-0.94%**

70294200		Water Enterprise Fund Pumping Expenses	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294200	530014	Refuse Disposal	$138	$145	$144	$144	-0.69%
70294200	532000	Telephone	1,423	1,220	1,282	1,346	10.33%
70294200	532002	Fuel - Oil	1,159	1,000	980	1,200	20.00%
70294200	532004	Electricity	14,178	15,195	12,500	15,103	-0.61%
70294200	532016	Telemetry	0	223	209	219	-1.79%
70294200	534024	Maintenance Of Pump Stations	680	1,800	1,800	1,800	0.00%
70294200		**Subtotal Services**	**$17,578**	**$19,583**	**$16,915**	**$19,812**	**1.17%**
70294200	540024	Chemicals And Gases	388	1,800	1,700	1,800	0.00%
70294200	540056	Pumping Materials & Supplies	225	400	300	400	0.00%
70294200		**Subtotal Commodities**	**$613**	**$2,200**	**$2,000**	**$2,200**	**0.00%**
70294200		**Total Pumping Expenses**	**$18,191**	**$21,783**	**$18,915**	**$22,012**	**1.05%**

70294400		Water Enterprise Fund Transmission & Distribution	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294400	534026	Maintenance Of Elevated Tanks	$5,369	$12,800	$11,600	$12,800	0.00%
70294400	534028	Maintenance Of Mains	9,045	8,000	20,000	11,000	37.50%
70294400	534030	Maintenance Of Water Services	9,596	14,000	18,000	14,000	0.00%
70294400	534032	Maintenance Of Water Meters	5,860	7,650	1,000	5,000	-34.64%
70294400	534034	Maintenance Of Hydrants	952	4,200	2,500	4,400	4.76%
70294400		**Subtotal Services**	**$30,822**	**$46,650**	**$53,100**	**$47,200**	**1.18%**
70294400	540010	General Materials & Supplies	0	100	90	100	0.00%
70294400		**Subtotal Commodities**	**$0**	**$100**	**$90**	**$100**	**0.00%**
70294400		**Total Transmission & Distribution**	**$30,822**	**$46,750**	**$53,190**	**$47,300**	**1.18%**

70294600		Water Enterprise Fund Personnel Services	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294600	511001	Full-Time Employees	$239,230	$251,878	$251,878	$251,784	-0.04%
70294600	511004	Overtime	8,502	8,000	8,000	8,000	0.00%
70294600	511005	Retirement/Vacation Reimb.	0	18,390	18,390	18,933	2.95%
70294600	511006	Longevity	8,059	7,185	7,185	7,523	4.70%
70294600		**Subtotal Wages**	**$255,791**	**$285,453**	**$285,453**	**$286,240**	**0.28%**
70294600	522250	FICA	19,033	19,769	19,769	19,843	0.37%
70294600	522300	Municipal Employees Retirement	29,099	31,502	31,502	32,335	2.64%
70294600	522301	Retirement - Defined Contribution	1,463	1,700	1,700	1,603	-5.71%
70294600	522818	Medical Insur-Active Employees	37,231	39,011	39,011	36,465	-6.53%
70294600	522822	Dental Insur-Active Employees	2,867	2,971	2,971	2,694	-9.32%
70294600	522840	Insurance Buyback	2,497	2,500	2,500	2,700	8.00%
70294600	522850	Life Insurance	112	111	111	107	-3.60%
70294600	529900	Worker's Compensation	7,510	0	8,249	9,228	0.00%
70294600		**Subtotal Benefits**	**$99,812**	**$97,564**	**$105,813**	**$104,975**	**7.60%**
70294600		**Total Personnel Services**	**$355,604**	**$383,017**	**$391,266**	**$391,215**	**2.14%**

70294700		Water Enterprise Fund Admin & General Expense	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294700	511009	Vac & Sick Pay Accrued Exp	($2,724)	$0	$0	$0	0.00%
70294700		**Subtotal Wages**	**($2,724)**	**$0**	**$0**	**$0**	**0.00%**
70294700	530020	Miscellaneous Services	957	1,077	1,657	1,117	3.71%
70294700	530066	Internet Access	0	490	480	502	2.45%
70294700	532004	Electricity	1,111	1,004	1,000	1,000	-0.40%
70294700	532008	Natural Gas	432	453	430	448	-1.10%
70294700	532010	Wastewater Fees	28	28	28	28	0.00%
70294700	532012	Water Fees	58	67	67	65	-2.99%
70294700	534012	Commun Equip. Maintenance	0	200	180	200	0.00%
70294700	534016	Computer/Software Maintenance	4,920	5,996	5,996	6,187	3.19%
70294700	534020	Maintenance Of Buildings	0	800	600	800	0.00%
70294700	538020	Postage	5,525	5,800	5,800	5,985	3.19%
70294700	538022	Printing Expenses	7,828	6,500	6,500	6,475	-0.38%
70294700	560010	Insurance	16,194	17,487	17,487	13,580	-22.34%
70294700		**Subtotal Services**	**$37,053**	**$39,902**	**$40,225**	**$36,387**	**-8.81%**
70294700	540010	General Materials & Supplies	320	750	700	750	0.00%
70294700	540012	Office Materials & Supplies	1,689	2,500	2,400	2,500	0.00%
70294700	540060	Vehicle Operation	8,828	9,444	7,500	8,876	-6.01%
70294700	580100	Miscellaneous Expenses	2,332	8,000	5,000	8,000	0.00%
70294700		**Subtotal Commodities**	**$13,170**	**$20,694**	**$15,600**	**$20,126**	**-2.74%**
70294700	530044	Non-Major Technology Reserve	1,000	1,000	1,000	1,192	19.20%
70294700		**Subtotal Capital Outlay**	**$1,000**	**$1,000**	**$1,000**	**$1,192**	**0.00%**
70294700		**Total Admin & General Expense**	**$48,499**	**$61,596**	**$56,825**	**$57,705**	**-6.32%**

70294800		Water Enterprise Fund Other Expenses	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294800	570002	Capital Improvements	($4,413)	$88,000	$88,000	$139,000	57.95%
70294800	570902	Depreciation	222,965	243,054	243,054	263,064	8.23%
70294800		**Subtotal Capital Outlay**	**$218,553**	**$331,054**	**$331,054**	**$402,064**	**21.45%**
70294800		**Total Other Expenses**	**$218,553**	**$331,054**	**$331,054**	**$402,064**	**21.45%**

	Total Water Enterprise Fund	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294100	Subtotal Source of Supply	$216,923	$257,155	$241,731	$254,739	-0.94%
70294200	Subtotal Pumping Expenses	18,191	21,783	18,915	22,012	1.05%
70294400	Subtotal Transmission & Distribution	30,822	46,750	53,190	47,300	1.18%
70294600	Subtotal Personnel Services	355,604	383,017	391,266	391,215	2.14%
70294700	Subtotal Admin & General Expense	48,499	61,596	56,825	57,705	-6.32%
70294800	Subtotal Other Expenses	218,553	331,054	331,054	402,064	21.45%
	Total Water Enterprise Fund	**$888,592**	**$1,101,355**	**$1,092,981**	**$1,175,035**	**6.69%**

FY 2020-2021 Revenue Statement

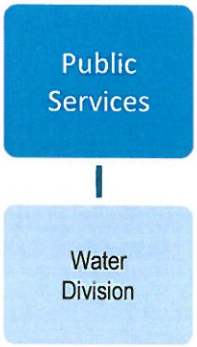
702		Water Enterprise Fund Description	2018-2019 Actual	2019-2020 Adopted	2019-2020 Projected	2020-2021 Proposed	Percent Change
70294000	417450	Metered Sales - Domestic	$884,017	$897,554	$856,846	$857,771	-4.43%
70294000	417550	Forfeited Disc & Penalties	5,469	5,500	4,500	5,500	0.00%
70294000	430170	Rental of Town Properties	274,080	281,687	281,687	286,704	1.78%
70294000	440460	Special Services - Turn off/On	5,439	1,897	5,439	5,520	190.99%
70294000	460010	Investment Income	45,877	15,000	15,000	20,000	33.33%
70294000	460500	GASB 31 Change	83,790	0	0	0	0.00%
70294000	470010	Miscellaneous Income	2,106	2,600	2,600	2,200	-15.38%
70294000	470020	NationalGrid Electricity Rebate/Solar	616	0	0	0	0.00%
70294000	470080	State of RI Water Protection	0	2,341	2,164	2,164	-7.56%
70294000	499050	Net Assets Forward To Operations	483	0	0	0	0.00%
702		**Total Water Enterprise Fund Revenues**	**$1,301,877**	**$1,206,579**	**$1,168,236**	**$1,179,859**	**-2.21%**
702		Total Water Enterprise Fund Expenditures	$888,592	$1,101,355	$1,092,981	$1,175,035	
702		**Income Over (Under) Expenditures**	**$413,285**	**$105,224**	**$75,255**	**$4,824**	

TAB 17
WATER ENTERPRISE FUND

FISCAL YEAR 2021-2022 PROPOSED
MUNICIPAL BUDGET PROGRAM
TOWN OF SOUTH KINGSTOWN, RHODE ISLAND

Water Enterprise Fund (0702)

Organizational Chart



Mission Statement

The mission of the Water Division, under the Department of Public Services, is to provide continuous municipal water which meets or exceeds requirements of the USEPA Safe Drinking Water Act for the South Shore and Middlebridge water systems, for both domestic use and fire protection.

General Explanation & Work Program

The Water Enterprise Fund was established in 1975. The Town's Water Division is comprised of the South Shore and Middlebridge water systems. The South Shore system services the southerly portion of Town from the Charlestown town line to East Matunuck, south of US Route 1, with the exception of Perryville. The Middlebridge system services the Middlebridge Road area from the Middlebridge bridge at the southerly end to Radial Drive at the northerly end.

Wholesale Water Purchase

The Water Division currently purchases wholesale water from Suez Water RI (formerly known as United Water RI), for the Town's two water systems, South Shore and Middlebridge. The purchase agreement for the South Shore system began in 2002, when it was determined that the South Shore well field needed a water filtration plant and it was found that purchasing water would be a more economical means of providing water. A permanent interconnection between the South Shore system and Suez Water RI was completed and fully operational in August 2005. The Water Division continues to maintain the South Shore well field in active status until such time that a water filtration plant can be funded and constructed. As Suez Water RI provides pH and corrosion control adjusted water, the South Shore and Middlebridge water systems comply with the USEPA Safe Drinking Water Act lead and copper rule. As such, reduced lead and copper sampling protocols are in effect for both water systems on a three year cycle.

A summary of past rate increases granted by the Public Utilities Commission (PUC) to Suez Water RI for wholesale customers are as follows:

Effective Date	Admin Fee (per month)	Consumption Fee (per 1.0 MG)	Wholesale Rate % Increase
January 12, 2014	$64.25	$1,124.00	18.31%
May 13, 2014	$81.88	$1,490.00	32.56%
October 4, 2018	$375.88	$1,630.00	9.39%

The October 2018 rate increase recovered capital costs associated with Suez's replacement 'Sherman' elevated water tank located off of South Road and various distribution system upgrades. The PUC also granted SUEZ a Distribution System Infrastructure Charge (DSIC) mechanism in October 2018, whereby SUEZ will have the ability to recover distribution system capital related expense each year up with a not to exceed increase of 2.5% in a given year. Once the sum total of yearly DSIC increases equals 7.5%, Suez would have to file for an overall rate increase with the PUC to be eligible for any additional rate payer funding. Given the recent significant rate increases by Suez, the Water Division will need to evaluate the cost to construct and operate a water filtration plant for its South Shore water system in comparison to the cost of continued wholesale water purchase.

Water Distribution System

The Town's water pumping and distribution system that is used to provide water purchased through United Water to the South Shore and Middlebridge water systems remains in good operating condition due to continued proactive maintenance by Water Division personnel. As a result of higher than expected unaccounted for water readings, the Water Division contracted with Matchpoint, Inc. in the Spring of 2017 for comprehensive system-wide leak detection services. However, no leaks were found in either the South Shore or Middlebridge water systems. Further, Suez Water RI calibrated all three of their wholesale water meters in June 2017. Given the fact that no leaks were found, leak detection and elimination continues to be a challenging and ongoing effort to ensure water is used efficiently and in compliance with State regulatory requirements. There is new leak detection technology, (i.e. helium injection) that will be considered during the next system wide leak detection survey, in lieu of traditional acoustic technology.

Water Demand

Variation in water demand is primarily attributed to seasonal weather conditions and associated outside water use demand. Seasonal water user demands can vary by a factor of four when comparing summer versus winter daily demand. This substantial change in consumption is due to the seasonal influx of summer residents, combined with high outside use of water in the warmer months. The Town Council adopted a new user rate structure in May 2014 in accordance with amendments to RIGL § 45-39.1-5 and § 46-15.8-4, which included a new quarterly water user billing format, replacing the rate structure that had previously been in effect since July 2012. The user rate structure incorporates an inclining block rate structure for excess water consumption, intended to promote water conservation.

