

**EAST SMITHFIELD WATER DISTRICT
WATER SUPPLY SYSTEM MANAGEMENT PLAN
EXECUTIVE SUMMARY**

PREPARED FOR:

**EAST SMITHFIELD WATER DISTRICT
307 WATERMAN AVENUE
SMITHFIELD, RHODE ISLAND**

PREPARED BY:

**PARE CORPORATION
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June 27, 2014



EXECUTIVE SUMMARY

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.

The East Smithfield Water District (ESWD), as a water purveyor supplying over 50 million gallons (MG) of water a year, is responsible for updating its WSSMP every 5 years. This document is the 2014 Update of the ESWD WSSMP. The WSSMP has been prepared to be consistent with the goals of these Rules as well as the strategies and goals articulated in the RIWRB's 2012 Strategic Plan. It is also consistent with the goals of State Guide Plan Element No. 721 – RI Water 2030 and the goals stipulated in the Comprehensive Plans for the Towns of Smithfield and North Providence.

Introduction

The ESWD's primary objective is to operate a water system for the benefit of, and to meet the legitimate needs of, the customers in its service area. In accordance with that objective, the ESWD's specific goals are to:

1. Promote the efficient use of water through:
 - Conservation and efficient operation of the system in accordance with industry and State standards.
 - Efficient use of water by the customers through effective metering and public information programs that encourage water conservation.
2. Comply with all applicable laws and regulations.
3. Protect the integrity of its existing source of supply connections to the Providence Water Supply Board (Providence Water) and the Smithfield Water Supply Board (SWSB).
4. Cooperate with the overall goals of the Town of Smithfield and the Town of North Providence as outlined in their respective Comprehensive Plans.
5. Provide for service to all locations within its service area.
6. Conform to the overall goals for water suppliers established in State Guide Plan Element No. 721 – Rhode Island Water 2030.



Background

The ESWD is an independent water district providing water to a specific service area in the Esmond and Georgiaville sections of the Town of Smithfield, and the village of Greystone in the Town of North Providence. The ESWD is established under state law with full authority to manage its business, as approved by qualified voters of the ESWD. It was incorporated as a quasi-municipal corporation in accordance with the Rhode Island Public Laws of 1934, with amendments in 1939 and 1952.

The ESWD owns, operates, and maintains the water system, which serves approximately 8,000 customers within the district. The seven member Board of Directors for the ESWD is comprised of five elected residents and two *ex-officio* members (the moderator and the treasurer), which aim to provide representation across the entire district. The Board establishes policy, approves budgets and employs a General Manager who is in charge of the day-to-day operations of the ESWD. The General Manager is responsible to the Board for all operations of the ESWD's water system. The current General Manager is Mr. Raymond DiSanto. The current staff also includes one full time Operations Manager, one Operator, and one Administrative Assistant.

The ESWD Offices are at:

307 Waterman Avenue
Smithfield, RI 02917
Telephone: (401) 231-0510

General System Description

The ESWD's water system consists of approximately 33 miles of looped transmission lines served from four separate interconnections and two booster pump stations, all of which establish six separate pressure zones. Two primary interconnections, at Waterman Avenue and Dean Avenue, are located in the southern portion of the system near Route 44 and are served directly from Providence Water. These two interconnections serve four separate pressure zones, two through each interconnection with Providence Water and two through separate booster pumping stations downstream of these interconnections. The two other primary interconnections are on Ridge Road, located on the northeast boundary of the system. One of the interconnections on Ridge Road is served by the nearby Providence Water storage tank on a separate pressure zone and directly serves the Villages of Summerfield residential development. The other interconnection at Ridge Road is with the SWSB, served by the SWSB's pumping station at the Longview Reservoir.



The ESWD obtains all of its water supply by direct wholesale purchase from Providence Water and indirect wholesale purchase from Providence Water, via the SWSB, through these interconnections. The ESWD does not have any temporarily inactive or abandoned water supply sources of its own and the development of its own source is not thought to be feasible. The ESWD has one emergency interconnection with the SWSB, located at Meadow View Drive and Stillwater Road, but it has not been used in several years.

