

TOWN OF WRENTHAM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
WATER DIVISION

WATER SYSTEM MASTER PLAN

Board of Selectmen Meeting

January 4th, 2022

ENVIRONMENTAL
 PARTNERS
— An Apex Company —

ABOUT EP

Environmental Partners (EP), an Apex company, is an award-winning multidisciplinary engineering and consulting firm celebrating its 24th year in business. With a team of over 80 professionals, EP provides a broad range of services to municipal, commercial, industrial, and institutional clients

OFFICE LOCATIONS

[HQ] Quincy, MA

Woburn, MA

Hyannis, MA

Middletown, CT

SERVICES INCLUDE

Civil Engineering

Construction Management

Drinking Water

Emergency Management Services

Environmental

Infrastructure Asset Management

Owner's Project Management (OPM)

Planning

Stormwater

Traffic and Transportation

Wastewater



AGENDA

WATER SYSTEM MASTER PLAN (WSMP)

- Discuss Master Plan Goals and Overview
- Define Future Needs and Demands
- Identify Water Supply Challenges
- Discuss Recommended Improvements
- Identify Potential Vulnerabilities Defined in Risk and Resilience Assessment (RRA) Report
- Develop New West Wrentham Groundwater Source
- Questions and Answers



Treatment Facility #3 Building Exterior

WSMP OVERVIEW

EP performed the following tasks:

- Reviewed Existing System
- Evaluated Current and Future Water Supply and Demands
- Calibrated Hydraulic Model
- Assessed Hydraulics and Control Strategies
- Identified Hydraulic Performance Deficiencies
- Confirmed Fire Protection Concerns
- Performed Risk and Resilience Assessment (RRA)
- Develop Developed Recommended Improvements Plan
- Provided Planning-level Capital Cost Estimates
- Prepared Capital Improvement Program with 20-year Schedule



Well 2 Building Exterior

EXISTING WATER SYSTEM

- About 11,700 Water Customers
- Five Water Supply Wells
- Three Treatment Facilities
- Three Storage Tanks
- Supervisory Control and Data Acquisition (SCADA) System
- Four Emergency Interconnections (Norfolk (2), Foxborough and Franklin)
- 101 Miles of Water Main (533,800 linear feet)
- One Pressure Zone