Functions

This section incorporates multiple accounts, each of which fall under the purview of the Water Enterprise Fund, and include the following:

Acct Number	Acct Description
70294100	Source of Supply
70294200	Pumping Expenses
70294400	Transmission & Distribution
70294600	Personnel Services
70294700	Admin & General Expense
70294800	Other Expenses

Duties of the Water Division include, but are not limited to:

- Ensure water quality meets or exceeds USEPA's Safe Drinking Water Act requirements
- Ongoing review of disinfection treatment performance and associated disinfection by-product levels
- Daily Water Meter Exception Reports with weekly checking for abnormal usage for leak detection purposes
- Biannual fire hydrant flushing and operations check
- Distribution system leak detection and elimination efforts
- Respond to water customer inquiries and complaints
- Oversee Cross Connection Control Plan (CCCP) compliance
- Perform water utility inspections for new customers
- Perform 'turn-on & turn-off' services on an as-need basis
- Assist other Town departments on an as need basis with support services

FY 2020-2021 Priorities

Priorities	Town Council Goals & Objs
Install additional coliform sampling stations for summer sampling sites	FI / SNR
Mautucket Road and Victoria Lane water tank exterior cleanings	FI / SNR
Complete Middlebridge and South Shore water system-wide meter replacement program	FI / SNR
Daily water meter leak alerts now available for leak detection purposes, with fixed based meter reading system	FI / SNR
Continue ongoing distribution system leak detection and repair efforts	FI / SNR
Maintain an unaccounted for water percentage in both the Middlebridge and South Shore water systems below the 10% State goal	FI / SNR
Continue water quality testing to ensure potable water meets or exceeds water quality standards	FI / SNR
Work with Suez Water RI to ensure adequate disinfection residuals for purchased water	FI / SNR
Review disinfection by-product levels and possible solutions, should exceedances continue	FI / SNR
Design and repair water tank anchor bolts	FI / SNR
Require cell carriers to repair and paint antenna pods affixed to water towers	FI / SNR

FY 2021-2022 Proposed Priorities

Proposed Priorities	Town Council Goals & Objs
Interior water tank inspection and cleaning on an as needed basis	FI / SNR
Remain vigilant to identify and repair any distribution system leaks	FI / SNR
Remain vigilant to minimize 'unaccounted for' water to achieve State goal of 10%	FI / SNR
Continue working with Suez Water RI to ensure adequate disinfection residual levels are maintained for purchased water	FI / SNR
Ensure continued compliance with Cross Control Connection Plan (CCCP)	FI / SNR
Complete Middlebridge and South Shore water system-wide meter replacement program	FI / SNR
Daily water meter leak alerts now available for leak detection purposes, with fixed based meter reading system	FI / SNR

Specific Performance Measurements

A summary of the South Shore Water and Middlebridge Water systems customer base and system wide volume sales is as follows:

Description	FY 2018-2019 Actual	FY 2019-2020 Projected	FY 2020-2021 Projected	FY 2021-2022 Anticipated	Town Council Goals & Objs
South Shore purchased water	16,582,444	16,742,356	16,417,012	16,580,604	FI / SNR / TBF
Middlebridge purchased water	2,227,273	2,731,194	2,338,876	2,432,448	FI / SNR / TBF
Total Purchased Water ft³	**18,809,717**	**19,473,550**	**18,755,888**	**19,013,052**	FI / SNR / TBF
South Shore water sales	14,692,645	14,739,890	14,996,657	14,996,657	FI / SNR / TBF
Middlebridge water sales	1,764,032	1,649,341	1,669,111	1,669,111	FI / SNR / TBF
Total Water Sales ft³	**16,456,677**	**16,389,231**	**16,665,768**	**16,665,768**	FI / SNR / TBF
South Shore water accounts	2,551	2,558	2,564	2,570	FI / SNR / TBF
Middlebridge water accounts	288	288	289	289	FI / SNR / TBF
Combined Water Accounts	2,839	2,846	2,853	2,859	FI / SNR / TBF
Additional Units	600	601	601	601	FI / SNR / TBF
Total Water Units	**3,439**	**3,447**	**3,453**	**3,462**	FI / SNR / TBF

A summary of water user rates and income generated is as follows:

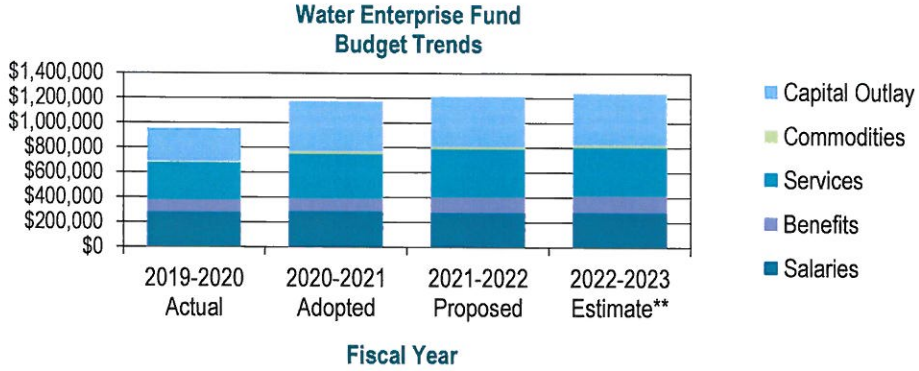
User Rates	FY 2018-2019 Actual	FY 2019-2020 Actual	FY 2020-2021 Projected	FY 2021-2022 Anticipated	Town Council Goals & Objs
Min in Advance/Qtr (w/ 1,250 ft³ allowance)	$48	$48	$48	$48	FI / SNR / TBF
Additional Unit charge per quarter	$22	$22	$22	$22	FI / SNR / TBF
Excess Charge 1st Step per 100 ft³ (1,251-2,500)	$3.25	$3.25	$3.25	$3.25	FI / SNR / TBF
Excess Charge 2nd Step (over 2,501)	$3.75	$3.75	$3.75	$3.75	FI / SNR / TBF

Revenue Summary	FY 2018-2019 Actual	FY 2019-2020 Actual	FY 2020-2021 Projected	FY 2021-2022 Anticipated	Town Council Goals & Objs
Excess Revenue 1st Step	$101,450	$100,915	$110,910	$110,905	FI / SNR / TBF
Excess Revenue 2nd Step	$144,260	$155,160	$151,845	$151,845	FI / SNR / TBF
Combined Excess Revenue	$245,710	$256,075	$262,755	$262,750	FI / SNR / TBF
Minimum Revenue	$559,532	$564,528	$565,968	$566,832	FI / SNR / TBF
Miscellaneous Revenue	$54,301	$52,615	$52,113	$52,113	FI / SNR / TBF
Total Revenue	**$859,543**	**$926,106**	**$933,746**	**$934,670**	FI / SNR / TBF

FY 2021-2022 Funding Comparison

Water Enterprise Fund	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Increase Over Prior Year
Personnel FTE*	**2**	**2**	**2**	**2**	**0**
Salaries	$278,607	$286,240	$282,240	$276,484	($9,756)
Benefits	99,558	104,975	120,254	126,482	21,507
Subtotal Personnel Expenditures*	**$378,165**	**$391,215**	**$402,494**	**$402,966**	**$11,751**
Services	$298,694	$358,138	$379,493	$385,839	$27,701
Commodities	11,813	22,426	17,290	22,350	(76)
Capital Outlay/Depreciation	264,715	403,256	397,532	405,529	2,273
Subtotal Operating Expenditures	**$575,222**	**$783,820**	**$794,315**	**$813,718**	**$29,898**
Total Expenditures	**$953,388**	**$1,175,035**	**$1,196,809**	**$1,216,684**	**$41,649**

**Please note the Personnel FTE represents the employees within the department. The salaries and benefits expenditure figures shown above represent only the personnel expenditures allocated to this account. Some roles are allocated across additional accounts.*



***FY 2022-2023 is estimated based on the following assumptions: 1% increase in Services and Commodities, 2% increase in Capital Outlay, 6% increase in Benefits, and 1.2% increase in Salaries.*

FY 2021-2022 Expenditure Statements

70294100		Water Enterprise Fund Source of Supply	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294100	530072	Analysis Of Wells	$7,744	$11,784	$11,000	$11,770	-0.12%
70294100	532020	Purchased Water - Middlebridge	28,117	32,486	37,994	39,190	20.64%
70294100	532022	Purchased Water - South Shore	180,284	210,269	209,767	212,790	1.20%
70294100	534022	Maintenance Of Public Wells	0	200	100	200	0.00%
70294100		**Subtotal Services**	**$216,145**	**$254,739**	**$258,861**	**$263,950**	**3.62%**
70294100		**Total Source Of Supply**	**$216,145**	**$254,739**	**$258,861**	**$263,950**	**3.62%**

70294200		Water Enterprise Fund Pumping Expenses	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294200	530014	Refuse Disposal	$144	$144	$144	$151	4.86%
70294200	532000	Telephone	1,515	1,346	1,341	1,408	4.61%
70294200	532002	Fuel - Oil	397	1,200	1,200	1,200	0.00%
70294200	532004	Electricity	11,035	15,103	12,500	15,024	-0.52%
70294200	532016	Telemetry	0	219	0	0	-100.00%
70294200	532017	Telemetry-SCADA	0	0	5,000	7,500	0.00%
70294200	534024	Maintenance Of Pump Stations	1,593	1,800	1,600	1,800	0.00%
70294200		**Subtotal Services**	**$14,685**	**$19,812**	**$21,785**	**$27,083**	**36.70%**
70294200	540024	Chemicals And Gases	0	1,800	1,800	1,800	0.00%
70294200	540056	Pumping Materials & Supplies	0	400	300	400	0.00%
70294200		**Subtotal Commodities**	**$0**	**$2,200**	**$2,100**	**$2,200**	**0.00%**
70294200		**Total Pumping Expenses**	**$14,685**	**$22,012**	**$23,885**	**$29,283**	**33.03%**

70294400		Water Enterprise Fund Transmission & Distribution	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294400	534026	Maintenance Of Elevated Tanks	$6,620	$12,800	$18,620	$5,500	-57.03%
70294400	534028	Maintenance Of Mains	7,227	11,000	20,000	15,000	36.36%
70294400	534030	Maintenance Of Water Services	19,017	14,000	18,000	16,000	14.29%
70294400	534032	Maintenance Of Water Meters	497	5,000	3,000	7,500	50.00%
70294400	534034	Maintenance Of Hydrants	2,244	4,400	2,500	4,800	9.09%
70294400	534039	Maintenance Of SCADA System	0	0	0	5,000	0.00%
70294400		**Subtotal Services**	**$35,605**	**$47,200**	**$62,120**	**$53,800**	**13.98%**
70294400	540010	General Materials & Supplies	0	100	90	100	0.00%
70294400		**Subtotal Commodities**	**$0**	**$100**	**$90**	**$100**	**0.00%**
70294400		**Total Transmission & Distribution**	**$35,605**	**$47,300**	**$62,210**	**$53,900**	**13.95%**

70294600		Water Enterprise Fund Personnel Services	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294600	511001	Full-Time Employees	$242,384	$251,784	$251,784	$245,721	-2.41%
70294600	511004	Overtime	12,173	8,000	4,000	8,200	2.50%
70294600	511005	Retirement/Vacation Reimb.	0	18,933	18,933	18,933	0.00%
70294600	511006	Longevity	6,898	7,523	7,523	3,630	-51.75%
70294600		**Subtotal Wages**	**$261,455**	**$286,240**	**$282,240**	**$276,484**	**-3.41%**
70294600	522250	FICA	19,489	19,843	19,843	18,860	-4.95%
70294600	522300	Municipal Employees Retirement	30,333	32,335	32,335	30,845	-4.61%
70294600	522301	Retirement - Defined Contribution	1,529	1,603	1,603	2,294	43.11%
70294600	522818	Medical Insur-Active Employees	34,842	36,465	36,465	43,387	18.98%
70294600	522820	Medical Insur-Retirees	0	0	15,279	17,668	0.00%
70294600	522822	Dental Insur-Active Employees	2,520	2,694	2,694	2,539	-5.75%
70294600	522840	Insurance Buyback	2,490	2,700	2,700	1,400	-48.15%
70294600	522850	Life Insurance	106	107	107	109	1.87%
70294600	529900	Worker's Compensation	8,249	9,228	9,228	9,380	1.65%
70294600		**Subtotal Benefits**	**$99,558**	**$104,975**	**$120,254**	**$126,482**	**20.49%**
70294600		**Total Personnel Services**	**$361,013**	**$391,215**	**$402,494**	**$402,966**	**3.00%**

70294700		Water Enterprise Fund Admin & General Expense	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294700	511009	Vac & Sick Pay Accrued Exp	$17,152	$0	$0	$0	0.00%
70294700		**Subtotal Wages**	**$17,152**	**$0**	**$0**	**$0**	**0.00%**
70294700	530020	Miscellaneous Services	497	1,117	1,657	1,071	-4.12%
70294700	530055	Asset Management Software	0	0	0	750	0.00%
70294700	530066	Internet Access	0	502	480	526	4.78%
70294700	532004	Electricity	1,089	1,000	1,200	1,000	0.00%
70294700	532008	Natural Gas	466	448	650	580	29.46%
70294700	532010	Wastewater Fees	28	28	30	30	7.14%
70294700	532012	Water Fees	67	65	65	72	10.77%
70294700	534012	Commun Equip. Maintenance	0	200	180	200	0.00%
70294700	534016	Computer/Software Maintenance	5,099	6,187	6,187	6,187	0.00%
70294700	534020	Maintenance Of Buildings	0	800	600	800	0.00%
70294700	538020	Postage	5,657	5,985	5,657	6,000	0.25%
70294700	538022	Printing Expenses	7,011	6,475	6,441	7,175	10.81%
70294700	560010	Insurance	12,345	13,580	13,580	16,615	22.35%
70294700		**Subtotal Services**	**$32,260**	**$36,387**	**$36,727**	**$41,006**	**12.69%**
70294700	540010	General Materials & Supplies	120	750	700	750	0.00%
70294700	540012	Office Materials & Supplies	1,263	2,500	2,400	2,500	0.00%
70294700	540060	Vehicle Operation	7,310	8,876	7,000	8,800	-0.86%
70294700	580100	Miscellaneous Expenses	3,121	8,000	5,000	8,000	0.00%
70294700		**Subtotal Commodities**	**$11,813**	**$20,126**	**$15,100**	**$20,050**	**-0.38%**
70294700	530044	Non-Major Technology Reserve	1,000	1,192	1,192	392	-67.11%
70294700		**Subtotal Capital Outlay**	**$1,000**	**$1,192**	**$1,192**	**$392**	**0.00%**
70294700		**Total Admin & General Expense**	**$62,225**	**$57,705**	**$53,019**	**$61,448**	**6.49%**

70294800		Water Enterprise Fund Other Expenses	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294800	550002	Computer Equipment	$(1)	$0	$0	$0	0.00%
70294800	570002	Capital Improvements	38,611	139,000	133,276	157,000	12.95%
70294800	570902	Depreciation	225,104	263,064	263,064	248,137	-5.67%
70294800		**Subtotal Capital Outlay**	**$263,715**	**$402,064**	**$396,340**	**$405,137**	**0.76%**
70294800		**Total Other Expenses**	**$263,715**	**$402,064**	**$396,340**	**$405,137**	**0.76%**

