



Drinking Water Regional Planning – Supply, Demands & Opportunities

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Introductions



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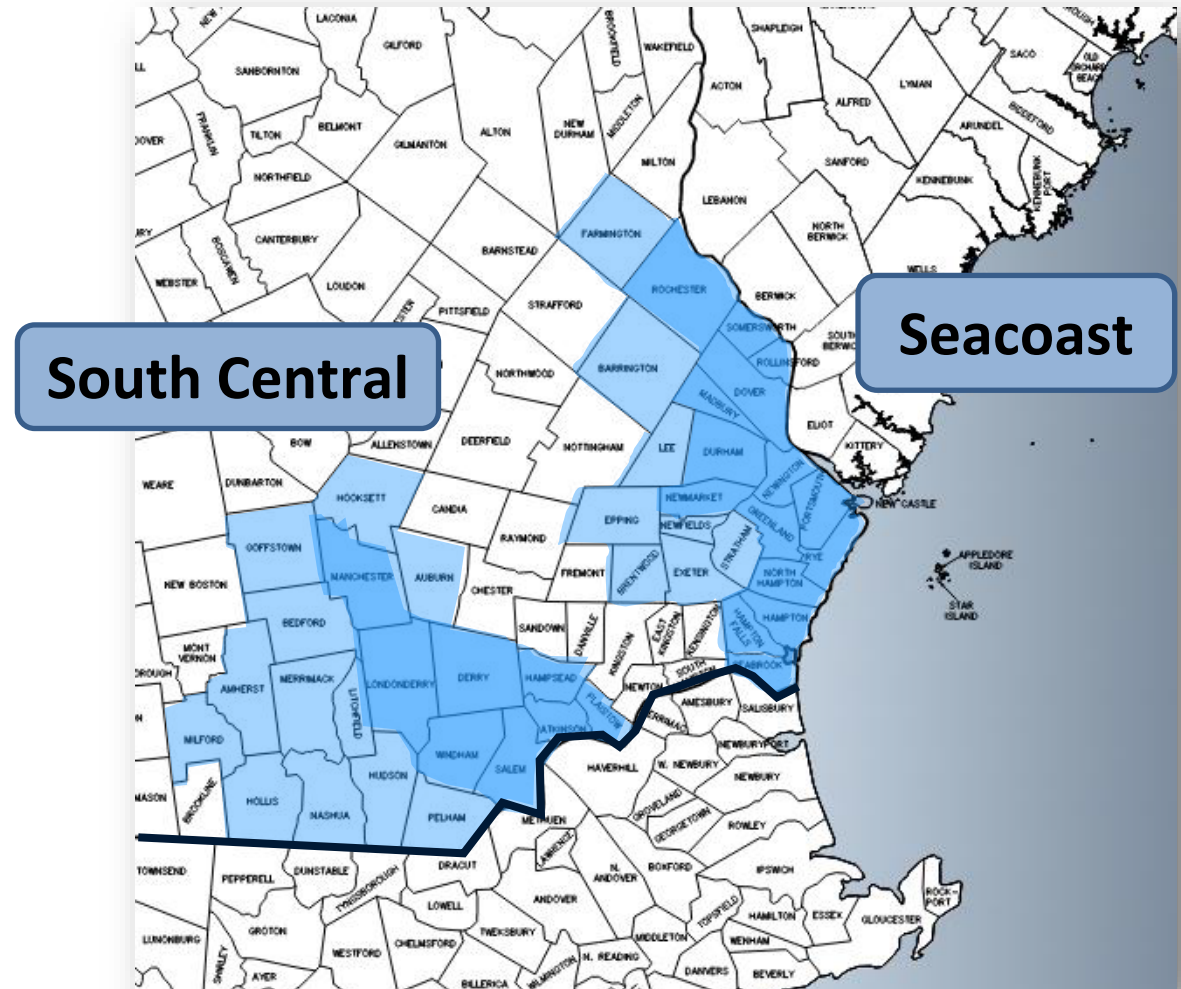
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Overview



- NHDES Perspective
- South/Central NH Examples
 - Large Water Systems
 - Small Water Systems
- Seacoast Emergency Interconnection Study
- Closing Thoughts





NHDES Perspective & South/Central NH Examples

Mike Unger, PE
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What is regionalization (this presentation)?

- Public water systems in more than 1 town interconnecting for water supply
 - Permanent,
 - Year-round,
 - Seasonal,
 - Supplemental, and/or
 - Emergency

What is regionalization/consolidation (other contexts)?

- Ownership
 - Regional water authority, not NH (yet?)
 - Sale
 - Joint
- Joint administration
- Joint operations

Drivers

- Contamination
- Environmental Factors: drought, extreme precipitation, cyanobacteria
- Economic Development
- Small Community Water System (CWS) Challenges

Benefits of Regionalization/Interconnection/Consolidation

- Resilience
 - Diversify sources of supply
 - Spread risks
- Efficiency / Economy of Scale
 - Share resources
 - Physical: treatment, storage, etc.
 - Human: managerial, operational, administrative
 - Use more efficient, reliable sources of supply instead of developing new
 - Spread costs

Challenges of Regionalization

- Political
 - Local control
 - Promoting development in neighboring towns
- Environmental Impact
 - Allows development in areas without adequate water supply locally
 - Inter-basin transfer
- Management
 - Allocating costs and responsibilities for O&M of shared facilities and resources

Considerations / Tools

- Legal Agreement
- Technical advice: engineer
- Legal advice: attorney
- Environmental Finance Center Network

<https://efc.sog.unc.edu/resource/consolidation-of-water-and-wastewater-systems/>

Keys to Regional Project Success

1. Start with the needs and goals and work backward
2. Find a champion
3. Engage decision makers early and often
4. Keep the plates spinning
5. Decide when to fish or cut bait

Funding Opportunities

- Drinking Water State Revolving Loan Fund (DWSRF): pre-app due May/June
- PFAS Remediation Loan and Grant Fund: apply any time
- NH Drinking Water and Groundwater Trust Fund (DWGTF): funding applications due September 24, 2026
- **Consolidation Study Assistance Program (CSAP)** from DWGTF: \$10k grant, apply any time
- Outside DES – USDA Rural Development, CDBG, Northern Borders, EDA

<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/pws-funding-resources.pdf>



South/Central NH Regional Water Study



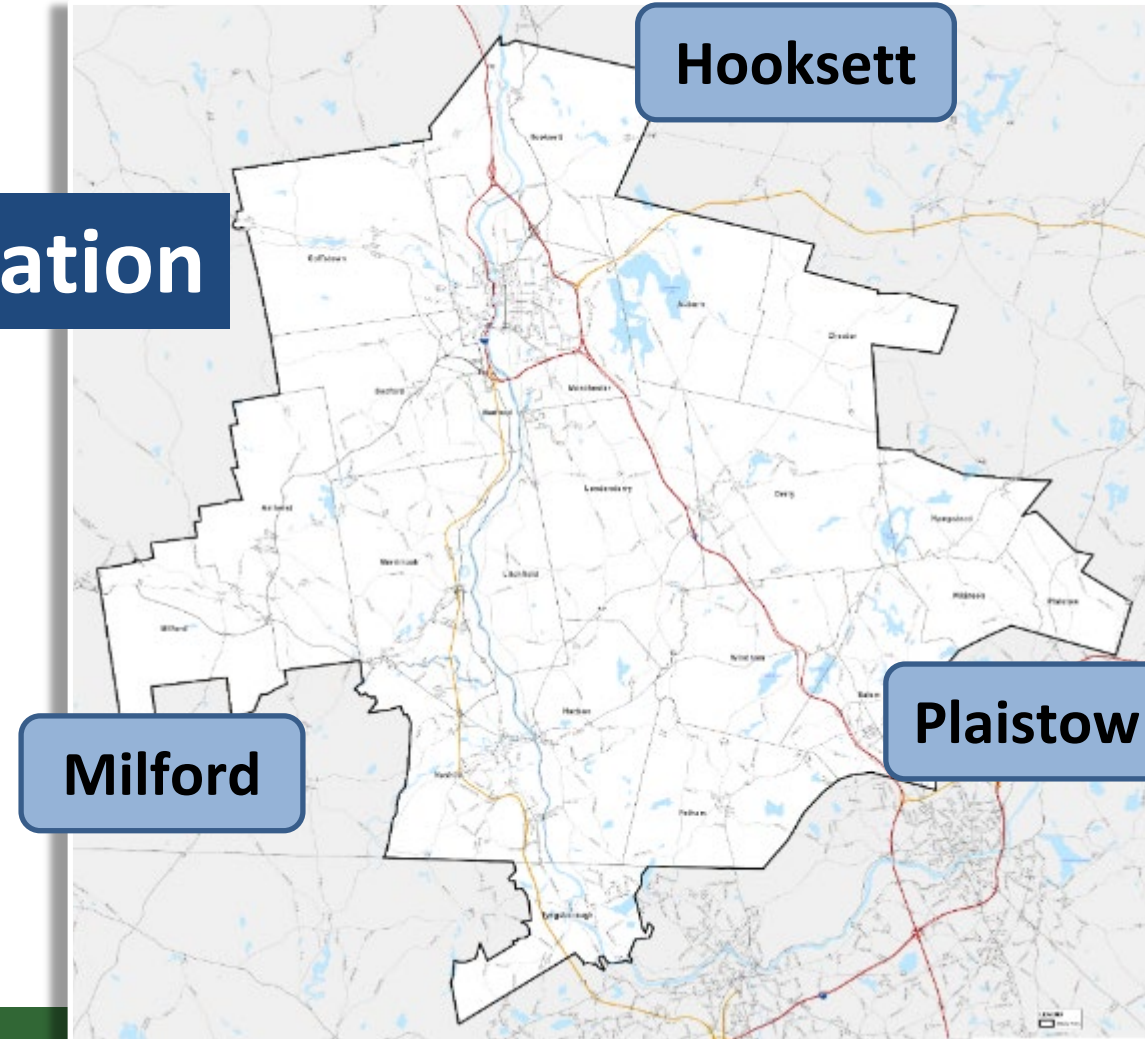
Study Area



21 Communities Total

Approximately 40% of NH's population

- 85 million gallons per day
- 9 Large Water Suppliers
- 200+/- Community Water Systems
- 60,000+/- private wells



Study Objectives



1. Comprehensive, high-level regional water supply plan
2. Efficiently allocate region's source water
3. Prioritize infrastructure improvement projects in the near-term consistent with the region's long-term needs

Study Questions



- What is the existing supply capacity of the region?
 - By PWS / Town
- What are current and projected demands?
 - By PWS / Town
- Does the region have sufficient supply capacity?
- Identify and screen viable alternatives to allocate supply capacity
- Evaluate most promising alternatives

