



An Integrated Water Resources Management Plan for Easthampton, MA

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Outline

- What is an Integrated Water Resources Management Plan?
- Why an IWRMP for Easthampton?
- City of Easthampton Overview
- Infrastructure Evaluations
- Asset Prioritization
- Moving Forward with a Plan



What is an Integrated Water Resources Management Plan?

- Considers all Water Resources in Community
- Infrastructure Assessment Plan:
 - Water
 - Wastewater
 - Stormwater
- Identification & Prioritization of Needs
- Pro-active Asset Management



Integrated Planning - Drivers



- Regionalization
- Overlapping / conflicting Master Plans
- Multiple demands on a single resource
- Consensus-based planning
- **Cost-effectiveness of regulatory compliance**
 - **EPA Guidance Document: “Integrated Municipal Stormwater and Wastewater Planning Approach Framework” (2012).**

https://www.epa.gov/sites/production/files/2015-10/documents/integrated_planning_framework.pdf

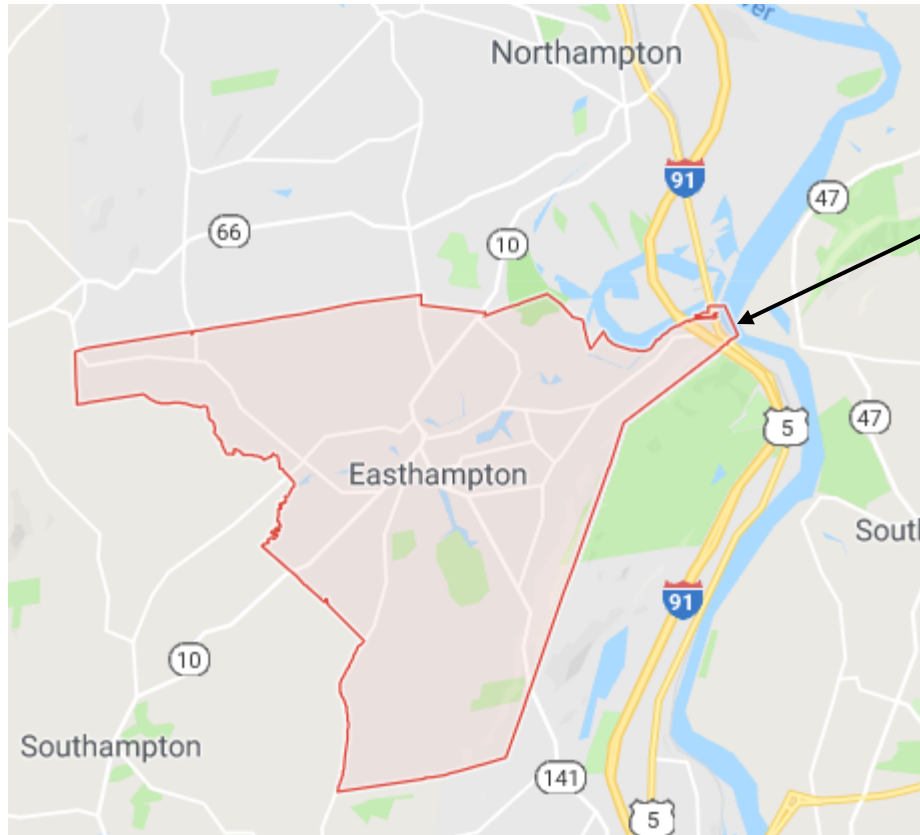


Easthampton – IWRMP Project Drivers

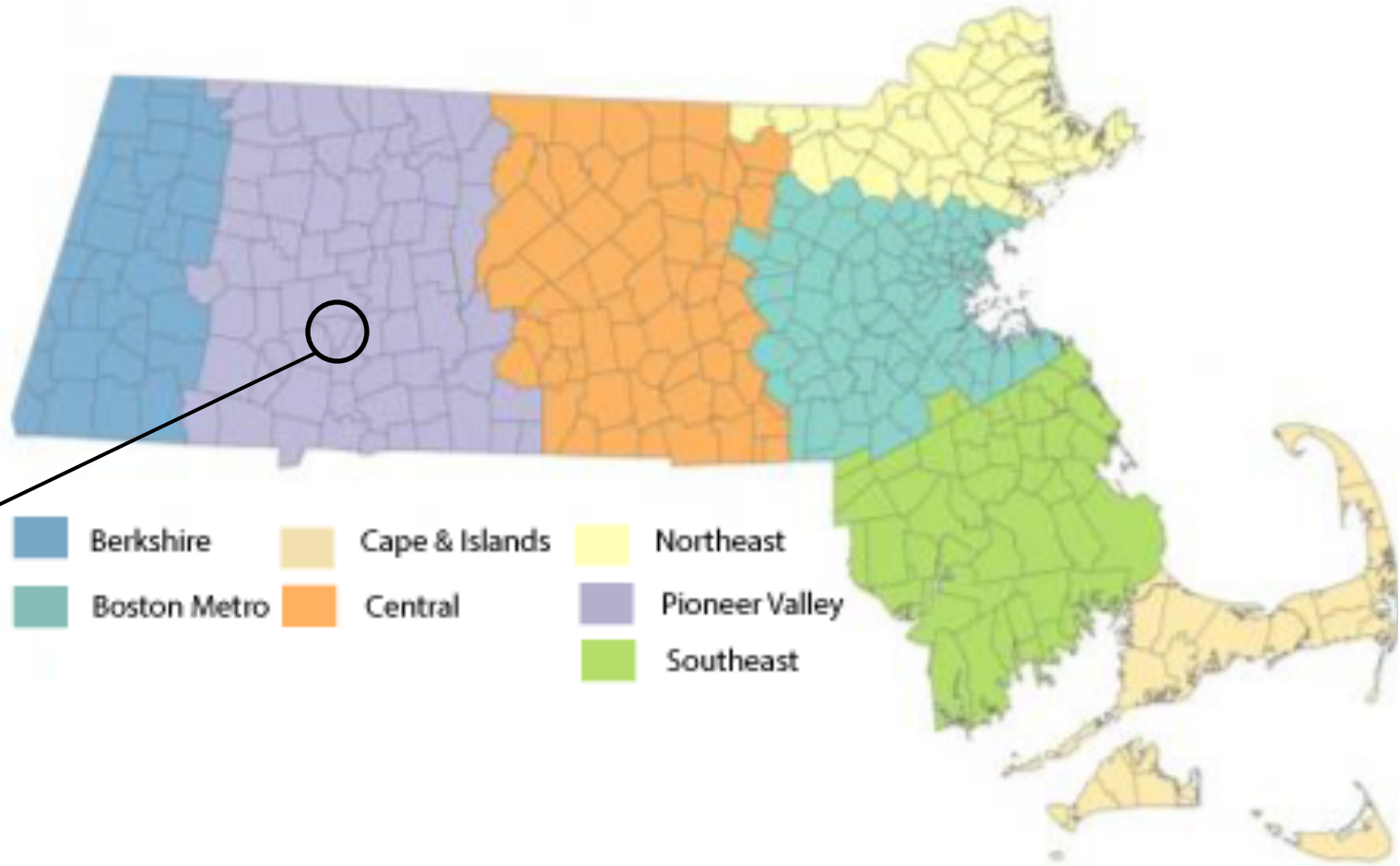


- Aging Infrastructure
- Retirements of Key Personnel
 - Capture Institutional Knowledge
- Lack of Compiled/ Updated Information on City-Owned Water Infrastructure
- Need for Capital Planning and to Support Redevelopment in City
- Justification for Funds and Staffing Levels
- New Regulations for Water, Stormwater, and Possibly WW

Easthampton, MA



www.google.com/maps/place/Easthampton



www.masstech.org

City of Easthampton, MA

- Population: ~16,100
- Square Miles: 13.33
- ~1,200 Persons/ Square Mile
- Government: Mayoral
- Median Income: \$58,000
- Old Mill Town
- Almost Fully Developed
- Redevelopment / Infill



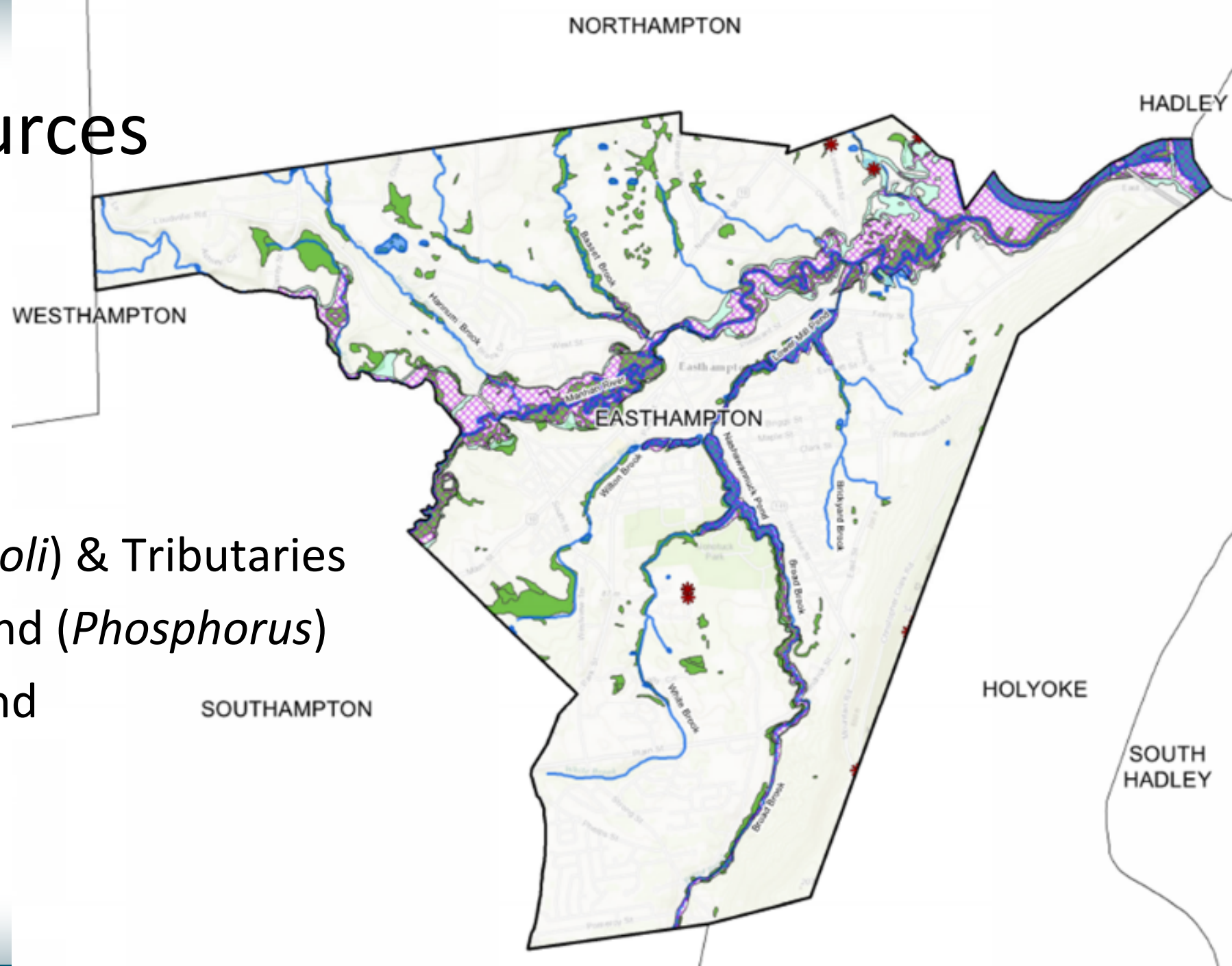
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businesswest.com/blog/success-stories-2/

