VEOLIA

VEOLIA, SOUTH KINGSTOWN

Executive Summary

SEPTEMBER 2024

Water-Supply System Management Plan
Wakefield, Rhode Island

WRIGHT-PIERCE
Engineering a Better Environment

Water-Supply System Management Plan
Wakefield, Rhode Island
Veolia, South Kingstown

September 2024

Prepared For:

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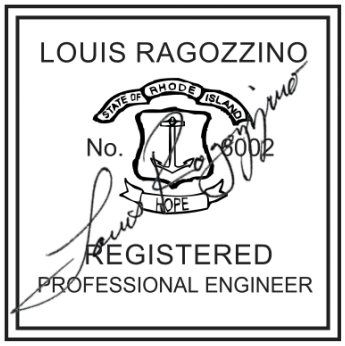

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1.1 Introduction

This Executive Summary for the Veolia Rhode Island (fka SUEZ Rhode Island) Water-Supply System Management Plan (Plan) 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, dated October 2002, 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 Plan maintains consistency with the goals and policies of the Comprehensive Plan of the Town of South Kingstown, July 1992, as amended May 2005, 2014, and 2021, and the Comprehensive Plan of the Town of Narragansett (2015, as amended 2017). Additional plans that have been incorporated into the update include the following:

- Water Resources Board (WRB) 2012 Strategic Plan
- State Guide Plan Element 721, Report 115, Rhode Island Water 2030
- Rhode Island State Land Use Policies and Plan – Land Use 2025
- United Water (SUEZ) Rhode Island Demand Management Strategy, prepared by Pare Corporation, December 2012 (included in Appendix A)

Common goals expressed in these plans, such as water source protection and control of land development, have been reviewed prior to development of this plan.

This revised Plan is set up in a manner which is consistent with the format of the Water Supply System Management Plan (WSSMP) check list. Worksheets, tables, and figures are located at the end of the WSSMP to complement the presentation of data and to facilitate review.

The goal of this Plan is to comply with the provisions of the Water Supply Planning Regulations, previously referenced, by developing a comprehensive water supply management plan for the Veolia Water Rhode Island (Veolia) 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 Veolia Water Rhode Island customer base.

The goals of the South Kingstown Comprehensive Plan and the Narragansett Comprehensive Plan are to maintain the high quality of residential life within the subject service areas, while controlling the future rate of growth. These goals are recognized herein, and their contents are referenced in the development of future water demand projections. Additionally, the region has opportunities for economic development through areas in and around the special planning districts of both communities, as well as within other industrial and commercial zoned portions of the water supply service area.

The goals of the WRB 2012 Strategic Plan include the following:

1. Regulate the proper development of the water resources of the State
2. Regulate the proper protection of the water resources of the State
3. Regulate the proper conservation of the water resources of the State
4. Regulate the proper use of the water resources of the State

The goal of this plan is furthermore consistent with the overall goal of the RI State Guide Plan No. 721, Report 115 Rhode Island Water 2030, which is to develop a long-range program to improve the quantity and quality of water required by the citizens within the service area in the most cost effective and environmentally sound manner.

The goals of the Rhode Island State Land Use Policies and Plan – Land Use 2025 are to guide future land use and development and present State Guide Plan policies under which State and local land development activities will be reviewed for consistency.

The goal of the Veolia Rhode Island Demand Management Strategy is to establish water use targets as indicated below:

1. Residential average annual water use of 65 gallons per capita per day (gpcd)
2. Efficient outdoor water use
3. Efficient indoor water use
4. A full accounting of non-billed water
5. Leakage of no more than 10%
6. Accurate metering and billing

1.1.1 R.I. Gen. Laws § 46-15-2

The water supply system must be in accordance with the following RI General Laws:

§ 46-15-2. Approval of public water supply facilities.

(a) No municipal water department or agency, public water system, including special water districts or private water companies, engaged in the distribution of water for potable purposes shall have any power:

(1) To acquire or take a water supply or an additional water supply from an existing approved source;

(2) To take or condemn lands for any new or additional sources of water supply or for the utilization of supplies;

(3) To extend its supply or distribution mains into a municipality or special water district wherein it has not heretofore legally supplied water;

(4) To construct any extension of its transmission mains;

(5) To extend the boundaries of a special water district; or

(6) To supply water in or for use in any other municipality or civil division of the state which owns and operates a water supply system therein, or in any duly organized special water district supplied with water by another municipal water department or agency, special water district, or private water company, until the municipal water department or agency, special water district, or private water company has first submitted the maps and plans therefor to the director of the department of health, the state planning council and the board, as hereinafter provided, and until the water resources board, after receiving the recommendations of the director of the department of health and the division of statewide planning, shall have approved the recommendations or approved the recommendation with modifications as it may determine to be necessary; provided, however, this subsection shall not apply to any area presently served by any municipal water department or agency, or special water district.