The ESWD does not provide any treatment to the water in the distribution system in addition to the treatment provided by Providence Water and does not have any storage facilities of their own. There are currently two booster pump stations in the system, identified as the Farnum Pike Pump Station and the North Elmore Pump Station. Both pump stations raise the hydraulic gradient to serve specific service areas of the ESWD system. The North Elmore Pump Station consists of three 250 gpm, 20 H.P. pumps that boost pressure in the Woodhaven area of the system. The Farnum Pike Pump Station consists of two 250 gpm, 15 H.P. pumps that boost pressure to the far western part of the system.

The ESWD will be installing a new pump station, identified as the Waltham Street Pump Station, in the summer of 2014. It is a prefabricated station that will consist of two low service, 115 gpm, 5 H.P. pumps and two high service, 810 gpm, 60 H.P. pumps. This pump station will boost pressure to the Timberlane Condominium development while also boosting pressure to the western part of the system and stabilizing water pressure along Old County Road. The project also includes replacing an existing 8" asbestos cement (AC) water main in Hillside and Fairmount streets with a new 12" ductile iron (DI) water main, which was recently completed. This station, once completed, will effectively serve the area of the system currently supplied by the Farnum Pike Pump Station. As such, the Farnum Pike Pump Station will be permanently taken out of service. The Farnum Pike Pump Station has become unreliable in its current condition, requiring that the ESWD perform increased maintenance and temporary repairs so that it can continue to function.

The ESWD distribution system consists of approximately 33 miles of water main ranging in size from 2" to 16". It is comprised of cast iron (CI), DI, AC, and a small amount of polyvinyl chloride (PVC) pipe.

The ESWD has made several recent upgrades to its distribution system piping. Upgrades performed in the last 10 years are summarized in Table 1.



Table 1: Recent Distribution System Upgrades

Year	Description	Type of Pipe	Pipe Size (Inches)	Type of Upgrade	Length (L.F.)
2014	Hillside & Fairmount	DI	12	Replacement	1,350
2014	Hillside Street	DI	8	Replacement	450
2012	Fenwood Avenue	CI	8	Clean & Line	2,000
2010	Arnold Avenue	CI	6	Clean & Line	492
2010	Maple Street	DI	8	Replacement	450
2008	Higgins Street	DI	8	Replacement	1,750
2007	Berwick Avenue	DI	8	Replacement	450
2006	Second St.	DI	8	Replacement	415
2005	Jackonia & Stella Dr.	DI	8	Replacement	750
2004	River & High St.	DI	8	Replacement	140
2004	Cragie St. (looping)	DI	8	Replacement	270

The “Rules and Regulations for Water Supply Management Planning” define transmission piping as the pipes “required to carry potable water from a water source to or throughout an area served or to be served by a water supply system for the specific purpose of supplying water to support a general population.” According to this definition, four distribution lines can be categorized as transmission mains, as follows:

Waterman Avenue/Farnum Pike to Old County Road – Approximately 65 year old 12” CI transmission main. This water main is approximately 14,000 feet long and is reportedly in fair condition.

Dean Avenue to Esmond Street – Approximately 65 year old 8” CI transmission main. This 2,400-foot main is believed to be in poor condition based on C-value testing performed by the ESWD.

Ridge Road to Whipple Road – Approximately 45-year old 8” AC transmission main. This water main is approximately 3,000 feet long and is reportedly in good condition.

Ridge Road to Villages of Summerfield – Approximately 15-year old, 12” DI transmission main used to supply the Villages of Summerfield development. This water main is approximately 4,400 feet long and is reportedly in good condition.



The ESWD is supplied by four wholesale interconnections, described as follows:

- Twelve-inch (12") interconnection with Providence Water on Waterman Avenue, in the southern portion of the ESWD system close to Route 44.
- Eight-inch (8") interconnection with Providence Water on Dean Avenue, also in the southern portion of the ESWD system and close to Route 44.
- Twelve-inch (12") interconnection (water main is 12", meter is 10") with Providence Water on Ridge Road, which serves the Villages of Summerfield development.
- Eight-inch (8") interconnection with SWSB on Ridge Road. This represents an indirect connection with Providence Water, as SWSB purchases all of its water from Providence Water.