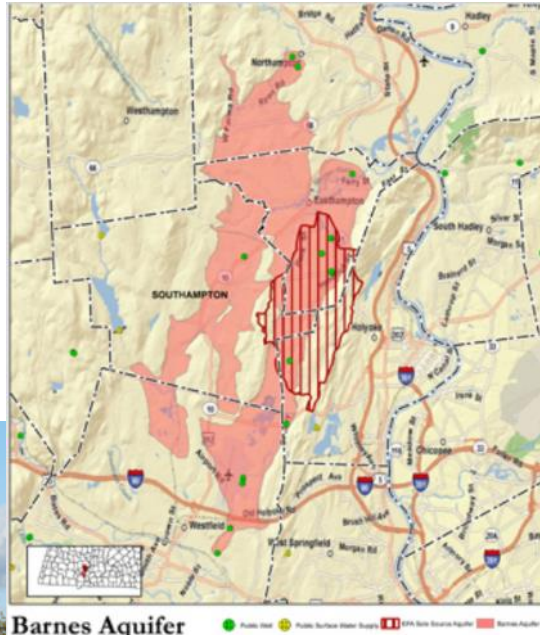
Water Resources

- Barnes Aquifer
- CT River (*E. coli*)
- Oxbow (*Turbidity*)
- Manhan River (*E. coli*) & Tributaries
- Nashawannuck Pond (*Phosphorus*)
- Rubber Thread Pond
- Lower Mill Pond
- Upper Pond





