THE COORDINATED WATER SYSTEM PLANNING PROCESS

Connecticut’s regional public water supply planning process was prompted by the state’s extended drought in the early 1980s. During the 1985 legislative session, the Connecticut General Assembly passed Public Act 85-535, “An Act Concerning a Connecticut Plan for Public Water Supply Coordination,” initiating the first statewide water supply planning program. The Connecticut Department of Public Health (DPH) in consultation with the Public Utilities Regulatory Authority (PURA), the Connecticut Department of Energy and Environmental Protection (DEEP), and the Office of Policy and Management (OPM) was given the charge of developing a coordinated approach to long-range water supply planning to assure future supplies. The legislative finding, as reflected in Connecticut General Statutes (CGS) Section 25-33c, states the following: “In order to maximize efficient and effective development of the state’s public water supply systems and to promote public health, safety, and welfare, the DPH shall administer a procedure to coordinate the planning of public water supply systems,” a charge that specifically states that water supply development be performed with “a minimum of loss and waste.”

The specific regional approach to water supply planning is contained in the Coordinated Water System Plan (CWSP) of the Eastern, Central, and Western water utility coordinating committees (WUCCs).

The Regulations of Connecticut State Agencies (RCSA) Section 25-33h-1(d) requires the following for each regional CWSP:

- Completion of a Water Supply Assessment of current regional public water supply conditions and problems;
- Establishment of exclusive service area (ESA) boundaries delineating each public water system’s potential service area;
- Completion of an Integrated Report providing an overview of public water systems and addressing areawide water supply issues, concerns, and needs to promote cooperation among public water systems; and
- Completion of an Executive Summary to serve as an abbreviated overview of the CWSP.

Each of the three WUCCs was required by RCSA Section 25-33h-1(f) to submit each of the four components of the CWSP to DPH within a specified timeframe, resulting in a two-year planning process. The process began in June 2016 with completion of the regional Water Supply Assessments in December 2016, establishment of ESA boundaries in June 2017, and completion of regional Integrated Reports and Executive Summaries in May and June of 2018.

Although the two-year CWSP process has concluded, the WUCCs are continuing their efforts to facilitate regional water supply planning and implement the recommendations of the regional CWSPs.

THE TOP TEN NEEDS FOR PUBLIC WATER SYSTEMS

As envisioned in CGS Section 25-33c, “an adequate supply of potable water for domestic, commercial and industrial use is vital to the health and well-being of the people of the state.” This vision statement guided the CWSP process and requires constant vigilance by state agencies and public water systems to ensure adequate water quality and quantity is maintained. Each regional CWSP includes more than 60 specific recommendations in the Integrated Report for responsible planning, drought management, source protection, water conservation, resiliency, and funding to be pursued through 2030. These recommendations are reflected in the following top ten needs for public water systems statewide, each of which is discussed further on the following pages.

1. Regionalization and Interconnections
   Ensure redundant and environmentally responsible supplies.

2. Water Conservation and Water Efficiency
   Reduce future demands and unnecessary water use.

3. Reduction in Clustering of Small Water Systems
   Encourage system consolidations and ensure responsible planning to prevent proliferation of adjacent (but independent) small systems.

4. Assistance to Small Public Water Systems
   Ensure proper technical, managerial, and financial capacity of small public water systems.

5. Investment in Infrastructure
   Replace aging infrastructure, including century-old pipes.

6. Funding
   Provide grants and loans for planning, projects, and small systems in line with the above needs.

7. Drought Management and Resilience
   Increase awareness of drought impacts and standardize responses to the extent practicable.

8. Resiliency to Storms and Climate Change
   Reduce recovery time and adapt to future conditions.

9. Protection of Watersheds and Supplies
   Continue to ensure adequate water supplies with high water quality.

10. Planning for Water Demand & Drinking Water Quality Risks
    Ensuring that public water systems continue to maintain supply to meet projected demands and maintain the highest quality drinking water.
1. REGIONALIZATION AND INTERCONNECTIONS

A rigorous analysis was conducted for all large water utilities in Connecticut that currently serve greater than 250 customers or 1,000 people. Projected water demands were analyzed for the 5-, 20-, and 50-year planning horizons; forecasted deficits were determined; and vulnerable systems were identified where source redundancy may be lacking. Finally, areas that are not currently served but are/will be in need of service have been analyzed. Based on the collective findings in all three WUCC regions, the following specific needs are of paramount importance to water supply in Connecticut:

1A. Provision of a Regional Supply to East Hampton

East Hampton is currently served by 56 separate public water systems, including 13 community systems serving residential populations. Collectively, these systems struggle to meet current demands, and the lack of a cohesive water supply system is hindering economic development in East Hampton. The Town has envisioned an expanded municipal water system estimated at $80 million, but sufficient supply is not likely to be available within the town boundaries. An interconnection with Portland Water Department could meet the projected needs of East Hampton, with potential water sources including: the Portland Reservoir, a new wellfield along the Connecticut River, the MDC, or the Cromwell Fire District, all of which would need to be developed at additional cost.