Each of the interconnections with Providence Water are owned, operated, and maintained by Providence Water. Each interconnection has a compound meter that records in cubic feet and is read monthly by Providence Water personnel. The ESWD owns the interconnection with the SWSB and provides all needed maintenance, calibration, and meter reading. In 2007, the ESWD upgraded this interconnection to an 8" connection with a new meter and pressure reducing valve. This meter is also a compound meter but records in gallons.

Average Day Demand (ADD) for Fiscal Year 2013 was estimated to be 0.476 MGD based on total water use of 173.83 million gallons. The vast majority of water use in the system is residential. Residential water use was estimated to be 163.42 million gallons in Fiscal Year 2013. Residential average daily per capita water use was estimated to be approximately 56.0 GPCD based on a service area population of 8,000 residents. The Maximum Day Demand (MDD) was estimated to be 1.19 MGD using a MDD to ADD peaking factor of 2.5 in accordance with AWWA Manual M32.

There were approximately 2,401 active accounts in Fiscal Year 2013, of which over 95% were residential. Three (3) customers currently qualify as major users, with annual demand of at least 3 MG. These customers are the Homestead Mills Condo Association, Induplicate, and Greystone Lofts. Induplicate is an industrial user while the other two major users are large, multi-family residential facilities. The service connections in Fiscal Year 2013 were as follows:

- Residential 2,341
- Commercial: 51
- Industrial: 9
- Total: 2,401



The ESWD implemented a service meter radio-read conversion program in 2008, converting virtually all customer meters in the system to radio-read meters. The entire system is now metered, and all meters are read at least quarterly, while large meters are read monthly. Meters 2-inches in size and smaller have an anticipated useful life of at least 15 years, and the ESWD will begin testing and replacing meters, as necessary, at that time. These comprise almost all of the meters active in the system. Large meters are tested more frequently based on size, according to AWWA guidelines.

The current condition of the Farnum Pike Pump Station is the most significant system deficiency currently identified by the ESWD. This pump station has become increasingly unreliable, utilizes outdated technology, and provides a limited boost in pressure that is insufficient for some customers. The new Waltham Street Pump Station, which was first conceived as a private pump station to boost pressure to the existing Timberlane Condominium development but will now be owned and operated by the ESWD, will effectively replace the Farnum Pike Pump Station. The Waltham Street Pump Station is currently under construction and is planned to come online at the end of summer 2014. The Farnum Pike Pump Station will be taken out of service upon completion of the Waltham Street Pump Station.

While the distribution system is currently in good working order, much of it is comprised of aging asbestos-cement pipe that is prone to future breaks and old cast iron pipe that results in “rusty” water complaints from customers in some parts of the system. These issues do not necessarily represent major system deficiencies as the water delivered to customers continues to be of good quality. However, the ESWD has identified this as an area of improvement in the system and the majority of their immediate future system upgrades target the distribution system, beginning with areas that have received the most complaints, contain the oldest pipes, or are critical water mains of paramount importance to the distribution system. The implementation component of the WSSMP summarizes these rehabilitation projects.

Water Quality Protection Component

The ESWD purchases all of its water through direct and indirect wholesale connections to Providence Water. They do not have any current or former supply sources and they do not provide additional treatment to the water received through the wholesale interconnections. As such, a Water Quality Protection Plan (WQPP) or Source Water Assessment Plan (SWAP) is not required for this WSSMP.



Anticipated Future Demands

Anticipated future demands were developed based upon several factors, including:

- historic trends for water use;
- anticipated population changes;
- effects of conservation efforts;
- building code changes and efficiency of water using facilities and equipment (both system and user facilities and equipment);
- service area zoning and municipal policies; and
- known or anticipated major water user considerations.

Table 2 presents anticipated water use in the 5-year and 20-year planning periods with consideration to the factors identified above.