Supply Capacity Assessment



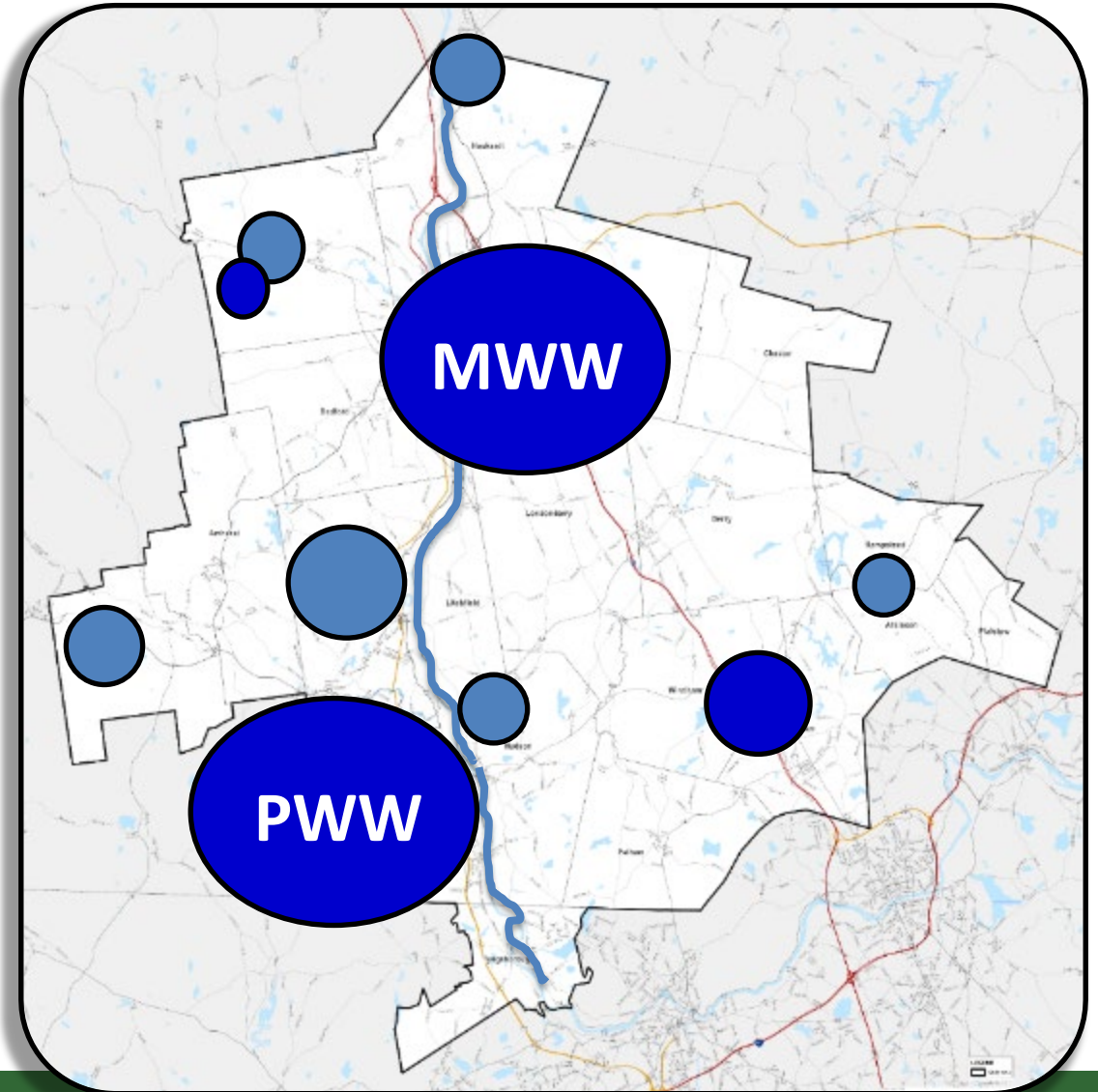
Current Supply Sources

● = Surface Water

● = Groundwater

MWW: Manchester Water Works – Lake Massabesic and Merrimack River radial well

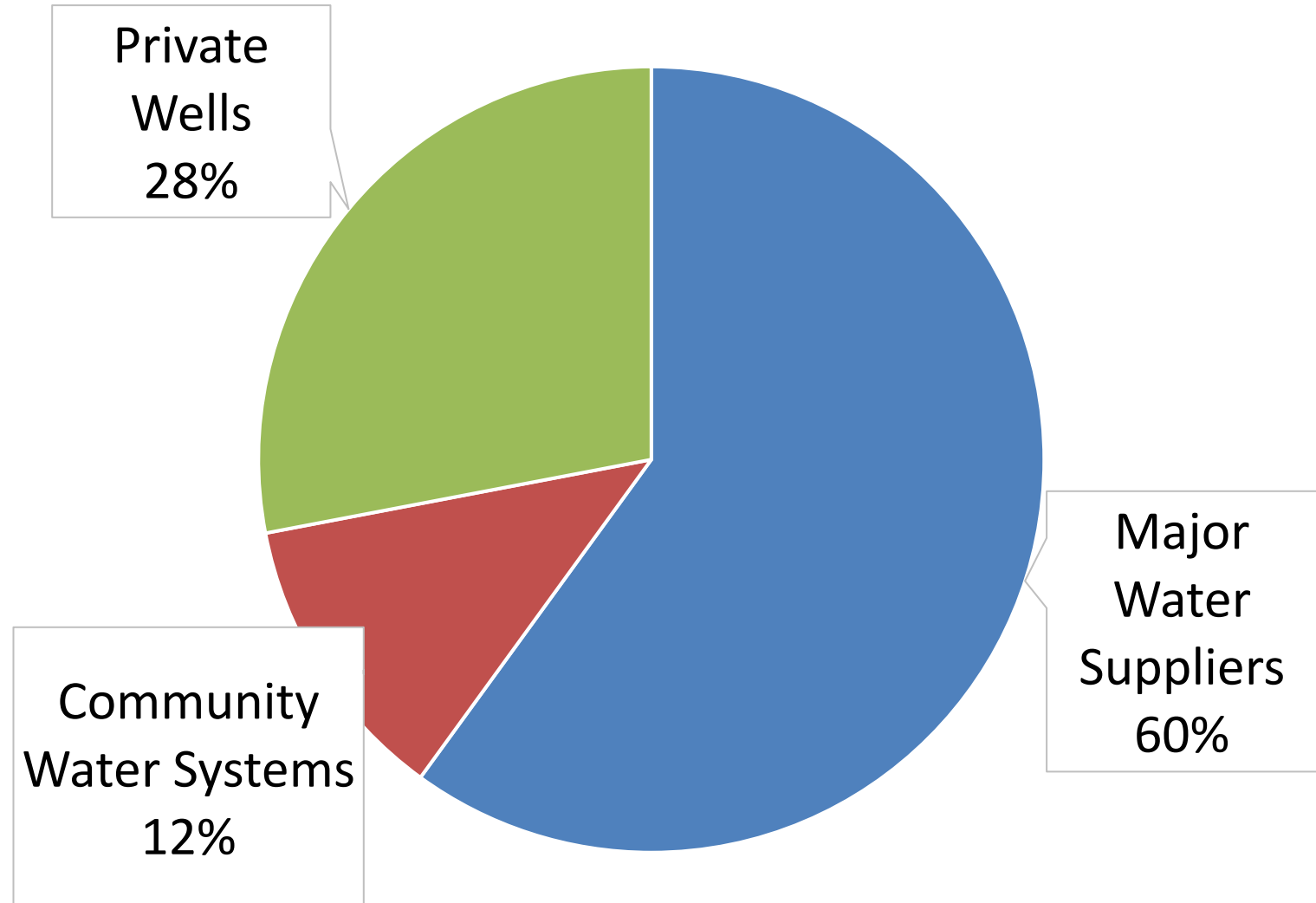
PWW: Pennichuck Water Works – Merrimack River



Drinking Water Sources

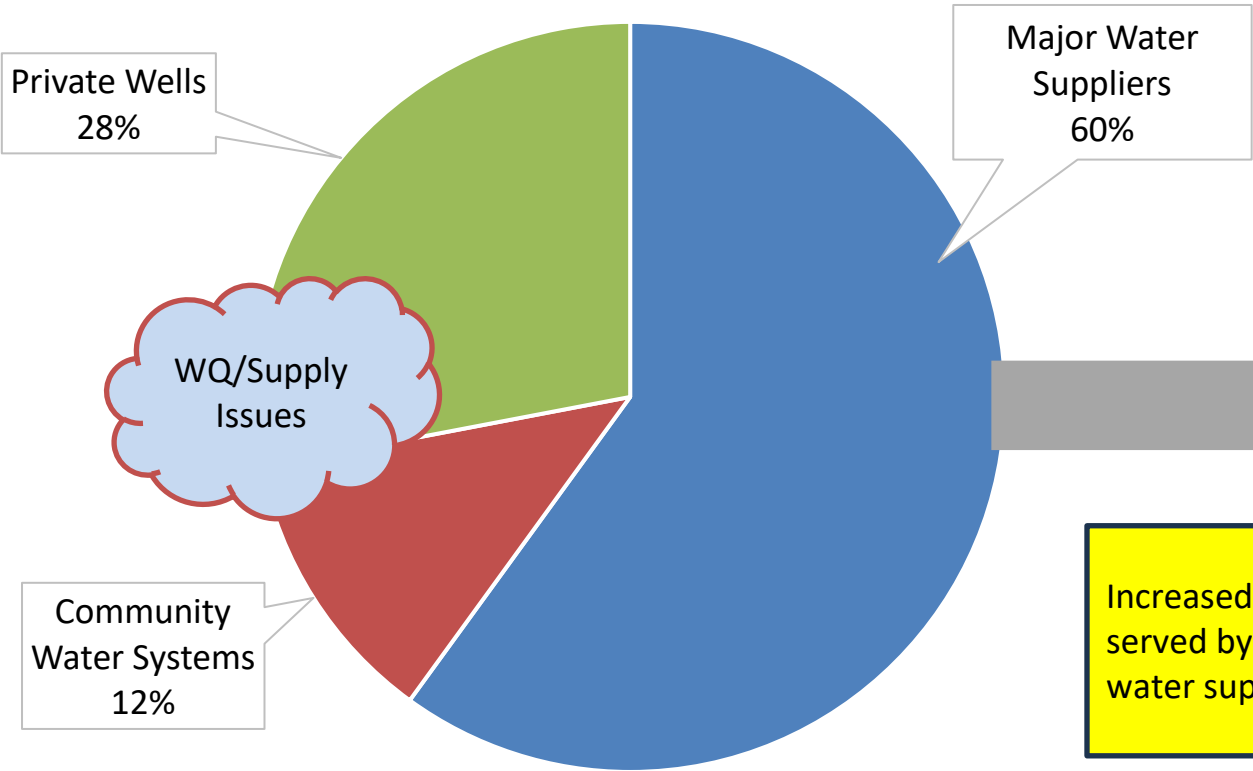


- 516,000 people
~40% of NH
- 21 communities
- 85 million gal/day
- 9 Lg. Water Suppliers
- +/- 200 CWS
- +/- 60k private wells

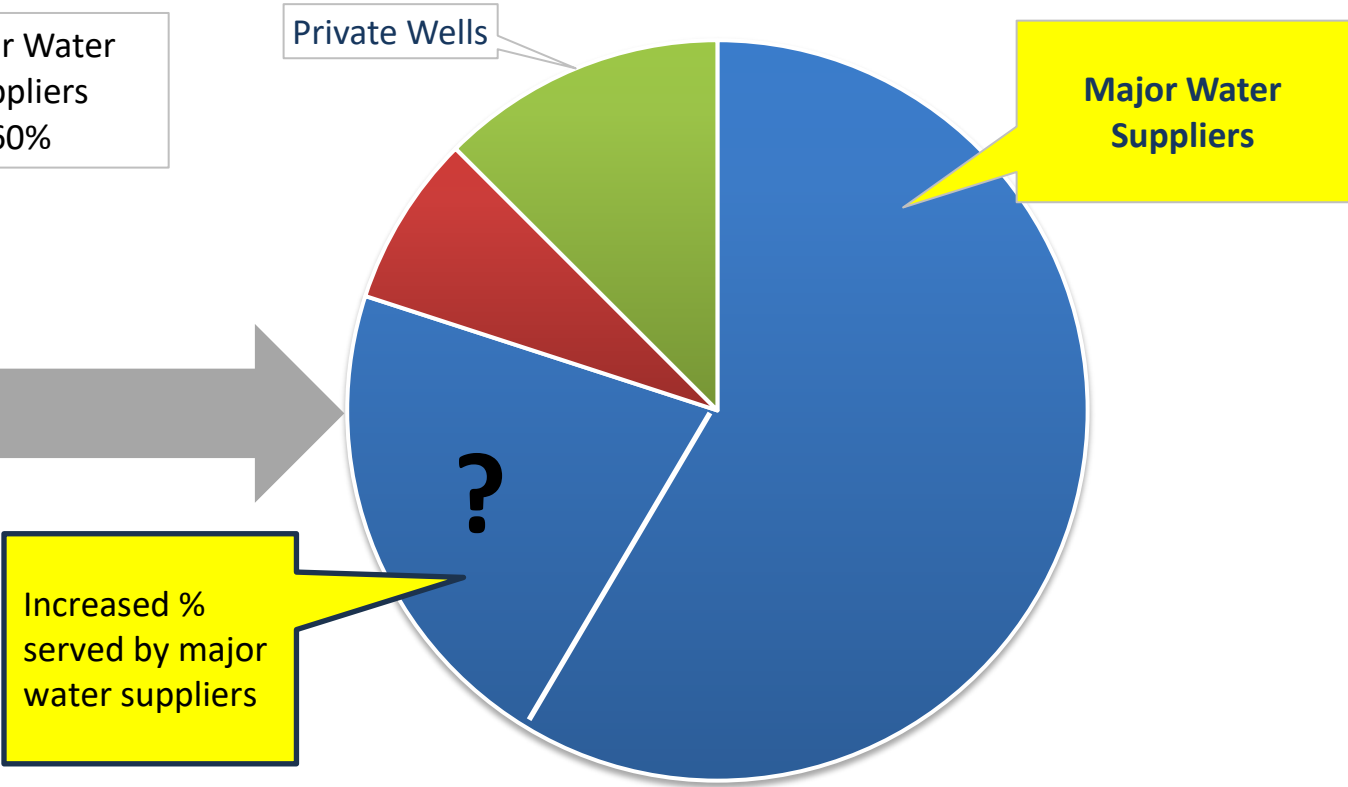


Balancing the Supply

Existing Water Source Breakdown



Future Water Source Breakdown



Data Collection



- Stakeholder meetings
- NHDES One Stop
- GIS
- Sanitary survey reports
- Master plans
- Stakeholder questionnaire



Pexels.com

Questionnaire



- Water Supply Needs?
- Water Quality Issues?
- Planned Growth?
- Consolidation of CWS?
- Redundancy?

DRAFT Information Request
Water Supplier/Town/City
South Central NH Regional Water Supply Plan
Study Phase Engineering Evaluation
3/31/2022



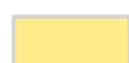
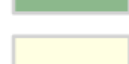
Projected Future Supply Capacity Surplus/Deficit

