

# **PASCOAG UTILITY DISTRICT WATER SUPPLY SYSTEM MANAGEMENT PLAN**

## **EXECUTIVE SUMMARY**

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# **Executive Summary**

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## ***Introduction***

This Water Supply System Management Plan Update has been prepared in accordance with the *Rules and Regulations for Water Supply System Management Planning* promulgated pursuant to the requirements and provisions of Chapter 46-15.3 of the Public Drinking Water Supply System Protection Act of 1997 RI General Laws, as amended. Other legislation that is applicable to the development of this Plan includes the Federal Safe Drinking Water Act [42 U.S.C. § 300f et seq.], RI General Law Chapter 46-13 – Public Drinking Water Supply, RI General Law Chapter 46-14 – Contamination of Drinking Water, administered by the Department of Health, RI General Law 45-22.2 – RI Comprehensive Planning and Land Use Act and State Guide Plan Element 721 both administered by the RI Statewide Planning Program.

This updated Plan maintains consistency with the goals and policies of both the Town of Burrillville Comprehensive Plan and the State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030*.

This updated Plan, prepared by C&E Engineering Partners, Inc., utilizes the previous report also prepared by C&E Engineering Partners, Inc. as the base document and the Pascoag Utility District's documents to produce the 2015 Water Supply System Management Plan Update.

## ***Goals Statement***

The goal of this updated Plan is to comply with the provisions of the Water Supply System Management Planning Act, and other legislation referenced in the Introduction. This will be accomplished by updating the comprehensive Water Supply System Management Plan (WSSMP) for the Pascoag Utility District's (PUD) water supply system that was completed and approved in February 2009. Components of this updated Plan will address the successful execution of effective and efficient conservation, development, utilization and protection of the PUD's resources in ways that satisfy the present and future needs of the PUD service district, which is located in the Town of Burrillville, RI.

A goal of the Burrillville Comprehensive Plan is to develop a long range program to improve the quantity and quality of water required by the Town's citizens in the most cost effective and environmentally sound manner. The Comprehensive Plan is recognized herein and its contents are referenced in the development of future water demand projections.

The goals of this Plan are, furthermore, consistent with the overall goals of the RI Water Resources Board 2012 Strategic Plan and State Guide Plan No. 721 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 and to coordinate with adjacent Cities and Towns for the utilization of water resources either for emergency purposes or on a permanent basis to meet future water demands of the PUD water supply system.

### ***Background***

The PUD is a quasi-municipal public utility providing water, fire protection and electricity. The Pascoag Fire District was first chartered in 1887 in Rhode Island. The Pascoag Utility District, sans the Pascoag Fire Department, was redefined/created by an act of the Rhode Island Legislature in 2001. The PUD currently maintains an office at 253 Pascoag Main Street, in Pascoag, RI. The operations are financed directly through the sale of water. Policies and budgets are approved by a Board of Utility Commission, while the General Manager directs the day-to-day operations.

### ***Water System Description***

The PUD water system is supplied with water via an interconnection with the Harrisville Fire District (HFD) water system and groundwater withdrawn from Well No. 5. Until a MTBE contamination event, the water supply for the PUD consisted exclusively of a groundwater withdrawal system. Currently, the interconnection between the HFD and the PUD serves as the primary source of water for the PUD water system. Well No. 5, active as of January 1, 2008, has been successfully utilized to augment water supply from the HFD interconnection. Since the activation of Well No. 5, the daily production from this source has averaged 59,400 gallons per day which provides approximately 15% of the system average daily demand.

Due to a fecal coliform contamination event during the summer of 2002 at the HFD wells, the PUD was mandated by the RI Department of Health (RIDOH) to install a temporary chlorination facility located downstream of the primary interconnection. This facility is equipped with a chlorine feed system whereby the incoming water supply from the HFD can be adjusted to increase the residual in the PUD's system. The PUD's Well No. 5 is also equipped with a chlorination feed system.

Currently there are two (2) interconnections between the PUD and the HFD. One interconnection is located on Union Avenue and the other interconnection is located on Main Street. Both interconnections were used for emergency purposes until the occurrence of a MTBE contamination event at Well Nos. 3 and 3A in 2001. Presently, the interconnection on Main Street serves as the main connection between the PUD and HFD systems and the interconnection on Union Avenue serves as an emergency connection. In the fall of 2002, the PUD installed a 10-inch turbine meter in a below grade meter pit to monitor flows from the HFD at the Main Street interconnection. Water from the meter pit on Main Street flows directly to the PUD transmission and distribution system as well as to the two (2) storage tanks.