(b) Approval shall not be necessary of any plan or work for the extension of supply or distributing mains or pipes of a municipal water supply plant or special district or private water company into and for the purpose of supplying water in any territory within the limits of the municipality or special district or within the franchise area of the private water company, owning the plant, including territory within the municipal special district or franchise limits which has not been heretofore supplied with the water by the plant, nor for the reconstruction or replacement of existing facilities in connection with an existing plant, wherein the capacity of the plant is in no way increased, nor for the construction of filtration or other treatment facilities which will not in any way increase the amount of water which can be made available from the present sources of supply. Notwithstanding any provision of this section to the contrary, a municipal water department, agency, or public water system governed under this section shall review applications for plans or work for the extension of supply or distribution mains or pipes in accordance with the following standards:

(1) The application must not be prohibited by the specific language of the latest water supply system management plan ("WSSMP") of the public water supply system;
(2) The application must comply with the design and construction standards and specifications established by the public water supply system for the sizing and location for the infrastructure;
(3) The extensions shall not reduce the necessary level of fire protection for the community;
(4) All water main and service connection materials, construction, and inspection required hereunder shall be at the sole cost and expense of the applicant;
(5) The public water supply system shall be granted an easement in a form acceptable to them which shall permit the maintenance, repair, or replacement of water lines and all other related activities;
(6) For applications for single-family residential lots, the applicant must show that:

(i) The existing or proposed well for the property does not meet the well industry standard as described in the department of environmental management regulations for "yield per depth of well chart" which is required by the department of health for a dwelling unit; and
(ii) Due to the unique characteristics of the property that the drilling of a new well is not feasible;

(7) For applications located within a public water supply system with limited capacity, applicants for commercial uses/properties shall be governed by the rules established for such connections by the public water supply system, which shall be in accordance with the system's approved WSSMP.

A public water supply system governed under this section may provide for lower standards for approval for residential property if such standards meet the requirements of the agency's state-approved WSSMP, and such WSSMP is not expired.

(c) The water resources board shall enforce the provisions of this section, and the superior court by injunction may, upon application of the water resources board, prevent any action to be taken by any municipal water agency or department, special district, or private water company without the approval of the water resources board as required by this section.

1.2 Background

Veolia North America is a global water, waste, and energy management group. Veolia owns and operates a public water supply and distribution system in a non-exclusive territory that serves portions of the Towns of South Kingstown, Narragansett, and the Village of Point Judith. Neighboring water purveyors located in the area include the Town of South Kingstown Utilities Department, the Town of Narragansett Water Division, the Town of North Kingstown Water Department, the Kingston Fire District, and the University of Rhode Island Utility System. Figure No. 1 and Figure No. 2 show an overview of the Veolia system and Figure No. 2 illustrates the spatial relationship between these systems.

Wakefield Water was incorporated in 1887 by George Alexander, Benjamin C. Mudge, George T. Lamphear, and Benjamin R. Curtis with the intent of furnishing water to the Town of South Kingstown and neighboring communities. In 1956, General Waterworks purchased the Wakefield Water Company. Later in April 1994, SUEZ Water Resources Inc. merged with GWC Corporation, the parent company of General Waterworks. The following year, the Wakefield Water Company was renamed to United Water Rhode Island (UWRI). Twenty years later, SUEZ Water changed names to SUEZ Water Rhode Island (SWRI). Finally, in 2022, Veolia acquired the water supply system from SUEZ. In 2022, Veolia provided water to approximately 40% of the combined populations of the Town of South Kingstown and the Town of Narragansett, either directly or through wholesaling. Information pertaining to the incorporation of the Veolia system is included in Appendix B.

Veolia is organized as a Corporation under the Laws of the State of Rhode Island. Veolia is a 100% subsidiary of Veolia Resources, Paramus, NJ, which is a wholly own subsidiary of Veolia, Paris, France. The CEO of Veolia North America is Frédéric Van Heems. Table 1 provides a listing of key executive personnel and their positions.

Water system management and day-to-day operations are the responsibility of the Company Manager, Christopher Jacobs, and staff. Figure No. 3 provides an organizational chart of the Veolia's personnel structure and responsibilities. Veolia currently employs 10 persons to operate and maintain the water distribution system, and the staff is of adequate qualifications, number and experience to effectively and efficiently perform such duties.