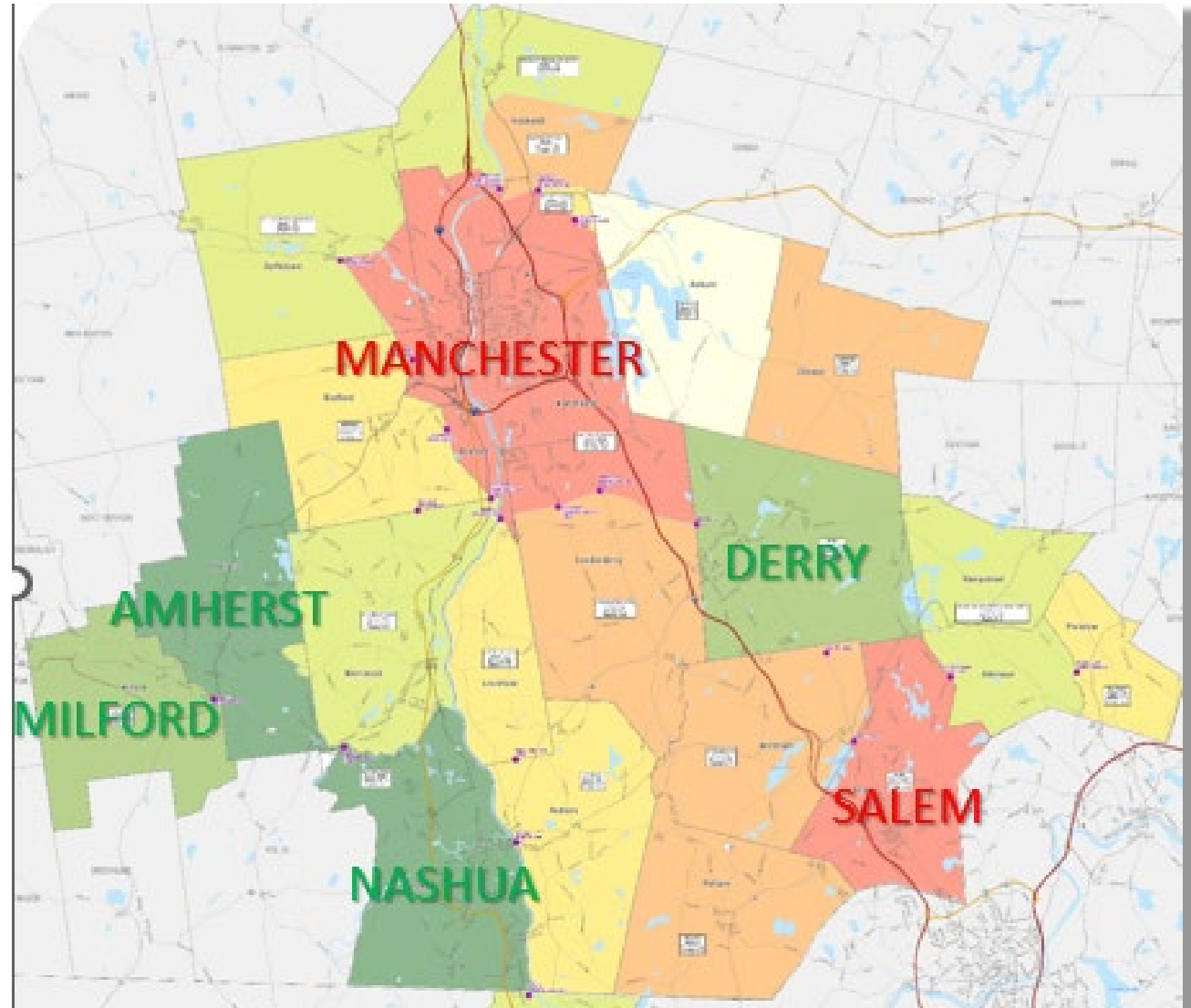


LEGEND

 Water System Interconnections

Water Supply and Demand Future MDF Difference (MGD)

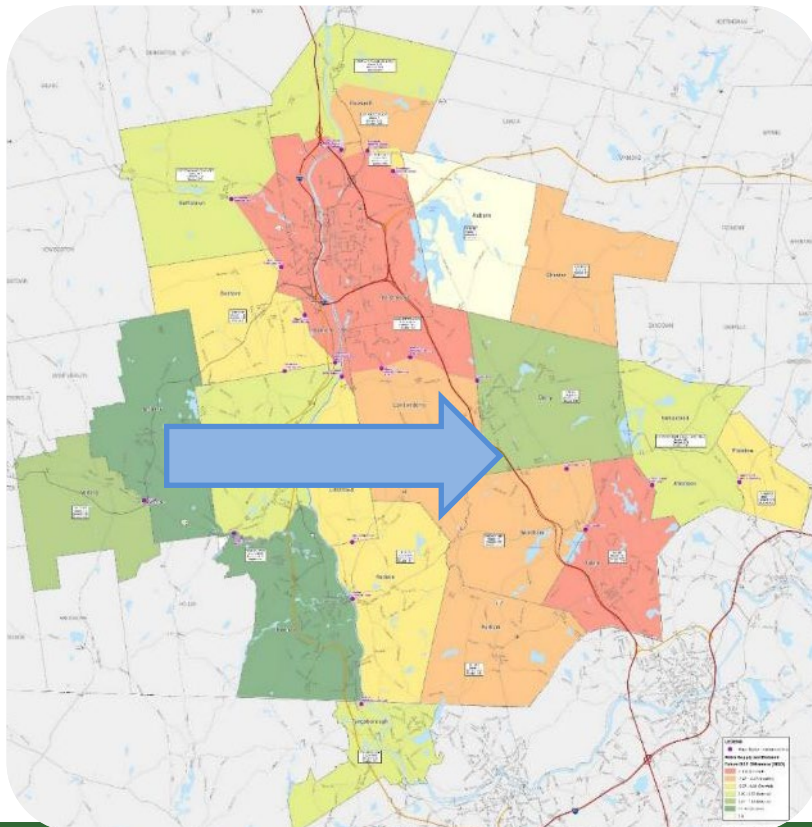
	> -2.3 (Shortfall)
	-2.07 - -0.37 (Shortfall)
	-0.37 - 0.02 (Shortfall)
	0.02 - 0.37 (Surplus)
	0.37 - 1.55 (Surplus)
	> 1.55 (Surplus)
	0.0



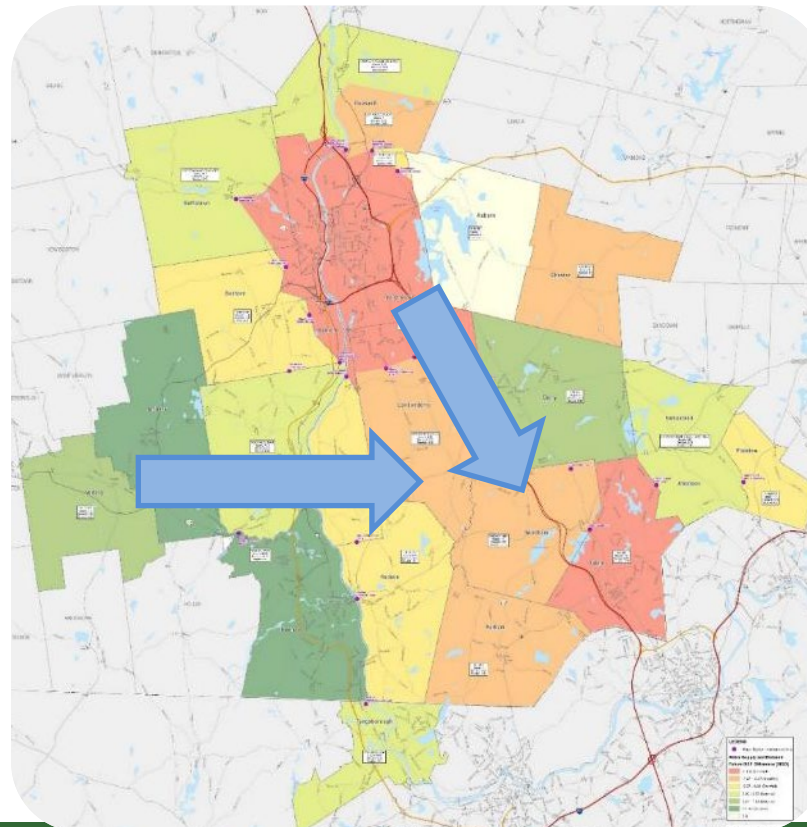
Infrastructure Alternatives



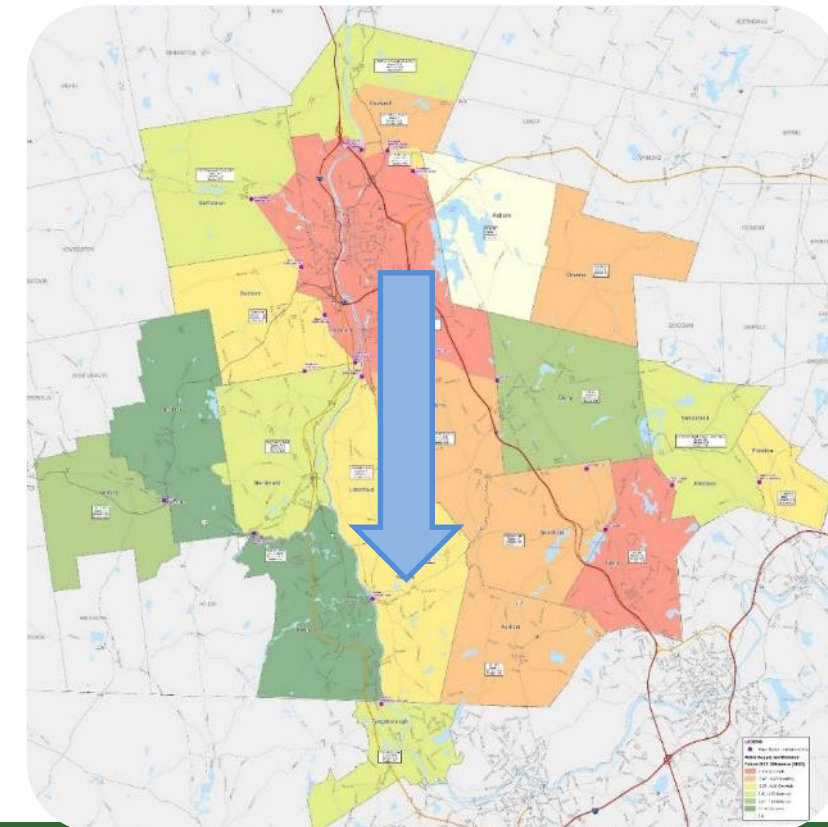
**Alternative 1
West to East Supply**



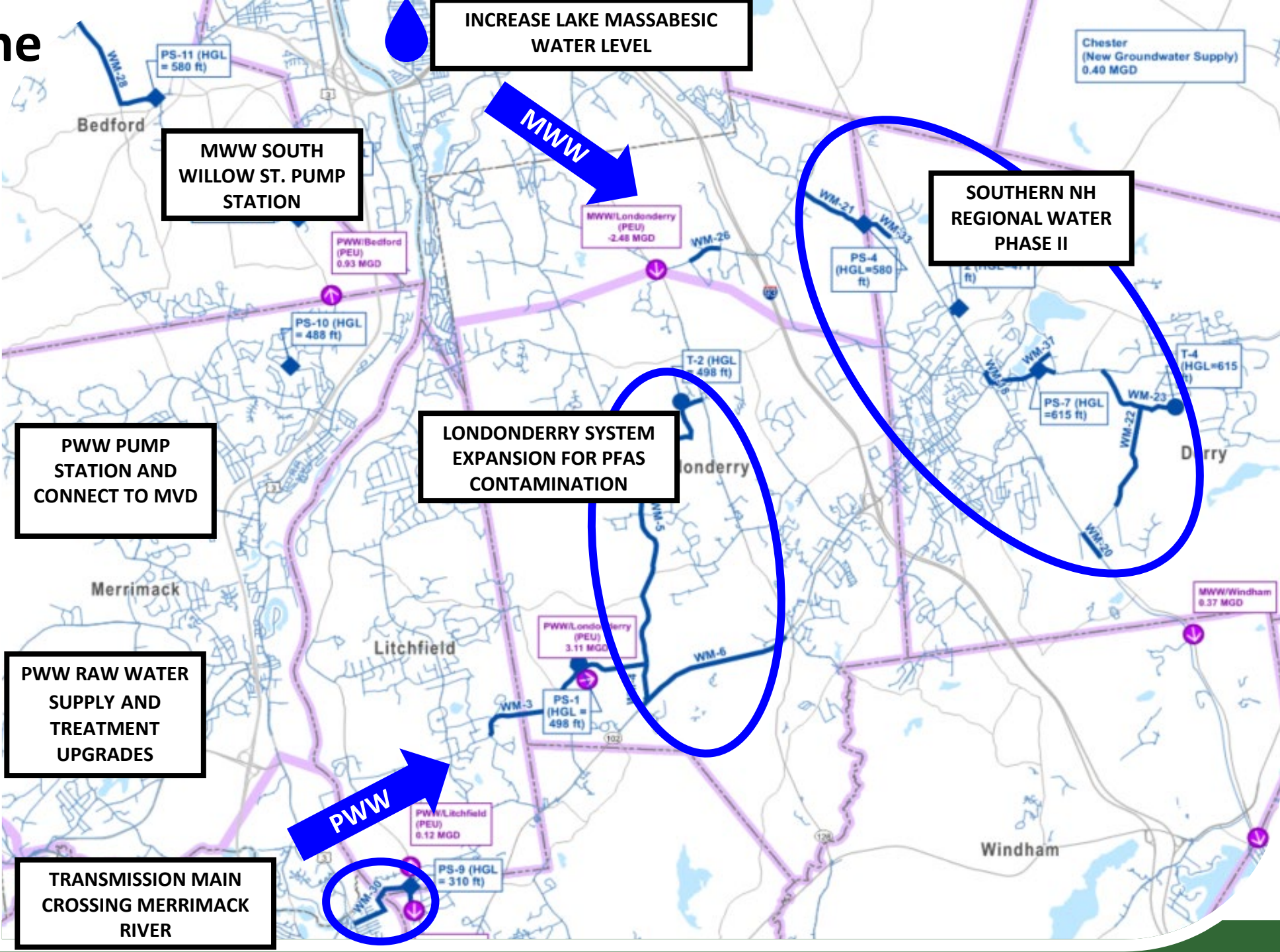
**Alternative 2
Hybrid Supply**



**Alternative 3
North to South Supply**



Connecting All the Pieces



Significant Findings



- Region has sufficient supply capacity
 - Challenge is transmission (and in some cases treatment), not supply
- Large regional projects underway are positioning region to respond to contamination and growth
- Future improvements/projects should be phased and adapt as needs arise



