

**QUONSET DEVELOPMENT CORPORATION
QUONSET BUSINESS PARK
WATER SUPPLY SYSTEM**



**WATER SUPPLY SYSTEM
MANAGEMENT PLAN**

EXECUTIVE SUMMARY

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Original Submission – January 2022

ACKNOWLEDGMENTS

Pare Corporation would like to acknowledge the invaluable assistance provided by the following individuals at the Quonset Development Corporation during preparation of this plan:

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- Mr. William G. Young, P.E., Director of Operations
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- Ms. Norine Lux, Director of Finance
- Mr. Jimmy Folco, Superintendent – Water
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Introduction

This Water Supply System Management Plan (WSSMP) has been prepared as required under Rhode Island General Laws 46-15.3, as amended and titled “The Water Supply System Management Planning Act” (Act). The legislative authority to effectuate the goals and policies of this Act has been conferred to the Rhode Island Water Resources Board (RIWRB). To this end, the RIWRB has promulgated the Rules and Regulations for Water Supply System Management Planning, last revised in October 2002, as amended to implement the provisions of the Act.

Under this legislation, the Quonset Development Corporation (QDC), as a water purveyor supplying over 50 million gallons of water per year, is responsible for the preparation and adoption of a WSSMP. It is also required that the QDC update this WSSMP periodically, every five years, or as otherwise stipulated in the Regulations. This is the 2021 update of the current WSSMP approved by the RIWRB on September 18, 2015.

This WSSMP has been prepared to provide the proper framework to promote effective and efficient conservation, development, utilization, and protection of the natural groundwater resources of the State as utilized by the QDC. Further, the overall goals are consistent with State Guide Plan Element 721, “RI Water 2030” and the 2012 Strategic Plan prepared by the RIWRB. The purpose of this WSSMP is to outline the objectives of the Water Supply System Management Planning process for the QDC water distribution system, and to serve as a guide to employ the proper decision-making processes.

The WSSMP has been prepared in three stand-alone volumes. Volume I contains a detailed description of the existing water system and includes the policies and procedures related to the general operation and management of the water system. Volume II, the Emergency Management section, relates to the vulnerability assessment of the water system for use in emergency planning. Volume III is an update of the 2003 Kent County and North Kingstown Source Water Assessment and Protection Plan for the QDC, which was completed in accordance with Version 3 of the Guide to Updating Source Water Assessments and Protection Plans, dated December 2010. The QDC shall implement the recommendations and procedures outlined in each volume of this WSSMP in order to comply fully with the overall requirements of the Act.

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Background

The Quonset Business Park is located in the Quonset/Davisville area of North Kingstown, Rhode Island. It was originally developed as a Naval Air Station and Naval Construction Battalion Center (NCBC) at Quonset / Davisville in 1942. At its peak in World War II, the facility comprised upwards of 100,000 military personnel (Seabee builders – fighters). In 1974, due to defense spending cutbacks in military operations, the Naval Air Station was decommissioned. Since 1976, the Naval Air Station has been operated for civilian use by the State of Rhode Island as the Quonset State Airport with adjacent land areas utilized as an industrial park. At such time, ownership of approximately 754 acres of Federal land was transferred to the State.

The QDC has developed much of the facility into a thriving commercial and industrial park and is charged with maintaining and further developing the business park. Based on the 2018 Master Plan, the facility consists of approximately 3,800 acres of developable acreage, of which approximately of 1,143 acres have been developed while the remaining 292 acres of land is eligible for development. In 2018, the QDC revised their Master Plan, which provides general and long-range guidance to accommodate mixed uses, emphasizing commercial and industrial development and the use of multiple transportation facilities during the next 5-20 years at the site. The primary objective of the QDC through implementation of the Master Plan is to develop a world class multi-modal industrial business park and to provide jobs and other economic benefits to the residents of Rhode Island.

General System Description

The QDC water supply and distribution system is classified by the Rhode Island Department of Health (RIDOH) as a “Non-Transient, Non-Community” water supply system. As such, the system is required to conform to applicable rules and regulations of the RIDOH and the Federal Safe Drinking Water Act (SDWA). Currently, the system maintains full compliance with the stipulations of these rules and regulations.