The Rules, Regulations and Rate Schedule for Veolia, in Appendix C, provides the legal basis for all water distribution related issues within the water supply system as approved by the State of Rhode Island Public Utilities Commission (RIPUC). While compliance with State Rules and Regulations governing water supply systems establishes the framework for Veolia 's operations, Veolia may periodically develop policies (typically adopted by company resolution) for implementing specific water system goals and programs.

1.3 General System Description

The Veolia Rhode Island water system consists of the following components:

- Two well fields
- Treatment facilities (at each well field)
- Six pump stations (one at each well field and four in the distribution system). (Two pump stations in the distribution system are out of service)
- Five storage facilities (one at each well field and three distribution system tanks)
- Transmission system
- Seven system interconnections

The system relies on all components functioning in concert. The two well fields, Howland and Tuckertown, produce finished water by utilizing pumps and treatment facilities. The well fields have storage capacity in the form of clear wells. The finished water is then pumped through the pump station (Howland or Tuckertown) into the transmission system. The transmission system functions to distribute water to customers and to provide or draw water from the storage facilities in the transmission system. The three distribution system storage tanks serve to even out periods of low and high demand. If the aggregate customer demand exceeds the total finished water produced from the well fields, the tanks will provide the additional finished water to meet demand.

1.4 Water Supply Sources

The singular source of raw water supply for the Veolia water system is groundwater. Two well fields located within the same groundwater aquifer accommodate 100% of the service area demand. After treatment at the well fields, water is supplied either directly into the distribution system for consumption or serves to augment storage volumes within the storage facilities. Figure No.1 provides a graphic illustration of the location of each of the wells and associated pumping stations. Appendix D includes a 2,000- foot radius plan of both well fields.

There are, at present, a total of seven gravel-packed wells and six booster pumping stations (two of which are out of service) that comprise the source water supply portion of the Veolia water system.

Overall, the operation and productive capabilities of the system to meet the needs of the water service community have been efficient and capable, with the ability to supply potable water of good to superior quality to the service population being readily maintained.

1.5 Water Treatment Facilities

Raw water is treated at both the Tuckertown and Howland well fields. Lime is added to provide for the adjustment of pH values for corrosion control, which in effect, raises the pH from an initial value of approximately 5.8 to approximately 7.6. Sodium hypochlorite is also injected into the water at both locations to provide for disinfection in such a manner as to maintain a 0.5 mg/1 free chlorine residual. In addition, zinc orthophosphate is also added to the water for corrosion control and raw water is passed through an aerator for the removal of carbon dioxide. Full emergency power is available through an emergency generator. The Veolia system does not utilize filtration or treatment tanks, so no sludge is discharged or disposed of offsite.

1.6 Storage Facilities

The Veolia water system includes five storage facilities (one at each well field and three in the distribution system). The clear wells at each well field site function as storage facilities and there are three remaining storage facilities located throughout the service area. All storage facilities are constructed of steel, with the storage facilities in the distribution system being of standpipe configuration, and the clear wells being of the reservoir type. The facilities were inspected as part of RIDOH sanitary surveys, the most recent one being in 2023. The status of all three distribution storage facilities is continuously transmitted via telemetry to the control system located at the Tuckertown well field site which responds to changes in storage levels.

The controls are set up in the form of a matrix which allows selection of the water level in any of the three distribution storage tanks to operate the booster pumps at either or both well fields. This remote transmission allows a continuous charting and digital display of facility water levels at the control location or can also be monitored via computer phone modem to the Veolia office for management overview as well as for the Chief Plant Operator to monitor from their home or vehicle. Recent improvements to the storage system include the

replacement of the Tower Hill tank as well as Sherman Tank (completed June 2018), and the replacement of water mains on River Street, Winchester Drive, Bonnet Point Road, Alan Avenue, and Ocean Road. The overall reliability of the facilities is generally good.

1.7 Pumping Stations

The Veolia water-supply system includes five booster pumping stations, one each located at the Howland and Tuckertown well fields, and the location of the remaining three booster stations being depicted on Figure No. 7. The booster stations provide how water from the well fields can be supplied to the system. Information regarding each of the pump stations is available on Worksheet No. 5. The two well field pump stations are equipped with three centrifugal pumps, two of which alternate automatically, with the third maintained as an emergency back-up. The operation of the pump stations is automatically controlled by the water level in any of the three distribution storage facilities.