Nashawannuck Pond



Barnes Aquifer

Barnes Aquifer



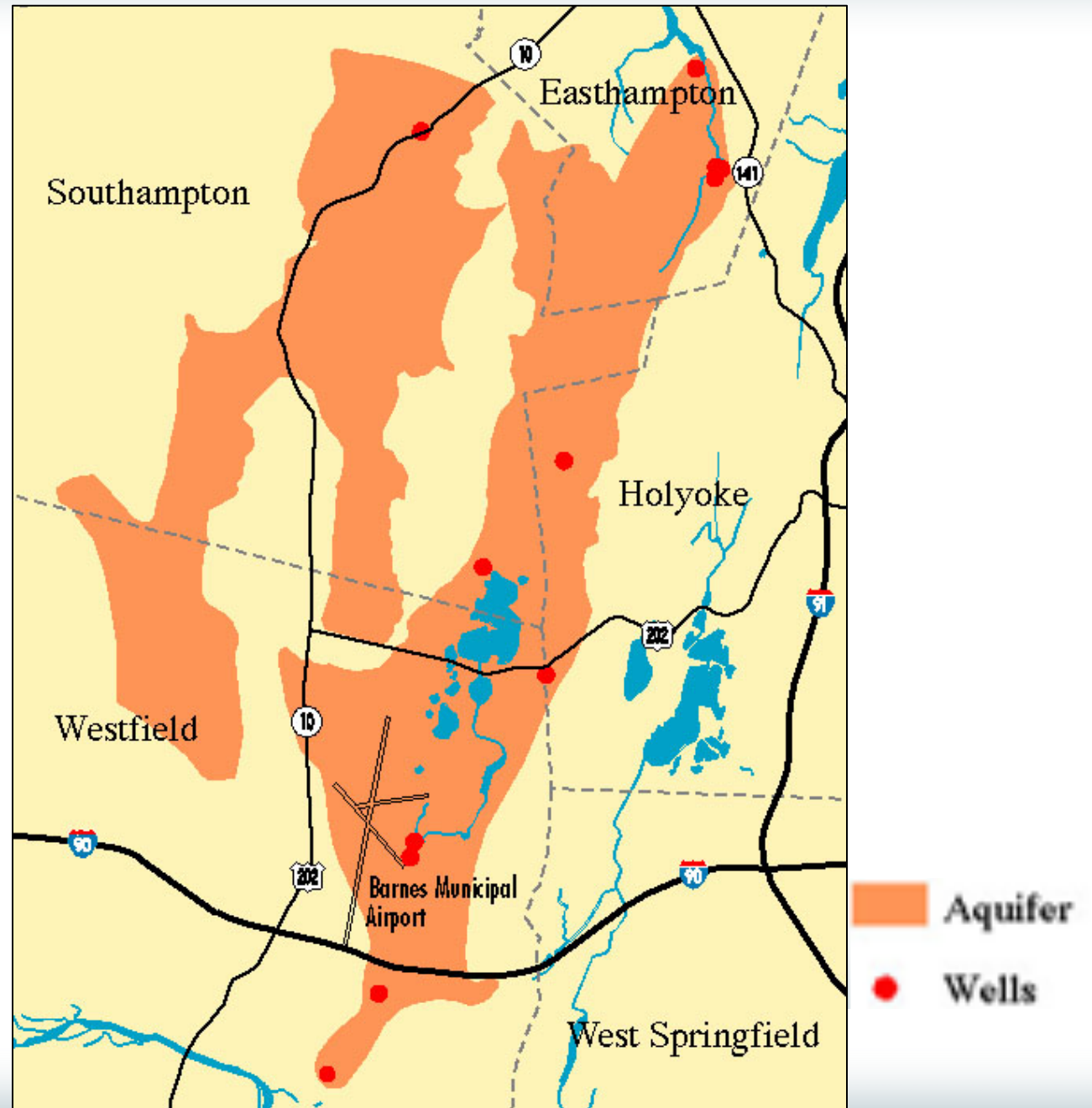
Masslive.com



Oxbow

Barnes Aquifer

- 4 Municipalities:
 - Westfield
 - Holyoke, and
 - Easthampton
 - Southampton
- 11 wells - 5 MGD to 60,000 customers
- Most Valuable Asset



Easthampton water named best in nation by National Rural Water Association taste test

By CHRIS LINDAHL
@cmlindahl

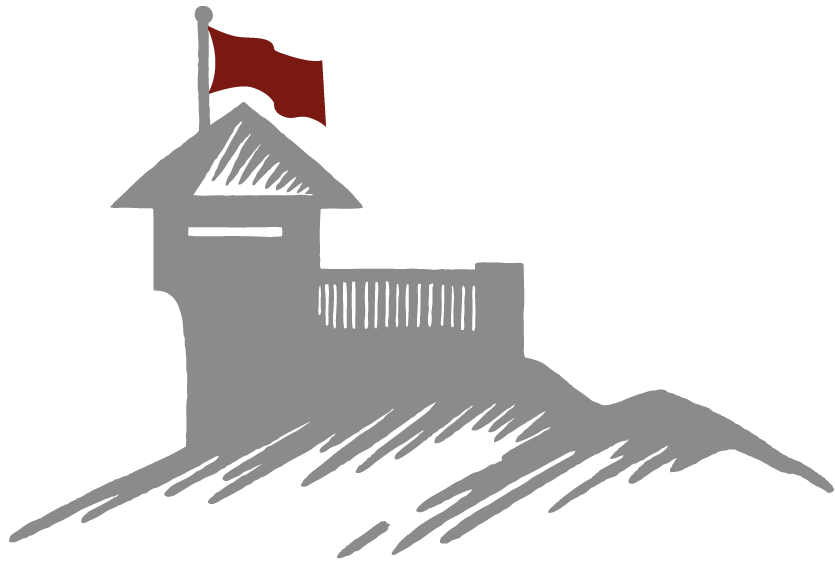
Last modified: Friday, February 13, 2015

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www.reynoldspurifiedwater.com/articles/