The existing QDC water system was developed primarily from the original water supply system installed and maintained by the Navy in 1942. Improvements have been implemented over the years to maintain and upgrade the system and to keep pace with increasingly stringent water



quality regulations. The water quality has consistently been rated as good to excellent and is continually monitored and tested to ensure compliance.

Source of supply is obtained from three (3) gravel packed wells. Well Stations #9A and #14A were installed in 1940 and Well Station #3A was installed in 1964. Collectively, these wells have a pumping capacity of approximately 4.2 million gallons per day (MGD). Source water is treated by the addition of potassium hydroxide (KOH) for pH adjustment, ortho polyphosphate blend for corrosion control, and sodium hypochlorite (NaOCL) for disinfection.

The transmission and distribution system consists of approximately 37 miles of active, in-service water mains ranging in size from 6 to 30 inches in diameter, most of which are cast iron or asbestos cement pipes that were installed in the 1940's. New and replacement main installations consist of polyvinyl chloride pipe or ductile iron. The QDC has endeavored to replace many aging water mains in recent years, particularly those considered most vulnerable.

Two (2) elevated steel storage tanks were constructed in 1998 and remain in service today. The tanks have a combined usable storage volume of 1.0 million gallons (MG), identified as the Devil's Foot Road Tank (0.25 MG capacity) and the Mooring Drive Tank (0.75 MG capacity). The system maintains a hydraulic grade of approximately 185 feet Mean Sea Level (MSL), which translates to system pressures in the distribution system within the range of 55-65 psi. The QDC supplies potable water and fire protection service to approximately 266 service accounts consisting of government, commercial and industrial customers. There are no residential customer accounts in the system.

The source and distribution system is 100 % metered. The QDC operations staff is responsible for the daily operation and maintenance of the water system, which also includes metering and billing of customers. Meter readings and billings are performed monthly across the entire service area. Water and sewer charges are combined onto one monthly bill. The revenues collected from customers support the operation and maintenance of the water system. There are three interconnections with neighboring water suppliers, specifically the Town of North Kingstown and the Kent County Water Authority (KCWA), which are in place for emergency purposes only and have not been used in recent years.



Approximately 12,300 people are currently served by the water system, which is comprised of employees, visitors, and customers using the business park. Total system production for Fiscal Year 2021 was approximately 268 million gallons, while total system demand was approximately 245 million gallons. Average Day Demand (ADD) for Fiscal Year 2021 was estimated to be 660,000 gallons per day (gpd). Given the estimated service area population, the current generalized per capita system demand was estimated to be 53.67 gpcd. The Maximum Day Demand (MDD) was estimated to be 920,000 gpd for Fiscal Year 2021, which was computed as the average daily flow during the month with the highest water demand during the year. This calculation is consistent with methodology used to estimate the MDD for previous years, as daily totals of water demand are not available. Water conservation, economic conditions, and changes in use in the business park have likely all contributed to efficient water use.

Ten (10) customers currently qualify as major users, with annual demand of at least 3 million gallons. Toray Industries is by far the largest customer in the system, typically using over 100 million gallons of water each year. In addition to the implied legal obligations associated with the QDC furnishing potable water to its customers, the QDC is legally bound to provide up to 780,000 gallons of potable water per day to Toray Industries by their property deed.

The QDC has made major efforts to reduce non-accounted water (includes non-billed/non-metered), which is now consistently below 6% (on average) of total water production on an annual basis. Each supply well and every service connection in the system is metered, and the QDC maintains an active meter replacement program to ensure a high level of meter accuracy. The QDC also works diligently to promote conservation within its system. The QDC routinely provides educational material to its customer base regarding water conservation, and imposes outdoor water use restrictions when conditions dictate.

Water Quality Protection Component

Volume III of this WSSMP contains an Update of the 2003 Kent County and North Kingstown Source Water Assessment and Protection Plan for the QDC (SWAP Update). This SWAP Update was completed in accordance with Volume 3 of the Guide to Updating Source Water Assessments and Protection Plans, dated December 2010. The findings of the SWAP Update determined that there has been no change in the final risk rating for wells #3A, #9A, or #14A from 2003 to the present, as was the case from 2003 to 2007 in the previous SWAP Update.