	Total Water Enterprise Fund	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294100	Subtotal Source of Supply	$216,145	$254,739	$258,861	$263,950	3.62%
70294200	Subtotal Pumping Expenses	14,685	22,012	23,885	29,283	33.03%
70294400	Subtotal Transmission & Distribution	35,605	47,300	62,210	53,900	13.95%
70294600	Subtotal Personnel Services	361,013	391,215	402,494	402,966	3.00%
70294700	Subtotal Admin & General Expense	62,225	57,705	53,019	61,448	6.49%
70294800	Subtotal Other Expenses	263,715	402,064	396,340	405,137	0.76%
	Total Water Enterprise Fund	**$953,388**	**$1,175,035**	**$1,196,809**	**$1,216,684**	**3.54%**

FY 2021-2022 Revenue Statement

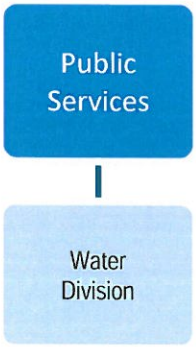
702		Water Enterprise Fund Description	2019-2020 Actual	2020-2021 Adopted	2020-2021 Projected	2021-2022 Proposed	Percent Change
70294000	417450	Metered Sales - Domestic	$873,995	$857,771	$883,894	$884,818	3.15%
70294000	417550	Forfeited Disc & Penalties	5,056	5,500	4,500	5,500	0.00%
70294000	430170	Rental of Town Properties	281,050	286,704	285,745	291,342	1.62%
70294000	440460	Special Services - Turn off/On	5,145	5,520	5,439	5,500	-0.36%
70294000	460010	Investment Income	82,347	20,000	20,000	25,000	25.00%
70294000	460500	GASB 31 Change	39,961	0	0	0	0.00%
70294000	470010	Miscellaneous Income	1,851	2,200	2,200	2,200	0.00%
70294000	470020	NationalGrid Electricity Rebate/Solar	1,317	0	0	0	0.00%
70294000	470080	State of RI Water Protection	0	2,164	2,324	2,324	7.39%
70294000	499050	Net Assets Forward To Operations	800,000	0	0	0	0.00%
702		**Total Water Enterprise Fund Revenues**	**$2,090,723**	**$1,179,859**	**$1,204,102**	**$1,216,684**	**3.12%**
702		Total Water Enterprise Fund Expenditures	$953,388	$1,175,035	$1,196,809	$1,216,684	
702		**Income Over (Under) Expenditures**	**$1,137,335**	**$4,824**	**$7,293**	**$0**	

TAB 17
WATER ENTERPRISE FUND

FISCAL YEAR 2022-2023 PROPOSED
MUNICIPAL BUDGET PROGRAM
TOWN OF SOUTH KINGSTOWN, RHODE ISLAND

Water Enterprise Fund (0702)

Organizational Chart



Mission Statement

The mission of the Water Division, under the Department of Public Services, is to provide continuous municipal water which meets or exceeds requirements of the USEPA Safe Drinking Water Act for the South Shore and Middlebridge water systems, for both domestic use and fire protection.

General Explanation & Work Program

The Water Enterprise Fund was established in 1975. The Town's Water Division is comprised of the South Shore and Middlebridge water systems. The South Shore system services the southerly portion of Town from the Charlestown town line to East Matunuck, south of US Route 1, with the exception of Perryville. The Middlebridge system services the Middlebridge Road area from the Middlebridge bridge at the southerly end to Radial Drive at the northerly end.

Wholesale Water Purchase

The Water Division currently purchases wholesale water from Suez Water RI (formerly known as United Water RI), for the Town's two water systems, South Shore and Middlebridge. The purchase agreement for the South Shore system began in 2002, when it was determined that the South Shore well field needed a water filtration plant and it was found that purchasing water would be a more economical means of providing water. A permanent interconnection between the South Shore system and Suez Water RI was completed and fully operational in August 2005. The Water Division continues to maintain the South Shore well field in active status until such time that a water filtration plant can be funded and constructed. As Suez Water RI provides pH and corrosion control adjusted water, the South Shore and Middlebridge water systems comply with the USEPA Safe Drinking Water Act lead and copper rule. As such, reduced lead and copper sampling protocols are in effect for both water systems on a three- (3) year cycle.

A summary of past rate increases granted by the Public Utilities Commission (PUC) to Suez Water RI for wholesale customers are as follows:

Effective Date	Admin Fee (per month)	Consumption Fee (per 1.0 MG)	Wholesale Rate % Increase
January 12, 2014	$64.25	$1,124.00	18.31%
May 13, 2014	$81.88	$1,490.00	32.56%
October 4, 2018	$375.88	$1,630.00	9.39%

The October 2018 rate increase recovered capital costs associated with Suez's replacement 'Sherman' elevated water tank located off of South Road and various distribution system upgrades. The PUC also granted SUEZ a Distribution System Infrastructure Charge (DSIC) mechanism in October 2018, whereby SUEZ will have the ability to recover distribution system capital related expenses each year, with a not to exceed increase of 2.5% in a given year. SUEZ received a 2.5% DSIC increase effective November 1, 2021. Once the sum total of yearly DSIC increases equals 7.5%, Suez would have to file for an overall rate increase with the PUC to be eligible for any additional rate payer funding. Given the recent significant rate increases by Suez, the Water Division will need to evaluate the cost to construct and operate a water filtration plant for its South Shore water system in comparison to the cost of continued wholesale water purchase.

Water Distribution System

The Town's water pumping and distribution system that is used to provide water purchased through United Water to the South Shore and Middlebridge water systems remains in good operating condition due to continued proactive maintenance by Water Division personnel. As a result of higher than expected unaccounted for water readings, the Water Division contracted with Matchpoint, Inc. in the Spring of 2017 for comprehensive system-wide leak detection services. However, no leaks were found in either the South Shore or Middlebridge water systems. Further, Suez Water RI calibrated all three of their wholesale water meters in June 2017. Given the fact that no leaks were found, leak detection and elimination continues to be a challenging and ongoing effort to ensure water is used efficiently and in compliance with State regulatory requirements. There is new leak detection technology, (i.e. helium injection) that will be considered during the next system wide leak detection survey, in lieu of traditional acoustic technology.

Water Demand

Variation in water demand is primarily attributed to seasonal weather conditions and associated outside water use demand. Seasonal water user demands can vary by a factor of four when comparing summer versus winter daily demand. This substantial change in consumption is due to the seasonal influx of summer residents, combined with high outside use of water in the warmer months.

Water Rates

The Town Council adopted a new user rate structure in May 2014 in accordance with amendments to RIGL § 45-39.1-5 and § 46-15.8-4, which included a new quarterly water user billing format, replacing the rate structure that had previously been in effect since July 2012. The user rate structure incorporates an inclining block rate structure for excess water consumption, intended to promote water conservation.

An increase to user fees is proposed for FY 2020-2023, which is due in part to Sprint decommissioning their cellular equipment at the Victoria Lane water tank and associated non-rate base revenue loss. In addition, increased expenditures associated with wholesale water purchase from SUEZ is also contributory to an adjustment in user fees.

Proposed rates as denoted below in "User Rates" summary table.

Functions

This section incorporates multiple accounts, each of which fall under the purview of the Water Enterprise Fund, and include the following:

Acct Number	Acct Description
70294100	Source of Supply
70294200	Pumping Expenses
70294400	Transmission & Distribution
70294600	Personnel Services
70294700	Admin & General Expense
70294800	Other Expenses

Duties of the Water Division include, but are not limited to:

- Ensure water quality meets or exceeds USEPA's Safe Drinking Water Act requirements;
- Ongoing review of disinfection treatment performance and associated disinfection by-product levels;
- Daily Water Meter Exception Reports with weekly checking for abnormal usage for leak detection purposes;
- Biannual fire hydrant flushing and operations check;
- Distribution system leak detection and elimination efforts ;
- Respond to water customer inquiries and complaints;
- Oversee Cross Connection Control Plan (CCCP) compliance;
- Perform water utility inspections for new customers;
- Perform 'turn-on & turn-off' services on an as-need basis;
- Assist other Town departments on an as need basis with support services.

FY 2021-2022 Priorities

Priorities	Town Council Goals & Objs
Continue to sample additional coliform sampling stations for summer sampling sites	FI / SNR
Monitor daily user leak reports for leak detection purposes	FI / SNR
Continue ongoing distribution system leak detection and repair efforts	FI / SNR
Maintain an unaccounted for water percentage in both the Middlebridge and South Shore water systems below the 10% State goal	FI / SNR
Continue water quality testing to ensure potable water meets or exceeds water quality standards	FI / SNR
Work with Suez Water RI to ensure adequate disinfection residuals for purchased water	FI / SNR
Review disinfection by-product levels and possible solutions, should exceedances continue	FI / SNR
Design and repair water tank anchor bolts	FI / SNR
Require cell carriers to repair and paint antenna pods affixed to water towers	FI / SNR

FY 2022-2023 Proposed Priorities

Proposed Priorities	Town Council Goals & Objs
Interior water tank inspection and cleaning on an as needed basis	FI / SNR
Remain vigilant to identify and repair any distribution system leaks	FI / SNR
Remain vigilant to minimize 'unaccounted for' water to achieve State goal of 10%	FI / SNR

Continue working with Suez Water RI to ensure adequate disinfection residual levels are maintained for purchased water	FI / SNR
Ensure continued compliance with Cross Control Connection Plan (CCCP)	FI / SNR
Monitor daily user leak reports for leak detection purposes	FI / SNR

Specific Performance Measurements

A summary of the South Shore Water and Middlebridge Water systems customer base and system wide volume sales is as follows:

Description	FY 2019-2020 Actual	FY 2020-2021 Projected	FY 2021-2022 Projected	FY 2022-2023 Anticipated	Town Council Goals & Objs
South Shore purchased water	16,742,356	17,200,294	15,261,791	16,841,698	FI / SNR / TBF
Middlebridge purchased water	2,731,194	2,457,948	2,604,477	2,472,138	FI / SNR / TBF
Total Purchased Water ft³	**19,473,550**	**19,658,242**	**17,866,268**	**19,313,836**	**FI / SNR / TBF**
South Shore water sales	14,739,890	15,717,610	14,996,657	14,996,657	FI / SNR / TBF
Middlebridge water sales	1,649,341	1,703,969	1,669,111	1,669,111	FI / SNR / TBF
Total Water Sales ft³	**16,389,231**	**16,**	**16,665,768**	**16,665,768**	**FI / SNR / TBF**
South Shore water accounts	2,558	2,568	2,572	2,578	FI / SNR / TBF
Middlebridge water accounts	288	290	289	290	FI / SNR / TBF
Combined Water Accounts	2,846	2,858	2,861	2,868	FI / SNR / TBF
Additional Units	601	601	601	601	FI / SNR / TBF
Total Water Units	**3,447**	**3,459**	**3,462**	**3,469**	**FI / SNR / TBF**

A summary of water user rates and income generated is as follows:

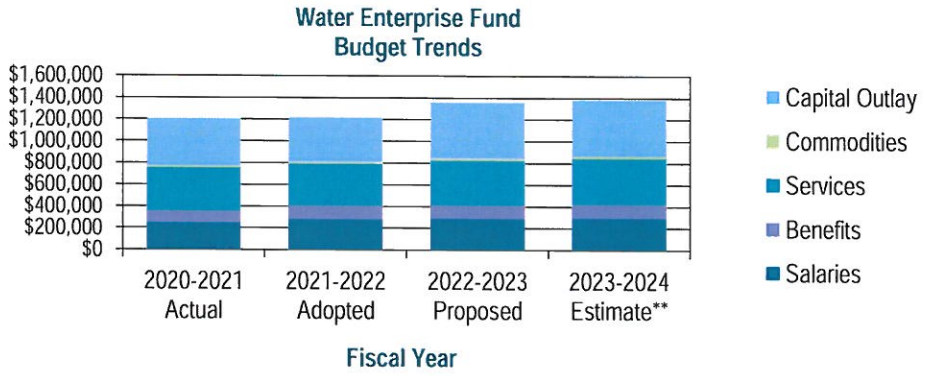
User Rates	FY 2019-2020 Actual	FY 2020-2021 Actual	FY 2021-2022 Projected	FY 2022-2023 Anticipated	Town Council Goals & Objs
Min in Advance/Qtr (w/ 1,250 ft³ allowance)	$48	$48	$48	$55	FI / SNR / TBF
Additional Unit charge per quarter	$22	$22	$22	$27.50	FI / SNR / TBF
Excess Charge 1st Step per 100 ft³ (1,251-2,500)	$3.25	$3.25	$3.25	$3.50	FI / SNR / TBF
Excess Charge 2nd Step (over 2,501)	$3.75	$3.75	$3.75	$4.00	FI / SNR / TBF

Revenue Summary	FY 2019-2020 Actual	FY 2020-2021 Actual	FY 2021-2022 Projected	FY 2022-2023 Anticipated	Town Council Goals & Objs
Excess Revenue 1st Step	$100,915	$113,672	$103,251	$111,190	FI / SNR / TBF
Excess Revenue 2nd Step	$155,159	$159,330	$136,159	$145,236	FI / SNR / TBF
Combined Excess Revenue	$256,074	$273,002	$239,410	$256,426	FI / SNR / TBF
Minimum Revenue	$564,528	$566,581	$567,944	$568,824	FI / SNR / TBF
Miscellaneous Revenue	$105,503	$106,721	$104,829	$117,879	FI / SNR / TBF
Total Revenue	**$926,105**	**$946,304**	**$912,183**	**$943,129**	**FI / SNR / TBF**

FY 2022-2023 Funding Comparison

Water Enterprise Fund	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Increase Over Prior
Personnel FTE*	**2.0**	**2.0**	**2.0**	**2.0**	**0.00**
Salaries	$245,574	$276,484	$276,284	$284,706	$8,222
Benefits	108,964	126,482	125,969	124,150	(2,332)
Subtotal Personnel Expenditures*	**$354,538**	**$402,966**	**$402,253**	**$408,856**	**$5,890**
Services	$398,161	$385,839	$383,618	$414,670	$28,831
Commodities	14,959	22,350	20,290	22,650	300
Capital Outlay/Depreciation	438,081	405,529	386,879	512,857	107,328
Subtotal Operating Expenditures	**$851,201**	**$813,718**	**$790,787**	**$950,177**	**$136,459**
Total Expenditures	**$1,205,740**	**$1,216,684**	**$1,193,040**	**$1,359,033**	**$142,349**