New Industry Customers

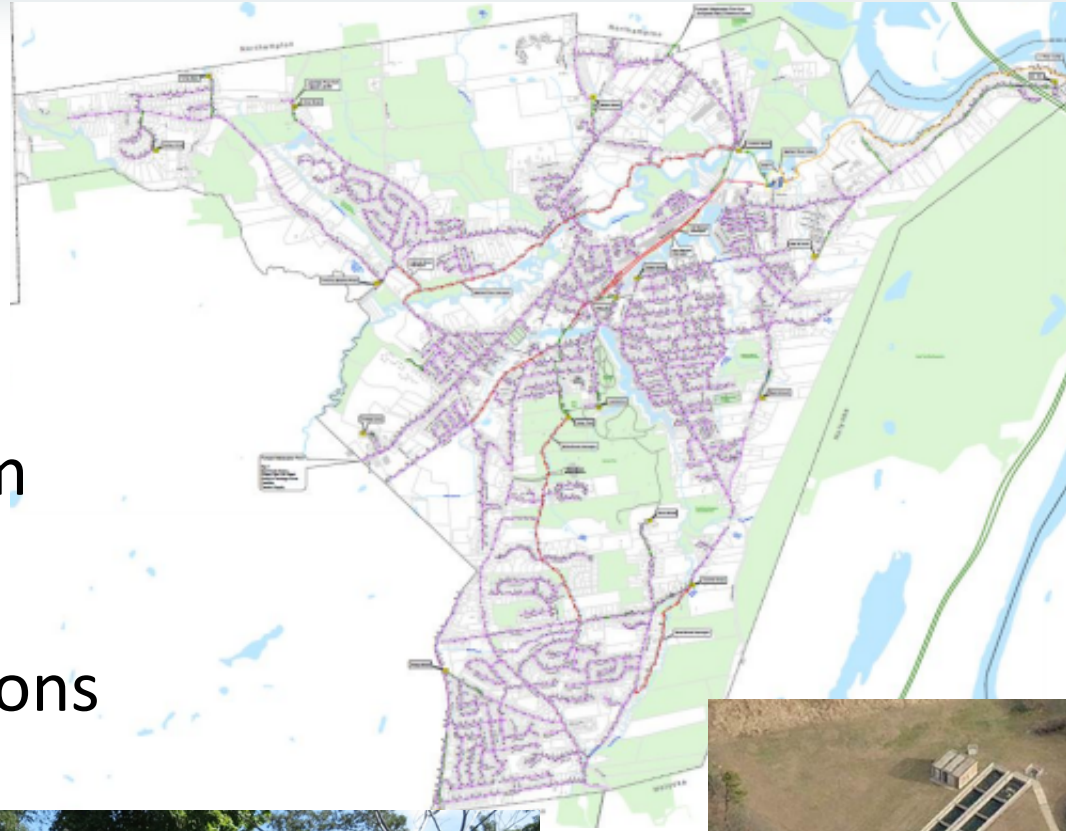


Fort Hill Brewery



Wastewater

- 3.8 MGD WWTP
- 18 Pump Stations
- 81 miles of Collection System
- 5 miles of Force Main
- 35 miles of Service Connections



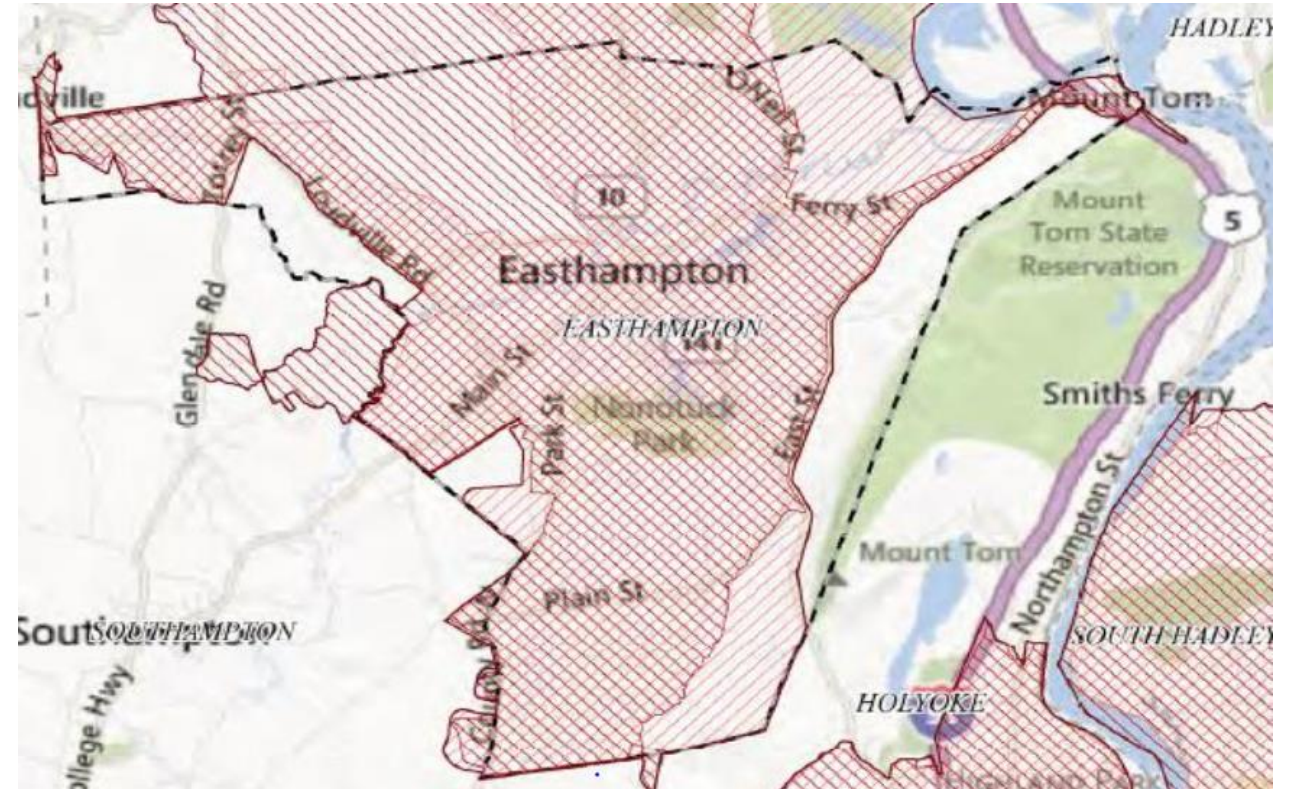
Drinking Water Infrastructure

- Source: Barnes Aquifer
- 4 Wellfields
- Treatment - for Trichloroethylene (TCE)
- 3 Storage Tanks
 - 2 in Use
 - 1 Not in Use
- Distribution System