Table 2: Summary of Anticipated Annual Water Demand

	Current [2013]	5-Year Period [2018]	20-Year Period [2033]
<i>Water Sales</i>			
Residential (MG)	163.42	169.7	201.7
Commercial (MG)	3.11	5.3	7.0
Industrial (MG)	7.308	12.4	16.4
Total, ADD (mgd)	0.476	0.513	0.617
Total Annual Use (MG)	173.83	187.4	225.1
Annual Non Account Water (MG)	42.5	33.1*	39.7*
Total Annual Wholesale Water Purchases by ESWD (MG)	216.3	220.5	264.8
Estimated MDD (MG)**	1.19	1.28	1.54

* Non-account water estimated to be 15% of total wholesale water for planning purpose

** Estimated based on a MDD to ADD peaking factor of 2.5

It should be noted that water use has decreased in the years since the 2005 WSSMP update, rather than follow the projected increases. That said, projecting a continued downward trend in water



demand would represent a lack of conservative planning, which would be inappropriate for this WSSMP. The current downward trend in water demand has been reported in other communities in the State and is likely due to a mix of increased water conservation efforts and a reduction in development, tied in part to the poor economic conditions experienced in Rhode Island in recent years. It is difficult to predict how future water use patterns will follow as the economy recovers, but some moderate increase in water use is inevitable.

Available Water

The water available to the ESWD is limited by state law and the wholesale purchase agreements with Providence Water and the SWSB. These agreements do not stipulate the maximum amount of water the ESWD can purchase annually or on any given day. Consequently, the ESWD estimates its available water supply in accordance with Chapter 1278 of the Public Laws of 1915, which provides for Providence Water to supply 150 gallons per capita per day on a monthly basis. The ESWD has historically used, and continues to use, far less than this. Also, projected demand for the 5-year and 20-year planning periods is well within the range of water demand from previous years when water use was much higher than it is currently.

Alternative sources of supply and supply augmentation are not believed to be important considerations for the ESWD at this time. Anticipated total wholesale purchases in the 20-year planning period have been estimated at 264.8 million gallons. This was exceeded in 2007 and 2008 without any supply constraints or concerns.

Demand Management

The *Rules and Procedures Governing the Water Use and Efficiency Act for Major Public Water Suppliers*, adopted May 16, 2011, established efficient water use targets for major public water suppliers, which includes the ESWD. The ESWD is in general compliance with the requirements of this Act. This includes the residential average per capita water use goal of 65 gallons per capita per day (GPCD), which was estimated to be 56.0 GPCD for Fiscal Year 2013. The ESWD estimates non-billed water from various uses, such as firefighting and system flushing, and meets the metering and billing requirements stipulated in the Act. The ESWD has retrofitted the vast majority of the meters in the system to radio-read meters. The ESWD has also presented efficient indoor and outdoor water through offering residential retrofit kits and providing educational materials to the customer base.



Unknown water use was estimated to be 13.55% of total water production for Fiscal Year 2013, ending June 30, 2013. This is above the 10% target for leakage, though it likely includes some amount of water lost due to theft and other unknown, unauthorized uses. As such, the ESWD immediately implemented leak detection surveys to comply with the requirements of the Act.

A two-year system-wide leak detection survey that was completed in July 2013 by M2 Service Group of Exeter, New Hampshire identified six significant leaks in the ESWD water system. As a result of this survey and the subsequent repairs, unaccounted water was reduced for the second half of 2013. The reported unaccounted water percentages for July – September and October – December in 2013 were 8.61% and 9.23%, respectively. The ESWD will routinely monitor system leakage and will continue to implement leak detection and repair efforts in the future, as conditions warrant.

System Management

The major goals of system management include the following:

- Maintaining non-account water use to below 15% of total system demand, in accordance with State Guide Plan Element 721;
- Reducing leakage to below 10% of system demand;
- Establishing a preventive maintenance program; and
- Maintaining compliance with the applicable requirements of the *Rules and Procedures Governing the Water Use and Efficiency Act for Major Public Water Suppliers*.

Leak detection surveys have routinely been performed by the ESWD to identify and reduce leakage, most recently in 2013. Repairs are made at locations that leaks are detected, lowering unaccounted water. The ESWD anticipates performing leak detection surveys on a roughly annual basis, as funding allows and as needs arise.