**Please note the Personnel FTE represents the employees within the department. The salaries and benefits expenditure figures shown above represent only the personnel expenditures allocated to this account. Some roles are allocated across additional accounts.*



***FY 2023-2024 is estimated based on the following assumptions: 1% increase in Services and Commodities, 2% increase in Capital Outlay, 6% increase in Benefits, and 2% increase in Salaries.*

FY 2022-2023 Expenditure Statements

7029410		Water Enterprise Fund Source of Supply	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
7029410	53007	Analysis Of Wells	$13,984	$11,770	$11,000	$10,150	-13.76%
7029410	53202	Purchased Water - Middlebridge	41,686	39,190	35,272	36,799	-6.10%
7029410	53202	Purchased Water - South Shore	244,865	212,790	220,766	221,666	4.17%
7029410	53402	Maintenance Of Public Wells	0	200	150	200	0.00%
7029410		**Subtotal Services**	**$300,536**	**$263,950**	**$267,188**	**$268,815**	**1.84%**
7029410		**Total Source Of Supply**	**$300,536**	**$263,950**	**$267,188**	**$268,815**	**1.84%**

7029420		Water Enterprise Fund Pumping Expenses	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
7029420	53001	Refuse Disposal	$156	$151	$324	$324	114.57%
7029420	53200	Telephone	1,570	1,408	1,128	1,184	-15.91%
7029420	53200	Fuel - Oil	1,679	1,200	1,200	1,300	8.33%
7029420	53200	Electricity	11,333	15,024	12,500	13,830	-7.95%
7029420	53201	Telemetry	0	0	480	680	0.00%
7029420	53201	Telemetry-SCADA	6,728	7,500	7,500	8,300	0.00%
7029420	53402	Maintenance Of Pump Stations	565	1,800	1,600	1,800	0.00%
7029420		**Subtotal Services**	**$22,030**	**$27,083**	**$24,732**	**$27,418**	**1.24%**
7029420	54002	Chemicals And Gases					0.00%
7029420	54005	Pumping Materials & Supplies	0				0.00%
7029420		**Subtotal Commodities**	**$503**	**$2,200**	**$2,100**	**$2,200**	**0.00%**
7029420		**Total Pumping Expenses**	**$22,533**	**$29,283**	**$26,832**	**$29,618**	**1.14%**

7029440		Water Enterprise Fund Transmission & Distribution	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
7029440	53402	Maintenance Of Elevated Tanks	$16,366	$5,500	$6,200	$14,700	167.27%
7029440	53402	Maintenance Of Mains	8,838	15,000	20,000	15,000	0.00%
7029440	53403	Maintenance Of Water Services	12,170	16,000	12,000	16,000	0.00%
7029440	53403	Maintenance Of Water Meters	310	7,500	5,761	7,500	0.00%
7029440	53403	Maintenance Of Hydrants	2,082	4,800	2,500	4,800	0.00%
7029440	53403	Maintenance Of SCADA System	0	5,000	5,000	14,810	0.00%
7029440		**Subtotal Services**	**$39,767**	**$53,800**	**$51,461**	**$72,810**	**35.33%**
7029440	54001	General Materials & Supplies	0	100	90	100	0.00%
7029440		**Subtotal Commodities**	**$0**	**$100**	**$90**	**$100**	**0.00%**
7029440		**Total Transmission & Distribution**	**$39,767**	**$53,900**	**$51,551**	**$72,910**	**35.27%**

70294600		Water Enterprise Fund Personnel Services	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
70294600	511001	Full-Time Employees	$216,989	$245,721	$245,721	$259,507	5.61%
70294600	511004	Overtime	2,977	8,200	8,000	8,000	-2.44%
70294600	511005	Retirement/Vacation Reimb.	48,702	18,933	18,933	10,300	-45.60%
70294600	511006	Longevity	5,417	3,630	3,630	6,899	90.06%
70294600		**Subtotal Wages**	**$274,085**	**$276,484**	**$276,284**	**$284,706**	**2.97%**
70294600	522250	FICA	20,322	18,860	18,860	20,135	6.76%
70294600	522300	Municipal Employees Retirement	27,726	30,845	30,845	34,048	10.38%
70294600	522301	Retirement - Defined Contribution	2,010	2,294	2,294	2,599	13.30%
70294600	522818	Medical Insur-Active Employees	31,759	43,387	43,387	45,585	5.07%
70294600	522820	Medical Insur-Retirees	15,279	17,668	17,155	9,097	0.00%
70294600	522822	Dental Insur-Active Employees	1,909	2,539	2,539	2,692	6.03%
70294600	522840	Insurance Buyback	1,406	1,400	1,400	1,025	-26.79%
70294600	522850	Life Insurance	90	109	109	393	260.55%
70294600	529900	Worker's Compensation	8,463	9,380	9,380	8,576	-8.57%
70294600		**Subtotal Benefits**	**$108,964**	**$126,482**	**$125,969**	**$124,150**	**-1.84%**
70294600		**Total Personnel Services**	**$383,049**	**$402,966**	**$402,253**	**$408,856**	**1.46%**

70294700		Water Enterprise Fund Admin & General Expense	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
70294700	511009	Vac & Sick Pay Accrued Exp	($28,511)	$0	$0	$0	0.00%
70294700		**Subtotal Wages**	**($28,511)**	**$0**	**$0**	**$0**	**0.00%**
70294700	530013	Custodial Services	0	0	0	745	0.00%
70294700	530020	Miscellaneous Services	1,073	1,071	1,071	1,255	17.18%
70294700	530055	Asset Management Software	0	750	0	3,000	0.00%
70294700	530066	Internet Access	0	526	526	514	-2.28%
70294700	532004	Electricity	1,495	1,000	1,200	1,575	57.50%
70294700	532008	Natural Gas	791	580	570	610	5.17%
70294700	532010	Wastewater Fees	30	30	30	35	16.67%
70294700	532012	Water Fees	65	72	68	72	0.00%
70294700	534012	Commun Equip. Maintenance	0	200	180	200	0.00%
70294700	534016	Computer/Software Maintenance	4,855	6,187	6,187	6,187	0.00%
70294700	534020	Maintenance Of Buildings	60	800	600	800	0.00%
70294700	538020	Postage	5,149	6,000	6,090	6,100	1.67%
70294700	538022	Printing Expenses	6,783	7,175	7,100	7,200	0.35%
70294700	560010	Insurance	15,528	16,615	16,615	17,334	4.33%
70294700		**Subtotal Services**	**$35,829**	**$41,006**	**$40,237**	**$45,627**	**11.27%**
70294700	540010	General Materials & Supplies	160	750	700	750	0.00%
70294700	540012	Office Materials & Supplies	1,330	2,500	2,400	2,500	0.00%
70294700	540060	Vehicle Operation	7,605	8,800	7,500	9,100	3.41%
70294700	580100	Miscellaneous Expenses	5,361	8,000	7,500	8,000	0.00%
70294700		**Subtotal Commodities**	**$14,457**	**$20,050**	**$18,100**	**$20,350**	**1.50%**
70294700	530044	Non-Major Technology Reserve	3,574	392	392	857	118.62%
70294700		**Subtotal Capital Outlay**	**$3,574**	**$392**	**$392**	**$857**	**118.62%**
70294700		**Total Admin & General Expense**	**$25,348**	**$61,448**	**$58,729**	**$66,834**	**8.77%**

70294800		Water Enterprise Fund Other Expenses	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
70294800	550002	Computer Equipment	$3,294	$0	$1,976	$0	0.00%
70294800	570002	Capital Improvements	205,807	157,000	159,411	250,000	59.24%
70294800	570902	Depreciation	225,406	248,137	225,100	262,000	5.59%
70294800		**Subtotal Capital Outlay**	**$434,507**	**$405,137**	**$386,487**	**$512,000**	**26.38%**
70294800		**Total Other Expenses**	**$434,507**	**$405,137**	**$386,487**	**$512,000**	**26.38%**

	Total Water Enterprise Fund	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percent Change
70294100	Subtotal Source of Supply	$300,536	$263,950	$267,188	$268,815	1.84%
70294200	Subtotal Pumping Expenses	22,533	29,283	26,832	29,618	1.14%
70294400	Subtotal Transmission & Distribution	39,767	53,900	51,551	72,910	35.27%
70294600	Subtotal Personnel Services	383,049	402,966	402,253	408,856	1.46%
70294700	Subtotal Admin & General Expense	25,348	61,448	58,729	66,834	8.77%
70294800	Subtotal Other Expenses	434,507	405,137	386,487	512,000	26.38%
	Total Water Enterprise Fund	**$1,205,740**	**$1,216,684**	**$1,193,040**	**$1,359,033**	**11.70%**

FY 2022-2023 Revenue Statement

702		Water Enterprise Fund Description	2020-2021 Actual	2021-2022 Adopted	2021-2022 Projected	2022-2023 Proposed	Percen Chang
70294	41745	Metered Sales - Domestic	$894,629	$884,818	$862,503	$893,619	0.99%
70294	41755	Forfeited Disc & Penalties	4,907	5,500	4,700	5,200	-5.45%
70294	43017	Rental of Town Properties	285,949	291,342	291,342	267,529	-8.17%
70294	44046	Special Services - Turn off/On	4,639	5,500	5,000	5,000	-9.09%
70294	46001	Investment Income	51,536	25,000	25,000	25,750	3.00%
70294	46050	GASB 31 Change	(51,119)	0	0	0	0.00%
70294	47001	Miscellaneous Income	2,980	2,200	2,200	2,200	0.00%
70294	47002	National Grid Electricity	1,500	0	0	0	0.00%
70294	47008	State of RI Water Protection	-	2,324	2,295	2,295	-1.25%
70294	49905	Net Assets Forward To Operations	79,003	0	0	157,440	0.00%
702		**Total Water Enterprise Fund**	**1,274,025**	**$1,216,684**	**$1,193,040**	**$1,359,033**	**11.70%**
702		Total Water Enterprise Fund	$1,205,740	$1,216,684	$1,193,040	$1,359,033	
702		**Income Over (Under)**	**$68,285**	**$0**	**$0**	**$0**	

APPENDIX E

DEMAND MANAGEMENT STRATEGY

Town of South Kingstown, RI

509 Commodore Perry Highway
Wakefield, RI 02879
Tel. 401-789-9331
Fax. 401-782-8068

PUBLIC SERVICES DEPARTMENT

November 26, 2012

Mr. Kenneth J. Burke, P.E., General Manager
RI Water Resources Board
One Capitol hill
Providence, RI 02908

Subject: South Kingstown Demand Management Strategy (DMS)

Dear Mr. Burke:

In accordance with RIGL 46-15.8, find enclosed a Demand Management Strategy (DMS) plan for the Town's South Shore and Middlebridge water systems.

Please feel free to contact me at 789-9331, extension 2250, should you have any additional questions relative to this matter.

Sincerely,

Jon R. Schock
Public Services Director

Enc.: Demand Management Strategy

Cc: Lucien Masson, Water Superintendent

Town of South Kingstown

Water Use and Efficiency Rule for Major Public Water Suppliers

Water Efficiency and Demand Management Strategy (DMS)

November 2012

Town of South Kingstown

Water Use and Efficiency Rule for Major Public Water Suppliers

Water Efficiency and Demand Management Strategy (DMS)

November 2012

Statement of Purpose

Pursuant to the "Rules and Procedures Governing the Water Use and Efficiency Act for Major Public Water Suppliers – May 2011" (herein after called the "Rules"), the Town of South Kingstown hereby submits the following and attached information.

Background

Under Section 5.2 of the "Rules", suppliers are required to prepare and submit a Water Efficiency and Demand Management Strategy (DMS) addressing Section 3.0 and 4.1 of said "Rules".

It should be noted that the Town of South Kingstown recently completed a Water Supply System Management Plan (WSSMP) in accordance with the "Rules and Procedures for Water Supply System Management Planning – October 2002". This document was approved by the RI Water Resources Board (RIWRB) on December 21, 2010. Much of the information required within the DMS requirement can be found within that submittal.

"Rules" Section 3.0 – Water Efficiency and Demand Management Targets for Major Public Water Suppliers"

3.1 The "Rules" cite an average annual water use of 65 GPCD. The Town of South Kingstown owns and maintains two- (2) separate water systems; the "South Shore" and "Middlebridge" water systems. Unfortunately, the US Census "blocks" for April 1, 2010, do not exactly coincide with the South Shore waters system. However, the U.S. Census does differentiate between occupied housing as of April 1, 2010 (year-round) and non-occupied (seasonal) housing. Unlike the South Shore system, the US Census tracks are significantly different for the Middlebridge water system service area, whereby the Middlebridge census tracks cannot be used to establish the Middlebridge water system population. As such, the same per capita population for the South Shore system will be used for the Middlebridge system. As noted in the attached spreadsheet, both the South Shore and Middlebridge water systems have year-round and seasonal GPCD less than the State target of 65 GPCD.

3.1.1 Population Fluctuations – As noted above, South Kingstown's water system population (and associated water demand) fluctuates greatly, especially during summer months with the influx of seasonal residents. Local popular beaches (South Kingstown Town Beach and East Matunuck State Beach), and associated population influx, result in greater daily water consumption during the summer months, especially on weekends.

3.1.2 Multi-uses residences – There are very few multi-family residences (i.e.: "Park House" in Matunuck) on either water system.

3.2 Efficient outdoor water use – In May of each year, water officials from the Town of South Kingstown, Narragansett and United Water Rhode Island (UWRI) confer to determine if water restrictions are appropriate based upon anticipated summer user demand and climate forecast. The water utilities typically impose "odd/ even" outside water use restrictions just before the 4th of July and until after Labor Day of a given year. This program allows for outside water use only on days that correspond to the property street address number. As conditions warrant, odd/ even restrictions sometimes transition to full outside water use prohibition depending upon customer demand and lack of precipitation.

3.3 Efficient indoor water use – The Town's Building Inspection office insures that all new and retrofit construction is in accordance with the applicable plumbing codes, including codes that deal with the use of water-saving fixtures. In addition, water conservation kits consisting of low-flow shower and sink heads, toilets dams, dye tablets and tips on conserving water are available for $6 each.

