

## Central New Hampshire Regional Planning Commission

### Mutual Aid Study

**Watershed Conference  
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## Presentation Agenda

- Project Objectives
- Participating Water Systems and Communities
- Overview of Project Scope of Work
- Scenario Planning Workshop
- Scenario Planning Workshop Outcomes
- Capacity Evaluation
- Hydraulic Model Development
- Key Findings
- Management Recommendations
- Q&A

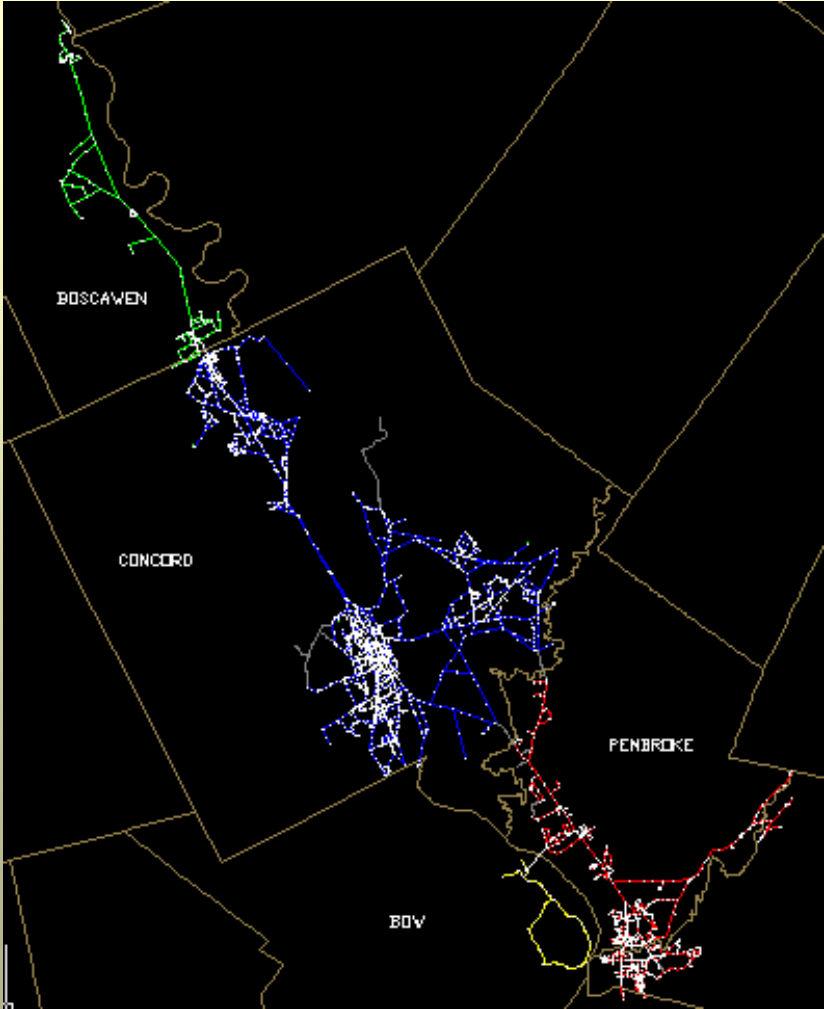
## Project Objectives

- Develop Consensus Around What Would Constitute Low, Moderate, and High Risk Water Supply Interruption Planning Scenarios
- Examine Technical, Financial, and Political Sensitivity to Implementing Mitigation Strategies
- Develop a Mutual Aid Action Plan to Mitigate Water Supply Interruption on a Regional Basis

## Participating Water Systems and Communities

- Bow Water System
- Concord Water System
- Pembroke Water Works
- Penacook and Boscawen Water Precinct

# Study Area Water System Networks



## Overview of Project Scope of Work

- Collect Baseline Information
- Conduct Hydraulic Modeling
- Evaluate System Supply, Distribution and Storage Capacity
- Evaluate Water Quality Interactions
- Involve System and Community Stakeholders
- Prepare Mutual Aid Recommendations

## Conducted A Scenario Planning Workshop

- Defined What We Currently Know
- Identified Low, Moderate and High Risk Potential Events
- Identified Driving Forces, Predetermined Elements and Critical Uncertainties
- Developed Low, Moderate, and High Risk Scenarios
- Evaluated Technical, Environmental, Regulatory, Financial, and Public Acceptance Considerations