1.8 Raw and Finished Water Transmission Facilities

The system's water transmission mains convey potable water between the well pumping stations, the booster pumping stations, the water supply service area, and the system storage facilities. The system employs a well dispersed and generally strong grid layout to provide and maintain satisfactory reliability and redundancy. The entire distribution system is fully interconnected, with the Sherman Tank, Tower Hill Tank, and Boston Neck Tank at overflow elevations of 248.0, 245.0 and 180.0 feet respectively. This configuration allows the system to be operated as a single pressure zone and also permits both well fields to supply all parts of the system. The early portions of these mains date back to 1887 and are typically 6 to 16 inches in diameter.

These components of the treatment and transmission facilities are routinely monitored, repaired and/or upgraded to maintain performance reliability.

Veolia customer service representatives are also trained to be attentive and alert to possible leaks whenever in the vicinity of customer components (i.e., meter, curb stop, hydrant, valve). In addition, storage facilities, production records, and distribution system pressure are continuously monitored daily to detect unusual or abrupt changes in performance.

1.9 Distribution Facilities Including Low and High Service

The entire distribution system is fully interconnected, with the overflow elevations of the distribution system storage tanks being designed to assist with the control pressure in their zones.

1.10 Planned Extensions

There are presently no major planned extensions of the water distribution system.

1.11 Interconnections

Veolia currently maintains a total of seven system interconnections with neighboring water utilities. Two interconnections for the wholesaling of water are maintained with the Middlebridge section of the Town of South Kingstown Utilities Department. Veolia is the sole source of supply to the Middlebridge system, with the Torrey Road interconnection as the primary means of supply. In 2008, the wholesale meter at Torrey Road was replaced with a larger 12-inch Mag meter. Also, an interconnection with the South Kingstown South Shore Water System was placed in service in 2008. Likewise, three interconnections are operated with the Town of Narragansett Water Division for supply of water to the Point Judith and North End sections of its distribution system. Veolia Rhode

Island is responsible for the calibration and meter testing at the emergency interconnection to SK as well as the two meters controlling the Middlebridge Road system. The Town of Narragansett is responsible for calibration and testing of our interconnection meters wholesaling water to their system. Worksheet No. 7 describes each of these interconnections.

1.12 Population Served and Projections

Veolia supplies a significant portion of the Towns of Narragansett and South Kingstown, which includes a various array of structures (i.e., residential, commercial, industrial, governmental), that are serviced by Veolia.

All undeveloped areas within the water service area are eligible to be served as the demand requires, and depending upon the circumstances involved, Veolia or the property developer may extend existing water main lines and associated appurtenances necessary for the adequate supply of water into those areas. Extension of water distribution lines outside of the present service area is contingent upon formal approval of Veolia and is subject to the hydraulic feasibility of the current system to accommodate any such extensions. In either case, the new mains would become the property of Veolia following satisfactory installation, testing and acceptance.

There continues to be a portion of the service area which depends primarily on private well systems. Most of these private wells are associated with single family residences; however, some wells provide water to commercial and industrial facilities within the service area. These private well systems and their service population would also be eligible to be served by the Veolia system; again, contingent upon formal approval of Veolia.

Table 1 presents the current and projected services populations for the Veolia water supply system.

Table 1: Present and Projected Service Population

2021	2026	2041
22,195	22,860	24,970

1.13 Major Users

In addition to its two wholesale customers, Veolia supplies water to seven other major users, including South County Hospital, URI Bay Campus, Hampton Inn, South Shore Village, Rose Hill Gold Club, Stop and Shop Plaza, and Whaler's Brewing. These major users are involved in a range of operations from residential, governmental, health services, commercial, and recreational. The water consumed by South County Hospital is the most significant of all the major users.

1.14 Metering

1.14.1 Master Meters

All the water pumped from the Veolia groundwater supply system is metered at each well field. These Master Meters provide 100% source metering and are provided with corresponding transmitters which allow a continuous charting and digital display of well field production at both sites. These meters are checked and calibrated annually.

1.14.2 Distribution Meters

Every residential, commercial, industrial and government customer serviced by the Veolia's water supply distribution system is metered, thus providing 100% distribution metering. Wholesale meters are read daily and

billed on a monthly basis. Residential users are also billed monthly. Most commercial, industrial, and seasonal users are read on the same cycle and billed monthly. The larger users are also read and billed monthly.

It should be noted that Veolia does not meter the volume of water consumed within its own water supply facilities, since most of this water is re-routed back into the discharge main. Only the amounts of water utilized for sanitary purposes at both well fields are not quantified accurately.