The ESWD performs sound preventive maintenance (PM) practices at the two pump stations, the only major components in the system. The ESWD performs system flushing and exercises valves routinely to maintain the distribution system in good working order.

The ESWD is in compliance with the *Rules and Procedures Governing the Water Use and Efficiency Act for Major Public Water Suppliers*.



Emergency and Drought Management

An updated Emergency Response Plan was prepared as part of this WSSMP, which generally establishes the following:

- Responsibilities and authority within the ESWD for responding to most probable emergencies;
- Most probable causes for emergencies and their potential impacts to the system;
- System components that are vulnerable to damage or incapacitation based on the most likely causes for emergency; and
- Specific tasks for carrying out functional and constructive solutions based on a review of the potential emergencies and the associated system risks.

Drought is one specific type of emergency that is treated separately, as it can impact the system over an extended period of time. The ESWD relies solely on Providence Water for water supply and is therefore dependent on Providence Water for drought management at the source. The ESWD works in conjunction with Providence Water and the SWSB on preventive measures and maintenance to aid in drought management.

The ability of the ESWD to withstand a drought is largely dependent upon the water supply demands of Providence Water. The direct effects of drought on the ESWD system potentially include:

- Reduction of available wholesale water from Providence Water;
- Reduction of Providence Water's surface water levels which can adversely impact water quality in addition to water quantity; and
- Reduction of operating income due to reduced delivery of water.

The ESWD has identified three water quantity tiers in its Emergency Response Plan. Water use reductions correspond with Tier 2 and Tier 3 water quantity conditions based on the severity of the drought or emergency, as follows:

1. **Tier 1** – 0.5 MGD – Water quantity consistent with normal operating conditions of the water system in regard to the ability to provide potable water for the average day use.
2. **Tier 2** – 0.25 MGD
3. **Tier 3** – <0.1 MGD



The ESWD will take steps to restrict water use to these tiered conditions in the event of a drought or emergency, in accordance with the Emergency Response Plan.

Implementation and Financial Management

A detailed schedule outlining the individuals responsible, timing, and capital costs associated with recommendations of this WSSMP has been developed and is presented in Table 3. This schedule has been prepared with consideration to the modifications and upgrades identified in the ESWD’s 2012 Clean Water Infrastructure Replacement Plan (CWIRP) along with the ESWD’s assessment of current system conditions and priorities. For the most part, the projects anticipated in upcoming years are outside of the capabilities of the ESWD Operations personnel to perform in-house. The ESWD General Manager and Board of Directors will be responsible for soliciting for these services and selecting contractors to perform them.

Table 3: Implementation Schedule

Plan Element	Responsibility	Scheduled Completion Date	Estimated Cost	Possible Funding Source
Miscellaneous computer hardware/software upgrades	ESWD Operations Staff	2016	\$10,000	Annual Budget General Fund
Repair/replace 13 “very poor” condition hydrants	Outside Contractor	2016-2017	\$65,000	Annual Budget General Fund
Replace 1,000 feet of 8” AC on North Elmore	Outside Contractor	2018	\$200,000	Infrastructure Replacement Fund
Clean and Line 1,600 feet of 8” CI on Old County Road	Outside Contractor	2018-2019	\$160,000	Infrastructure Replacement Fund
Clean and Line 2,400 feet of 8” CI in Dean Avenue	Outside Contractor	2018-2019	\$240,000	Infrastructure Replacement Fund
Replace 500 feet of 8” AC on Julia Drive	Outside Contractor	2020	\$100,000	Infrastructure Replacement Fund
Replace 1,000 feet of 6” CI/AC on Whitman Street	Outside Contractor	2020	\$200,000	Infrastructure Replacement Fund



The ESWD has typically funded improvement projects through their Infrastructure Replacement Fund (IRF), when possible. However, larger projects, including many of the projects listed in Table 3, will likely require that the ESWD seek out State Revolving Fund (SRF) loans or other loan and grant opportunities.