South/Central NH Small System Consolidation Evaluation

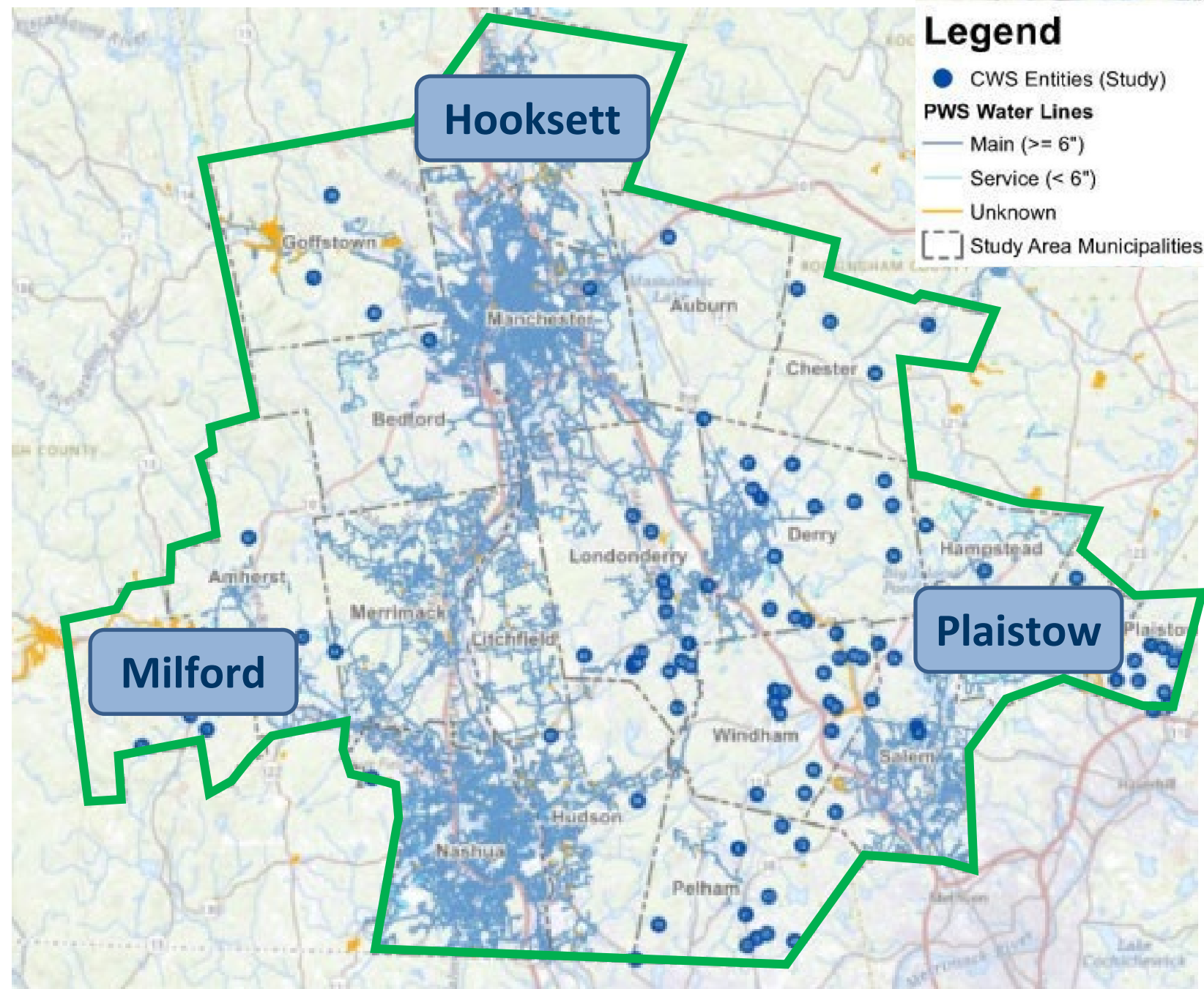


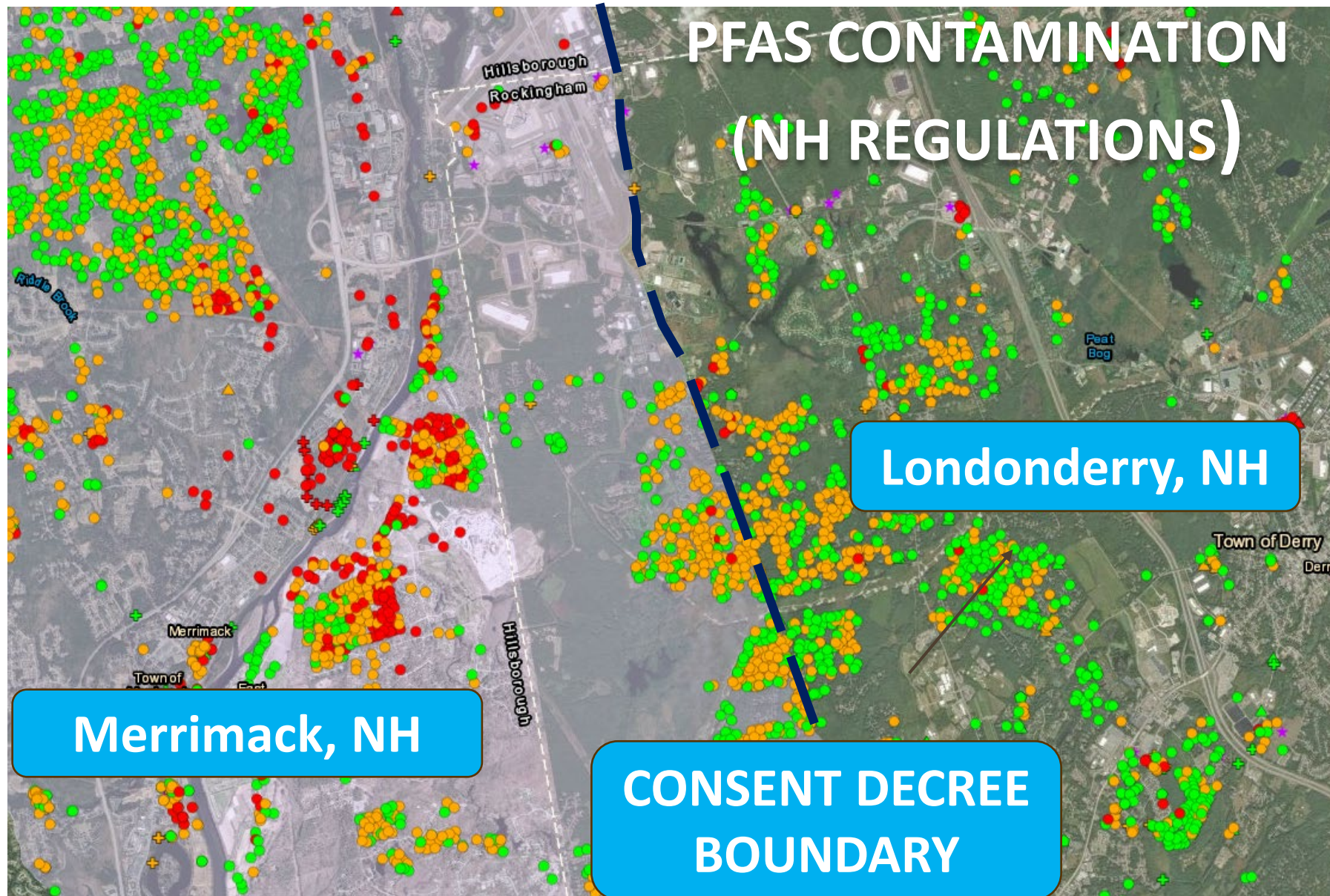
Project Goals

Assess PFAS impacts on Small Community Water Supply (CWS) systems within the South-Central New Hampshire (SCNH) region and identify long term solutions.

Questions:

1. What will it cost?
2. What will be the burden on the water supply?





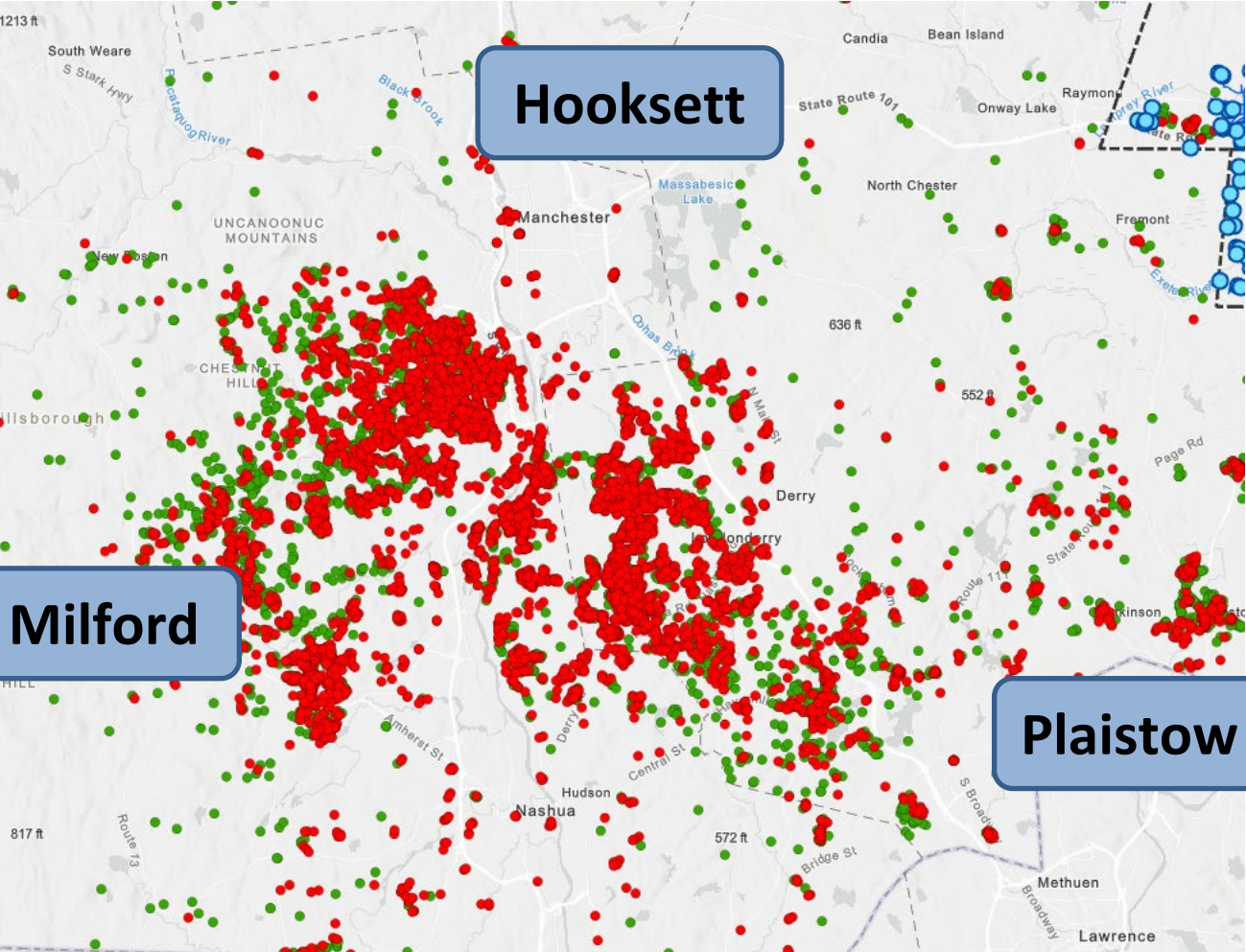
**Contamination
Is the Driver**

NHDES PFAS Sampling Map

Regulation Changes



2024 EPA PFAS Drinking Water Regulations



Chemical	Current NH Standard	New Enforceable Federal Regulation (Maximum Contaminant Level (MCL))	Maximum Contaminant Level Goal (MCLG)**
PFOA	12 ppt	4.0 ppt*	0
PFOS	15 ppt	4.0 ppt*	0
PFNA	11 ppt	10 ppt	10 ppt
PFHxS	18 ppt	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	None	10 ppt	10 ppt
Mixture of two or more: PFNA, PFHxS, HFPO-DA, and PFBS	Not Applicable	Hazard Index of 1	Hazard Index of 1