Veolia is currently involved in a meter replacement program to provide Advanced Metering Infrastructure (AMI) meters. The company currently has about 30% of the AMI meters installed, with the remaining approximately 70% radiofrequency (RF) meters. The existing RF meters remain from the previous meter replacement program. The order of scheduled meter replacement is determined by meter age, with the older meters having priority over newer meters. This new technology will enable Veolia to track customer use more aggressively and more accurately identify possible leaks. Upon completion of the program all meters will be of the AMI type.

Meter testing and calibration is provided by Veolia on a request (from Owner) basis, in the event of meter failure, or when owner use dramatically changes. Additionally, random meter testing is performed by Veolia personnel as manpower requirements dictate. Small user meters (less than 2") are tested and calibrated on a 20-year cycle or whenever the meter register rolls over, if that occurs first. This testing is performed by an outside contractor. Maintenance of these meters is generally not performed unless it can be accomplished efficiently. Normally, since Veolia does not maintain a meter repair shop, the meters are simply replaced. Larger meters (2" and above) are tested and calibrated every two years. Wholesale meters are checked and calibrated annually. This work is performed by an outside contractor through competitive bidding. Typically, the same company performs necessary repairs or replacements in a timely manner. Meters for the system's major users, are read monthly and are listed in Worksheet No. 10. Major user meter data are described in Worksheet No. 11.

1.15 Legal Agreement

In addition to the implied legal obligations associated with the Veolia corporate regulations defining the responsibility of Veolia to furnish potable water to its customers, the company is also legally bound to provide water to its wholesale customers. The company maintains legal agreements with the Town of South Kingstown Utilities Department and the Town of Narragansett Water Division for the supply of water. While Veolia Rhode Island is regulated as a public water supply, no additional specific legal obligations or contract agreements exist regulating Veolia’s provision of water.

1.16 Unaccounted-For Water

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. This unaccounted-for water typically consists of water consumed for both authorized and unauthorized uses. Authorized uses include water main/storm drain flushing, sewer/street cleaning, landscaping in public areas, construction sites, etc. It also includes water, which 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 use, etc. Veolia has instructed the use of a bulk metering system located at the Tuckertown Well Field for pool filling companies, towns, and contractors to reduce the amount of unaccounted-for water. The bulk metering system was put into effect in July 2016. Veolia's estimated percentage of system unaccounted-for water is currently 5.40%, well in line with the desired State goal of 15%.

It should be noted, as sections of this plan describe, that Veolia has several programs in existence which endeavor to promote the maximum efficiency of its water use and curtail even further the degree of unaccounted-for water.

1.17 Demand Management

1.17.1 General

Demand management consists of those conservation measures which 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 Rhode Island Water Resources Board has developed a guidance document, dated May 16, 2011, entitled, "Rules and Procedures Governing the Water Use and Efficiency Act for Major Public Water Suppliers" and the purpose of the document is to establish targets and methods for efficient water use.

The demand management program proposed herein will, therefore, focus predominantly on those measures and approaches which achieve permanent long-term water savings without requiring major user habit changes. The five 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 most effective measures are those that achieve long-term water savings without great expense, effort, or inconvenience to water users (e.g., installation of water-saving devices and technologies, manufacturing process changes, or pressure reduction). In comparison, the effectiveness of water use restrictions and other methods that require intensive participation or habit changes are likely to diminish over time.

1.17.2 Goals

The demand management goals of Veolia are divided into short-term and long-term goals, summarized as follows:

Short-Term Goals

1. minimize peak demand use requirements; and
2. implement system-wide Residential Retrofit Program.

Long-Term Goals

1. minimize average demand use requirements; and
2. provide water-use audit services to all major users.

1.18 Supply Management

The Veolia system's historic water production volumes for the past five years of available data are presented below.

Table 2: Summary of Historic Water Production (Thousand Gallons)

2017	2018	2019	2020	2021
651,246.0	629,025.0	649,224.0	647,959.8	622,080.2

1.19 Available Water

It is the overall objective of Veolia 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. This information will then be compared to the average and maximum day demands for existing and expected future system conditions. Also included is a discussion of the system's overall ability to meet the future system needs including, as necessary, identification of timing and quantity of additional supplies and associated facilities.

1.19.1 Aquifer Yield

Veolia is committed to the ongoing assessment of water availability, aquifer yield data, and the impacts of withdrawals in the Mink aquifer to ensure adequate water supplies and to identify any long-term trends or impacts. This comprehensive analysis will be directly connected to Veolia's initiatives to minimize leakage, non-account water, and enhance overall water efficiency. By closely monitoring and evaluating the availability of water in the Mink aquifer, Veolia aims to address concerns about seasonal intermittent flows in Mink Brook and the potential impacts on freshwater wetlands in the area, as noted by the Department of Environmental Management. The hydrogeologic analysis presented in the WSSMP indicates that the Mink Brook Aquifer is partially recharged by groundwater flow from the larger Chipuxet system, with evidence of seasonal intermittent flows since 1979. Despite the long operational history of Veolia's wells, it remains essential to consider the possibility that local pumping may contribute to these intermittent flows. Therefore, Veolia will continue to prioritize efficient water use and the reduction of leakage to ensure the sustainability of current groundwater sources for future use. Veolia is also investigating additional sources of water supply outside the Mink aquifer to reduce the impact in this resource area.