The watershed of the Hunt Aquifer includes portions of the Towns of East Greenwich and North Kingstown and the City of Warwick. The groundwater of the Hunt Aquifer is a shared resource of the North Kingstown Water System (NKWS), the QDC, and the KCWA as a supply source for potable water. In 1988, a planning consortium now formally recognized as the “Hunt Wellhead Protection Area Plan Committee” (Committee), was developed to explore wellhead protection strategies in the aquifer system. Members of the Committee include the KCWA, the QDC, and the three municipalities referenced previously. The Committee hired GZA GeoEnvironmental, Inc. to prepare a formal Wellhead Protection (WHP) Plan, which was completed in 1995 and remains as the guiding document for shared use of the Hunt Aquifer.

In 2007 the QDC, KCWA, and the Town of North Kingstown coordinated the Hunt River Aquifer Water Supplier Action Plan (Plan), which was reviewed and accepted by the RIWRB. The plan details actions on the part of each supplier and recommendations/responsibilities on the part of the RIWRB/State of Rhode Island. The following provides an overview of the QDC’s actions to date for the Plan.

- The QDC provides a conservation brochure to all of its users, educating the customer base with regards to water conservation and demand management.
- The QDC uses bill inserts and web postings outlining outdoor water use restrictions based on conditions as determined by the RIWRB drought steering committee.
- The QDC provided meeting space for the Watershed Stewardship Program, hosted several educational classes, and made financial contributions toward six watershed watch sites used to monitor the level and quantity of water in the Hunt River.
- The QDC performed a leak detection program in 2013, and since has had no significant leakage losses. QDC owns the leak detection equipment and continuously monitors any system loss and will check as required.
- The QDC previously reviewed water reuse options for irrigation of the North Kingstown Municipal Golf Course, but it was determined to be cost prohibitive. Since then, the golf course has reactivated an on-site well that they now use for irrigation, significantly reducing their demand from the QDC water system.
- The QDC has done extensive clearing around the perimeter fencing surrounding the well sites and has installed enhanced security measures, including motion detected lighting throughout the well facility grounds.



Anticipated Future Demands and Available Water

The QDC water system is one of the few systems in the State of Rhode Island where a large degree of development is projected within its current geographical boundaries. The 2018 Master Plan projected the ADD and MDD to increase to 1.70 MGD and 2.40 MGD, respectively, from respective values of 0.80 MGD and 1.75 MGD estimated from 2013. However, current system demand is far less than these projections as well as the water use estimated for 2013, despite an increase in population within the business park since this time. Despite the downward trend in water use in recent years, it is recognized that water use in the system can fluctuate based on development patterns in the business park, and that a reduction in anticipated future demands is likely not prudent from a water supply planning perspective. Therefore, the ADD and MDD estimated for the 5-year and 20-year planning periods presented in the 2018 Master Plan has been used for this WSSMP, as summarized in the following table.

**ANTICIPATED FUTURE DEMANDS
QUONSET BUSINESS PARK**

	5-Year Period (MGD)	20-Year Period [Full Build-Out] (MGD)
ADD	0.80	1.7
MDD	1.75	2.4

The 20-year planning period represents full build-out of the business park, with the 5-year period representing a linear progression in development from current conditions to full build-out. The 20-year projected ADD of 1.7 MGD is approximately 40% of the total pumping capacity of QDC’s supply wells (4.2 MGD, estimated as 90% of the combined maximum pumping capacity, irrespective of the safe yield of the wells and aquifer in general). The 20-year projected MDD of 2.4 MGD is a little less than 60% of total capacity from the supply wells.

Supply & Demand Management

Five possible sources of alternative water supply available to the QDC have been identified, as follows:



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- purchased water from neighboring utilities;
 - surface water source development;
 - additional groundwater source development;

Purchased water through interconnections with neighboring utilities is possible with the NKWS and the KCWA. The QDC currently has emergency interconnections in place with both of these water suppliers. However, each of these systems rely on the Hunt Aquifer and the Scituate Reservoir, as well as the broader HAP Aquifer system, for groundwater supply which is already stressed during dry conditions and periods of high demand. As such, development and permitting of a new well to increase supply would be difficult.