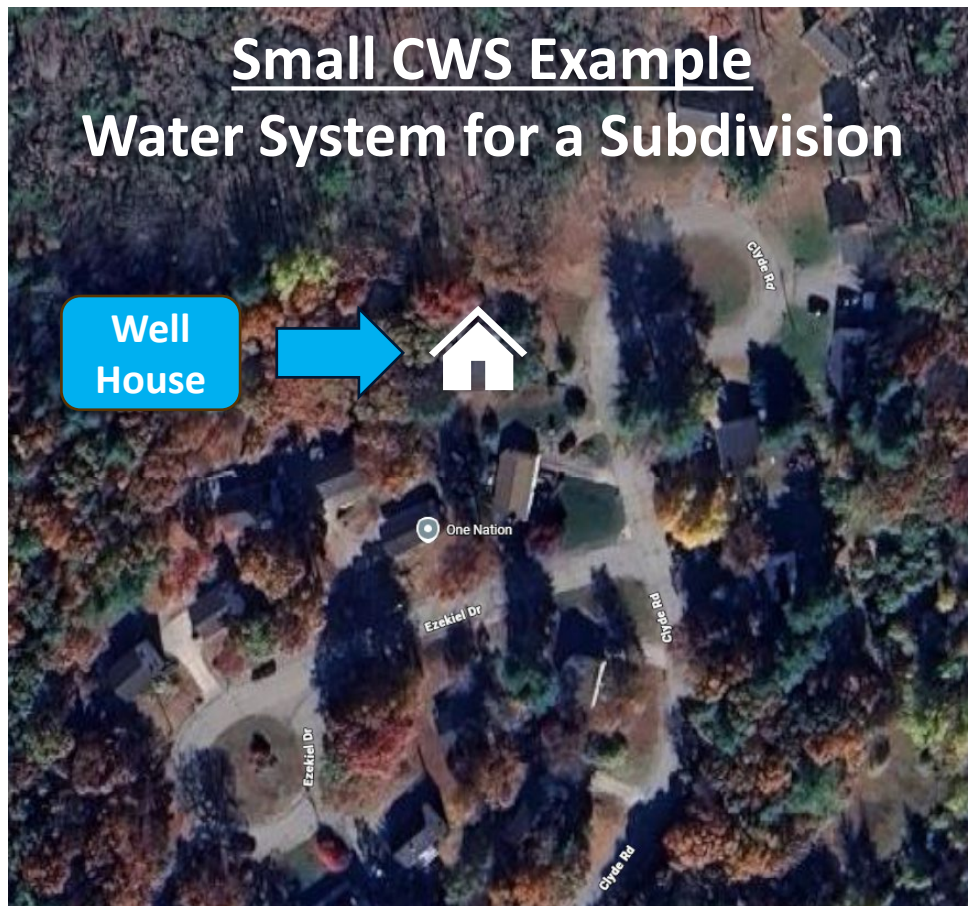
Legend

PFOA or PFOS > or = to Federal MCL

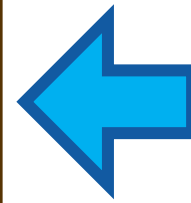
PFOA and PFOS < Federal MCL



Small CWS Example Water System for a Subdivision



47 small CWS systems
with PFAS and no
solution in place

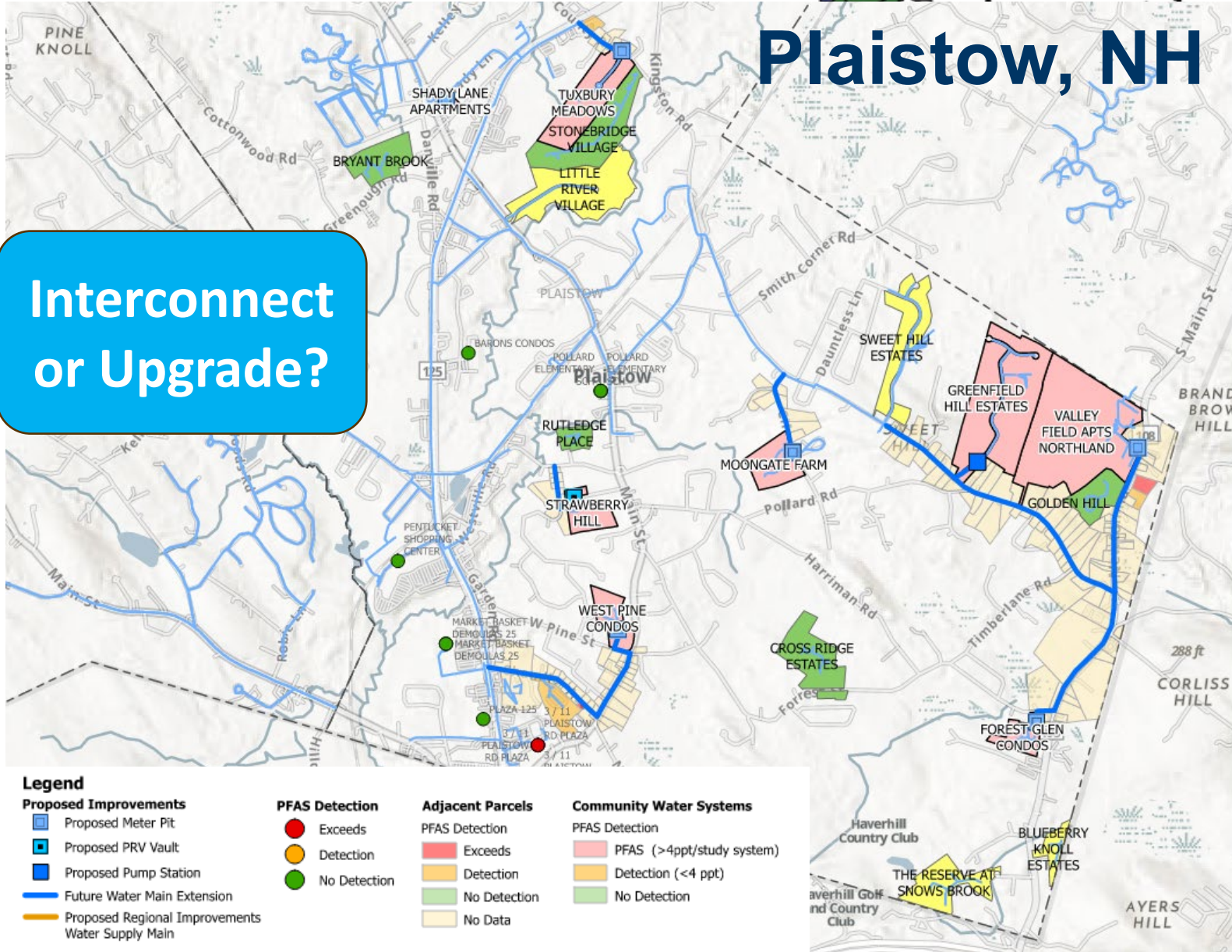


Town	Small CWS	Transient Non-CWS	Non-Transient Non-CWS
Amherst	4	7	7
Atkinson	5	4	1
Auburn	1	10	3
Bedford	1	12	8
Chester	4	7	3
Derry	14	9	2
Goffstown	3	1	2
Hampstead	2	8	7
Hooksett	0	4	3
Hudson	2	4	1
Litchfield	0	2	2
Londonderry	16	3	7
Manchester	1	4	1
Merrimack	0	0	0
Milford	3	1	3
Nashua	1	0	1
Pelham	12	15	10
Plaistow	18	13	8
Salem	6	8	4
Windham	15	26	24
Total	108	138	97

Engineering Evaluation



Interconnect
or Upgrade?



SC Small System Study Takeaways



- Based on a weighted 20-year present worth evaluation, **26** of the **47** small systems were identified for interconnection potential
- Estimated Capital Cost = **\$45,400,000**
- Estimated Additional Water Supply = **570,000 gpd**
- Benefits of Interconnections:
 - Lower O&M costs
 - Reduce operations & administrative burdens
 - Water service area expansion
 - Potential for fire protection





Seacoast NH Emergency Interconnection Study



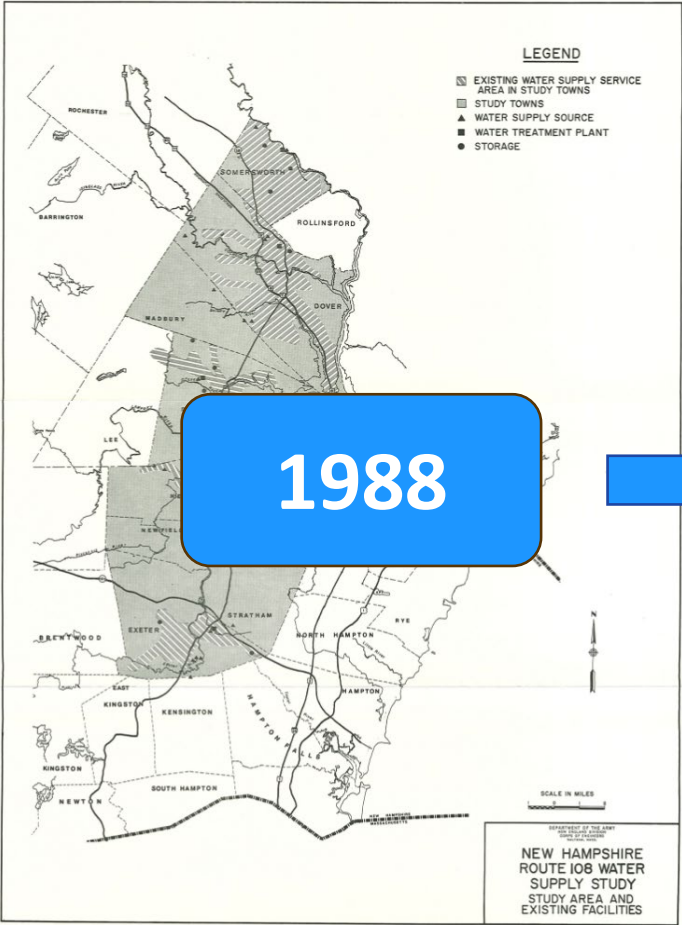
Project Goals

- Mutual Aid
- Regional evaluation to establish a planning tool to best utilize limited water resources in the Seacoast in an emergency.
- Assesed vulnerabilities
- Consolidating smaller CWS.
- 20 - 50 year planning window
- Update previous studies

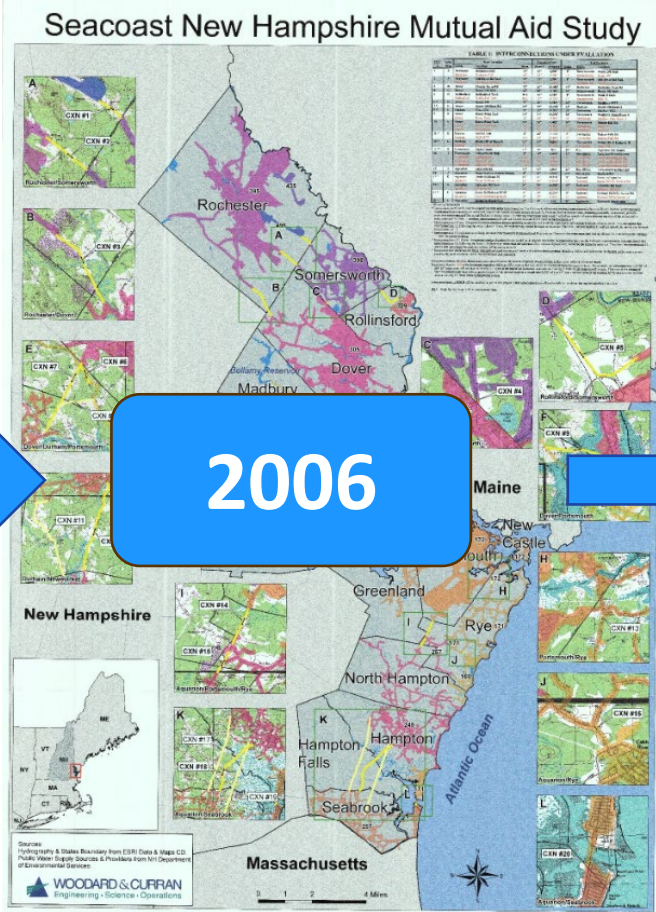
High Level planning study for
Seacoast Commission & NHDES