Currently available yearly production data from Veolia indicate that to date, the peak demand year for its well fields in the Mink Brook watershed occurred in 2020. Approximately 1,204 million gallons were pumped that year from the MBA (i.e., an average of 3.30 mgd). The demand value for Veolia pumpage from its wells in the MBA projected to the year 2035 is 1,357 million gallons per year (3.72 mgd). Given the historical ability of the Veolia supply wells and MBA to sustain pumpage at about 3 mgd, and the current land-use and recharge characteristics of the hydraulically connected Chipuxet River watershed and associated glacial outwash deposits, the current and projected Veolia demands are considered to be sustainable by the local groundwater resources.

Although the ability to calculate an exact aquifer yield value for the MBA and associated lower portion of the Chipuxet River watershed is limited due to the currently available site-specific hydrogeologic data, Wild and Nimroski (2004) indicate that at the 50th percentile, the estimated gross yield of the Chipuxet River watershed (from baseflow calculations) during the typical annual lowest-flow condition month of September is approximately 15.90 mgd. As previously discussed, available historic pumpage data for the Veolia supply wells during the peak

demand summer months (including September) indicate that some portion of the 15.90 mgd annual low-flow yield in the Chipuxet River basin is available as recharge (either as direct inflow or as replenishable storage) to the MBA and is expected to continue to be available in order to meet the projected future average daily demand of 3.42 MG for 2035.

1.19.2 Safe Yield

The capacity of the well or well field is evaluated to determine if adequate supply is available. In conformance with the Division guidelines, 90% of the well/well field capacity can be utilized towards determination of the system's available water.

1.20 Anticipated Future Demands

1.20.1 Future Demand Analysis

It should be noted that the development of future projections assumed reasonable estimates for unaccounted-for water and would, therefore, reflect the total amount of water supply needed (i.e., total pumping supply) to meet overall system demands.

It is anticipated that the present levels of available water will be more than sufficient to accommodate the expected growth in the system average and maximum day demands.

When developing these scenarios, no consideration was made for anticipated "water savings" other than reduction in the level of unaccounted-for water, therefore, allowing the demands to be evaluated on a worst-case scenario. It is anticipated that a future water conservation target in the region of 10% will only help to further ensure an efficient and adequate supply of source water throughout the 5- and 20-year planning horizons.

1.20.2 Growth in Demand

The intent of this section is to project the future water demands expected of the Veolia water supply system for the 5- and 20-year planning periods. To best project future water use, several factors must be considered and evaluated for both the Town of South Kingstown and Town of Narragansett portions of the service area; some of which include changes in population density, industrial and commercial water use and development, wholesale of water to adjacent systems, seasonal influx, economic development, changes in the service area, land use, water quality, water use rates, and conservation measures.

In an effort to quantify the likely growth expected in Veolia demands during the planning horizons of this plan, the Narragansett and South Kingstown Community Comprehensive Plans, completed in recent years, were reviewed. These documents focus primarily on current and future trends in each Town and allow a determination of the availability of opportunities for population and economic growth in both Towns. The potential impact that these opportunities will likely have on future growth of both wholesale users, as well as within Veolia's own service area, have been analyzed.

1.20.3 Narragansett

The Town of Narragansett Comprehensive Plan – Baseline Report, dated September 5, 2017 presents build out information. A population projection prepared by the Rhode Island Division of Statewide Planning (RIDSP) was developed in 2013 estimates that the Town population in 2040 will be 16,411. These estimates would amount to an approximate population increase of less than 1 percent between 2020 and 2040. Narragansett was one of the only

municipalities to lose population between 2010 and 2020, so near-term future population increases are expected to be small. The impact on demand should be minimal in the short term as a result of the increase.

The majority of future growth in the Town is expected to consist of residential development which continues to be the Town's dominant land use. Economic development in the Town is not expected to increase significantly during the next 5- to 20-year periods due to limited availability of developable industrial land.

