

Executive Summary

INTRODUCTION

The prior version of the Harrisville Fire District Water Supply System Management Plan (WSSMP) was approved by the Rhode Island Water Resources Board (RIWRB) in 2007. This current WSSMP, submitted in May 2013, serves as an update to the 2007 plan. This WSSMP has been prepared in accordance with the Rules and Procedures for Water Supply System Management Planning dated October 2002 as required by the Rhode Island General Laws 46-15.3 as amended and titled "The Water Supply System Management Planning Act". These rules and regulations are under the auspices and legal authority of the RIWRB.

Under this legislation the Harrisville Fire District (HFD), as a water supplier, is responsible for the preparation and adoption of the WSSMP. It is required that the HFD periodically (every five years) update the WSSMP in accordance with the RIWRB rules and regulations.

The WSSMP is written consistent with the overall goals of the State, Town of Burrillville, HFD and with the State Guide Plan Element 721, "Water Supply Policies for Rhode Island". This WSSMP is designed to define the objectives of the HFD and to promote the effective and efficient conservation, development, utilization and protection of the HFD's resources in order to satisfy present and future needs of the HFD.

The WSSMP includes a description of the HFD's organizational structure, the distribution system components and their ability to meet the water demands of the community which they provide drinking water.

BACKGROUND

The HFD was incorporated by an Act of the General Assembly on March 14, 1906. Prior to and including this period, water had been supplied by the Pascoag Water System whose supply and distribution system date back to the early 1900's. At that time, the water system consisted of two (2) artesian wells and two shallow trenches that acted as infiltration galleries.

This entire system operated under private ownership until 1934, when the systems (Harrisville and Pascoag) were both taken over by the Fire Districts. The Fire Districts subsequently operated together for approximately ten (10) years, at which time the HFD installed its own 300,000 gallon elevated storage tank, and in 1947 Pascoag developed its first large capacity gravel packed well. The HFD and Pascoag Utility District (PUD) have primarily acted separately since this point however emergency interconnections as well as personnel assistance agreements have been in place.

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The (HFD) is a quasi-municipal public utility providing water and fire protection and was chartered in 1910 in the State of Rhode Island. The HFD Water Department (HFDWD) is financed directly through the sale of water. The HFD has the ability to distribute and sell water in the entire Town of Burrillville and includes any areas within or outside of the boundaries of the HFD. However, neither the HFD Charter, nor the Town of Burrillville identifies the HFD as the sole water supply provider in the Town.

WATER SUPPLY SYSTEM DESCRIPTION

The existing water supply for the HFD now operates on five (5) gravel packed wells. The water supply system Wells #1 through #3 are located approximately 1,000 feet east of the intersection of Central Street and Steere Farm Road. Water from Wells #1 and #3 are pumped through Pump Station #3 for flow measurement. Water from Well #2 is pumped through Pump Station #2 where chlorine and sodium hydroxide are added. Well #1 came online in 2001 and is a replacement well of the original Well #1. The water supply system Wells #5 and #6 are located adjacent to Eccleston Field. These three (3) wells tie into a common header pipe before entering the Eccleston Field Pump Station. Wells #5 and #6 came online in 2002. Treatment of all water is achieved with chlorine for disinfection purposes and sodium hydroxide for corrosion control of the distribution system. Well #4 has been offline as of 2009 due to water quality issues and low yield.

The existing water storage system for the HFD consists of a new 500,000 gallon composite storage tank located off Cherry Farm Road and a 500,000 gallon elevated storage tank located off Steere Farm Road. Currently, the HFD has 19.8 miles of water distribution piping ranging in size from 1-1/4 inches to 16-inches. At the present time, the HFD's policy is that all distribution system piping is a minimum eight (8) inches in diameter. Thus, from an engineering standpoint, additions or upgrades to the water system should be at least 8-inch pipe. The current condition of the system is good, mainly due to the implementation of corrosion control in 1990. Master meters are located at Pump Station #2, Pump Station #3 and the Eccleston Field Pump Station. They are tested and calibrated once a year. All service connections are metered for billing purposes.

WATER QUALITY PROTECTION

The HFD realizes that Water Quality Protection is an important aspect of sustaining the water supply. In July 2007 the Wellhead Protection Plan was updated by Stantec Consulting Services. On the municipal level, the Town of Burrillville has adopted aquifer protection by-laws and has applied them to certain "Aquifer Zones". These Aquifer Zones were taken from the U.S. Geological Survey Water Resources Investigation 18-74 entitled "Availability of Ground Water in the Branch River Basin, Providence County, Rhode Island", December, 1974. These bylaws set requirements for the sewerage of residences and businesses within these Aquifer Zones, consequently the majority of these zones are sewerage.