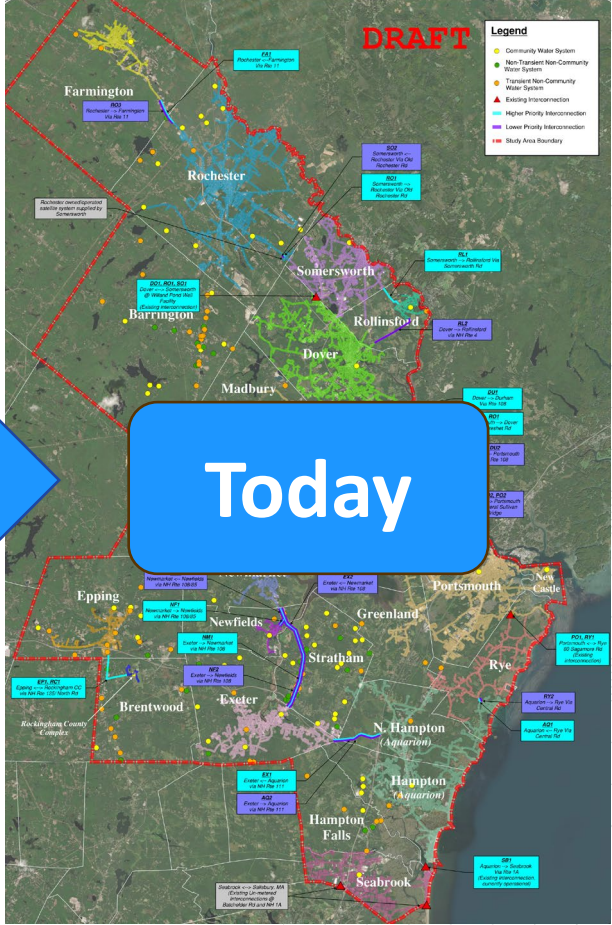
History – Past Studies



1988

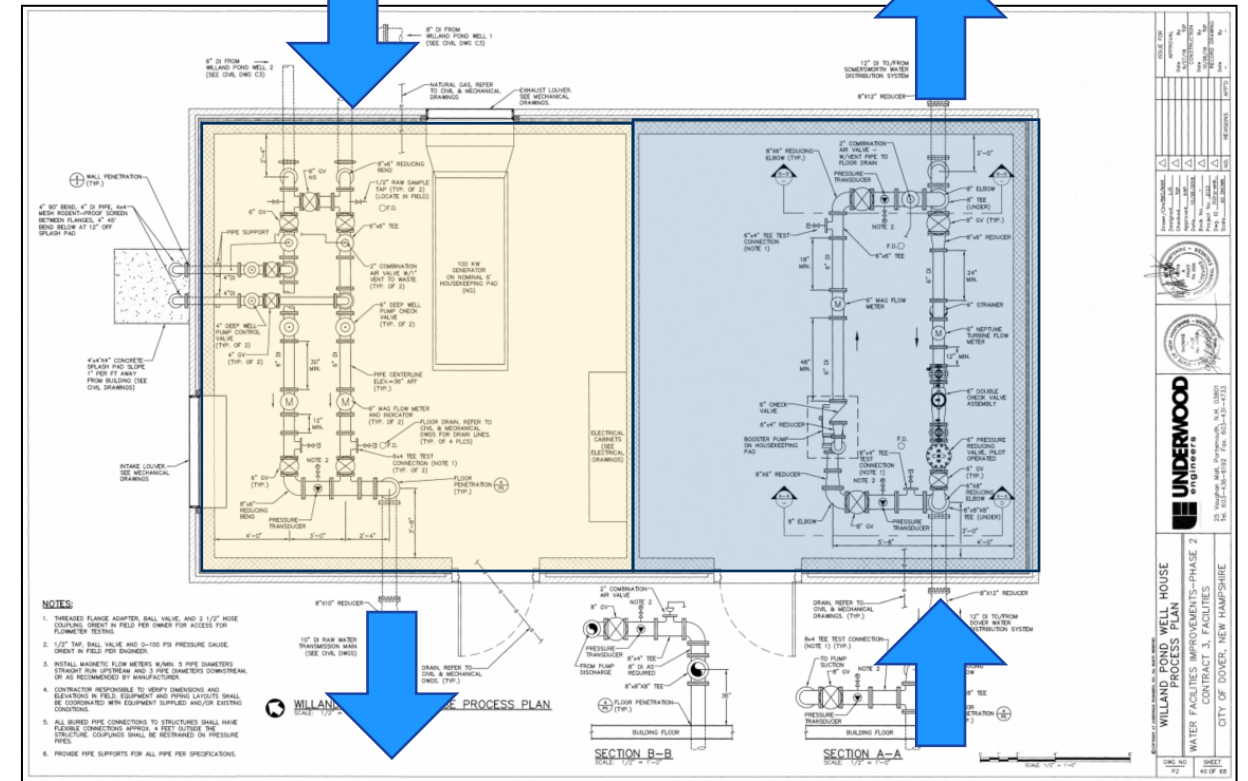
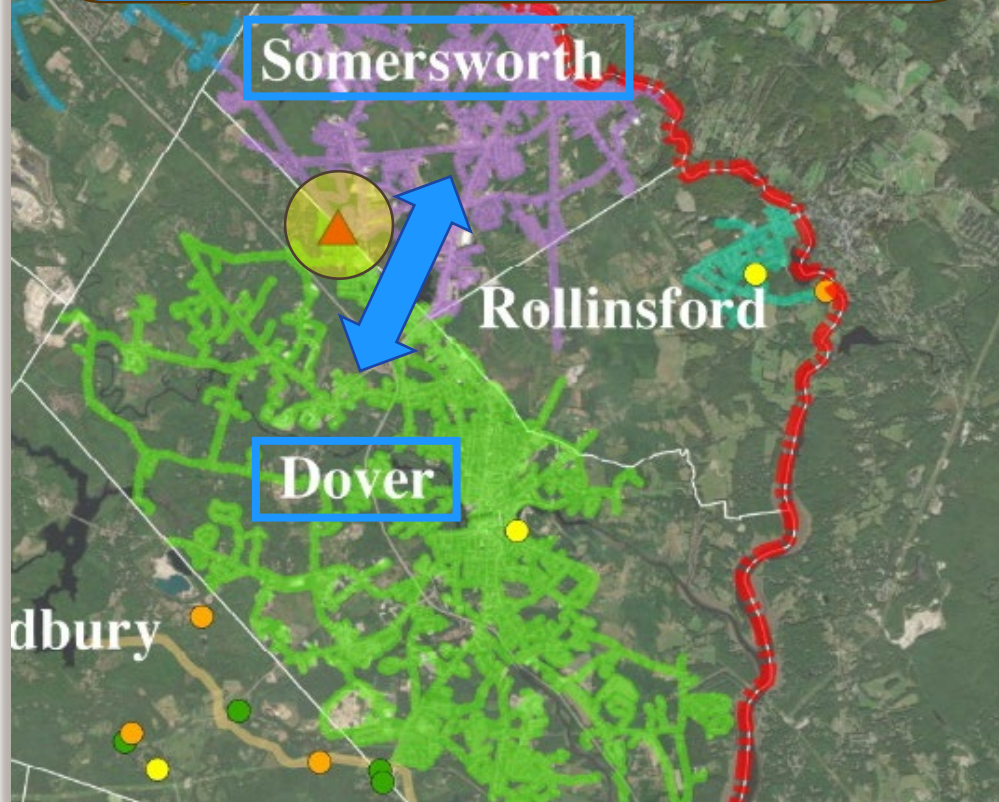


2006



Today

2006 Recommendation: Somersworth-Dover Interconnection





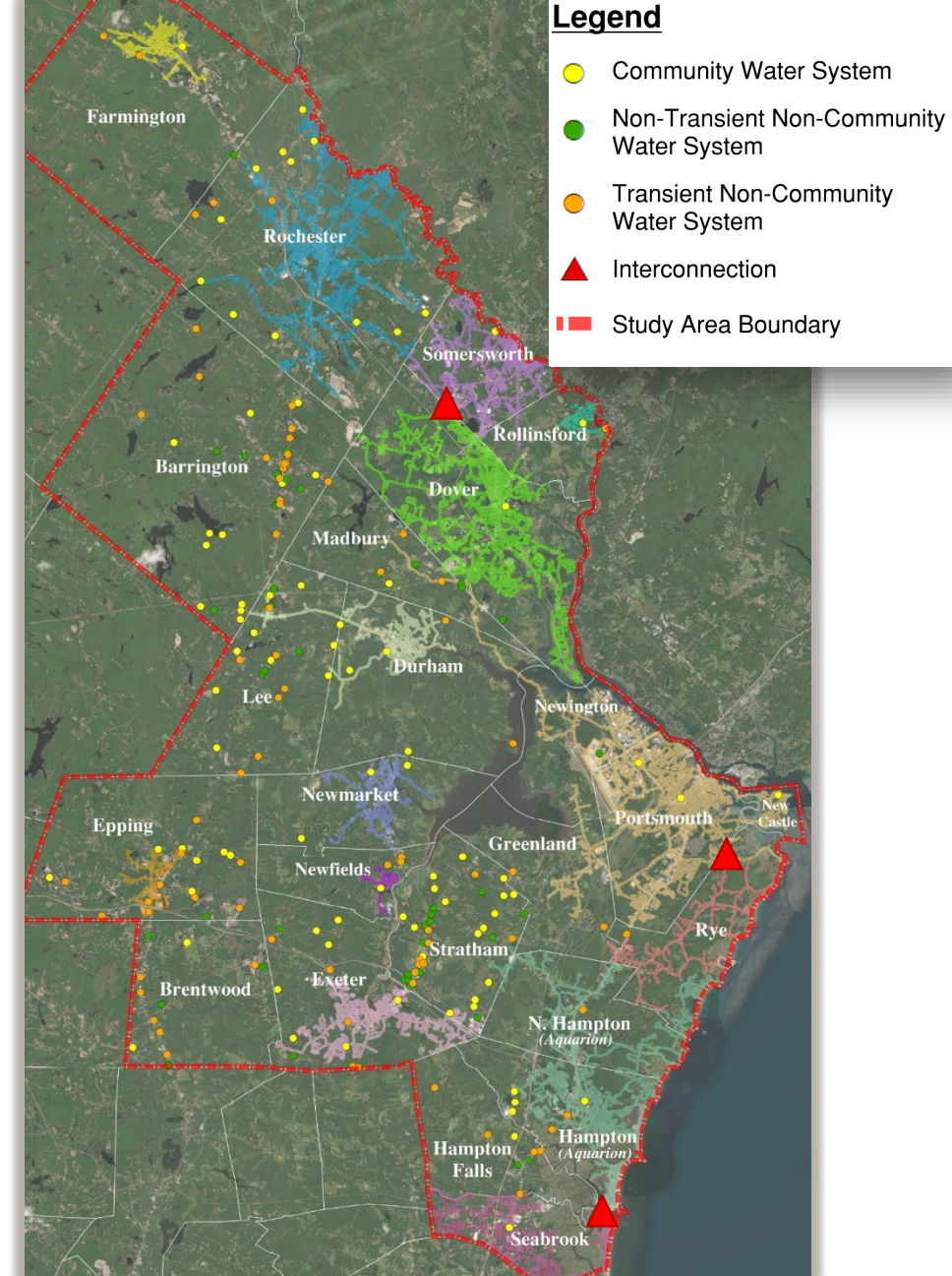
**Feb 8th 2025: ~3 Million Gallon Water Leak in
Dover in less than 24 hours.
Activated the Emergency Interconnection**

2025 Seacoast New Hampshire Mutual Aid Study

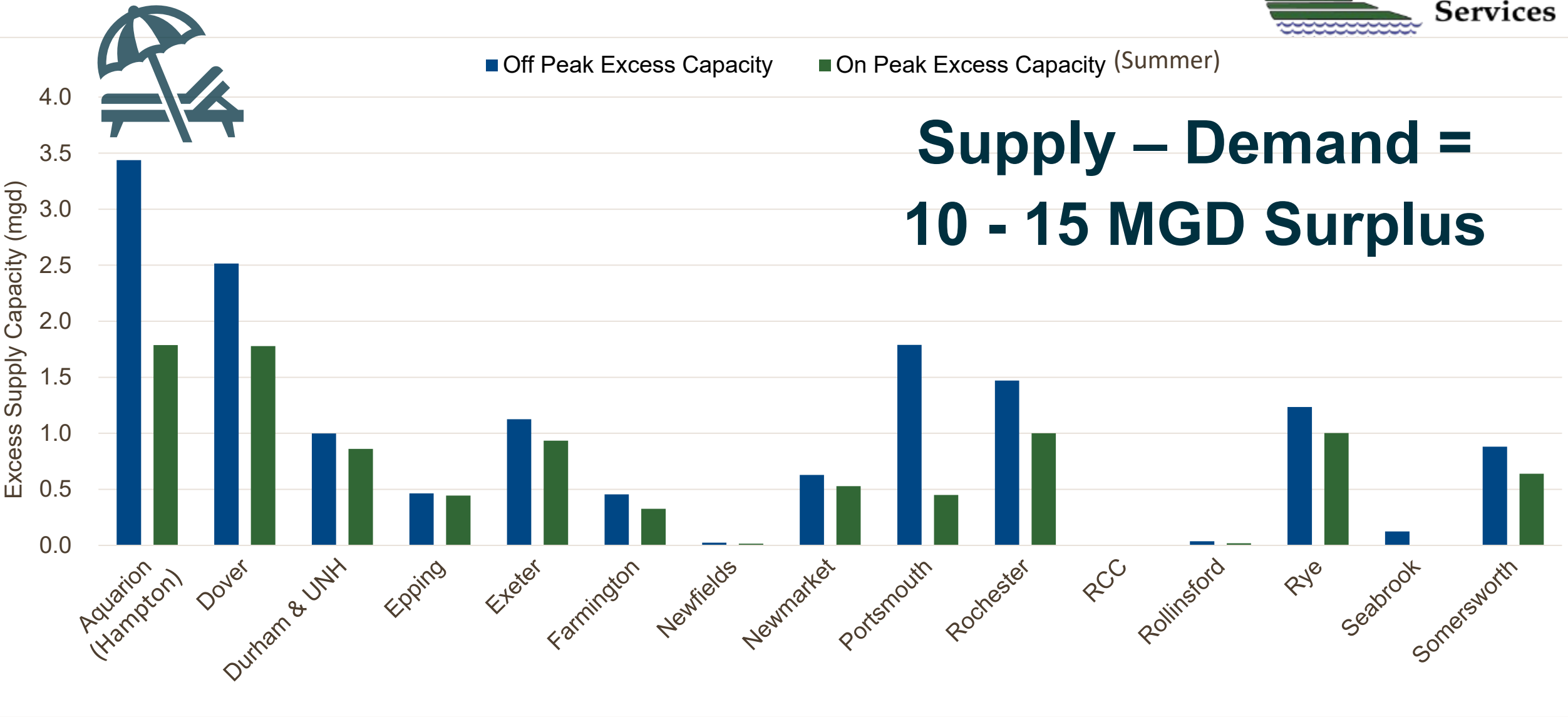
Study Area

- 24 Communities
- 15 Large Water Systems
 - 73 Wells
 - 8 Surface Water Treatment Facilities
 - 3 Existing Interconnections
 - 1,461 Miles of Water Main
- 77 Small Community Water Systems
- Hundreds of Transient Systems
- 200,000+ Residents

This Study



Excess Capacity for Mutual Aid



**Supply – Demand =
10 - 15 MGD Surplus**

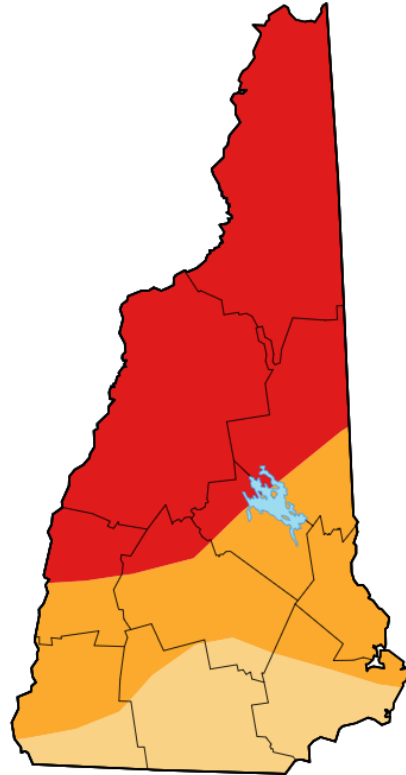
Vulnerability Assessment

Potential Scenarios

- Water main break
- Storage tank failure
- Intake collapse
- Gas spill (Supply contamination)
- Cyanobacteria
- Cyber terrorism
- Drought
- **Infinite possibilities!**

Design Scenario

- Largest source or water treatment facility offline
- Future summer (peak) demands



NH Drought Map
(October 9th, 2025)