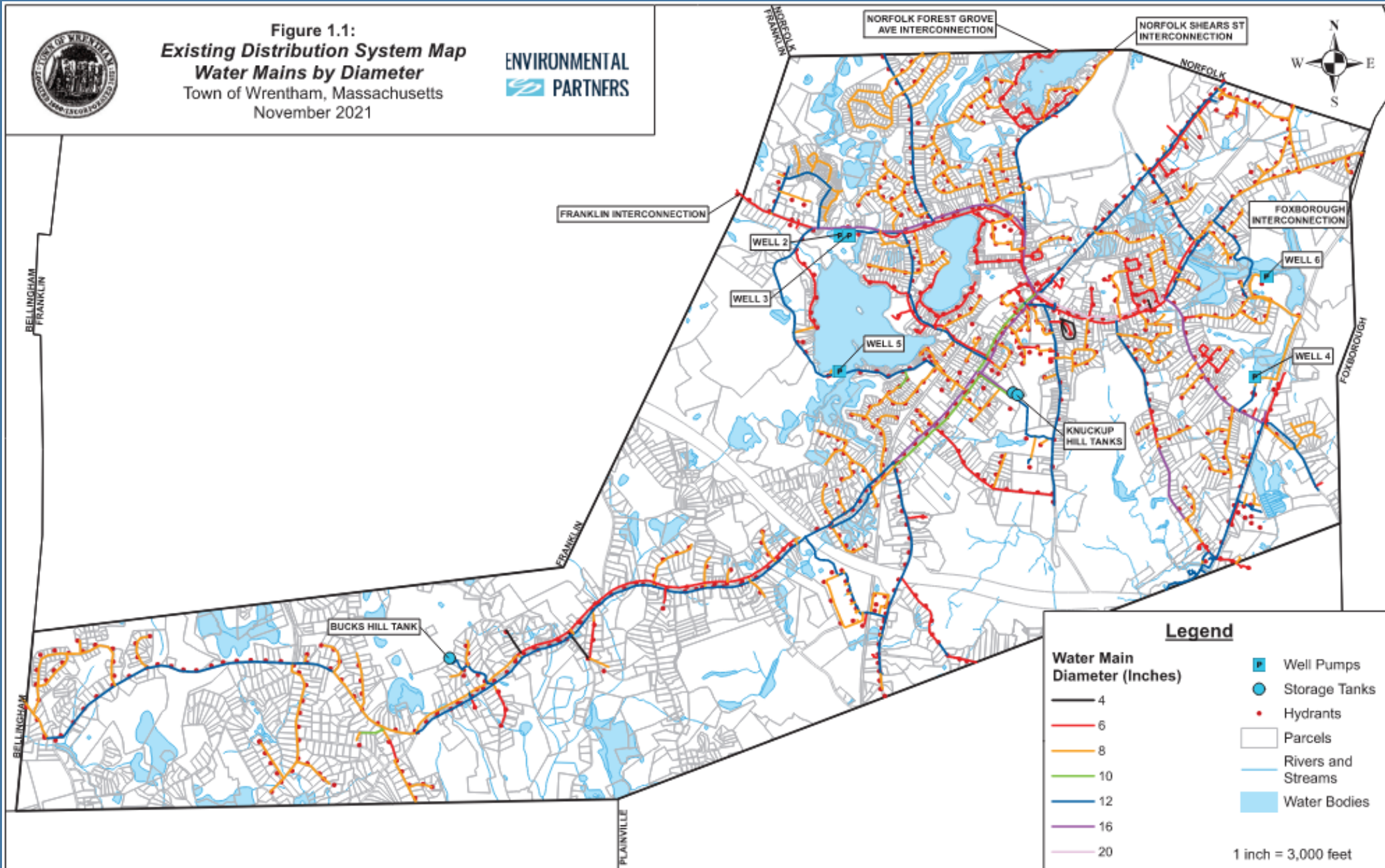
*Knuckup Hill Storage Tanks
(250,000 gallon left and 1,500,000 gallon right)*

EXISTING WATER SYSTEM



Figure 1.1:
Existing Distribution System Map
Water Mains by Diameter
Town of Wrentham, Massachusetts
November 2021

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EXISTING SUPPLY AND DEMAND ANALYSIS

EXISTING WELL AND TREATMENT CAPACITY

- MassDEP-Approved Pumping Rate
- Well Safe Yield (Ability to Produce)
- Current Operational Capacity