QDC is currently engaged in a method to significantly bolster their supply and they have successfully implemented several strategies to manage demand. These efforts have helped result in an overall decrease in water use despite an increase in the population served in the business park. Some of these strategies include the numerous educational and informational programs that continue to be implemented, including mailing of conservation brochures to customers in the system and posting of conservation tips and suggestions on the QDC website. The QDC continues to impose outdoor water restrictions and communicates this with the customer base through bill inserts and website postings as well. In the past the QDC has also hosted the Watershed Stewardship Program at their facilities and has financed monitoring sites along the Hunt River.

The QDC performed a leak detection program in 2013 which identified a relatively small number of leaks that were subsequently repaired. Unaccounted water and leakage is relatively low in the QDC water system, meeting the state's 10% goal for leakage. Since 2007, the QDC has purchased leak detection equipment and performs leak detection survey as required. The QDC also has continued their Preventative Maintenance (PM) Plan which is in place to ensure that system operations are maintained and that potential infrastructure deficiencies are reduced to the degree possible.



Emergency and Drought Management

The Emergency Management section of the WSSMP (Volume II) establishes the responsibilities and authority within the QDC for responding to most probable emergencies while outlining 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 the intent that this document provides guidance to ensure that the primary aspects of recovery from an emergency are addressed in an organized manner to aid in an efficient response while maintaining drinking water quality and quantity. The Emergency and Drought Management sections are consistent with State Guide Plan Element 724 and RI Drought Management Plan, Section 8.09 of the WSSMP Rules and Procedures, last revised October 2002.

Implementation

This WSSMP details an implementation plan of infrastructure rehabilitation and improvements and reports and studies required by state regulations as well as through the Hunt River Aquifer Water Supplier Action Plan. The water system is in good condition and is in compliance with state regulations. Anticipated infrastructure improvements were identified in the Clean Water Infrastructure Replacement Plan (CWIRP) most recently updated by Pare on behalf of the QDC in 2017.

Financial Management

Current (2022) water rates are structured based on meter size and consumption, as follows:

Minimum Monthly Charge

- 1" Meter Size	\$61.00
- 1-1/2" Meter Size	\$178.31
- 2" Meter Size	\$266.28
- 3" Meter Size	\$500.94
- 4" Meter Size	\$764.92
- 6" Meter Size	\$1,131.06
- 8" Meter Size	\$1,131.06



<i>Water Rate/1,000 Gallons (Beyond Minimum Charge Above)</i>	\$2.35
<i>Public Fire Protection/Hydrant</i>	\$55.20
<i>Monthly Private Fire Protection</i>	
- 2" Service	\$5.54
- 4" Service	\$17.28
- 6" Service	\$34.59
- 8" Service	\$55.34
- 10" Service	\$79.55
- 12" Service	\$107.22
- 16" Service	\$197.15

The QDC has two sources of funding the operation and maintenance requirements and capital improvements for the water supply system. Operation and maintenance (O & M) is generally funded through sale of water to its customers. The budget to determine O & M cost is developed annually and water rates are adjusted accordingly. Capital improvement projects, upon approval by the QDC Director of Operations, are funded by the QDC general fund and/or an Infrastructure Replacement Fund and when available, state and federal grants. The June 2017 CWIRP prepared by Pare on behalf of the QDC identified the capital improvements, and their associated costs, anticipated for the 20-year planning period.

Coordination

This WSSMP was developed in conjunction with reviews of the North Kingstown, East Greenwich, and City of Warwick Comprehensive Plans. The QDC maintains close coordination with each community as well as the KCWA and NKWS, two neighboring water suppliers. Further, the QDC's design review process includes input from state review agencies as well as the Town of North Kingstown to ensure municipal participation in development projects proposed within the business park. The Town is given the opportunity to review Environmental Review Forms that are required components of any development project in the business park, and all development proposals are subject to review by a joint committee comprised of representatives from the QDC and Town of North Kingstown.