The potential exists that a contamination event may occur at an individual household. This contamination event may not be a deliberate action, but rather be a result of not fully

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understanding the ultimate fate of the contaminant in the groundwater environment. It is believed that public education on the hydrologic cycle, the potential for aquifer contamination stemming from residential activities and the HFD groundwater withdrawal system is important. This knowledge may provide the basis from which decisions regarding the handling of household hazardous chemicals would be made. The HFD believes this public education tool to be a simple and economical tool through which public awareness of groundwater contamination could be increased.

SUPPLY MANAGEMENT

Tables ES-1 and ES-2 depict the recent water usage and the predicted future requirements. Future requirements are based on the population projections contained in the Town of Burrillville Comprehensive Plan Report of 2011. In this plan, a 5.8 percent growth rate was estimated between 2010 and 2020, while a growth rate between the years 2020 and 2030 was estimated to be 4.28 percent.

TABLE ES-1
Recent Water Usage (2001-2005)

	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Volume Pumped (Master Meters)	191,804,350	216,981,030	205,133,310	198,255,480	167,992,160	156,792,820	167,003,940
Volume Billed	178,469,742	190,059,250	169,171,890	176,051,622	157,646,526	156,364,959	163,116,482
Fire Dept. Drills	1,000,000	1,500,000	1,000,000	1,165,000	1,000,000	-	100,000
Non-Billed Metered	1,711,000	1,818,500	5,536,553	2,718,190	1,770,774	-	311,945
System Flushing	2,000,000	2,000,000	3,000,000	2,000,000	2,000,000	-	160,450
Unaccounted-For	8,623,608 4.50%	21,603,280 9.96%	26,424,867 12.88%	16,320,668 8.23%	5,574,860 3.32%	427,861 0.27%	3,315,063 1.99%

TABLE ES-2
Estimated Future Supply Requirements

<u>Year</u>	<u>2012</u>	<u>2017</u>	<u>2022</u>	<u>2027</u>	<u>2032</u>
Total Water Services (Harrisville)	1,252	1,325	1,381	1,440	1,502
Average Day Demand (Harrisville) (gpd)	199,434	211,939	221,010	230,469	240,333
Average Day Demand (Wholesale) (Pascoag Utility District) (gpd)	247,460	278,487	290,407	302,836	315,797
Average Day Demand (Total) (gpd)	446,894	490,426	511,416	533,305	556,130
Unaccounted for Water (gpd)	9,082	24,521	25,571	26,665	27,807
Total Average Day (gpd)	455,976	514,947	536,987	559,970	583,937
Total Max Day (gpd)	911,953	1,029,894	1,073,974	1,119,940	1,167,873

Note: 2012 numbers are actual, other years are extrapolated based on 160 gpd/service (Harrisville) and 5% unaccounted for water.

As can be observed by Table ES-1, the water use has steadily decreased from the years 2007 to 2011. Since the discovery of contamination to the original PUD water supply sources, PUD has identified two (2) additional water supply sources which have alleviated some of their dependency on Harrisville. The HFD placed new wells #4, #5, and #6 online at the same time. These wells were originally intended to provide the HFD with reserve capacity for the anticipated growth within the community. However, since 2002 the new sources have been used to supplement the system to supply the demand in Pascoag. In order to develop reserve capacity for maximum day demand and future growth of the community, the HFD has implemented a well exploration program. With these future sources in place, the new total capacity of the system is expected to meet the projected demand through 2025. The test well exploration program identified two (2) potential well sites for the future. One site is referred to as Well #7 and is located near Eccleston Field. Well #7 is pending funding source approval to be constructed and based on pump tests will have a pumping capacity of 300 gpm. The second site is located about one (1) mile to the east of the HFD's offices and may be developed within the next five (5) years.

DEMAND MANAGMENT

The HFD provides Public Education and Information regarding water supply in a variety of methods and in conjunction with the Town of Burrillville. The HFD makes available to all customers the retrofit kits at no cost to residential users. The HFD produces an annual pamphlet with the intent on educating the general water consumer on the HFD. The pamphlet includes general information on the HFD wellfield and distribution system, leaks, sources of lost water,

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and the aquifer from which the water is withdrawn. Additionally, the pamphlet contains information on water consumption and daily activities which could contribute to contamination of the water system. Finally, the pamphlet addresses consumer concerns and consumer confidence in the HFD.