## Scenario Planning Workshop Outcomes

- Low Risk Scenarios
  - Main Breaks
  - Power Interruption
- Moderate Risk Scenarios
  - Prolonged Power Outage
  - Storage Tank Failure
  - More Extensive Transmission Main Failure
- High Risk Scenarios
  - Loss of Major Supply Source due to Contamination
  - Extended Drought



## Capacity Evaluation

- Objectives:
  - Identify Water Systems with Excess Production and Storage Capacity
  - Provide Insight Into Ability of Each Water System to Aid Other Water Systems
- Production Capacity Evaluation Method:
  - Actual Production Capacity - Required Production Capacity = Surplus/Deficit
  - Actual Production Capacity Considers Safe Yield, Treatment, Hydraulic Constraints
  - Required Production Capacity = Maximum Day Demand of Individual System

## Capacity Evaluation, cont'd

- Storage Capacity Evaluation Method:
  - Available (i.e. useable) Storage - Required Storage = Surplus/Deficit
  - Available Storage Assumes No Pressures < 20 psi
  - Required Storage Based on Ten States Standards (Min. Required Storage = ADD + Fire Storage Component)
- Conclusions of Capacity Evaluation:
  - Most Water Systems Have Sufficient Capacity
  - Most Systems Have Some Surplus Storage
  - Surplus Storage Typically < 1 Day of Demand
  - Use of Excess Storage Poor Remedy for Long Term Emergencies

## Hydraulic Model Development

- Collection of Baseline Information
- Conversion of Existing Hydraulic Computer 'Sub-models'
  - WaterGEMs, KYPipe, Database Files
  - Converted Each Water System Model to WaterGEMs
- Development of New Sub-models
- Sub-models Imported to Create Area-Wide Model

## Scenarios Modeled

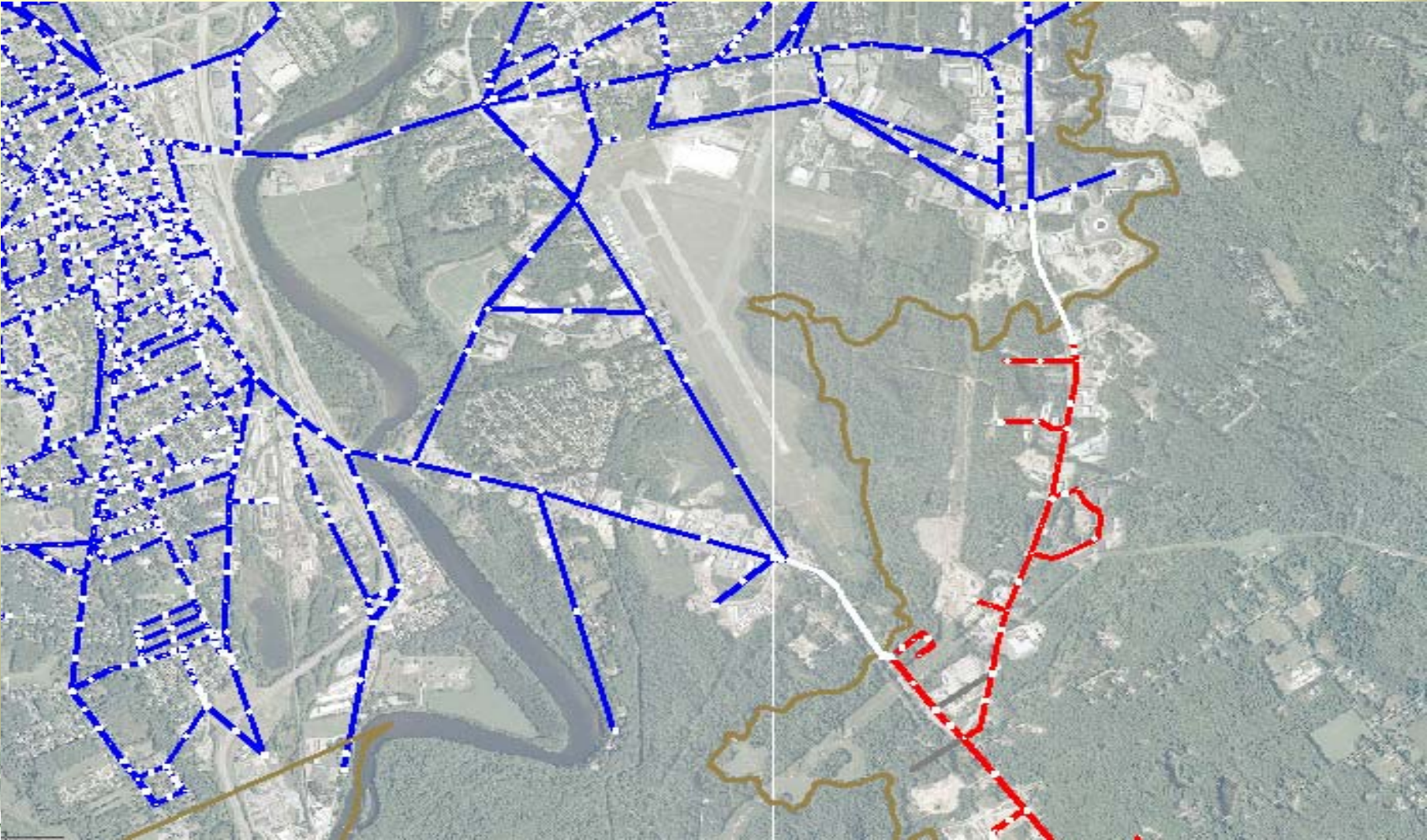
- Loss of Wells Supplying Penacook and Boscawen Water Precinct
- Loss of the Concord Wells and Route 106 Well in Pembroke
- Loss of Bear Brook Wells in Pembroke
- Loss of Concord Water Treatment Plant
- Loss of Bow Wells (Future Condition)