3.4 Full accounting for non-billed water – There are a number of factors that affect unaccounted for water, including:

- Hydrant flushing – currently done twice annually. The South Shore system typically requires ten- (10) days to flush the water system. During flushing activities, approximately 300,000 gallons ± is consumed each day for this activity. Therefore, approximately 3.0 MG is consumed during each flushing activity (or 6.0 MGY). The Middlebridge system can be flushed in one- (1) day, which consumes approximately 300,000 gallons of water (or 0.6 MGY).

- Street sweeping (Town and State) – we can only estimate this by the number of fill-ups; it is simply not possible to track State DOT sweeping operations. For purposes of the DMS, it is assumed that the RIDOT consumes 0.1 MGY from the South Shore system and 0.1 MGY from the Middlebridge system for State road sweeping purposes. However, we estimate 40 work days of Town sweeping in the South Shore area, which requires the 300 gallon sweeper tank to be filled 5 times per day. This equates to .06 MGY. The Middlebridge area can be swept by the Town in two- (2) days, which equates to .003MGY per year.

- Fire-fighting – This is obviously an unknown component, as hydrant usage during fire-fighting operations is unmetered.

- Hose testing – typically done each year by the Fire Department, pursuant to NFPA standards. We will continue to work with the Fire Department to develop a protocol for using a hydrant meter during these tests.

- Leaks – Town Water Division leak detection analysis has concentrated on the Middlebridge system given its limited distribution system size. Leak detection services using "correlator" technology was completed in 2008, however no leaks were found. The entire Middlebridge system was analyzed again in June 2012, by Conservation Technologies, Inc., of Seekonk, MA, using "acoustic" leak detection technology, whereby two- (2) leaks were found and promptly repaired; however, Middlebridge unaccounted water is still in excess of the State unaccounted for goal of 10%. Unfortunately, 99% of both water systems is comprised of asbestos-cement (AC) (a/k/a "transite") which has poor sound transmitivity properties.

  The Water Division will continue to investigate possible sources of water loss, including wholesale meter inaccuracy/ calibration issues in order to meet the State target of no greater than 10% unaccounted for water. The focus will continue with the Middlebridge water system and then transition to the South Shore system once Middlebridge unaccounted for water is resolved.

- Tank draining – Water tanks (400,000 gallon capacity) are typically drained every other year for tank inspections and whenever water sample results dictated they be drained. For example, the Mautucket Road water tank had to be drained in October 2012 and July 2008 as a result of positive total coliform sampling results. The volume of each tank would be then added to the annual unaccounted for water calculation.

- Main breaks and water sampling blow-offs: this is estimated at about 10,000 gallons per occurrence; typically only necessary when main work (repair or new) is done, or a water quality issue is present.

"Rules" Section 4.0 – Methods for Achieving Targets for Major Public Water Suppliers"
4.1 Required Methods for Achieving Targets

4.11 100% metering – Both South Shore and Middlebridge water systems are fully 100% metered.

4.1.2 Meter maintenance and replacement – Both South Shore and Middlebridge water systems are in full compliance with this required method.

4.1.3 Radio-read system – Radio read meters were installed for all South Shore and Middlebridge water customers in 2007. As such, the Town is in full compliance with this requirement.

4.1.4 Quarterly reading and billing – The Town will be transitioning to quarterly billing as of December 31, 2013, in accordance with R.I.G.L 39-15.1-3.

4.1.5 Education - Water conservation kits that include low-flow shower and sink heads, toilets dams, dye tablets and tips on conserving water are available for $6.00 from the Town's Water Division. The Town's Water Division web-site (http://www.southkingstownri.com/town-government/municipal-departments/public-services/water) has links to various web-sites relative to water conservation tips.

4.1.6 Rate structures – The Town maintains its water finances through the use of a Water Enterprise Fund. This fund relies on operating and non-operating revenues to support the full water program, including capital, operating, and debt service costs. No General Fund (i.e. property tax dollars) revenues are used to fund the Town's Water Enterprise Fund. Any revenue surplus in a given year is reserved in the Water Enterprise Fund retained earnings account.

The Town's current rate structure is based upon a "minimum in advance" rate, which affords 5,000 cu. ft. of water consumption per year. Any water consumed in excess of 5,000 cu. ft. is accessed an excess consumption charge. There is currently no tiered consumption charge rate structure.

4.1.7 Leak detection – Given the limited size of the Middlebridge system as compared to the South Shore system, leak detection efforts have been focused on reducing unaccounted for water in the Middlebridge system before embarking on a leak detection program for the South Shore system. The Water Division has made two- (2) system-wide attempts at finding leaks in the Middlebridge system.

In 2008, leak detection correlators (which is generally accepted as the most advanced technology for leak detection) were used to try an locate suspect leaks in the Middlebridge system. Unfortunately, no leaks were detected. As such, a leak detection consultant was subsequently hired in June of 2012 to perform a system-wide leak detection for the Middlebridge system utilizing acoustic technology. The consultant was able to detect two- (2) leaks, which were promptly repaired.

As detailed on the attached spreadsheets, unaccounted for water in both water systems is in excess of the State allowable goal of 10%.

Unfortunately, the water main material (asbestos cement- AC) for both water systems has poor transmitivity characteristics for leak detection equipment. The pipe material, in addition to highly permeable soils, and in some cases, high ground water table makes leak detection, using current technology, very problematic.

4.2 Optional Methods for Achieving Targets

4.2.1 Conservation pricing – The Town's current rate structure is based upon a "minimum in advance" rate, which affords 5,000 cu. ft. of water consumption per year. Any water consumed in excess of 5,000 cu. ft. is accessed an excess consumption charge. However, in anticipation of the December 31, 2013, quarterly billing requirement, the Town anticipates contracting with a consulting firm to analyze various utility rate structures. The consultant will be charged with analyzing various rate structures, including but not limited to, a "flat" quarterly administrative charge, in addition to flat and tiered consumption charges.

4.2.1 Reduce non-agricultural outdoor water use – Other than summer "odd/ even" seasonal restrictions program, the Town is not planning on implementing any other formal non-agricultural outdoor water use programs.

4.2.3 Improve efficiency of indoor water use – The Town enforces all applicable building code requirements in terms of water efficient fixtures and devices for residential and commercial buildings. There are no municipal buildings on the Middlebridge water system that have sanitary fixtures. There are two- (2) municipal buildings (Matunuck Elementary School and South Kingstown Town beach) connected to the South Shore water system, both of which employ low-flow fixtures in accordance with the State plumbing code.

4.2.4 Improve efficiency of water use by major water customers – The Town does not have the staff or financial resources to act as a water consultant to major water customers. In comparison to other water systems the Town's South Shore water system has few major water users, limited primarily to two- (2) restaurants, three- (3) marinas and seasonal cottage complexes (i.e.: Roy Carpenter's Beach Meadow). The Middlebridge water system has no major water customers.

South Shore & Middlebridge GPCD Calculations for
RIWRB Demand Management Strategy (DMS)

South Shore

Generalized South Shore US Census Blocks as of April 1, 2010:

Total Population	Total Housing Units	Total Occupied Housing Units	Total Vacant Units
3,832	3,727	1,658	2,069
		44.49%	55.51%

Per Capita Population as of April 1, 2010 at Time of Census	2.3112

Total Services	Total Housing Units	Total Occupied Housing Units	Total Vacant Units
2,469	3,038	1,351	1,687

Middlebridge

Middlebridge Unavailable due to census block configuration

Total Services	Total Housing Units	Total Occupied Housing Units	Total Vacant Units
281	292	292	-

Gallons per Capita per Day (GCPD) Calculation

	South Shore System	Middlebridge
April 1, 2010 Dwelling Units	1,351	292
March 2010 Water Consumption (cu. ft.)	646,826	119,013
March 2010 Water Consumption (gals.)	4,838,258	890,217
April Gal/ Household/ Day	119.33	101.62
Population per Household	2.31	2.31
Gallons/ Capita/ Day (GCPD)	**51.63**	**43.97**
July 2010 Dwelling Units	3,038	292
July 2010 Water Consumption (cu. ft.)	2,672,344	201,707
July 2010 Water Consumption (gals.)	19,989,133	1,508,768
July Gal/ Household/ Day	219.32	172.23
Population per Household*	3.47	3.47
Gallons/ Capita/ Day (GCPD)	**63.26**	**49.68**

Note:* A summer population peaking factor of 1.5 is assumed as a result of intensive beach/ summer home use

APPENDIX F

CRMC ASSENT FOR SOUTH SHORE WATER SYSTEM AND WATER SERVICE AREA

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, R.I. 02879-1900

(401) 783-3370
FAX: (401) 783-3767

ASSENT MODIFICATION

September 26, 2005

Town of South Kingstown
Attn: Stephen Alfred, Town Manager
South Kingstown Town Hall
180 High Street
Wakefield, RI 02879

United Water of Rhode Island
17 Arnold Street
Wakefield, RI 02880-0429

Rhode Island Department of Transportation
Attn: Edward S. Szymanski, PE, Assoc Chief Eng.
Division of Intermodal Plannings/Environmental Programs
Two Capitol Hill
Providence, RI 02903-1124

RE: Modification of **CRMC Assent M 2003-11-039** -- Alter the restriction placed on tie-ins to the water supply stations.
Site Address: Commodore Perry Memorial Highway
Site Town: South Kingstown

Dear Sirs:

The Rhode Island Coastal Resources Management Council has reviewed your request for modification of assent no. M2003-11-039 and approves the modification with the following alterations to stipulations:

Stipulations of Approval:

1. The applicant shall record this assent in its entirety in the land evidence records of the Town of South Kingstown within thirty (30) days of the date of assent issuance. Certification by the Town Clerk's office that this stipulation has been complied with shall be furnished to Coastal Resources Management Council by the applicant within fifteen (15) days thereafter. Failure to comply with provision will render this assent null and void.

2. Except/unless as stipulated herein, all stipulations of the original assent for CRMC File No. M2003-11-039, originally dated March 11, 2004.

3. Delete/remove the following stipulation of the original assent dated March 11, 2004: "G".

4. Add the following stipulation to the original assent dated March 11, 2004:

   H. The Maintenance Assent authorizes the provision of potable water via the UWRI interconnection to those properties lying within the bounds of the South Shore Water Service area as it existed as of March 11, 2004 and as is shown on the map submitted to the CRMC for review on September 12, 2005 entitled, "South Shore Water Service Area as of March 11, 2004, Town of South Kingstown Department of Public Services". Lots legally created after March 11, 2004 from properties lying within the South Shore Water Service boundary shall also be eligible to obtain water service. All other properties abutting the South Shore/UWRI U.S. Route 1 interconnection main or which would be serviced by tributaries or extension of the main are prohibited from obtaining water service.

All work approved by this assent modification must be completed within three (3) years of the date of this approval. Please be aware that the original CRMC Assent expiration of remains the same. In addition, all stipulations of the original CRMC Assent shall remain in full force and effect except as modified herein and/or by the plans approved by this assent modification approval.

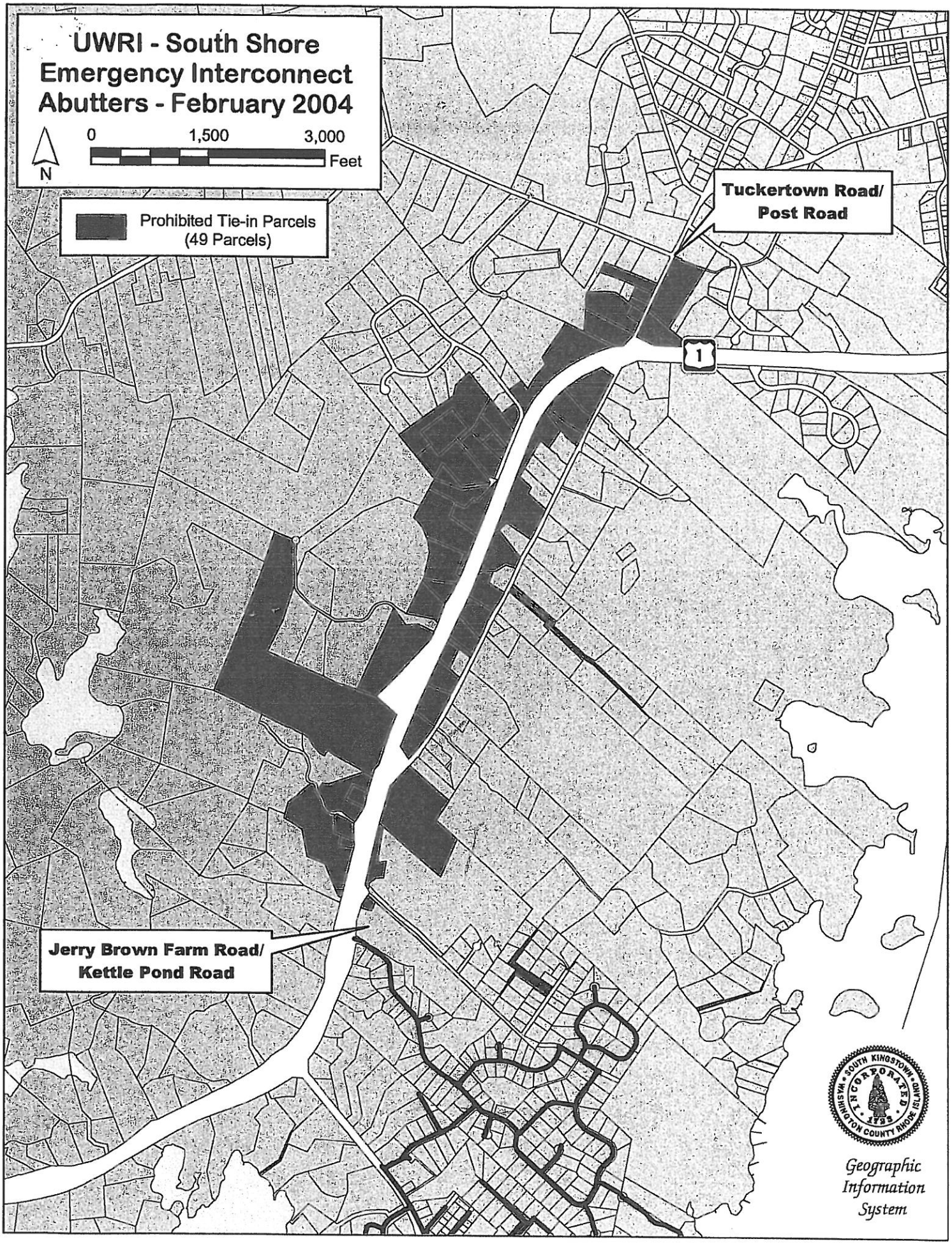
Please be aware that the original expiration date of the CRMC assent remains the same. In addition, all stipulations of the original CRMC Assent shall remain in effect unless specifically modified herein.