An analysis of current and future Town land use mapping as well as a plot of development constraints depicts the availability of developable land in the vicinity of the Veolia service area (Figure No. 14). The map, along with a buildout summary included in the Comprehensive Plan, indicates that much of the area served by the Veolia distribution system in the Town is located in Low density, Moderate-Low density and High density developed areas, with small commercial and minimal industrial regions. The impact of expected growth in the Veolia service area within the Town of Narragansett will largely result from expansion to its residential consumer base, with minimal growth expected in commercial and industrial sectors. The Comprehensive Plan also indicates that an additional 1,009 year-round homes could be built on existing vacant or underutilized lots. When or if these homes will be constructed is uncertain. It is assumed that it will take 20 years for the Town to be fully built out, within the time frame of the Comprehensive Plan.

1.20.4 South Kingstown

A review of the South Kingstown Comprehensive Community Plan (adopted 2021) was completed to develop a basis for understanding current and anticipated land use practices in the Town. The plan indicates that the majority of Town land is undeveloped or zoned residential and less than 1% is zoned commercial.

The plan indicated that population in the Town increased significantly between 1970 and 1990, with a 20.7% increase in each decade. Between 1990 and 2000, the population increased by 13.4% and between 2000 to 2010, the population increased by 10%. Between 2010 and 2020, the population increased by 5%. The rate of population growth has decreased over the past three decades, however, the percent of Rhode Island population that South Kingstown represents has been slowly increasing. The 2020 US Census stated the population as 31,931. The Rhode Island Statewide Planning Program prepared population projection estimates. The RIDSP estimates that the population in 2030 and 2040 will be 36,105 and 38,573, respectively. These estimates would amount to an approximately population increase of 13 percent between 2020 and 2030 and an approximate population increase of 7 percent between 2030 and 2040. These estimates are consistent with the slowing population growth trend over the last few decades. Similar to Narragansett, this gradual slow growth will be considered in the short-term demand projections but will become more significant for the 20-year planning period.

Commercial growth in the Town was noted as increasing at a rate of 1.05% during the 1990s. Given the limited availability of commercial space, special development districts have been established along Route 1, Main Street, and highway commercial areas to revitalize existing commercial space.

Industrial development in the Town has been very slow between 1990 and 2000, which is largely consistent with the trend in the State of Rhode Island and in the Northeast region. The plan concluded that the potential for future industrial growth in the Town will be a challenge in the decades to come.

A review of the Town land-use mapping and comparison to the existing water-supply service area indicates that the greatest impact on future growth of the Veolia system will likely result from increased development of residential

land within and adjacent to the current Veolia service area. Figure No. 14 indicates that two large medium-density populated areas exist within the "Greater Wakefield Area", which when coupled with the planned expansion to the wastewater collection system in this district, suggests the potential for greater development and thus an increase in customers. In addition, low-density populated land is located along the limits of the service area at South Road which will change as the Town builds out and thus provide additional potential customers. A small amount of growth is expected in commercial and industrial sectors.

1.20.5 Veolia Rhode Island Service Area

The impact that the development in both Towns has had on the growth of Veolia's own service area can be evaluated by considering the increase in the system's number of service connections over the past 10 years. As Worksheet 8 depicts, the annual number of service connections added to the system has been relatively constant and can be categorized as slow steady growth which is consistent with the previous decade as well. The average number of new system-wide service connections added annually from 2012-2021 is 54. This service connection growth rate compares favorably with the preceding development growth rates discussed for both Towns. Considering that, it appears that the rate of growth of both wholesale user service areas closely correlates with that of Veolia's own service area. It is therefore proposed that the 10-year historic rate of growth in Veolia system's production volumes be utilized as the methodology to predict the estimated future demands of the Veolia system.

As the above discussion suggests, quantifying the effects of increased development on future water use demands on the Veolia water-supply system is a complicated task due to the multitude of variables involved. Given the desirability of both the Town of South Kingstown and Narragansett as residential communities along with the availability of developable residential properties in both Towns, it is expected that the existing rate of growth in production volumes will likely continue for a number of years. It is expected that the major component of this growth will result from residential expansion, with minimal industrial and small commercial growth expected.

The expected system demand for the 5- and 20- year planning periods are presented below.