1B. Provision of a Regional Supply to Old Lyme

Old Lyme is currently served by 43 separate public water systems, including 11 community systems. Many of these include shoreline neighborhoods and entities where providing public water is not the primary business of the water system. The Town of Old Lyme has indicated its desire to see several shoreline systems consolidated. The Connecticut Water Company (CWC) has envisioned an extension of its Guilford system (at a cost of more than $8 million) to the east across the Connecticut River to meet this need. Such a project could also provide additional supply to East Lyme to meet projected demands.

1C. Provision of a Regional Supply to the Tylerville Section of Haddam from Chester

The Tylerville section of Haddam has long been identified as an area where groundwater contamination has occurred in private wells, with additional private wells being considered at risk. In December 2017 the Town of Haddam entered into a Consent Order with the DEEP and DPH to address the contamination. The proposed solution requires more than $5 million in additional funding to extend a water main from the CWC-Chester system to service properties in the Tylerville area.

1D. Development of Regional Supplies in Southeastern Connecticut

Water supply projections in southeastern Connecticut suggest that 7.3 million gallons per day (mgd) of new supply will be needed through 2030, with most of this water projected to be needed by Norwich Public Utilities (NPU), New London, and East Lyme. While some of this projected demand may be reduced through implementation of strong water conservation and water efficiency programs, some new supply sources will likely be necessary. NPU, New London, and Groton Utilities have identified potential new sources of supply that could be developed as regional sources.

1E. Reactivate the Housatonic Wellfield in Shelton to Serve as a Regional Supply

Water supply projections in southwestern Connecticut suggest that a significant amount of additional supply is needed through 2030. Aquarion Water Company (AWC) proposes to reactivate its Housatonic Wellfield in Shelton (supply of 16.9 mgd) and increase the capacity of interconnections between its systems to meet most of this projected demand, with the remainder to be addressed through implementation of rigorous water conservation and water efficiency programs.

1F. Interconnection for the Purpose of Redundancy and Resiliency

Numerous systems throughout the state rely on a single source of supply or are otherwise vulnerable to temporary outages. The interconnection of individual and regional systems with two-way flow capability will provide greater reliability and resiliency while reducing risk. To the extent practical, regulations should be streamlined to encourage implementation of emergency interconnection of systems. Funding to support the following actions and others will be critical:

- Interconnect Windham Water Works with redundant supply
- Install Housatonic River crossing (AWC and SCCRWA)
- Interconnect Ledyard to NPU in Preston
- Interconnect AWC systems from Monroe to Brookfield
- Interconnect SCCRWA, CWC–Central, and Waterbury
- Interconnect AWC systems with Danbury Water Department
- Interconnect Heritage Village with AWC - Valley and Woodbury
- Interconnect Torrington Water Company with Winsted and Bristol
- Interconnect Connecticut Valley Hospital and Middletown
- Interconnect multiple systems in Greater Hartford area
- Interconnect SCWA systems with Ledyard
- Consolidate CWC–Collinsville and Unionville
- Consolidate CWC–Crystal, Plainfield, and Gallup

Drinking Water Section
2. WATER CONSERVATION AND WATER EFFICIENCY

Although Connecticut’s water utilities have had water conservation programs in place for several decades, recent innovations for supply and demand management provide opportunities to revitalize water conservation goals. Water conservation is one of the central themes in the final draft State Water Plan (January 2018), and the regional CWSPs benefited from the policy and pathways forward recommendations in the final draft State Water Plan.