If water conservation is required, the HFD relies on advertisements and public service announcements in the local newspaper for notification of customers regarding water bans and user restrictions. The HFD would also notify the public by placing signs in public places in the Town of Burrillville.

SYSTEM MANAGEMENT

The purpose of the system management is to ensure that the physical components of the water system are properly operating and maintained. Since the last WSSMP Report several system improvements have been made including construction of the Cherry Farm Road composite storage tank, additional water main at the Eccleston Field Pump Station and new water main on Central Street. In addition, part of the routine operation of the HFD includes operation activities that ensure the system is performing well which goes to extending the useful life of the system. These activities include inspecting the chemical feed and flow measuring devices, replacing water meters, completing system wide leak detection, hydrant flushing, cleaning wells and inspecting and cleaning the water storage tanks. The HFD has made great strides in improving the percentage of water that is unaccounted for. The percentage of water has decreased from 10% in 2007 to 2% in 2012. It is generally understood that a certain volume of unaccounted for water is unavoidable and anticipated from the operation of a water system.

EMERGENCY MANAGEMENT

The HFD has an Emergency Management Plan to respond to extraordinary and routine emergencies which threaten the water supply, treatment, pumping, storage and distribution system components of the HFD's system. In response to the Public Health and Bioterrorism Preparedness and Response Act of 2002 the HFD has performed a Vulnerability Assessment (VA) and Emergency Response Plan (ERP).

The HFD maintains staff during regular business hours that routinely monitors every major component of the water system, through the use of dial-up alarms. The system is monitored 24-hours per day through the SCADA system. All HFD personnel have attended appropriate American Water Works Association (AWWA) training and seminars.

DROUGHT MANAGEMENT

The HFD has developed a policy which allows outdoor watering restrictions when certain well pumping thresholds have been met. The goal is to ensure that there is a sufficient water level in the well during pumping. Each well is equipped with a level transducer to provide real time data on each well's level. Five (5) out of the six (6) well pump motors utilize a Variable Frequency

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Drive (VFD) to control the pump speed, thus allowing the pump to operate to the maximum capacity without drawing the well down to critical levels.

The initial water restriction threshold is put in force when the combined pumping capacity of all sources is 800,000 GPD or more for three (3) consecutive days. This initial threshold is anticipated to reduce demand by about 10%. The second water restriction threshold is placed in force when the combined pumping capacity of all sources is 900,000 GPD or greater for three (3) consecutive days. This second threshold is anticipated to reduce demand by about 20%. These thresholds will be modified once well 7 goes online and the actual available capacity is known.

IMPLEMENTATION

In order to ensure the HFD's sustainability a capital improvement plan has been created to determine the small and large projects that the HFD plans to undertake over the next twenty years. By establishing a schedule, the HFD can ensure that every part of the water system receives attention routinely. Some projects planned over the next five (5) years include:

- a. Cleaning and redevelopment of existing wells on a regular basis
- b. Tank inspections for both the Steere Farm Road Water Storage Tank and Cherry Farm Road Tank
- c. Truck replacement
- d. Infrastructure replacement
- e. Land Acquisition and construction of a new water supply source

Some additional projects planned beyond the next five years include:

- a. Well cleaning and redevelopment
- b. Pump and motor replacement
- c. Tank inspection, cleaning and painting
- d. Truck replacement
- e. Infrastructure replacement
- f. Land Acquisition and construction of a new water supply source
- g. Pump station upgrades

FINANCIAL MANAGEMENT

The HFD is a quasi-municipal public utility providing water and fire protection. All operations of the HFD are financed from water revenues in the form of user fees. All residential, commercial, industrial and government water users are subject to the same fees and rates. User fees and charges levied by the HFD are established by the HFD Operating Committee. The HFD has numerous options for financing projects and will seek the most cost-effective manner of financing future capital needs.

Currently, water rates established by the Operating Committee include a flat fee every quarter per service connection and a fee for every gallon of water used. The flat fee is \$12.50/quarter/service and \$0.00406/gallon used. The wholesale rate is \$0.00353/gallon.

The HFD continue to make an effort to promote the effective and efficient conservation, development, utilization and protection of the HFD's resources in order to satisfy present and future needs of the HFD.