The PUD's water system is presently served by two (2) storage facilities. One storage tank is located on Rock Avenue near the village area of Pascoag and the second tank is located on South Main Street opposite of Lapham Farm Road. The Rock Avenue tank is a 1.5 million gallon standpipe constructed of welded steel. The South Main Street tank is a 265,000 gallon standpipe constructed of welded steel.

The PUD has approximately 15 miles of water transmission and distributions mains, composed of water mains ranging in size from 2 to 14-inches. Most of the pipes in the water system are unlined cast iron, installed in the late 1800's and early 1900's. The system cannot be looped due to funding and service area boundaries, which creates significant pressure reductions and constraints in the system during fire flow conditions. However, the PUD does seek to loop and reinforce water mains within the transmission and distribution system to the extent practical and as resources are available. Reinforcement and looping of the system water mains is balanced

with the need to periodically upgrade or replace older and aging sections of cast iron water main in the system.

The PUD water system is defined by the Village of Pascoag, which is bordered by the Village of Harrisville to the west, the Village of Bridgeton to the north, the Village of Huntsville to the west and the Pascoag Reservoir to the south. The Village of Pascoag is located within the Town of Burrillville, Rhode Island. It is not considered likely that the PUD water system's existing service area will extend beyond current service boundaries. However, consolidation of the PUD and HFD would result in a larger combined service area if the two Districts were to merge.

The PUD services 1,081 area water customer accounts consisting of 997 residential connections and 84 commercial/industrial connections. The PUD provides water to approximately 35% of its residents and businesses in Pascoag. The remaining population in Pascoag obtains water service via private wells. It is not anticipated that the residents currently not served by the PUD would be switched to the PUD water system or added to the current volume served. Current average day customer demands is 0.24 million gallons per day (MGD). Under projected water use for the 5 year planning period, it is expected that the average day demand will be equal to 0.24 MGD. For the 20 year planning period, it is expected that the demand will be 0.24 MGD. These projections are based primarily on population projections and do not account for significant water savings potentially realized through demand management techniques. They do, however, consider non-account water at the current rate of 13.50%.

As previously indicated, the PUD utilizes Well No. 5 to augment its water supply and purchases the remaining 85% of its water supply on a wholesale basis from the HFD. Currently, it appears that the water supplies servicing the PUD water system are adequate to meet the existing and future demands for the 5 and 20 year planning periods.

The PUD maintains a master meter at the connection with the HFD at Main Street. This meter is owned by the PUD and is a 10-inch by 10-inch turbine meter installed in 2002. All of the water pumped from the PUD's groundwater supply well is metered at Well No. 5. The Well No. 5

meter is owned by the PUD and is a 4-inch by 4-inch magnetic flow meter installed in 2007. These meters are tested on an annual basis and calibrated as needed.

Every residential and commercial/industrial customer serviced by the PUD's water supply distribution system is metered, providing 100% distribution metering. All meters are read monthly (i.e. twelve (12) times per year).

As previously described, the PUD obtains approximately 15% of its water supply via one (1) bedrock groundwater supply well. The PUD activated Well No. 5 on January 1, 2008 and utilizes it to augment the water supplied by the HFD wholesale interconnection. A review of pumping data totals for the past seven (7) years (2008 – 2014) reveals an average source production rate of 21.32 million gallons per year (MGY) with a high of 29.05 MGY occurring in 2009 and a low of 14.95 MGY occurring in 2014.

The PUD obtains the remaining 85% of its water supply via one (1) wholesale interconnection with the HFD. Over the past eleven (11) years (2004 – 2014), wholesale water purchases from the HFD have ranged from 84.06 MGY to 118.50 MGY. The PUD purchased 86.61 million gallons (MG) in 2014. Combining the wholesale water purchase with the production from Well No. 5 results in an average daily demand (ADD) of 0.28 MGD for 2014. During the past seven (7) years (2008 – 2014), the ADD has remained fairly consistent ranging from 0.28 MGD to 0.34 MGD. The 2014 maximum daily demand (MDD) was 0.39 MG, which equates to a peaking factor (MDD/ADD) of 1.39.

Total metered consumer water demand over the past seven (7) years (2008 – 2014) has averaged 88.48 MG with a high of 91.66 MG in calendar year 2008 and a low of 85.70 MG in calendar year 2011. An important trend in water supply planning is the “per service” consumption. Per capita consumption is often used for long-term water supply projections; however, it is difficult to determine the PUD service population. The actual number of services of the PUD system is more accurately available. The actual number of customers is influenced by the multi-dwelling units served by a single meter. The total number of water services for 2014 is 1,081. The average

per service water use for 2014 based upon an annual water use of 86.35 MG for 2014 is equal to 218.85 gallons per service per day (gpsd).