Each CWSP utilized Scenario I (passive water conservation improvements) from the State Water Plan to modify utility projections in order to reduce the expected need for new water supply. In addition, all three CWSPs recommend development of targeted water conservation and water efficiency efforts in specific systems such as those envisioned under Scenario II (ultra-efficient indoor use) and Scenario III (ultra-efficient indoor use with a 20% decrease in outdoor water use) of the State Water Plan. The DPH has partnered with the Alliance for Water Efficiency, a national nonprofit organization that advocates for water conservation and water efficiency, to educate and support public water systems in the development of targeted water conservation and water efficiency programs. Each program must be tailored to the public water system and be focused on cost-effective and attainable goals, including the following:

- Use of water conservation tracking tools by customers and the utility
- Work with municipal governments to adopt local efficiency standards, codes, and ordinances including those controlling outdoor water use
- Audits of major users and education for developers and engineers
- Active meter replacement and water usage tracking programs
- Installation of automatic meter reading and advanced meter infrastructure devices to continuously track system usage
- Using innovative technologies such as truck-mounted flushing systems that reduce or eliminate flushing to waste
- Participation in EPA’s Water Sense Program and strong public outreach

As these targeted water conservation and water efficiency programs are enacted over the next decade, it is expected that per-capita water demands will correspondingly decline. Reduced demands should help prevent or delay the need for new source development as well as reduce demands on stressed water basins as identified in the analysis conducted for the State Water Plan.

3. REDUCE CLUSTERING OF SMALL WATER SYSTEMS

In many Connecticut communities, the lack of a centralized public water system has resulted in the proliferation of small public water systems, many of which are proximal but separate in every way. Interconnection, consolidation, and/or shared resources for these systems is a high priority, with the goal of increased system redundancy and/or enhancement of the ability to provide a pure and adequate water supply for customers. The establishment of Exclusive Service Areas (ESAs) is expected to optimize consolidation of community water systems, however, new small non-community systems continue to develop where community water systems do not exist.

3A. Identify Alternatives Before New Systems are Proposed

Each WUCC is required to recommend whether a new public water system should be developed within its management area. The WUCCs use this to discuss with town leaders and developers alternatives, such as interconnections and consolidations to new water systems.

Ideally, an assessment of public water supply needs would be performed locally through municipal Plans of Conservation and Development, and local Zoning Regulations would require analysis of alternatives to prevent proliferation of small systems.

3B. Interconnection and/or Consolidation of Small Public Water Systems

Interconnecting small water systems increases source redundancy. Consolidations have the potential to reduce operational costs, increase redundancy and resiliency, and reduce risk through elimination of separate small systems. Many communities have clusters of small systems that could be consolidated.

Eliminating the proliferation of small systems may be possible in communities where public water system expansions have occurred and sizeable systems are now proximal to small systems. Examples include Brookfield, Durham, East Hampton, Mansfield, Marlborough, New Milford, and Ridgefield. Typical barriers to interconnecting or consolidating small systems include lack of funding and/or desire to make the investment, lack of interest from the small system, potential changes in water quality, potential changes in pressure, and limited mechanisms to provide communication, education, and guidance to these systems.
5. INVESTMENT IN INFRASTRUCTURE

Connecticut’s water supply infrastructure is aging. Many larger water systems were originally developed in the 19th century, while many smaller systems were originally developed in the 1950s and 1960s. Some water utilities and public water systems maintain robust asset management and corresponding capital improvement programs; others have struggled to demonstrate adequate managerial and financial capacity in this area. Some municipal systems rely heavily on municipal budgets to fund capital projects, with the timing of non-emergency infrastructure replacements sometimes extending well past the useful life of the infrastructure component. Many smaller public water systems have no asset management structure at all and capital improvements are only performed when there is an infrastructure failure. In addition, many systems will have changing water treatment needs as new rules and regulations to protect public health are promulgated by EPA.

Asset and fiscal management plans are now required for small community water systems. Identified necessary improvements could be funded through the Drinking Water State Revolving Fund. This approach has recently been successful in mandating emergency power for community water systems. Many types of infrastructure projects are prioritized under the Drinking Water State Revolving Fund at present, including tank replacements, replacement of lead service lines, and treatment upgrades. DPH will continue to hold training seminars to educate small systems in asset management techniques and capital improvement planning.
6. FUNDING

All public water systems should conduct proper asset management and capital improvement planning. As water conservation programs and changing land uses continue to drive revenue downwards, proper financial planning for water systems will be essential. DPH will continue to offer training programs for public water systems to improve financial capacity.

Access to adequate and dedicated funding will be key for many of the regional and individual water system projects envisioned in each CWSP. While municipal water systems have access to funding through municipal bonding, the availability of such bonding may be limited by other legitimately competing infrastructure and municipal service needs. The majority of public water systems rely on rates, grants, and/or loans to finance operations.