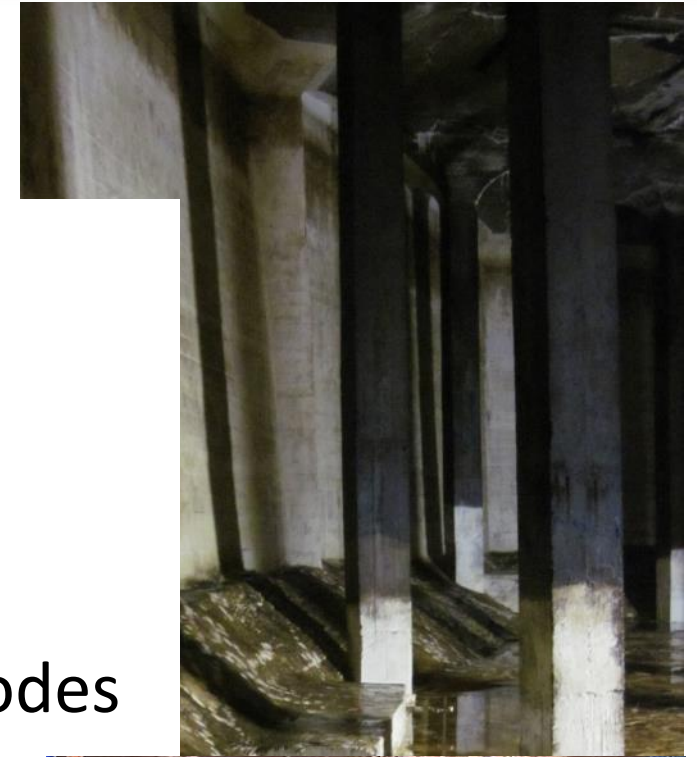
Stormwater

- Subject to MS4 Regulations
- ~20 Detention Basins
- 2,711 Catch-basins
- 190 Outfalls
- 69 Miles Storm Drain Pipes



Evaluation of Infrastructure

- Condition Assessments
- Capacity Assessments
- GIS Mapping
- Process Evaluations
- Permits/ Regulations/ Codes
- Energy Evaluations
- Cost Estimates
- Specific Questions



Wastewater Specific Evaluations

- Optimize No. Pump Stations
- WWTP Outfall Evaluation
- Sewer Infiltration Investigations in 3 Areas
 - Flow monitoring
 - CCTV
 - Manhole inspections
 - Dye Testing



Water System Infrastructure Tasks

- Hydraulic Model Update/ Calibration
- Water Age Analysis/ Optimization
- Evaluation of Mt. Tom Storage Tank
- Water Treatment Evaluation
- System Capacity Analysis



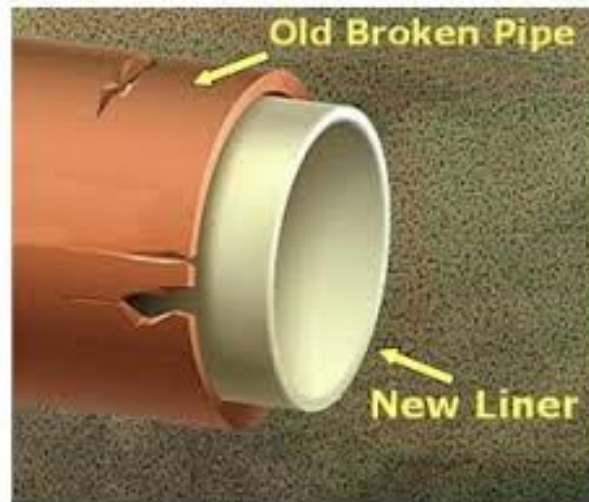
Stormwater Infrastructure Tasks

- Detention Basin Mapping
- Cost Estimate
- Preliminary SW Utility Evaluation
- MS 4 Compliance
- Notice of Intent
- O&M Manual
- IDDE Plan
- SWMP



Top Projects - Wastewater

- Replace Surface Aerators
- Replace Belt Filter Presses
- Repair CT River WWTP Outfall
 - New Access Road
- Remove 3 pump stations from collection system.
- \$4M Sewer Rehab.