## Hydraulic Modeling Scenarios

- Loss of the Concord Water Treatment Plant
  - Assumes WTP Completely Out of Service (Contamination, Fire, etc.)
  - Existing Rte 106 Well Only Remaining City Supply Source (1.0 mgd)
  - All 3 PBWP Wells On – 250 gpm to Concord through existing interconnection (interconnection throttled to limit flow)
  - Pembroke's 2 Concord Wells, 2 Bear Brook Wells and Route 106 Well On
  - 2,550 LF New 12-inch Water Main Interconnection Between Concord and Pembroke in Route 3; New Control Valve
  - 2,700 LF New 12-inch Water Main Interconnection Between Concord and Pembroke in Route 106; New Control Valve

# Loss of Concord WTP



## Hydraulic Modeling Scenarios, cont'd

- Loss of Concord WTP, cont'd
  - 800 gpm from Pembroke to Concord Through New Rte 3 Interconnection
  - 600 gpm from Pembroke to Concord Through New Rte 106 Interconnection
  - Pembroke Tanks in Equilibrium (No Significant Outflow)
  - 250 gpm from PBWP to Concord Through Existing Interconnection
  - Concord's Route 106 Well Providing 740 gpm
  - Net Supply to Concord = 2,390 gpm (3.4 mgd)

## Key Findings

- Costs to Construct Infrastructure Improvements to Address the Emergency Scenarios Evaluated During Study = \$550,000 - \$1,375,000 (Loss of Concord WTP)
- Certain Improvements Evaluated During the Study Provide Benefit to More Than One Water System
- Management Related Recommendations to Coordinate Future Planning Efforts

## Management Recommendations

- Encourage Participating Communities to Join NH Public Works Mutual Aid Program (Administered by UNH T<sup>2</sup>)
- Form a Regional Water Utility Network Composed of Four Participating Water Systems
- Conduct Regularly Scheduled Mutual Aid Meetings (i.e. Annually) Attended by Members of Regional Network, NHDES, Regional Planning Commission and Other Stakeholders
- Expanded Role for NHDES as a “Clearinghouse” for Review of Proposed Water System Infrastructure Improvements That Contribute to Regional Mutual Aid
- Pursue Available State and Federal Funding for Planning, Design and Construction of New Water System Interconnections That Contribute to Regional Mutual Aid

# QUESTIONS?