FIRM CAPACITY

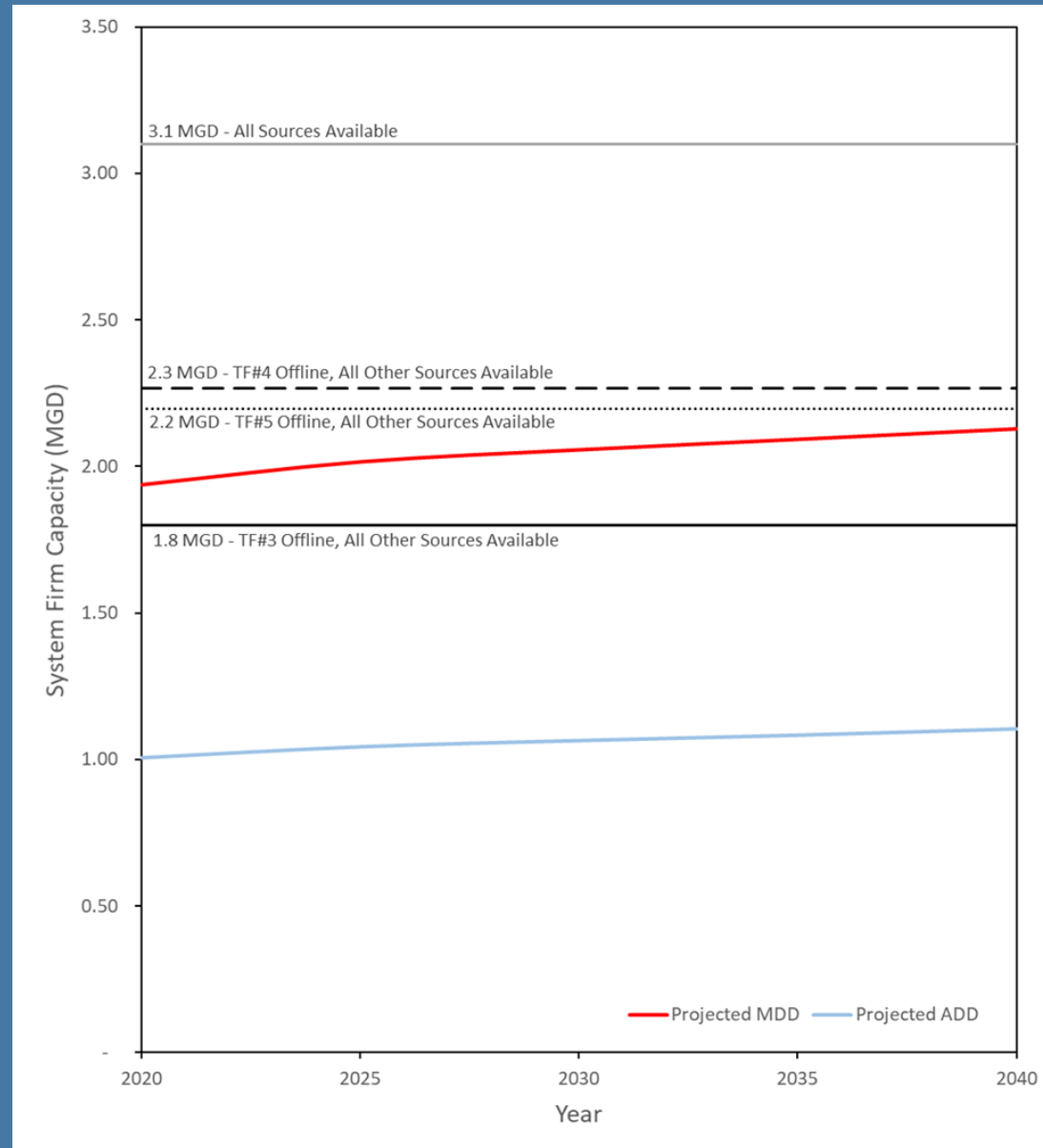
- Current system supply capacity is based on the lesser of safe yield and current operational capacity with largest single source out of service (i.e., lose of Treatment Facility #3).

Treatment Facility	Supply Wells		Treatment Facility Operational Capacity (MGD)	Firm Capacity (MGD)		
	Name	Capacity (MGD)		TF #3 Off	TF #4 Off	TF #5 Off
TF #3	Well #2	0.65	1.33	0.00	1.33	1.33
	Well #3	0.68				
TF #4	Well #4	0.86	0.86	0.86	0.00	0.86
	Well #6	0.19				
TF #5	Well #5	0.94	0.94	0.94	0.94	0.00
Totals		3.13	3.13	1.80	2.27	2.19

Treatment Facility Capacities and Firm Capacity Scenarios



PROJECTED WATER DEMANDS vs. SYSTEM CAPACITY SCENARIOS



WATER SUPPLY CHALLENGES/VULNERABILITIES

- Limited Water Supply Volumes at Existing Sources
 - Water Management Act (WMA) Limits on Existing Wells
 - Stressed Charles and Taunton River Basin (no more available supply for Wrentham)
- Age and Recent Failure of Well 3
- Age and Condition of Well 4
- The Town has **NO** water supplies in West Wrentham.
- Limited Water Main Redundancy to West Wrentham
- Excessively High System Pressure (Necessary to maintain acceptable pressures in West Wrentham)
- Limited Available Water Storage Volumes
- High Water Age in Storage Tanks Degrades Water Quality



Bucks Hill Storage Tank

RECOMMENDED IMPROVEMENTS

SOURCE WATER – TREATMENT – FIRE PROTECTION – STORAGE – DISTRIBUTION

- Replace Well 3 (constructed in 1960) and Well 4 (constructed in 1975)
- Explore New Groundwater Source in West Wrentham
- Improve Existing Chemical Feed Systems
- Develop New Interconnection in West Wrentham
- Enhance Fire Protection with Water Main Replacements
- Create New High Service Area in West Wrentham - New Elevated Storage Tank
- Replace Aging Piping in Distribution System