Existing Mechanical Surface Aerator



Existing Belt Filter Press

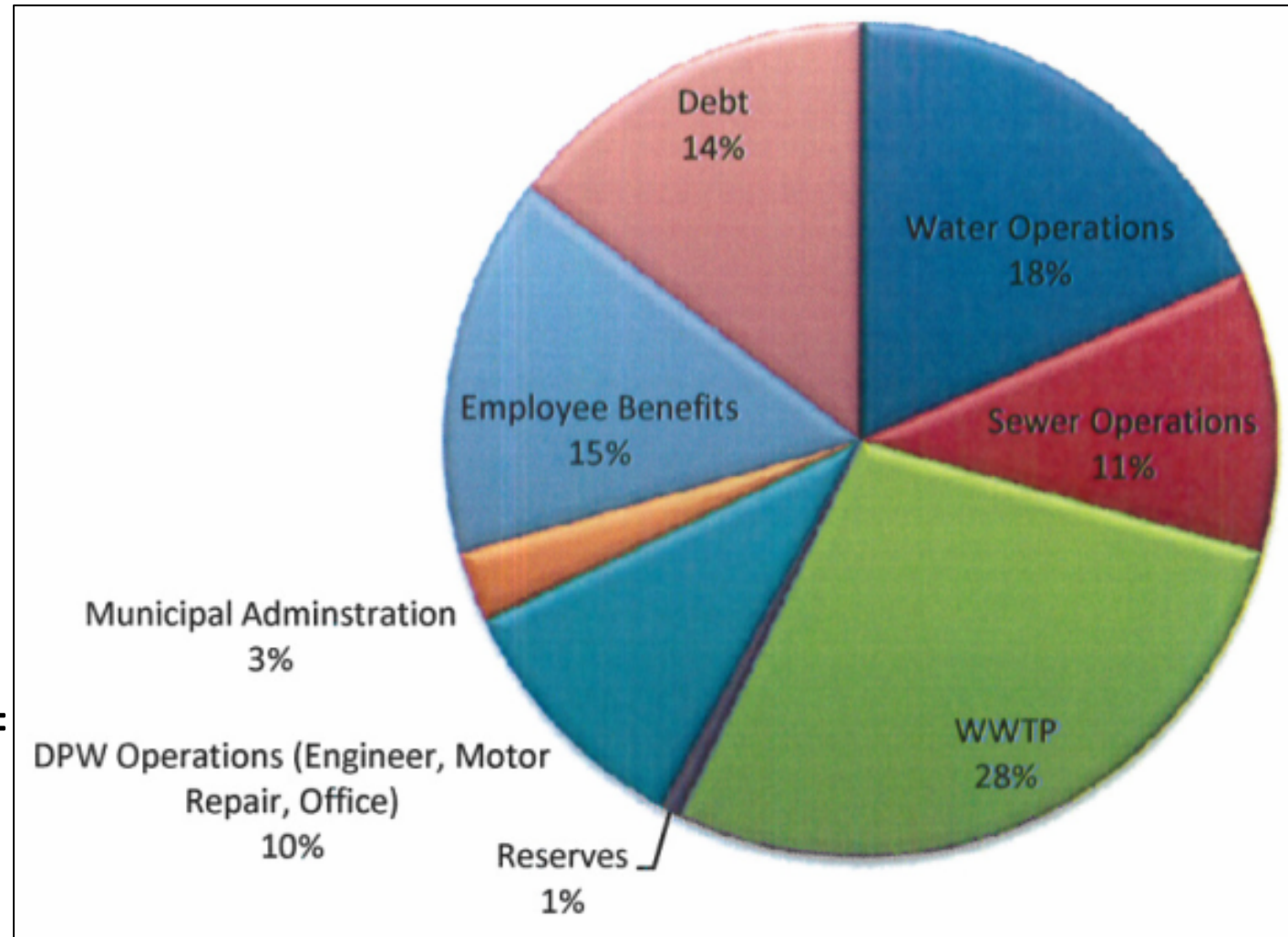
Top Projects - Water



- Add redundancy to TCE treatment process.
- Modify water supply operations to decrease water age in storage tanks.
- Water main upgrades.
- Water demand management program (to identify unaccounted for water).
- Increase pumping capacity of well-fields to sell water to Southampton.

Stormwater Needs

- Reliable funding
- Positioned for compliance with initial MS4 deadlines.
- Annual budget with MS4 estimated at > \$1.0 Million.
 - \$700,000 on SW repairs
 - MS 4 Costs + Capital Needs = ~\$370,000



Key Findings from Evaluations

- > 800 projects identified over next 20 years.
- ~\$50M
- Most for wastewater



Prioritizing Projects

Risk or Opportunity =

Likelihood x Consequence (of Failure or Success)

		Consequence Factors						
Risk / Opportunity	Immediacy	Public Health Impact	Environmental Impact	Cost/Benefit	Permit/Regulatory/ Code Violation	Likelihood of Failure / Success	Conseq. Factor	Risk/ Opportunity Score
Risk	Immediate	1-Minimal	1-Minimal	3-Moderate	5 - Immediate Violation	5	5.00	25.0
Risk	A	5-Very High	1-Minimal	5-Very High	1- No Violation	4	3.67	14.7
Risk	A	1-Minimal	1-Minimal	4-High	3- Potential Violation	4	2.57	10.3
Risk	A	5-Very High	1-Minimal	3-Moderate	3- Potential Violation	4	3.00	12.0

Risk / Opportunity Projects

Risks

- Age
- Condition
- Redundancy of Critical Equipment
- Capacity
- Regulatory Compliance
- Regulatory Readiness
- WQ Treatment Effectiveness

Opportunities

- Energy Savings
- Staffing Efficiency
- Regulatory Preparedness
- Other Efficiencies
 - Operations/ Administration
- Treatment/ Water Quality Optimization