Sincerely,

Grover J. Fugate, Executive Director
Coastal Resources Management Council

/lam

PROPERTIES PROHIBITED FROM OBTAINING SERVICE FROM THE SOUTH SHORE/UWRI EMERGENCY INTERCONNECTION MAIN		
PLAT	**LOT**	**LOCATION**
62-3	1	POST RD
62-3	2	CONGDON DRIVE
62-3	3	44 CONGDON DRIVE
62-3	5	60 CONGDON DRIVE
62-3	6	90 CONGDON DRIVE
62-3	16	111 CONGDON DRIVE
62-3	18	471 & 481 POST ROAD
62-3	19	501 POST ROAD
62-3	21	
62-3	22	509 POST ROAD
62-3	43	POST ROAD
63-1	2	
63-1	5	297 POST ROAD
63-1	6	234A POST ROAD
63-4	1	441 POST ROAD
63-4	21	322 POST ROAD
63-4	22	305 POST ROAD
63-4	23	319 POST ROAD
63-4	24	337 & 313C POST ROAD
63-4	25	351 POST ROAD
68	4	COMM O H PERRY HIGHWAY
68-2	10	633 POST ROAD
68-2	12	681 POST ROAD
68-2	14	733 POST ROAD
68-2	16	1543 COMM O H PERRY HIGHWAY
68-2	17	1519 COMM O H PERRY HIGHWAY
68-2	18	1509 COMM O H PERRY HIGHWAY
68-2	19	20 CONGDON DRIVE
68-2	22	RED FOX WAY
68-2	25	2 CONGDON DRIVE
68-2	26	POST ROAD
68-2	27	POST ROAD
68-3	1	921 & 947 POST ROAD
68-3	15	771 & 753 POST ROAD
68-3	16	823 POST ROAD
68-3	18	825 POST ROAD
68-3	20	847 POST ROAD
68-3	21	895 POST ROAD
68-3	25	RED FOX WAY
75-1	5	40 WHITE POND ROAD
75-1	6	1889 COMM O H PERRY HIGHWAY
75-1	7	10 WHITE POND ROAD
75-1	8	65 WHITE POND ROAD
75-2	1	1920 COMM O H PERRY HIGHWAY
75-2	2	1154 POST ROAD
75-2	8	1820 & 1822 COMM O H PERRY HIGHWAY
75-2	9	1829 COMM O H PERRY HIGHWAY

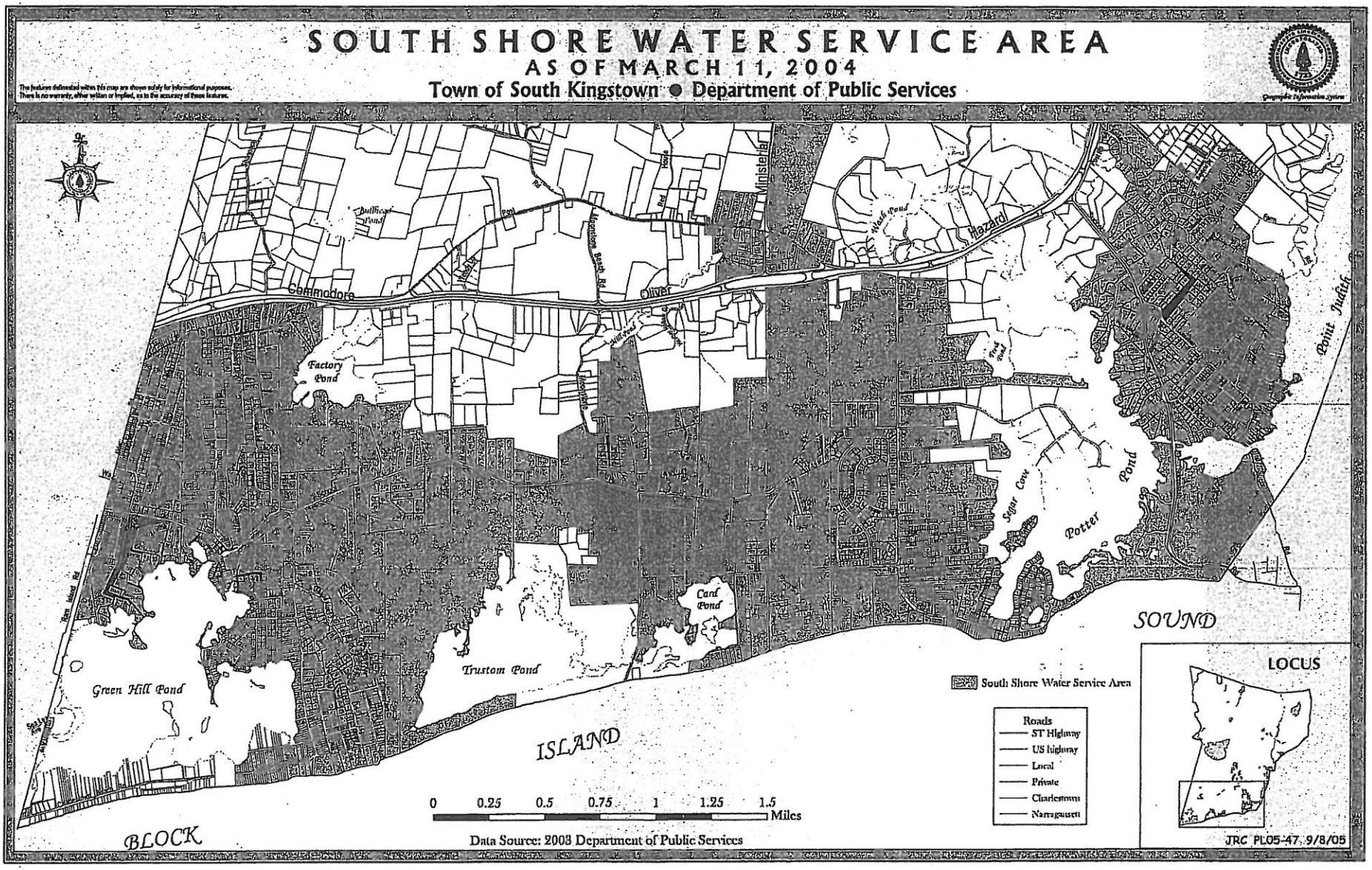

UWRI - South Shore
Emergency Interconnect
Abutters - February 2004
0
1,500
3,000
Feet
N
Prohibited Tie-in Parcels
(49 Parcels)
Tuckertown Road/
Post Road
1
Jerry Brown Farm Road/
Kettle Pond Road
TOWN OF SOUTH KINGSTOWN WASHINGTON COUNTY RHODE ISLAND
INCORPORATED 1723
Geographic
Information
System

SOUTH SHORE WATER SERVICE AREA

AS OF MARCH 11, 2004

Town of South Kingstown • Department of Public Services

The features delineated within this map are shown solely for informational purposes. There is no warranty, either written or implied, as to the accuracy of these features.



Data Source: 2003 Department of Public Services

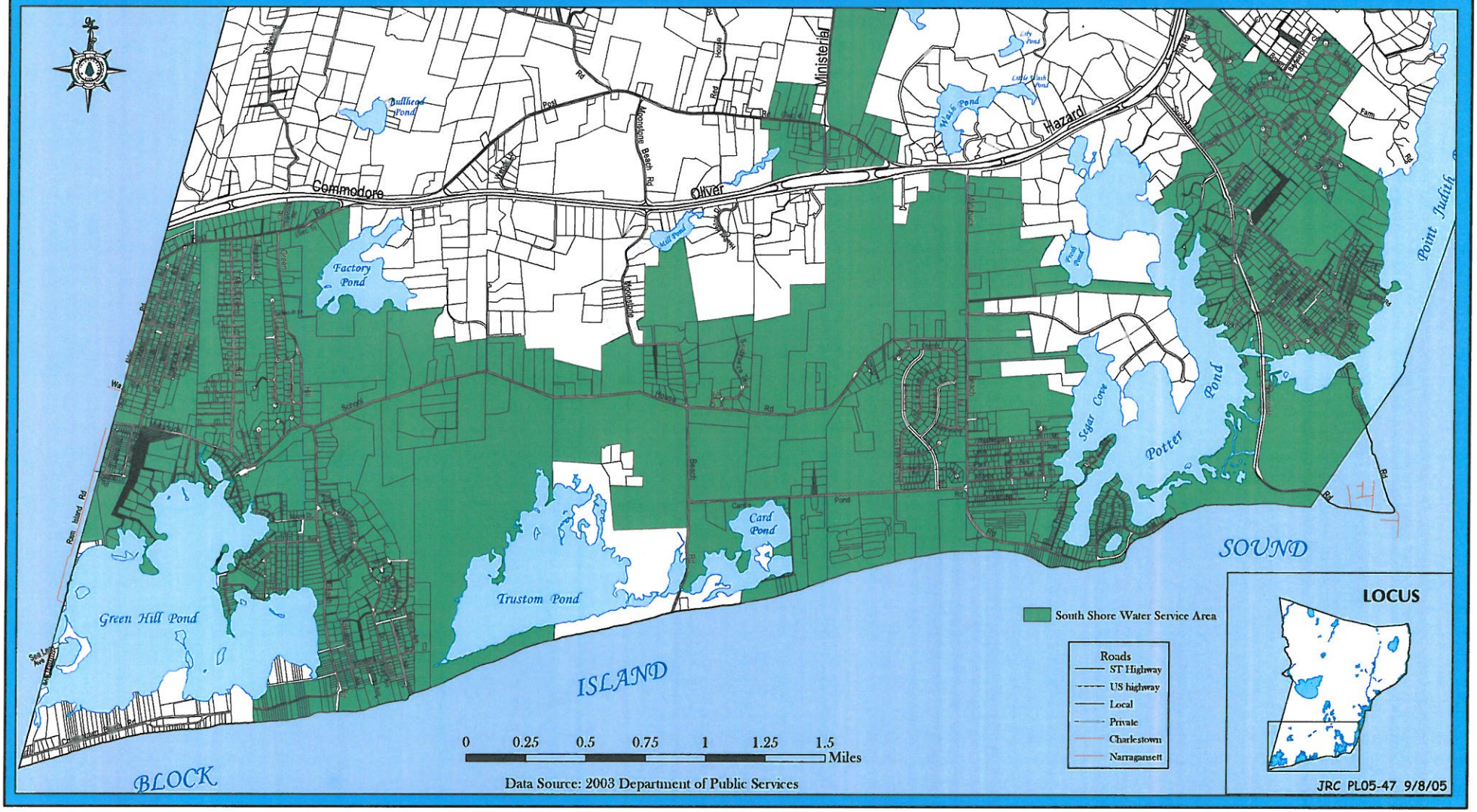
JRC PL05-47. 9/8/05

SOUTH SHORE WATER SERVICE AREA

AS OF MARCH 11, 2004

Town of South Kingstown ● Department of Public Services

The features delineated within this map are shown solely for informational purposes. There is no warranty, either written or implied, as to the accuracy of these features.



Data Source: 2003 Department of Public Services

JRC PL05-47 9/8/05

APPENDIX G

WATER SERVICE AREA MAP
and
SOURCE WATER MAP

Town of South Kingstown

WATER SERVICE AREA

Department of Public Services

Geographic Information System

MIDDLEBRIDGE

Torrey Road Wholesale Interconnect

Narragansett Interconnect

NARRAGANSETT BAY

Route 1 Wholesale Interconnection

Succotash Rd Emergency Interconnection

Cards Pond Pump Station

Well 1

Well 2

Well 3

SOUTH SHORE

Commodore

Oliver

Hazard

Ministerial

Post

Green

Factory Pond

Bullhead Pond

Long Pond

House Pond

Spectacle Pond

Lily Pond

Cedar Swamp Pond

Little Wash Pond

Wash Pond

Mill Pond

Fresh Pond

Card Pond

Trustom Pond

Green Hill Pond

Point Judith Pond

Potter Pond

Sugar Cove

SOUND

ISLAND

BLOCK

Ram Island Rd

Charlestown Beach Rd

Green Hill Ocean Dr

Sea Level Ave

Matunuck

Sycamore

Moonstone Beach Rd

Kingstown Rd

Post Rd

School House Rd

Beach Rd

Torrey Rd

Kenyon Hill

Shannock

Wyoming

Tower Hill

Gilbert Stuart

Fire Ln One

Fire Ln Two

Fire Ln Three

Fire Ln Four

Fire Ln Five

Fire Ln Six

Fire Ln Seven

Water Structures

Tank	
Blowoff	
Pump Station	P
Interconnects	▲
Wells	
Hydrants	

Pipe Diameter: 4", 6", 8", 10", 12", 14"