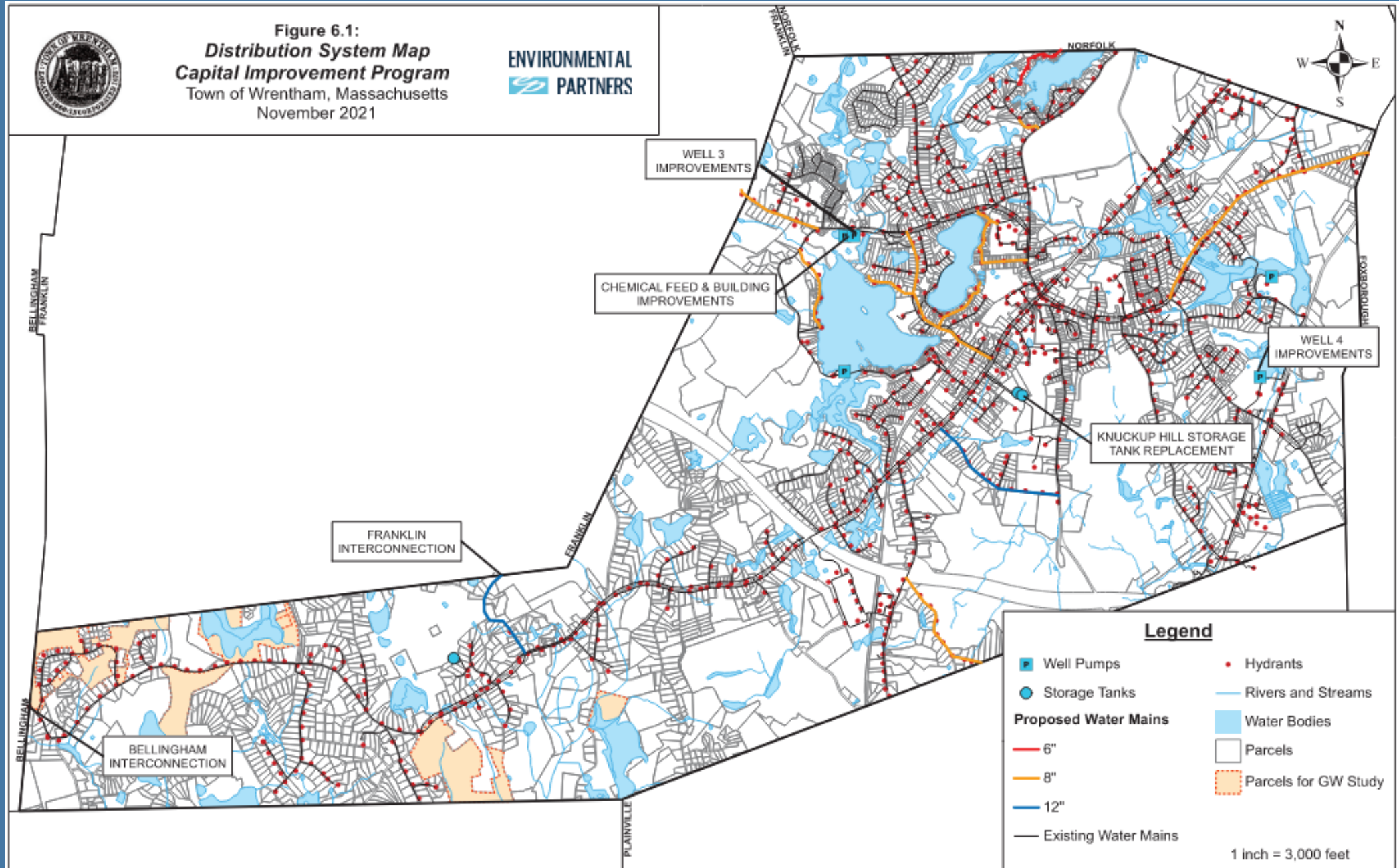
Well 3 Building Exterior

WATER SYSTEM CAPITAL IMPROVEMENT PROGRAM (CIP)