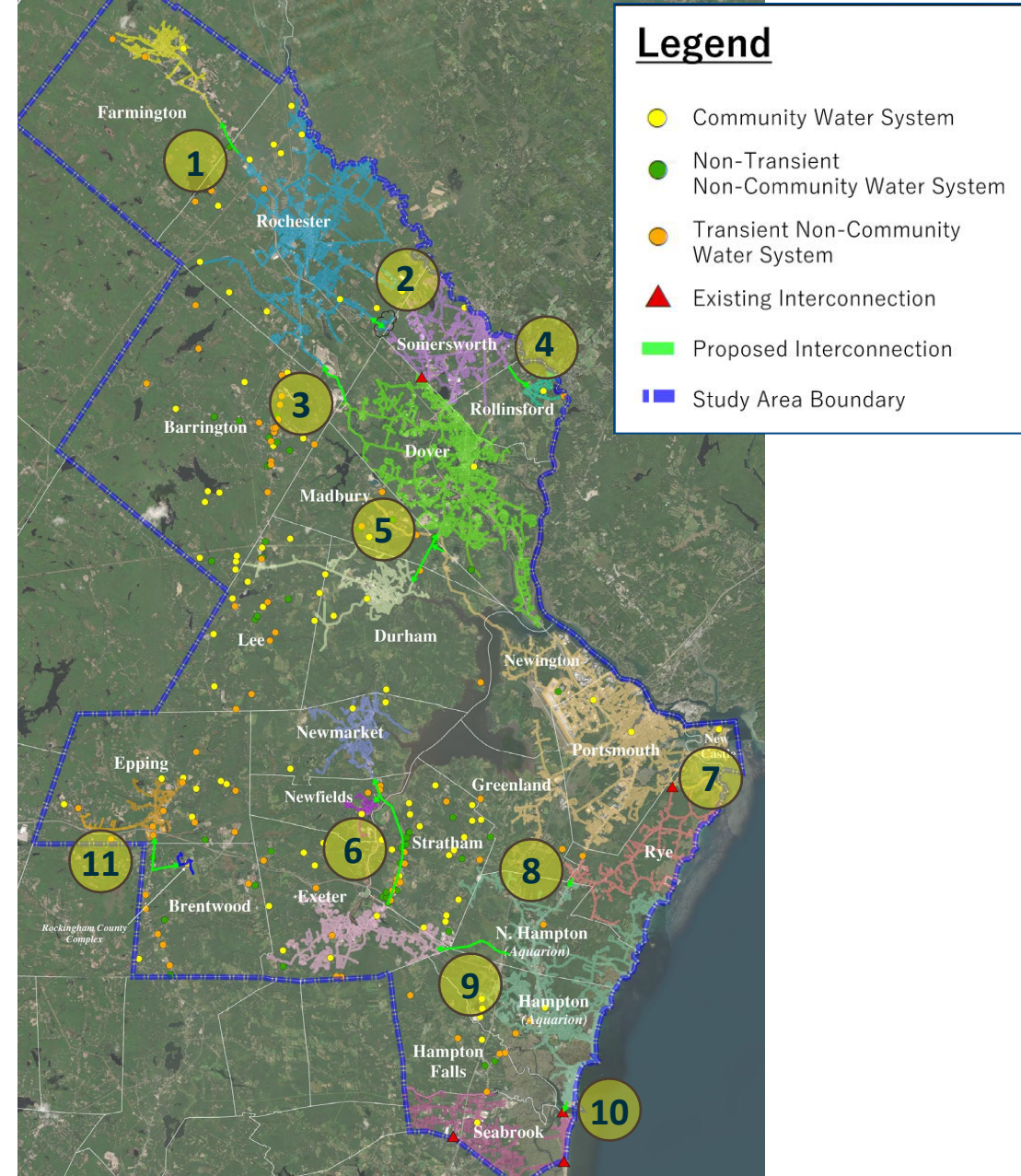
Newmarket Well Repair November 2024



Interconnection Evaluation

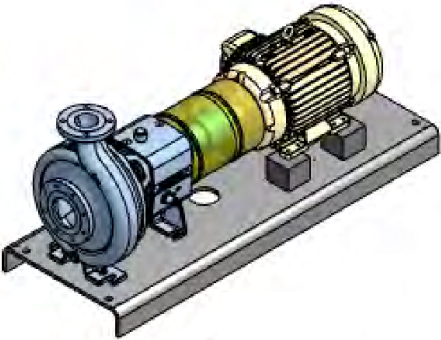
Screening

- Interconnections prioritized based on:
 - Emergency Needs
 - Excess Supply Capacity
 - Proximity
 - Infrastructure
- All interconnections allow for **bi-directional** flow
- Provides flexibility for the future



Hydraulic Evaluation

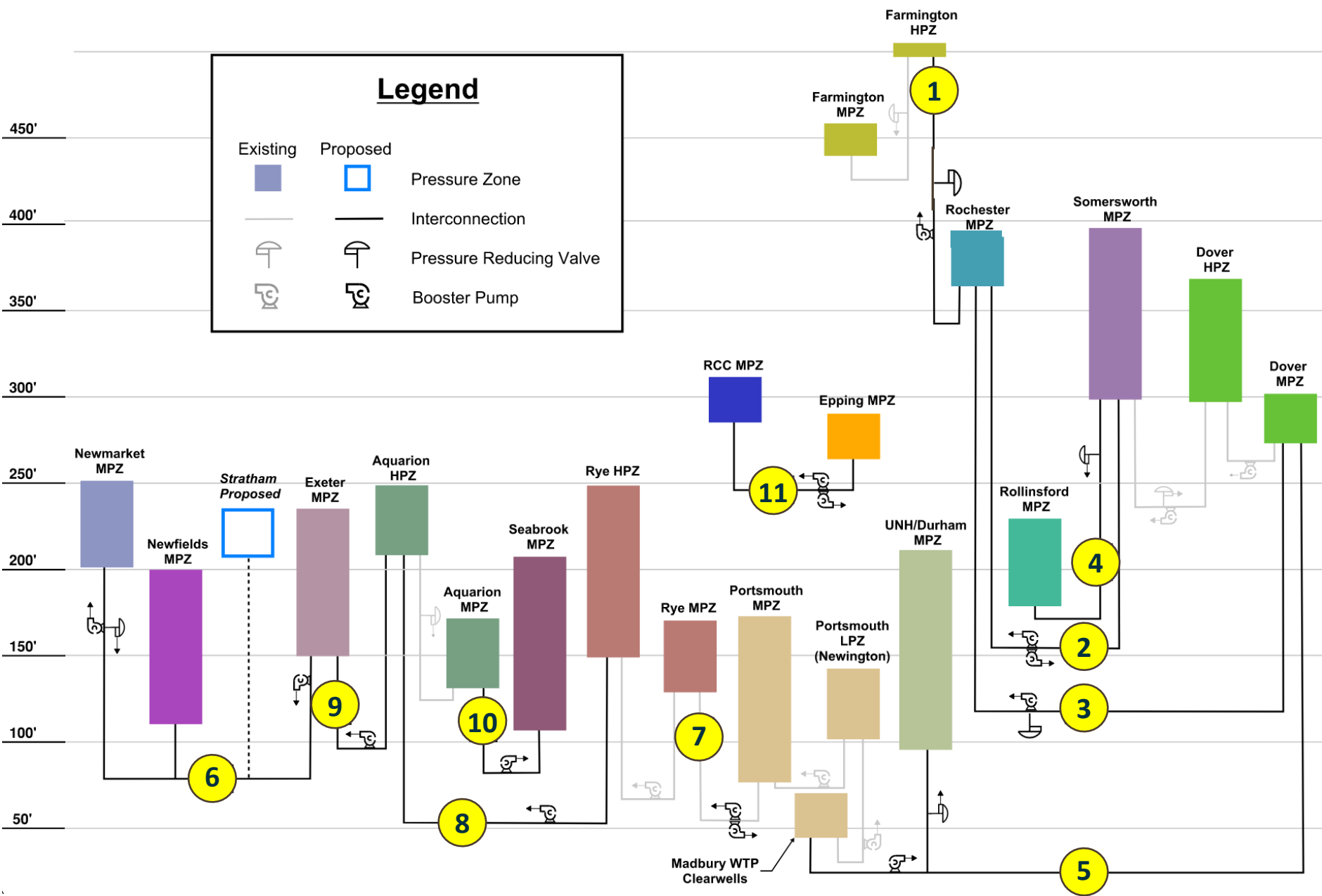
Regional
Hydraulic
Grade Line



OR



Elevation (ft AMSL)

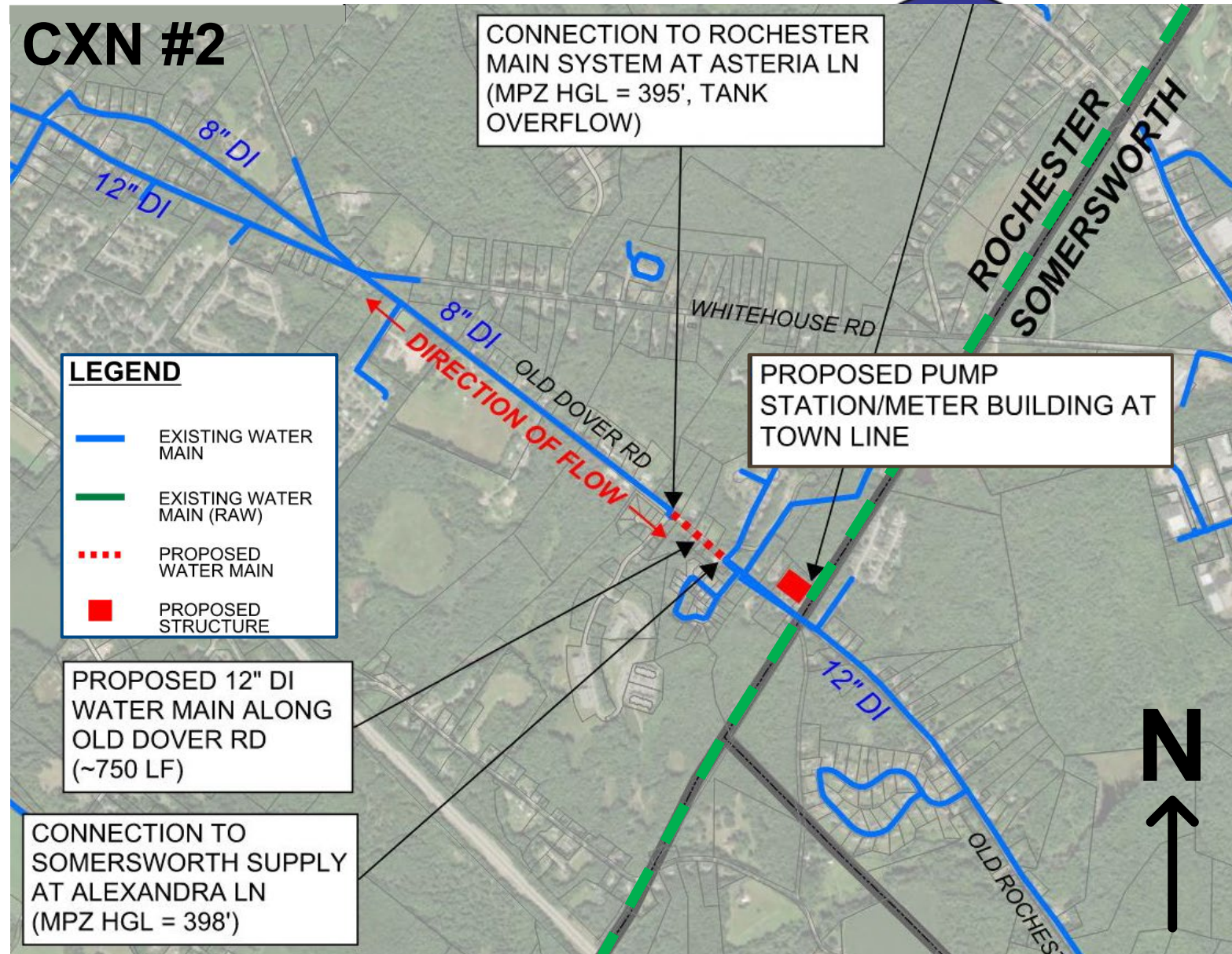


Example:

Rochester/Somersworth Interconnection Concept

Summary

- Improvements
 - 750 LF of 12" DI Wain
 - Facility
 - Pumps
 - Chemical Feed
 - Metering
- Opinion of Cost
 - \$ 4.3M +/- (2025)



Low Hanging Fruit

- There are a lot of opportunities, some are more complex than others, but we did identify many that have great benefit, lower cost, and are easier than others.
- (4) interconnects rose to top
 - Upgrade existing interconnect
 - <1,000 ft water main extension
- High value projects
- Links largest systems with high population centers
- Mitigates greater emergency needs