Table 3: Summary of Projected Water Demand (Million Gallons)

2026	2041
603.31	640.53

Table 4: Summary of Current and Projected Average Daily Demand (mgd)

	2013	2014	2015	2016	2017	2018	2019	2021	2022	2027	2047
ADD	2.77	2.70	2.72	1.83	1.78	1.72	1.78	1.78	1.62	1.65	1.75

1.21 Capital Improvement

Veolia continues to employ an aggressive pro-active Capital Improvement Program of water main replacement/rehabilitation which has been in effect for several years, with the intent of replacing existing low-capacity mains and water meters, upgrading system storage facilities, and improving overall system reliability. A principal target of this effort is the on-going Asbestos Cement Pipe replacement program designed to eventually eliminate the frequent failures of the system's "Century Pipe". In 2006, as part of the Master Plan, transmission

capacity was analyzed. One of the findings of this analysis was that limitations in transmission affect the ability to fill the Tower Hill and Boston Neck Tanks. The analysis emphasized that transmission between the Sherman and Tower Hill Tanks results in significant head loss. It was determined that this portion of the transmission system should be upgraded to improve the performance of the system. A new 12-inch water main was installed along Kenyon Avenue to improve transmission from the well fields to the eastern part of the system (Tower Hill and Boston Neck tanks) as well as the Narragansett interconnection.

1.22 Rate Structure

The current Water Rate Schedule as approved by the RIPUC provides a separate rate structure for assessing charges to residential users, commercial, industrial, and municipal users, among others. The rate structure for each consists of a combination of a Customer Service Charge (Flat Rate) plus a Volume Charge (Block Rate). The Customer Service Charge is applied based on the size of the customer's meter, with the Volume Charge computed based on the actual volume of metered consumption.

In the case of residential use, the Volume Charge is computed on an inclining block rate structure, with the user paying more per unit of water as consumption enters a higher block. This type of rate structure encourages the conservation of water by rewarding the user who minimizes use. The same incentive is not provided to commercial, industrial, or municipal users, however, who are assessed at the same flat rate for usage.

1.23 Financial Management

Veolia is a privately held water utility, operating under the laws and regulations of the State of Rhode Island, and subject to regulation by the RIPUC and Veolia utilizes an accrual system for recording its financial transactions. All books of record are kept in compliance with generally accepted accounting principles. It is the intent of Veolia that the costs (expenses, including depreciation) of providing the services to its users on a continuing basis be financed or recovered fully through user charges.

Veolia strives to meet the following objectives:

1. to provide its customers with potable water of high quality and enough to meet all of their needs while simultaneously providing excellent customer service, all at a reasonable cost
2. to provide our employees with challenging opportunities in the water industry, with fair and reasonable compensation
3. to provide our stockholders with a reasonable return on their investment

All general operations of Veolia are financed from water revenues in the form of user fees. Capital improvements to the water system are initially financed internally by generated funds of Veolia. Where sufficient funds are not available internally, a contribution to the equity of Veolia is made by the parent company.

1.24 Emergency Management

Veolia has an approved Emergency Management Plan. The plans established the responsibility and authority within Veolia for responding to potential emergencies and outlines specific tasks for addressing such emergencies.

1.25 Water Supply Source Protection

Veolia developed and submitted the formal Water Quality Protection Plan (WQPP) which includes necessary components of the RI Wellhead Protection (WHP) Program. Veolia has ongoing strategies to ensure the continued protection of the water-supply source. A primary goal of these strategies is to provide for the protection of raw water supplies in those areas subject to the influence of the groundwater wells. This protection is accomplished fundamentally by owning and controlling sufficient land area around each of these wells to preclude as much as possible the threat of raw water contamination. The company's Howland well field is located on a 29-acre parcel of land and its Tuckertown well field is located on a 30-acre parcel of land. Both parcels are owned by Veolia. In addition, Veolia has purchased land in the vicinity of Tuckertown well field. Ownership of the property has been transferred to the South Kingstown Land Trust with Veolia dictating permissible uses. A second parcel of land in the same vicinity has also been purchased and turned over to the land trust.

The RIDEM has delineated WHPA for all public wells in Rhode Island. The WHPA overlies the MBA and encompasses 100% of Veolia's water.

1.26 General Policies

The Plan is intended to be consistent with the goals and policies of the Town of South Kingstown and Narragansett Comprehensive Plans as they pertain to water supply and management. Conversely Veolia's Engineering and Water Operations personnel shall promote consistency between the contents of this Plan and the policies of these documents. For example, the cooperative efforts required with respect to source protection were noted earlier in this plan, and such joint efforts should progress as appropriate. Also, at present, prior to any type of water main extension or new development being serviced, local planning board approval must be issued.

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.

In addition, Veolia 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. Veolia has relationships with the South Kingstown Utilities Department, the Town of Narragansett Water Division, and the North Kingstown Water Department. 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 aquifer protection with adjacent towns, and state and federal agencies, system interconnections, service area expansion, capabilities to assist in the response to water supply emergencies, the potential for regionalization, etc.

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