Phase I Improvements - Years 2021-2025		
1	Water Audit and Leak Detection Study	\$55,000
2	Well 3 Exploration and Replacement Improvements	\$1,100,000
3	Chemical Feed Improvements	\$809,000
4	New Source Development Phase 1: Exploration	\$300,000
5	Unidirectional Flushing Program	\$65,000
6	Water and Stormwater GIS Needs Assessment	\$10,000
7	Well 4 Exploration and Replacement Improvements	\$1,100,000
8	Bellingham Interconnection	\$570,000
9	Franklin Interconnection	\$1,770,000
Phase I Improvements Total :		\$5,779,000
Phase II Improvements - Years 2026-2030		
1	Water Main Replacement - Fire Flow	\$4,390,000
2	Building Improvements	\$38,000
Phase II Improvements Total :		\$4,428,000
Phase III Improvements - Years 2031-2035		
1	Knuckup Hill Tank	\$8,094,000
2	Boosted Pressure Zone Study	\$75,000
3	Water Main Replacement - Unlined CI Phase I	\$6,450,000
Phase III Improvements Total :		\$14,169,000
Phase IV Improvements - Years 2036-2040		
1	Water Main Replacement - Unlined CI Phase II	\$1,240,000
2	Water System Master Plan	\$125,000
Phase IV Improvements Total :		\$1,365,000



WATER SYSTEM CAPITAL IMPROVEMENT PROGRAM FIGURE



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Q&A

Many Thanks to:

Kevin A. Sweet, MS, MPA, ICMA-CM, Town Administrator

Mike Lavin, Director, Department of Public Works

Brian Antonioli, Assistant Director, Department of Public Works

Dean Johnson, Water System Manager, Department of Public Works



THANK YOU

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STATE ARPA AND STATE BUDGET SURPLUS

UPDATE: DECEMBER 3, 2021

Legislature has sent \$4B COVID recovery bill to Governor Baker

FUNDING REVENUE SOURCES

- \$1.5B from fiscal 2021 state budget surplus
- \$2.5B from state's allocation under the American Rescue Plan Act

INFRASTRUCTURE FUNDING

- Water and Sewer Infrastructure
 - \$100M
- Environmental Infrastructure
 - \$100M
 - Municipal Vulnerability Preparedness Program (MVP)
- Broadband Access
 - \$5M

*Governor has until December 13th to sign or return with amendments



STATE REVOLVING FUND (SRF) PROGRAM

WATER | WASTEWATER | STORMWATER

Application Process Effort
Community Involvement
Funding Level Potential



AGENCY

State Federal Funding - Massachusetts Clean Water Trust/MassDEP

- SRF offers a low interest loan option to cities and towns in MA for water infrastructure projects in order to comply with state/federal water quality requirements.
- Municipality must complete a Project Evaluation Form (PEF) application to be considered for the State's Intended Use Plan (IUP).
- Principal forgiveness and reduction in loan interest rate available for certain eligible communities and types of projects.



AMOUNT OF FUNDING AVAILABLE

No specific funding limits.
Multiple year projects
can be funded.



DATES & DEADLINES

PEF Applications Due
August 2022



ASSET MANAGEMENT GRANT

INVENTORY & PLANNING FOR WATER, SEWER, AND STORMWATER

Application Process Effort ●●●○○
Community Involvement ●○○○○
Funding Level Potential ●●○○○

AGENCY

State Federal Funding - Massachusetts
Clean Water Trust/MassDEP

- Assists entities to meet federally required Fiscal Sustainability Planning.
- Wastewater, Drinking Water & Stormwater Systems
- Projects include Asset Inventory, Asset Management software and Asset Management Reports

*Application REQUIRES applying firms to be prequalified - EP is prequalified to do this work



AMOUNT OF FUNDING AVAILABLE

Max. \$150K
or 60% of project cost
(whichever is less)



DATES & DEADLINES

Jan/Feb 2022
with deadline of
August 2022



CAPITAL IMPROVEMENT PROGRAM (CIP) COST COMPARISON

Environmental Partners has prepared several WSMP and corresponding CIP for similar water systems in eastern Massachusetts.

Wrentham's per capita cost of the water system CIP is very comparable to other similar Massachusetts water systems.

Town	Population	Total CIP Cost (in 2021 USD)	Cost Per Capita (in 2021 USD)
Wrentham	11,678	\$ 25,741,000	\$ 2,204
Average (Three Towns)			\$ 2,136