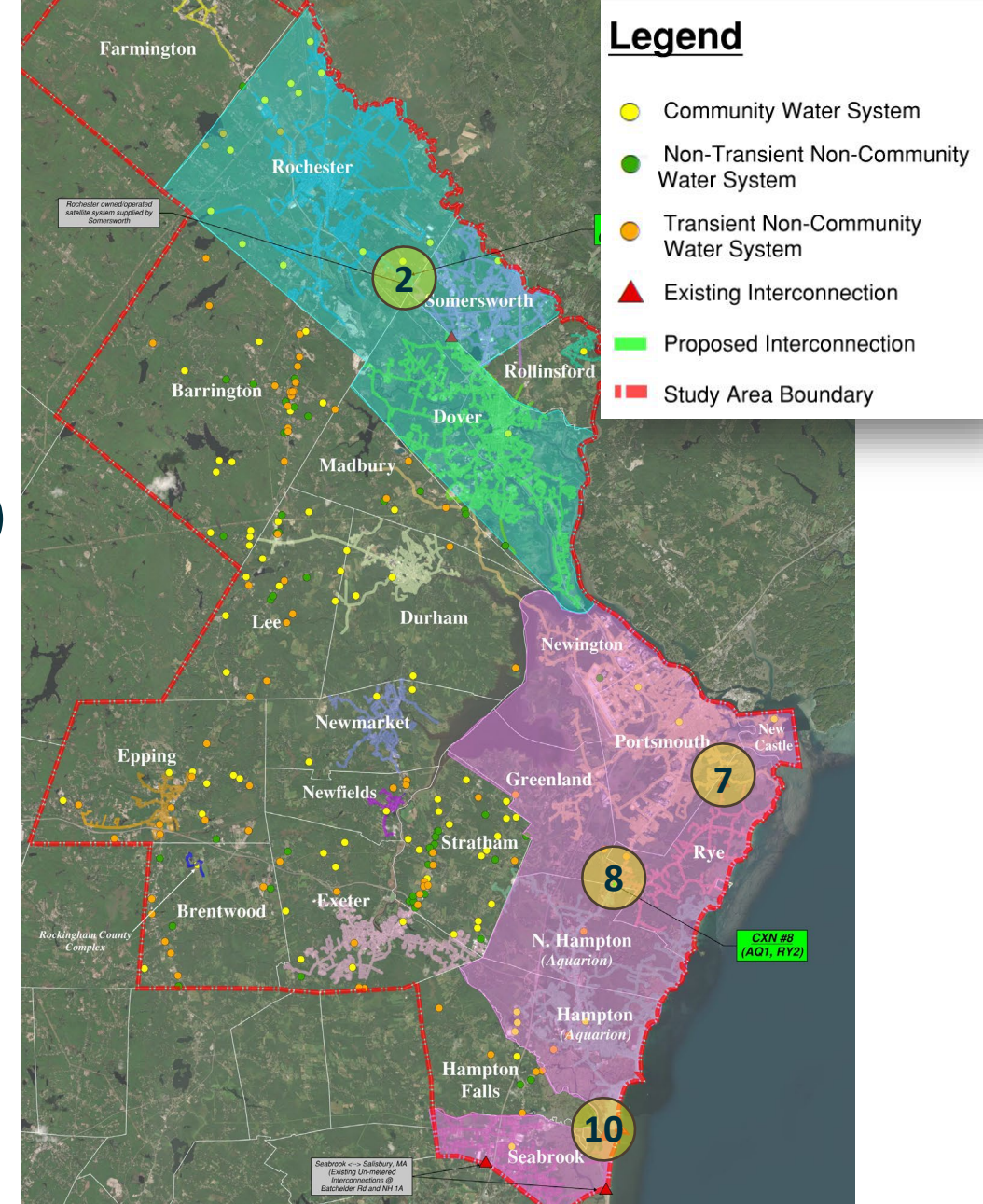


CXN# 2: Somersworth/Rochester

CXN# 7: Portsmouth/Rye

CXN# 8: Rye/Aquarion

CXN #10: Aquarion/Seabrook



High Regional Benefits

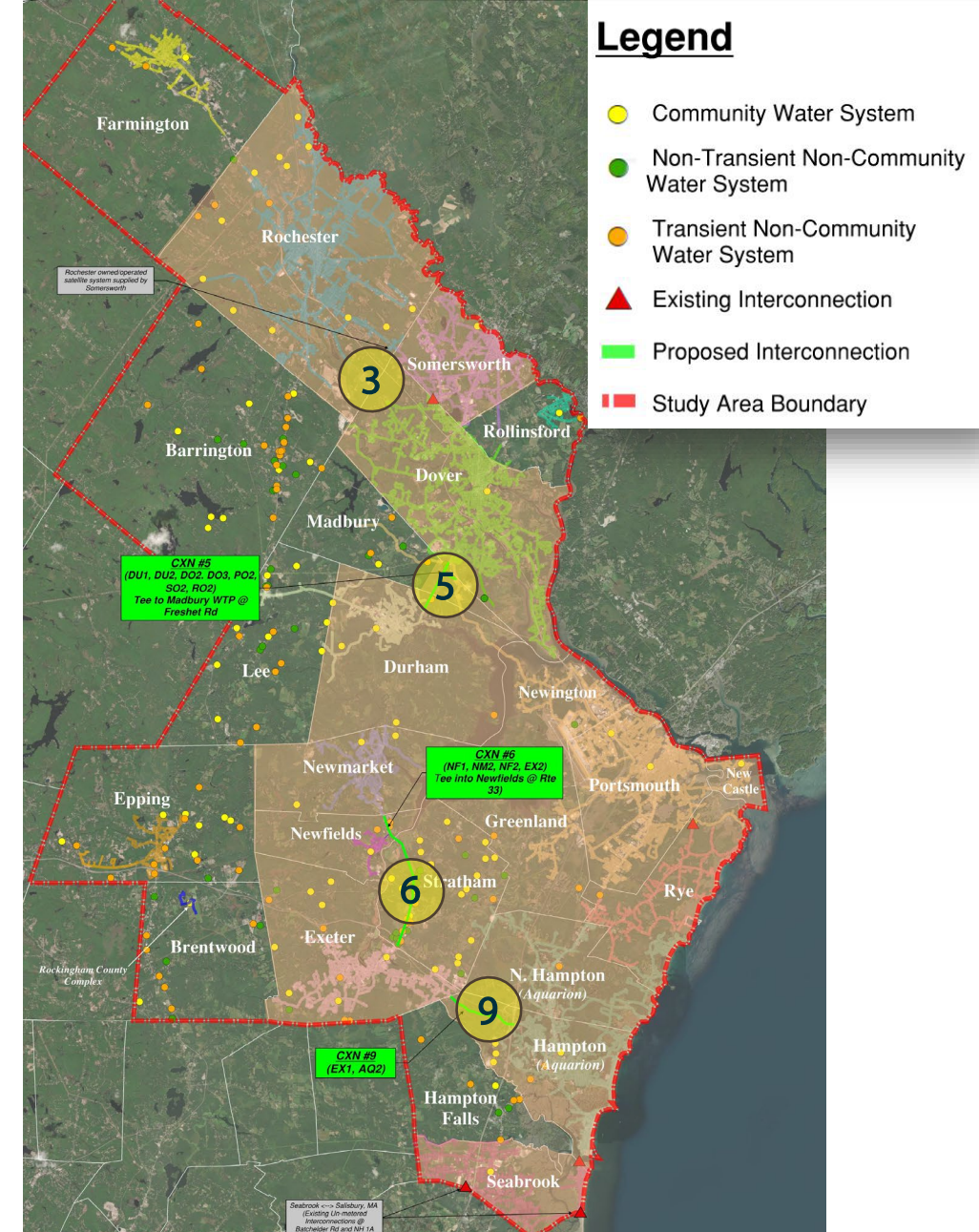
- (4) more expensive but high benefit projects
 - Links north and south
 - Addresses PFAS contamination
- Would likely need funding support
- Greatly increase resiliency of the region

CXN#4: Dover/Rochester

CXN# 5: Portsmouth/Dover/Durham & UNH

CXN# 6: Newmarket/Newfields/Exeter/Stratham

CXN# 9: Aquarion/Exeter



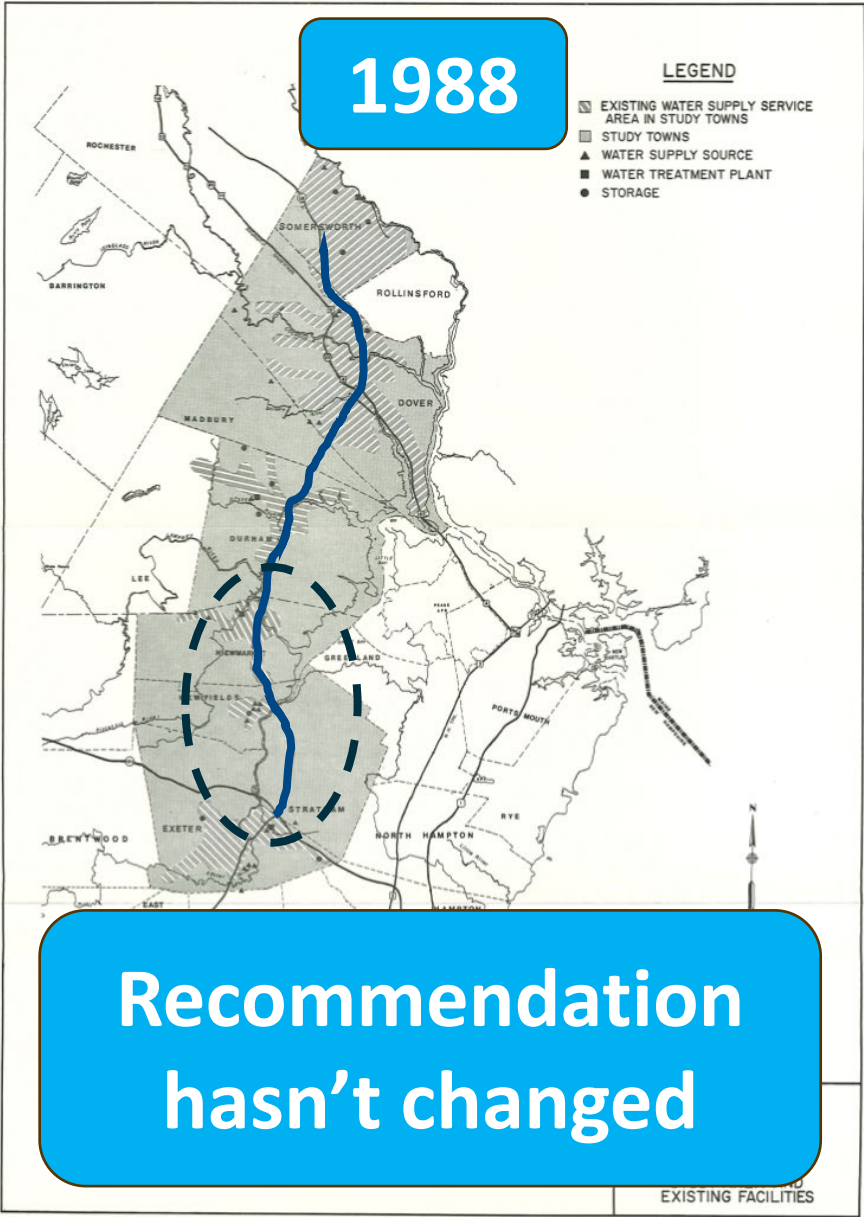
Benefits of Holistic Evaluation

New

Strat

Exet

New



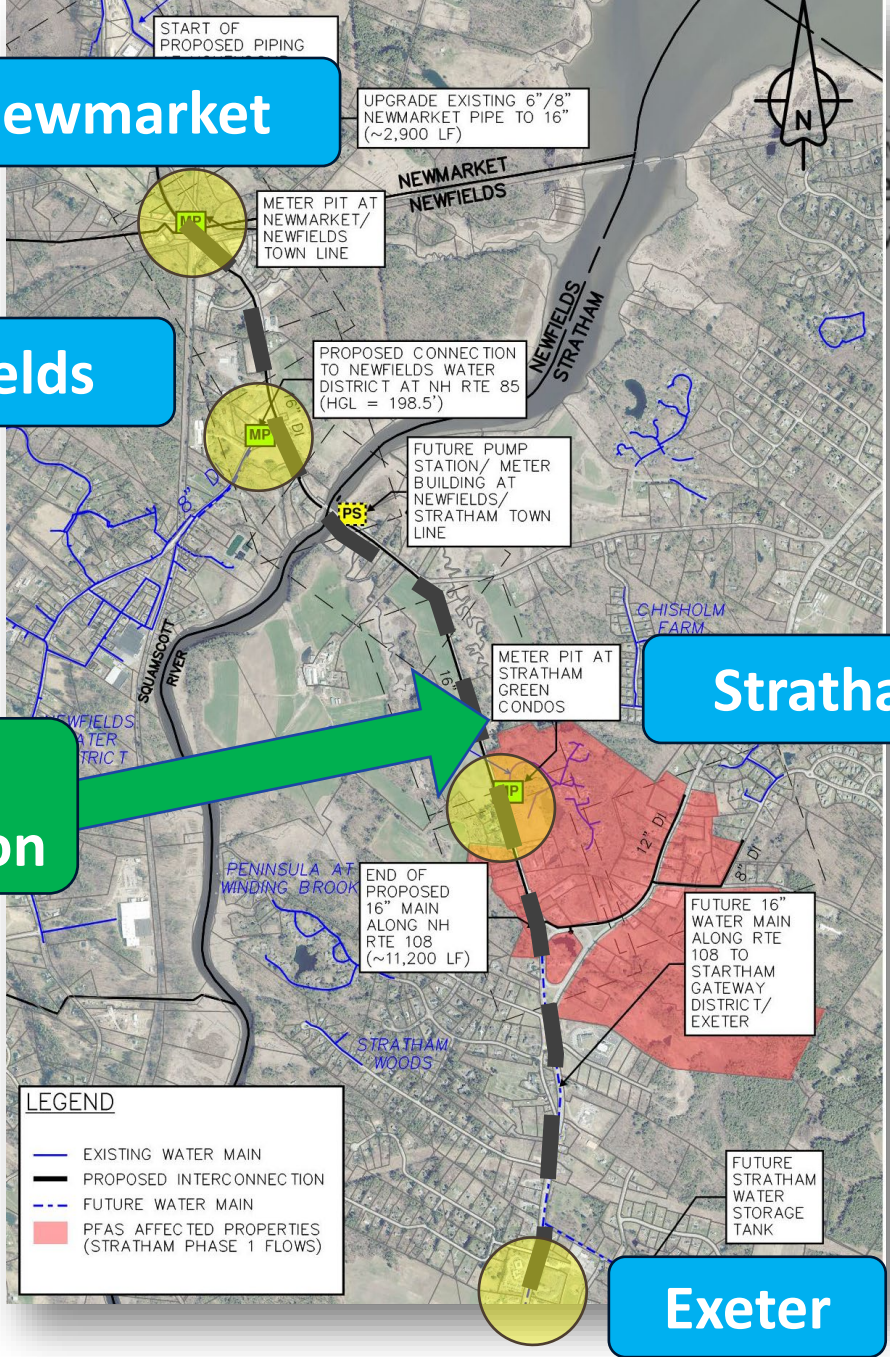
Newmarket

Newfields

PFAS Contamination

Stratham

Exeter



Seacoast Study Takeaways

- The surplus water exists to make interconnections feasible
- Interconnection can provide high value
 - Utilizing existing assets
- Communities have already started advancing discussions
- Linking the water systems in the Seacoast will greatly increase resiliency and reliability of the water systems in the region



Closing Thoughts

- New energy and precedent for interconnections in NH and across the country
- NHDES planning efforts “plant the seed” for communities to consider interconnections as a supply option.
- Interconnections provide a cost-effective source option in a variety of situations
- Interconnections can address multiple objectives with a single solution
- PFAS contamination and regulation changes are a driver

Stronger Together!



Thank You!



Questions?