Consequences / Criticality

Public Health	Costs / Benefits	Environmental	Permit/ Code/ Regulatory
<i>Affects:</i>	<i>Extent of Costs / Benefits:</i>		<i>Failure would result in:</i>
<10 customers No critical facilities	Minimal	Minor or No Impact to Non-impaired Waters	No Violation
10-25 customers No critical facilities	Low	Major Impact to Non-Impaired Waters	--
26-100 customers No critical facilities	Moderate	Minor Impact to Impaired Waters	Possible Violation
100-500 customers No critical facilities	High	Major Impact to Impaired Waters	--
>500 customers, or Critical facilities ¹	Very High	Impact to Barnes Aquifer	VIOLATION

Recommendations

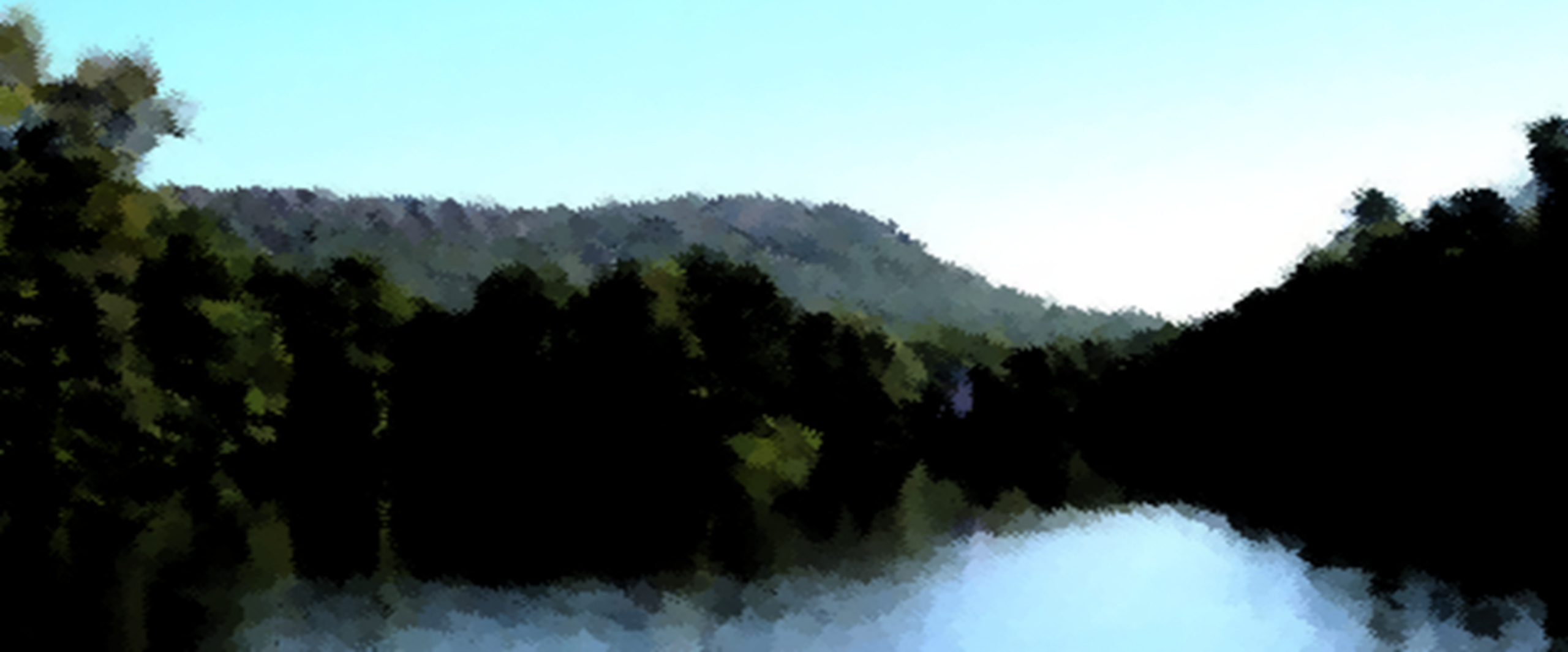
- Use the tools for capital planning.
- Adjust as necessary.
- Increase staffing at WTP, WWTP & Engineering.
- Initiate recommended O&M practices.
- Asset management program for W, WW, and SW.
- Results:
 - Protection of water resources,
 - improved function of infrastructure,
 - compliance with mandates/ permit & regulatory obligations.



Summary

- Easthampton has similar challenges to other communities in NE and has some unique assets.
- Engineering Team designed project and created deliverables to address Easthampton's specific needs.
- Collected feedback from all levels of City personnel & Public
- IWRMP will provide baseline of information covering all infrastructure assets.
- Plan will provide decision making tools for prioritization and project comparison as conditions change.

Questions?



Use of Integrated Planning Throughout the US

- Integrating Sectors: Water/Wastewater/Stormwater
 - Long-Term Planning
 - Improved Value in Regulatory Compliance
- Integrating Utilities/Districts/Cities
- Consensus-Based Long-Term Water Supply Plans
- Including Climate Adaptation to Reprioritize Risks in Master Plans
- Urban Planning: Transportation, Energy, Water



Evaluating Easthampton Water Infrastructure

- Wastewater

- Treatment Plant
- Collection System
- Pump Stations



- Stormwater

- City Owned Detention Basins/ Outfalls
- MS4 Permit Compliance

- Drinking Water

- Treatment
- Capacity – Drinking Water & Fire Flows
- Storage
- Distribution System