From 2004 to 2013, the percentage of unaccounted water has ranged from 13.01% in 2005 to 26.54% in 2009 with a ten (10) year average of 16.84%. The percentage of unaccounted water is equal to 13.50% for the current year, 2014. Over this eleven (11) year period, the percentage of non-account water has been above the 15% non-account water goal for water systems set forth in the Rhode Island State Guide Plan Element 721 – *Rhode Island Water 2030* six (6) times. The percentage of leakage is equal to 13.50% for the current year, 2014. Over the eleven (11) year period, the percentage of leakage has been above the 10% leakage goal for water systems set forth in the Rhode Island State Guide Plan Element 721 – *Rhode Island Water 2030*. The PUD is currently below the goal of 15% unaccounted water and slightly above the goal of 10% leakage at 13.50%. The PUD is working continuously to maintain the goals of less than 15% non-account water and less than 10% leakage as set forth in State Guide Plan Element 721.

The PUD practices the following demand management measures: 100% metering and billing of its water users, an aggressive inclining block rate structure, a residential retrofit program, a public education program and an “odd/even” outdoor water usage program, when needed.

It is the intent of the PUD to eliminate any major identifiable deficiencies present in the PUD water distribution system. The PUD’s ongoing Capital Improvement Program continues to modify and improve the system by replacing meters, water mains and hydrants. To reinforce the PUD’s commitment to improve the system’s reliability and operating efficiency, in 2014 a leak detection survey was performed where it was found that there were no leaks within the area of the distribution system that was surveyed. A study is currently underway to explore new supply sources for the PUD in an effort to ease the reliance of the PUD on the HFD water system for its water supply.

### ***System Improvements***

The PUD employs an annual capital improvement program which addresses system improvement and replacement/rehabilitation projects. The most significant modifications and improvements since preparation of the previous WSSMP include the following:

- Completely rehabilitate and bring up to code South Main Street and Rock Avenue storage tanks.
- Install new SCADA system to allow for remote data access and limited control of devices across the water system.
- Rehabilitate Well No. 5.
- Replace approximately 1,100 customer meters with Master Meter AMR meters.
- Repairs to water maintenance building.
- Replace key valves on system.

### ***Water Quality Protection***

The PUD purchases approximately 85% of the water it distributes on a wholesale basis from the HFD. For information on the water quality protection practices of the HFD, please refer to the HFD's Plan. Additionally, the PUD directly supports water quality protection efforts through a water quality protection billing charge.

The PUD supplies the remaining 15% of the water it distributes from its groundwater supply well, Well No. 5. The water quality protection strategies of the PUD are detailed in the Water Quality Protection Plan for Public Supply Well No. 5, February 2009. The 2009 Water Quality Protection Plan included the following:

- Wellhead protection and management strategies
- Well installation, development, testing and permitting
- Wellhead protection and mapping
- Identification and mapping of potential contamination sources
- Protection initiatives



### ***Supply Management***

The objective of Supply Management is to describe the measures necessary for the protection of present and future sources of drinking water in adequate quantity and quality to meet existing and projected demands for the 5 and 20 year planning periods of the water supply system. As required by Chapter 46-15.3 of the General Laws of Rhode Island, the PUD has a Water Quality Protection Plan. This Water Quality Protection Plan included wellhead protection and management strategies, wellhead protection mapping, identification of potential contamination sources and mapping and protection initiatives. The Water Quality Protection Plan identified structural and non-structural protection measures and land acquisition strategies.

The 5 and 20 year projections were made based on a review of current conditions, historical trends and the findings of the 2010 US Census, Rhode Island Statewide Planning (RISWP) Technical Paper 162 – *Rhode Island Population Projections 2010 – 2040* and the 2011 Burrillville Comprehensive Plan. *Appendix D – Water Supply and Demand Estimating, Northern Region* of the RI Water Resources Board 2012 Strategic Plan was also consulted to predict the future demands of the water system.

The following table details the average day demand for the current year and the projected 5 and 20 year planning periods.