Table 3 lists several projects the ESWD has under consideration for the next five years, but changing system conditions and future development patterns may necessitate that different projects be selected for implementation. For the most part, the projects listed in Table 3 are not of immediate concern nor are they needed to curtail imminent system deficiencies of a critical nature. Rather, the ESWD believes that approximately \$1 million in rehabilitation projects are feasible based on current and projected system revenues while allowing them to address many of their highest priority upgrade projects in the next five years. The total estimated cost of the projects listed in Table 3 is \$975,000.

The ESWD operates in a financially self-supporting manner and establishes water rates to fund operation and maintenance of the system while contributing to its IRF for future system upgrades. Revenues are from water rates as well as a service charge and miscellaneous other fees imposed by the ESWD. An inclining block rate structure has been in place since 2008.

Table 4 depicts the ESWD's overall financial trend for the last three years. These figures are from audited financial statements for Fiscal Years 2011-2013 (April 1, 2010 – March 31, 2013). The ESWD's Fiscal Year runs from April 1st to March 31st each year. A financial statement for Fiscal Year 2014 is not yet available at this time.

Table 4: ESWD Financial Management (2011-2013)

	2013	2012	2011
Total Revenues	\$1,005,056	\$928,759	\$852,019
Total Expenses	\$1,002,074	\$893,391	\$875,131
Total Income (Loss)	\$2,982	\$35,368	(\$23,112)

Current water rates for Fiscal Year 2015, which went into effect on April 1, 2014, are structured based on meter size and consumption.



Residential (single and two family dwellings) consumption rates are as follows:

	<u>Quarterly</u>
0 to 6,000 gallons*	\$3.35 per 1,000 gallons
6,001 to 21,000 gallons*	\$4.25 per 1,000 gallons
Over 21,000 gallons *	\$4.55 per 1,000 gallons
Infrastructure Rehab Fee	\$0.75 per 1,000 gallons

*Quantities in each bracket are doubled for two family dwellings.

Multi-family residential, commercial and industrial consumption rates are as follows:

	<u>Monthly</u>
Per 1,000 gallons	\$4.30
Infrastructure Rehab Fee	\$0.75

An annual service charge, excluding fire services, is also applied as follows:

<u>Metered Size (in)</u>	<u>Quarterly Accounts</u>	<u>Monthly Accounts</u>
5/8 & 1	\$13.00	\$4.33
1 ½	\$27.00	\$9.00
2	\$45.00	\$15.00
3	\$84.00	\$28.00
4	\$132.00	\$44.00
5 & above	\$200.00	\$66.67

An annual public fire service charge of \$325.00 per hydrant is also imposed.

The ESWD reads meters and bills residential customers on a quarterly basis and large commercial and industrial users, as well as eight multi-family housing facilities, are metered and billed monthly. The ESWD is in compliance with the State's requirements for metering and billing frequency.

Coordination

The WSSMP was prepared with consideration to the Comprehensive Plans of the Towns of Smithfield and North Providence. While little future development is anticipated in the part of the

ESWD system in North Providence, the Town of Smithfield anticipates increases in residential development in several parts of the town. This includes areas served by the ESWD. Commercial and industrial development is not anticipated by either town in areas within the ESWD service district.

The ESWD and SWSB had reached a formal, signed agreement to consolidate both water systems into one new water district, entitled the "Smithfield Consolidated Water District". The SWSB serves a slightly greater population and has approximately 30% higher annual water sales than the ESWD. Currently both systems are supplied entirely through wholesale purchases from Providence Water and they serve customers in both Smithfield and North Providence. Their service territories are immediately adjacent to each other and are already interconnected at Ridge Road. A closed interconnection at Meadow View Drive could also be opened to connect the two service areas. Consolidating the two districts would hope to achieve operational cost savings through shared resources, such as equipment and personnel.

Formation of this district would require an Act of Legislation to be passed by the Rhode Island General Assembly. Legislation was first introduced in the Rhode Island General Assembly in May 2013 and then again in 2014, but both attempts to submit the bill for a vote stalled. Consolidation of the ESWD and SWSB is still under consideration and may be pursued again in the future.