Water District Service Boundary*

Property Boundaries

*Water District legal boundary is the same as the service boundary

0 900 1,800 2,700 3,600 4,500 Feet

0 0.25 0.5 0.75 1 Miles

1 inch = 900 feet

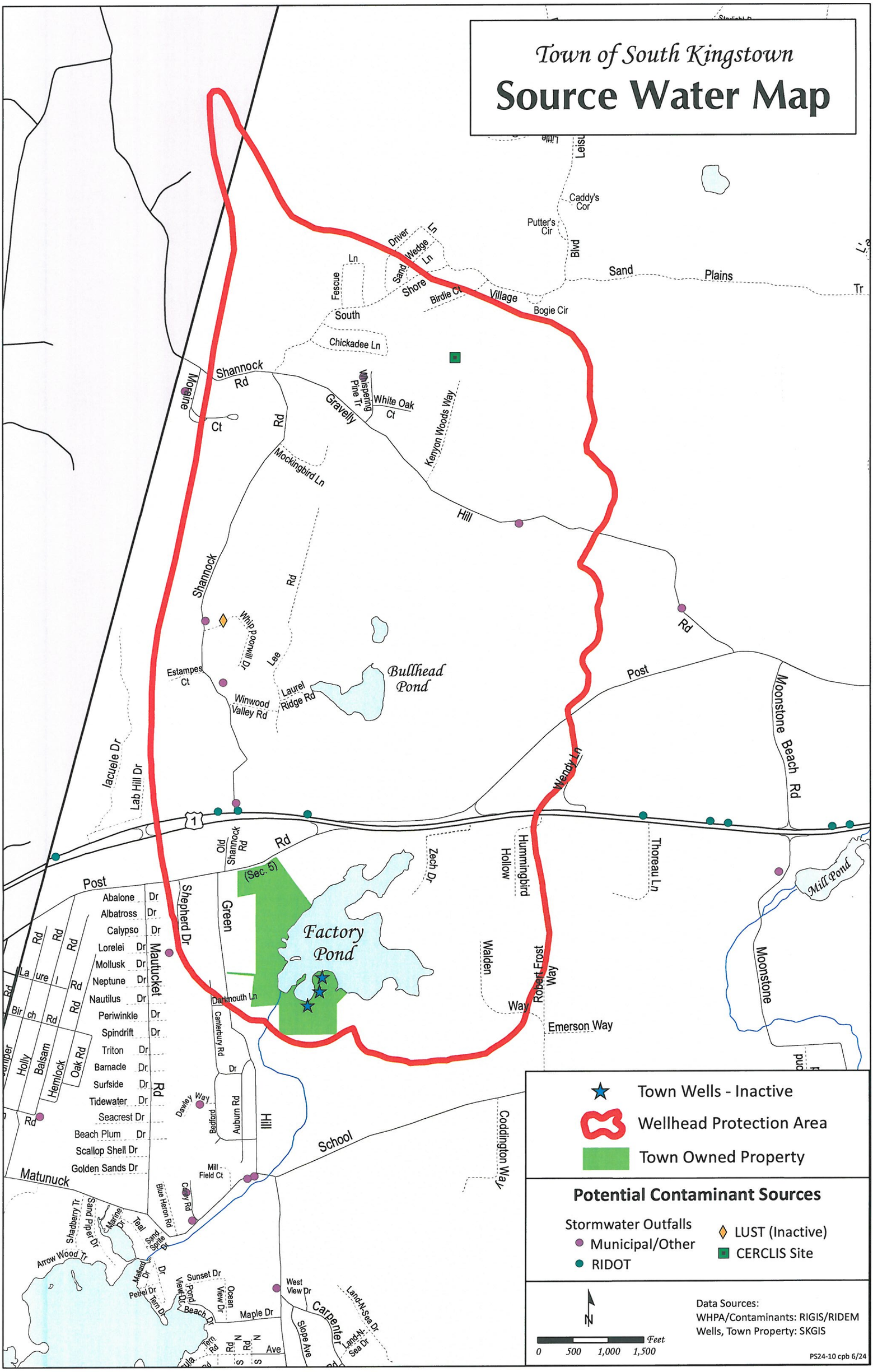
LOCUS

MIDDLEBRIDGE

SOUTH SHORE

Data Source: SKGIS

PS24-09 cpb 4/24


Town of South Kingstown
Source Water Map
Bullhead Pond
Factory Pond
Mill Pond
Town Wells - Inactive
Wellhead Protection Area
Town Owned Property
Potential Contaminant Sources
Stormwater Outfalls
Municipal/Other
RIDOT
LUST (Inactive)
CERCLIS Site
N
0 500 1,000 1,500 Feet
Data Sources:
WHPA/Contaminants: RIGIS/RIDEM
Wells, Town Property: SKGIS
PS24-10 cpb 6/24

APPENDIX H

WATER RESOURCES BOARD – REVIEW COMMENTS
and
TOWN PLANNER'S APPROVAL LETTER

State of Rhode Island - Water Resources Board
Division of Statewide Planning
235 Promenade Street, Suite 230
Providence, RI 02908
(401) 222-7901 FAX: (401) 222-2083

Water Supply System Management Plan 5-yr Update Agency Review Comments

February 12, 2024

Kathleen Crawley, Acting General Manager

David M. Procaccini, Programming Services Officer

Water Supplier: Town of South Kingstown Water Supply System Management Plan Five-Year Update (Plan)

Background: Pursuant to the provisions of RI Gen. Laws § 46-15.3, the Plan was received by the Water Resources Board on August 18, 2023. The previous plan was completed by Comprehensive Environmental Incorporated and approved by the Water Resources Board on February 15, 2019. The current plan was completed by James J. Geremia and Associates, Inc. and was due on November 14, 2024.

State agency review comments were received from the Department of Health (DOH), the Department of Environmental Management (DEM), and the Division of Statewide Planning (DSP) within the 90-day review period.

Discussion: The Plan generally follows the content requirements of the program, has a stand-alone executive summary to serve as the public document, and has included language about progress made and future improvements planned. The demand management strategy and other supporting documents are attached and discussed in the Plan.

Next Steps: Please provide an electronic redline version of the entire WSSMP that incorporates all requested revisions from the comments below. In addition, provide a memo with responses to all comments below and include page numbers of all revisions within the revised WSSMP. Ensure that all content changes are included in the Executive Summary.

General Comments

Throughout the Plan there are references that should be updated:

- The Plan should reference the most current WRB Regulations. This transmittal is organized according to the current regulations. Citations follow:
    - Rules and Procedures for Water Supply Systems Management Planning (490 RICR-00-00-2) https://rules.sos.ri.gov/Regulations/Part/490-00-00-2
    - Water Use and Efficiency Rule for Major Public Water Suppliers (490 RICR-00-00-1) https://rules.sos.ri.gov/Regulations/Part/490-00-00-1
- In the preface, add language related to the updated regulations. They were updated by WRB in 2018 primarily to meet the new format for the searchable RI Code of Regulations and did not include substantive content related changes. Their effective date is 1/4/2022. WRB staff are available to assist with this section if needed.
- The worksheets are not the most recent version. The correct worksheets are attached. They must be completed and submitted in the excel format and updated in the Plan.
- References to Suez Water should be updated to Veolia (formerly Suez, United) as applicable.
- The Plan should reference the most recently approved Community Comprehensive Plan for the Town (9/15/2021). Here is a link to the Division of Statewide Planning website.

- Attach a letter from the Town Planner to ensure that they have reviewed the Plan and have found it to be consistent with the Community Comprehensive Plan.
- The Division of Statewide Planning's Land Use and Natural Resources Staff reviewed the Plan and found no conflicts with the State Guide Plan (SGP) Elements related to drinking water supply (RI Land Use 2025, RI Water 2030, and RI Water Quality 3035).

Content Area Comments

2.8.1 Goal Statement: May be Incomplete.

Ensure that the Goals Statements are consistent with most current (2021) SK CCP. This section will be complete once the review and letter from the Town Planner are received.

2.8.2 Water Supply System Description: Incomplete

Ensure that all worksheets are completed.

2.8.3 Water Quality Protection Component: Incomplete

The Town maintains the three Factory Pond wells as a standby source but is currently purchasing all their water wholesale from Veolia. The Plan indicates that these wells would not be returned to active use without the construction of a treatment facility to address issues with high iron. The Town should, however, continue to maintain water quality protection strategies for the Factory Pond wells given that it could one day resume use of the wells as an active supply.

The WSSMP rules allow a supplier to substitute an approved wellhead protection plan if it meets all the requirements of the WSSMP rules (490-RICR-00-00-2, Part 2.8.3), namely, detailed analyses for the following:

- Delineation of Source Water Protection Areas.
- Inventory of significant potential sources of contaminants of concern in each source water protection area.
- Determination of Source Water Susceptibility.
- Description of present and past efforts to protect water quality, both regulatory and non-regulatory.

The plan states that the 1998 Wellhead Protection Plan *serves to fulfill the water quality protection requirement of the Water Supply System Management Plan.* Although the 1998 document was not provided with the plan, it is unlikely to meet the above requirements. The Water Quality Protection Component must incorporate, at a minimum, updated land use/land cover data, well head protection area delineations, and information regarding contaminant risks.

Revise the Plan to include the following:

- All information required in section 2.8.3 A
- To support the analysis required in the plan, include the following:
  - Update the 2003 Source Water Assessment. While the 2003 SWA used the EPA Safe Drinking Water Act criteria set at the time, the updated Source Water Protection Plan will need to meet the minimum requirements set for the Water Quality Protection Component of WSSMP. Please note that there are many resources and new data available. The guidance manual is attached and WRB staff can assist in connecting South Kingstown to resources including URI.
  - Incorporate the most recent wellhead protection area. The wellhead protection area (WHPA) for the Factory Pond wells was originally delineated in-house by DEM in 1989 and refined by DEM in 1993. Presumably this is the delineation used in the 1998 Wellhead Protection Plan. The WHPA was further revised in 2007 to extend further

north based on groundwater flow data from this report: https://pubs.usgs.gov/sir/2006/5271/pdf/sir2006-5271.pdf (USGS, Masterson 2006). See especially p. 22 figure. This remains the currently accepted delineation. Since the 1998 Wellhead Protection Plan was written prior to the development of the current WHPA delineation, South Kingstown would not have been able to inventory potential pollution sources or conduct a risk assessment/susceptibility analysis across the entirety of the current WHPA. The community wellhead protection area GIS data is available on RIGIS.

- Incorporate current (2020) data on land cover/land use and impervious cover.

The 1998 Wellhead Protection Plan was not provided with the submitted document for a conformance review. However, unless an updated Source Water Assessment Plan (SWAP) and the most recent WHPA have been incorporated, our finding is that the WQPC is not complete.

2.8.4 Mapping Requirements: Incomplete

Part 2.8.4 states*: Maps shall be in a format acceptable to the Board. The scale of each map should be large enough so that data contained on the map is intelligible, yet small enough so that the map extent fits onto a reasonable number of* sheets.

- Include larger format, legible maps in the body of the plan (24x36 is typical).
- The following GIS layers are requested:
  - The most recent water district boundary.
- Map #1 Water District System Map requirements:
  - Add the legal service area boundary. If the legal service boundary is the same as the current service area, please add a note stating same on the map.
  - Identify emergency and wholesale interconnections.
- Map # 2 Source Water Map- Include all information required in Part 2.8.4 (D)

2.8.5 Supply Management: Incomplete

- The Plan states (p.41): *Based on the information presented earlier in this section, it appears that the Town has already recognized the need to seek alternative sources of raw water supply and has had a consultant addressing the issue of supply augmentation for a number of years. Given the anticipated system demands for the 5- and 20-year planning horizons, it appears that ongoing supply augmentation studies should be sufficient to appropriately guide the Town towards accommodating its future water supply obligations.* Provide additional detail about the studies and findings and whether the Town is continuing to seek additional sources.
- There is a typographical error on p. 36, table 3-2 for the Middlebridge System Population Projection. The number should be 717 rather than 7,170.

2.8.6 Demand Management: Complete

2.8.7 System Management: Incomplete

- The discussions of non-account water and leakage in the plan should reference the targets of 15% non-account water and 10% leakage.
- Include additional detail about the components of non-account water that contribute to the exceedances. Some may be uses rather than losses to the system. Past plans had indicated that certain unbilled uses contribute to the higher rate.
- Include long term goals/plan to track and reduce non-account water.
- Add information about criteria for service area extensions (per reference p. 49, section 7.1).

2.8.8 Emergency Management: Incomplete

- Provide an update/additional detail on proposed "water station" agreements with Veolia, North Kingstown, and Narragansett.
- Is the Town considering joining RIWARN? If not, what are the concerns/obstacles?

2.8.9 Drought Management: Complete

2.8.10 Implementation Schedule: Complete

2.8.11 Financial Management: Complete

2.8.12 Coordination: Incomplete

- Attach a letter from the Town Planner to ensure that they have reviewed the Plan and have found it to be consistent with the Community Comprehensive Plan.

Minor Errata

Volume 1

p.10, Water Availability, missing word - *An overall objective of the SKWD **is** to ensure….*

p. 14, Goals Statement – eliminate the reference to the 30-month update. These are no longer required and have not been submitted in the past 5 years.

p.23, 2.4, Interconnections –

- *However, Narragansett constructed a subaqueous water main under Galilee channel, whereby the Jerusalem section of Narragansett is now supplied by Narragansett from **its** Galilee interconnection.*
- *This interconnection is a two-way metered facility that is used by SUEZ **for** its Narragansett water customers. The agreement governing use of the interconnections, and water transfers are discussed further in Section 2.7.*

p. 25, Master Meteres - *The South Shore interconnection has a 10-inch magnetic flow meter **that** monitors the flow (10-inch McCrometer, Hemet, CA, Ultra Mag SSN UM20040572).*

p.34, Table 2-13 – Footnote 6 is missing.

p.35, Growth in Demand - *Water main extensions beyond the existing service **area** are prohibited by CRMC Assent (refer to Appendix F). Expansion of the Middlebridge **system** also requires CRMC approval for any main extension beyond the existing service area.*

p. 53, Water Tank Expansion - *The Mautucket Road water tank was repainted in 2005, followed by Victoria ~~Road~~ **Lane** repainting in 2006.*

p.58, Assessment of Rates, second bullet, reference to annual billing – Change to quarterly billing?

Volume II –

p. 21 (1.1.1)- replace the word *confirm* with *conform*.

p. 22 (1.1.3) – the link does not take the reader to the stated webpage.

The Town also has an Emergency Preparedness webpage available for residents:
(www.southkingstown.com/942/Hazard_Mitigation-Plan-Update)

p. 51 (2.5.1) replace the word *emergence* with emergency.

TOWN OF SOUTH KINGSTOWN, RHODE ISLAND

PLANNING DEPARTMENT

180 High Street
Wakefield, RI 02879
Tel (401) 789-9331 x1244
Fax (401) 789-9792

April 12, 2024

Kathleen Crawley, Acting General Manager
Rhode Island Water Resources Board
89 Jefferson Blvd.
Warwick, RI 02888

Re: South Kingstown Housing WSSMP Comprehensive Plan Update

Dear Ms. Crawley:

Please be advised that I have reviewed the Town of South Kingstown's Water Supply System Management Plan Five-Year Update and have found the plan to be consistent with the Town's adopted Comprehensive Community Plan. If you have any questions, please do not hesitate to contact me.