<b>TABLE 1 PROJECTED WATER DEMANDS</b>					
		<b>5 Year Projections (2019)</b>		<b>20 Year Projections (2034)</b>	
<b>Category</b>	<b>2014 ADD</b>	<b>Annual Use</b>	<b>ADD</b>	<b>Annual Use</b>	<b>ADD</b>
Residential	0.182 MGD	66.39 MG	0.182 MGD	66.79 MG	0.183 MGD
Commercial/Industrial	0.054 MGD	19.70 MG	0.054 MGD	19.82 MG	0.054 MGD
<b>Total</b>	<b>0.236 MGD</b>	<b>86.09 MG</b>	<b>0.236 MGD</b>	<b>86.61 MG</b>	<b>0.237 MGD</b>

Again, the PUD purchases 85% of the water it supplies on a wholesale basis from the HFD. Currently, the PUD purchases 0.24 MGD of water from the HFD. Combined with the groundwater capacity of Well No. 5, the amount of water available to the PUD water system

totals 0.35 MGD. It would appear therefore, from a review of the projected water demands presented above, that the PUD water system supplies are adequate to meet existing and future demands for the 5 and 20 year planning periods.

A study is currently underway to explore the development of new groundwater supplies that would replace Well Nos. 3 and 3A which were contaminated with MTBE in 2001. The PUD has contracted to conduct a study to determine the viability of groundwater withdrawal from an infiltration gallery located in an area off of Pascoag Main Street near the intersection with Union Avenue and a second potential source of supply located off of RI Route 102 in nearby Glocester, RI. If this current study concludes that the aforementioned areas provide viable sources of supply for the PUD, the water supply resources of the PUD and the capacity to supply future water demands would be increased through the development of these sources.

### ***Demand Management***

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 departments 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 PUD has undertaken measures to achieve permanent and long-term water saving by implementing the following demand management techniques.

- Installation of water saving, low-flow plumbing devices.
- Promotion of water recycling and efficient use. The PUD will consult RI State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030* for applicable water reuse and recycling programs that may be able to be implemented by the PUD.
- Public education on water conservation/water supply issues.
- Use of fees, rates and charges appropriately.

- Water use regulations and restrictions.

### ***System Management***

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 the PUD 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:
  - Source Metering
  - Consumer Metering
- Leak Detection and Repair
- Preventive Maintenance
- Infrastructure Rehabilitation

It is essential for water utilities such as the PUD's to continually look ahead in order to prepare for needed capital improvements. 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.

The system management goals for the PUD water supply system are to determine the cause and extent of sources of unaccounted-for water and leakage, reduce or eliminate these losses and improve the overall efficiency of the water supply system. The PUD currently complies with the RI statewide goal of achieving and maintaining non-account water at 15% with a long-term goal of maintaining this figure of 15%. The PUD has set out to comply with the RI statewide goal of achieving and maintaining leakage at 10% within five (5) years, with a long-term goal aimed at maintaining this figure of 10%.

Currently within the distribution system, there are approximately 1,081 service connections containing meters. Due to the increasing age of the meters in the PUD water system, a system-wide replacement/upgrade of the meters was conducted between 2009 and 2012, which has

greatly increased the reliability, accuracy and ease at which the meters are read. The PUD replaced all of the customer meters in the system (approximately 1,100 meters) with Master Meter AMR meters. The general condition of these service meters is good (minimal failure rate). The PUD monitors meter operation and will replace faulty meters as may be identified through a combination of the following: the billing department identifies those meters which are “stopped” by comparing previous readings with present readings; PUD personnel physically identify a water meter from a service call, etc. in a residence; customer complaints or other potential inaccuracies in the customer bill either identified by the customer or PUD staff. The meters are read on a monthly basis and are replaced when consecutive readings appear erroneous. Replacement of these meters includes the installation of Master Meter AMR meters when necessary.

The PUD most recently conducted a leak detection survey of the Sayles Street and Church Street area of the distribution system in April 2014. This survey was conducted by Atlantic States Rural Water & Wastewater utilizing ZCOR equipment. The April 2014 leak detection survey concluded that there were no leaks within this area of the PUD water system. The PUD is committed to periodically conducting leak detection surveys in order to identify leaks and to reduce water loss.

The PUD annually provides for planned preventive maintenance of the water system components in the setting up of its yearly budget. This process provides for water main, meter and valve replacement, as well as for standard day-to-day operations (valve exercising, hydrant flushing, etc.) of the PUD appurtenances. In addition, annual testing of master meters and random testing of consumer meters is included as part of this program.

### ***Emergency Management and Drought Management***

The Emergency Management section of this Plan (Volume II) establishes the responsibilities and authority within the PUD 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.