Sincerely,

James D. Rabbitt

James D. Rabbitt, AICP
Planning Director

Cc: Rich Bourbonnais, Director of Public Service
James Manni, Town Manager

APPENDIX I

WORKSHEETS

This document is required to be filled out as part of the requirements to complete the Water Supply System Management Plan 5-Year Updates. The purpose of these worksheets is to compile important water system data to support information within the WSSMP. When the WSSMP and worksheets are completed please send the excel document as an attachment via email or SharePoint folder.

WORKSHEET_1	Surface water sources
WORKSHEET_2	Groundwater sources
WORKSHEET_3	Water treatment facility information
WORKSHEET_4	Storage facility information
WORKSHEET_5	Pump facility information
WORKSHEET_6	Tranmission system description
WORKSHEET_7	Interconnection information
WORKSHEET_8	Master meter information
WORKSHEET_9	Major user information (uses greater than or equal to 3 million gallons per year)
WORKSHEET_10	Major user master meter information
WORKSHEET_11	Current, 5 year, and 20 year projections for non-account water
WORKSHEET_12	5 year and 20 year projections for aggreagted water-use customers
WORKSHEET_13	5 year and 20 year projections for major users
WORKSHEET_14	Well information for available water
WORKSHEET_15	Current, 5 year, and 20 year projections for available water
WORKSHEET_16	Past 3 fiscal years revenue and expenses

Source_ID	DOH_PWS_ID	Surface_Area_Acre	Intake_Size_In	Intake_Elevation_ft	Total_Storage_Capacity_MG	Useable_Storage_Capacity_MG	Watershed_Size_Acre	Legally_Imposed_Discharge_MGD	Existing_Discharge_MGD	Proposed_Discharge	Reservoir_Function	Status	Note
NOT APPLICABLE													

Source_ID	DOH_PWS_ID	Well_Type	Well_Depth_ft	Well_Diameter_in	Type_of_Pump	Age_of_Pump_years	Remaining_Useful_Life_of_Pump_years	Capacity_of_Pump_GPM	Size_of_Pump_Discharge_in	Pump_size_GPM	Column_Size_in	Head_ft	Screen_Length_ft	Top_of_Screen_Depth_from_Surface_ft	Depth_to_Suction_ft	Type_of_Auxiliary_Power	Slot_Size_in	Date_Well_Drilled_modayyear	Name_of_Well_Driller	Well_Drilling_Method	Casing_Material	Well_Status	Date_Redeveloped_or_Serviced_modayyear	Note
Well #1	1615623	Gravel Packed	56	18	Vertical Turbine	44		800	8	850	35'-8" x 1.5"	230	12'-4"	11'-8"	40	Electric		11/30/1979	R.E. Chapman		Steel	Other	Spring 2000	
Well #2	1615623	Gravel Packed	56	18	Vertical Turbine	47		575	8	575		240	15'-8"	5'		Electric	2/16"	2/10/1976	R.E. Chapman		Steel	Other	Spring 2001	
Well #3	1615623	Gravel Packed	47	12	Vertical Turbine	24		500	6	500		230	10'-0"		37	Electric	0.075	Aug-99	D.L. Maher	Rotary	Steel	Other	Spring 2001	

Treatment_Facility_ID	Source_ID_Treated	Latitude_decimal_degree	Longitude_decimal_degree	Design_Flow_MGD	Max_Flow_MGD	Standby_Power	Power_Demand_of_Facility_KW	Power_of_Standby_Generators_KW	Chemical_Feed_Equipment	Note
NOT APPLICABLE										

WORKSHEET 3 WATER TREATMENT FACILITY INFORMATION

Storage_Facility_ID	Latitude_decimal_degree	Longitude_decimal_degree	Storage_Facility_Type	Total_Storage_Volume_gallons	Usuable_Storage_Volume_gallons	Facility_Age_year	Facility_Condition	Date_of_Last_Inspection_modayyear	Construction_Material	Interior_Pa	Cathodic_Protection	Note
Mautucket Road Tank			Elevated Storage Tank	400,000		1970		2020	Steel	Good		
Succotash Road Tank			Elevated Storage Tank	400,000		1970		2020	Steel	Good		

Pump_Station_ID	Latitude_decimal_degrees	Longitude_decimal_degrees	Type_of_Pump_Station	Type_of_Pump	Capacity_of_Pump_GPM	Hydropneumatic_Storage_Tank	Power_Demand_of_Facility_KW	Emergency_Power	Generator_Power_Rating_KW	Note
Pump Station #1			Transmission	Vertical In-Line	700		July 770 KW-hrs./day December 340 kW-hrs./day	No		
Pump Station #2			Transmission	Vertical In-Line	450		(combined)	No		
Card's Pond Pump Station			Booster	Vertical In-Line	Pump #1 150 Pump #2 500			No		

WORKSHEET 5 PUMP FACILITY INFORMATION

Transmission_Line_ID	Material	Age_of_Line_year	Diameter_in	Total_Length_ft	Condition	Note
Source Transmission Line (PS1 to Beach Rd.)	Asbestos_Concrete	1970	14	1750	Good	
Mautucket Tank Line	Asbestos_Concrete	1970	12	185	Good	
Succotash Tank Line	Asbestos_Concrete	1970	12	100	Good	
Matunuck School House Road	Asbestos_Concrete	1970'S	12	14462	Good	
Card's Pond Road	Asbestos_Concrete	1970'S	12	6177	Good	
Succotash Road	Asbestos_Concrete	1975	12	8275	Good	
Matunuck Beach Rd.	Asbestos_Concrete	1975	10, 12	11399	Good	
Beach Rd. (Green Hill Area)	Asbestos_Concrete	1975	8, 10, 12	4446	Good	
Succotash Rd.	Ductile_Iron	1990	12	6156	Good	

WORKSHEET 6 TRANSMISSION SYSTEM DESCRIPTION

Interconnection_ID	Supplier_Connected_To	Valve_1_Location	Valve_1_Ownership	Valve_2_Location	Valve_2_Ownership	Direction_of_Flow	Interconnection_Type	Type_of_Flow	Average_MGD_Water_Delivered_or_Received	Average_Annual_MG_Water_Delivered_or_Received	Frequency_Water_Delivered_or_Received	Tranmission_Main_Capacity_MGD	Transmission_Main_Condition	Note
South Shore - Route 1	Veolia (formerly Suez, United)	at Wholesale Meter Pit	South Kingstown			Receiving	Wholesale		0.31 - 0.35	114 - 128	Daily	1.25	Good	
South Shore Jerusalem	Town of Narragansett	E. Matunuck State Beach	Narragansett			Both	Emergency		0	0	Emergency Basis	1.25	Good	
Middlebridge	Veolia (formerly Suez, United)	East Bank Pattaquamscutt River near Midddlebridge Rd.	Veolia (formerly Suez, United)			Receiving	Wholesale		0.028 - 0.077	13.19 - 18.52	Daily	1	Good	

Meter_ID	Meter_Location	Device_Type	Reading_Frequency	Recording_Registar	Units_of_Registar	Multiplier_if_applicable	Date_Installed	Size_of_Meter	Connection_Size	Testing_Frequency	Date_Last_Serviced	Date_Last_Calibrated	Note
Well Production	Well Field	Magnetic Flow Meter	Daily	Circular Chart Totalizer	Gallons								
Narragansett 1	Jerusalem (E. Matunuck State Beach)	Turbine	Yearly	Dial w/Totalizer	Cubic Feet								
Middlebridge	Middlebridge Rd.	Turbine	Monthly	Dial w/Totalizer	Cubic Feet								
South Shore	Torrey Rd.	Turbine	Monthly	Dial w/Totalizer	Cubic Feet								
South Shore	Route 1 - Kettle Pond	Turbine	Monthly	Totalizer	Gallons								

WORKSHEET 8 MASTER METER INFORMATION

Major_User_Name	Major_User_Address	Major_user_primary_use_description	Note

NOT APPLICABLE

WORKSHEET 9 MAJOR USER INFORMATION (USES GREATER THAN OR EQUAL TO 3 MILLION GALLONS PER YEAR)

Major_User_Name	Date_Installed	Reading_Frequency	Units_of_Registar	Multiplier_If_applicable	Size_of_Meter	Testing_Frequency	Date_Last_Calibrated	Note
NOT APPLICABLE								

Non-Account Type	MIDDLEBRIDGE	Current_Year	5_Year	20_Year	Note
Year		2023	2028	2043	
Fire Fighting		20,000	22,000	24,000	
Non-Account Water					
Main Flushing - System Maintenance		15,900	17,490	19239	
Storm Drain Flushing					
Sewer Cleaning					
Street Cleaning					
Schools and Other Public Buildings					
Landscaping in Public Areas					
Swimming Pools					
Construction Sites					
Water Quality and Other Testing					
Process Water at Treatment Plants					
Other Unmetered Uses		4,379,340	4,598,307	4,828,222	
Leakage, Theft, Meter Error					
Total_NonAccount_MG		4,415,240	4,637,797	4,871,461	
Percent_NonAccount (Total NonAccount / Total Water Produced and Purchased)		28.50%	34.30%	35.00%	
Non-Account Type	**SOUTH SHORE**	**Current_Year**	**5_Year**	**20_Year**	**Note**
Year		2023	2028	2043	
Fire Fighting		100,000	110,000	121,000	
Non-Account Water					
Main Flushing - System Maintenance		1,256,660	1,382,326	1,520,588	
Storm Drain Flushing					
Sewer Cleaning					
Street Cleaning					
Schools and Other Public Buildings					
Landscaping in Public Areas					
Swimming Pools					
Construction Sites					
Water Quality and Other Testing					
Process Water at Treatment Plants					
Other Unmetered Uses		9,886,880	11,901,783	12,496,872	
Leakage, Theft, Meter Error					
Total_NonAccount_MG		11,243,540	13,394,109	14,138,460	
Percent_NonAccount (Total NonAccount / Total Water Produced and Purchased)		9.80%	10.70%	10.08%	

WORKSHEET 11 CURRENT, 5 YEAR, AND 20 YEAR PROJECTIONS FOR NON-ACCOUNT WATER

User_Type SOUTH SHORE	5_year_total_annual_MG	5_year_ADD	5_year_MDD	20_year_total_annual_MG	20_year_ADD	20_year_MDD	Notes
Residential_single	123.26	373,335	875,324	130.23	356,912	910,126	
Residential_multi							
Commercial							
Industrial							
Government							

User_Type MIDDLEBRIDGE	5_year_total_annual_MG	5_year_ADD	5_year_MDD	20_year_total_annual_MG	20_year_ADD	20_year_MDD	Notes
Residential_single	13.387	366,679	93,531	13.791	37,785	96,354	
Residential_multi							
Commercial							
Industrial							
Government							

WORKSHEET 12 5 YEAR AND 20 YEAR P0ROJECTIONS FOR AGGREGATED WATER-USE CUSTOMERS

Major_User	5_year_total_annual_MG	5_year_ADD	5_year_MDD	20_year_total_annual_MG	20_year_ADD	20_year_MDD	Notes

NOT APPLICABLE

Well_Information	Well_1_Data	Well_2_Data	Well_3_Data	Well_4_Data	Well_5_Data	Well_6_Data	Well_7_Data	Well_8_Data	Well_9_Data	Well_10_Data	Notes
well_name											
well_ID	1615623	1615623	1615623								
town_name	South Kingstown	South Kingstown	South Kingstown								
aquifer_well_withdrawing_from_name											
name_original_driller	R.E. Chapman	R.E. Chapman	D.L. Maher								
date_last_aquifer_test											
name_entity_conducted_last_aquifer_test											
last_aquifer_test-pump_rate_gpm											
last_aquifer_test-duration_hr											
last_aquifer_test-pump_capacity_gpm											
last_aquifer_test-yield_gpm											
last_aquifer_test-specific_capacity_gpm/ft											
last_aquifer_test-transmissivity_sqft/day											
depth_bedrock_ft											
aquifer_staturated_thickness_ft											
depth_from_watertable_to_bottom_well_ft											
watertable_elevation_ft											
ground_elevation_ft											
current_pumping_volume_gpm											
well_rating_gpm	700	450	500								
well_max_pump_rate_gpm	850	575	500								
number_observation_wells											

condition	SOUTH SHORE	Current_Year	5_Year	20_Year	Note
Year		2023	2028	2043	
groundwater_capacity (MGD)		1.3	1.3	1.3	
surfacewater_operational_safe_yield					
water_purchased (MG)		123.26	125.317	130.233	
total_available_water (MG)		123.26	125.317	130.233	
average_daily_demand (GPD)		337,744	373,335	356,912	
max_daily_demand (GPD)		861,324	875,505	910,126	
condition	MIDDLEBRIDGE	Current_Year	5_Year	20_Year	Note
Year		2023	2028	2043	
groundwater_capacity (MGD)		0.3	0.3	0.3	
surfacewater_operational_safe_yield					
water_purchased (MG)		13.258	13.387	13.791	
total_available_water (MG)		13.258	13.387	13.791	
average_daily_demand (GPD)		36,043	36,679	93,531	
max_daily_demand (GPD)		91,919	37,785	96,354	

WORKSHEET 15 CURRENT, 5 YEAR, AND 20 YEAR PROJECTIONS FOR AVAILABLE WATER

rev_exp_type	Fiscal_Year_1	Fiscal_Year_2	Fiscal_Year_3	Note
Year	2020	2021	2022	
annual_water_rate_revenue	$873,995	$894,628	$893,619	
general_facility_charge_revenue	$281,050	$285,949	$267,529	
special_assessment_revenue	$10,201	$9,546	$12,495	
capital_funds	$879,925	$79,004	$157,440	
reserve_fund_revenue	$3,166	$4,480	$2,200	
other_earned_revenue	$82,347	$51,536	$0	
other_unearned_revenue	-$39,961	-$51,119		
total_revenue	$2,090,723	$1,274,024	$1,333,283	
annual_water_system_indebtedness	$216,145	$300,536	$263,950	
debt_service_on_bonds	$0	$0	$0	
operation_maintenance_expenses	$512,139	$679,798	$704,595	
other_exenses	$225,104	$225,406	$248,137	Depreciation
total_expenses	$953,388	$1,205,740	$1,216,682	

WORKSHEET 16 PAST 3 FISCAL YEARS REVENUE AND EXPENSES