The PUD relies on the HFD for 85% of its water supply, and therefore, they are also, to an extent, dependent on the PUD for drought management. The PUD works in conjunction with the HFD on preventive measures and maintenance to aid this supplier in drought management. The PUD also provides response measures to emergency events, including drought, within the Emergency Response Plan, Volume II.

During a drought event, the PUD will work with State Officials to institute stricter water conservation measures in accordance with the RI State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030*. *Rhode Island Water 2030* identifies five (5) drought phases; normal conditions, drought advisory, drought watch, drought warning and drought emergency. Drought triggers based upon below normal precipitation, low well water levels or supply restrictions implemented by the HFD are utilized to determine the drought phase. Based upon the drought phase, the PUD will consider appropriate water conservation measures and notify the public of these measures. Such water conservation measures might include voluntary or mandatory water use restrictions, declarations of a local water emergency and the prohibition of nonessential uses of potable water. Any drought restrictions implemented by the PUD's supplier, HFD, in their system shall be adopted by the PUD water system.

The PUD's drought triggers and water reduction goals and responses for each stage of drought are consistent with RI State Guide Plan Element 721, Report 115 – *Rhode Island Water 2030* guidelines.

### ***Implementation Schedule***

A detailed implementation schedule outlining the individuals responsible and timing associated with recommendations of this updated Water Supply System Management Plan has been developed for the following programs:

- General Infrastructure (Mains) Improvements
- Hydrant Replacement Program
- General System Improvements
- Public Education of Proposed Water Conservation Programs
- Master Meter Replacement Program
- Maintain Existing Master Meter Testing Program
- Perform Leak Detection Activities
- Vehicle/Rolling Stock Replacement
- Inspect Water Storage Tanks
- Redevelop/Replace Well Nos. 3 and 3A
- Redevelop Well No. 2
- Comply with Requirements of Safe Drinking Water Act
- Assist Wholesale Supplier in Developing New Sources

The PUD is in the process of completing a study to determine the viability of new groundwater supply sources to replace Well Nos. 3 and 3A. Currently, it is a financial burden to the PUD to assist their wholesale supplier in developing new sources. Upon completion of their own exploration of new source development, the PUD shall consider assisting the HFD in developing new sources and determine if it is financially feasible to do so.

### ***Financial Management***

The PUD is a quasi-municipal utility that provides water on a “not for profit basis” and is managed to be self-supporting through user charges. The intent of the PUD is that the costs (expenses, including depreciation) of providing the services to the water consumers on a continual basis be financed or recovered through user charges.

All operations of the PUD are financed from the water revenue in the form of user fees. The budget for the PUD is prepared to incorporate all the operating costs such that the water rates are established so that the users pay for all the activities of the PUD. User fees and charges levied by the PUD are established by the PUD Board of Utility Commissioners.

Currently, water rates established by the Board of Utility Commissioners include a minimum charge for an initial volume of water usage, and an increasing block rate structure thereafter. The first 1,247 gallons of water use in each billing quarter is billed at a specified rate. Unit costs (per gallon) are then applied to the next 2,493 gallons followed by increased rates for use exceeding 3,741 gallons and 24,937 gallons. In addition to the charges for water usage, there are quarterly meter/service charges and fire protection/hydrant charges based upon the size of the meter utilized by the customer. There is also a water quality protection charge and a HFD surcharge. The PUD reads meters and bills each customer on a monthly basis. Bills are due when rendered and collections of the bills are actively pursued.

The PUD develops a budget including all costs of operating the water system and all anticipated revenues for approval by the Board of Utility Commissioners. 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 costs. Adjustments are made to the rates if necessary to assure that the revenue covers the operating costs.

### ***Coordination***

This Water Supply System Management Plan Update is intended to be consistent with the goals and policies of the Town of Burrillville Comprehensive Plan. Conversely, the Town and PUD personnel shall promote consistency between the contents of this Plan and the policies of the Town's Comprehensive Plan.

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, the PUD shall pursue the accommodation of the current and future needs of its water supply system through the coordination of its efforts with those of the HFD. This shall include efforts in regard to additional system interconnections, service area expansion, capabilities to assist in the response to water supply emergencies, the potential for regionalization, etc.

The PUD service district is defined in the Public Laws. The PUD and the neighboring HFD have historically coordinated with each other to provide water during emergencies through the use of an interconnection as well as the observing of PUD service area boundaries.

The PUD shall forward this WSSMP to the Town of Burrillville Planning Director for concurrence of its growth projections with the growth projections anticipated in the Burrillville Comprehensive Plan.