Although DPH provides low-interest loans for water system improvements through the Drinking Water State Revolving Fund, many utilities have identified the need for a reliable source of funding for regionalization and small system consolidation. For example, where it would be desirable to consolidate areas of densely concentrated small systems into one larger system, there is no financial impetus for the small system to undertake this effort, particularly if their system is functional. The DPH DWSRF program will continue to work with municipalities to adapt to better meet these needs, as funding such projects is essential.

DPH Drinking Water Section has recently used the Drinking Water State Revolving Fund to great success in promulgating its Emergency Power Generator Program for small public water systems. Subsidized loans were provided to small systems along with technical assistance to prepare generator specifications required for the loan application. DPH plans to continue offering subsidized loan options through this program to assist small systems needing other types of infrastructure upgrades.

7. DROUGHT MANAGEMENT AND RESILIENCE

The recent droughts in 2015 and 2016 reinforced the need to reconsider long-held notions regarding drought planning, tracking, and response. In particular, Public Act 17-211 requires that drought planning and response procedures developed by public water systems be available to the public. Many of the plans presently in use by larger utilities were written more than a decade ago and do not take into account lessons learned during recent droughts.

The Interagency Drought Work Group and the Water Planning Council are among those who are considering this issue. Utilities have voiced several concerns that they wish to see addressed as part of this process, including the ability to be able to enforce mandatory water restrictions in some way, and to tie responses to the capability of the water system rather than to a general standard. A delicate balance must be achieved in choosing to activate drought response triggers. Prudent decision-making is important and should elicit conservation results rather than “trigger fatigue” among end users who become immune to frequent messages announcing water use restrictions. Utilities desire for DPH to provide guidance on how to set triggers rather than specifying exactly what the triggers should be.
8. RESILIENCY TO STORMS AND CLIMATE CHANGE

As noted in the DPH/CIRCA Drinking Water Resiliency Plan, climate change is both a present threat and a slow-onset disaster. Rising mean temperatures, increased ambient water temperatures, changes in precipitation patterns, and sea level rise are having and will continue to have a variety of impacts on public water systems, including altering treatment requirements and placing shoreline infrastructure at risk. Furthermore, the changing/extreme weather patterns (specifically more high-intensity rainfall events occurring as severe storms) increase runoff and pollutants into reservoirs and source water areas, and alter the timing and magnitude of discharge in streams.

As climate changes, many of the underlying scientific assumptions in our regulations may become outdated. For example, the methodology used to determine the safe yield of public water supply sources will need to be reviewed and potentially revised on a regular (perhaps decadal) basis to ensure that the assumptions are still valid, and Ground Water Under the Direct Influence of surface water (GWUDI) studies may need revisiting.

The increase in extreme storm events is expected to result in more risk to public water systems from the effects of such storms, including flooding, high winds, dam failure, and power outages. Utilities need to be prepared to mitigate these risks in order to reduce the magnitude of losses and potential downtime as shown by the Resiliency Loss Curve below. Funding will be necessary to support certain types of resiliency projects such as the construction of interconnections to provide redundant supply sources.

Public water systems should consider development of redundant infrastructure, backup power, increased system storage, and more comprehensive emergency response planning as part of their individual resiliency efforts.

9. PROTECTION OF WATERSHEDS AND SUPPLIES

Protection of water supply sources is mutually beneficial for public health and environmental protection, ensuring pure drinking water supplies. Connecticut has progressively implemented a number of programs and procedures to govern source water protection, including DPH’s Source Water Protection initiatives, protective sanitary radii for public water supply wells, use of only the highest quality source water (Class AA or A), an inventory of high quality sources (CGS Section 25-33q), and regulations protective of public water supply watersheds.

As Connecticut continues to grow, development will continue to encroach on public water supply source water areas. Many utilities have expressed concern over a variety of potential impacts to source water areas, including application of road salt each winter, higher density developments occurring in public water supply watersheds, and the relatively limited ability of public water systems to prevent activities occurring on private property that could lead to aquifer or reservoir contamination.
10. PLANNING FOR WATER DEMAND & DRINKING WATER QUALITY RISKS

A significant effort was undertaken as part of the CWSP process to collect public water system demand data, with specific analyses of all community PWSs. The data were a critical component of both the CWSP process and the final draft State Water Plan as they were used to determine where water is being withdrawn, used, and needed.

Notably, the CWSPs have calculated demands and margins of safety for all of Connecticut’s community public water supplies for the 5, 20 and 50 year planning periods (i.e. 2060). Water surpluses or deficits to 2060 are now identified and discussed within the CWSPs. The coordinated planning process identified the need to continually analyze, plan for and address projected deficits to available water.

There is shared concern with regard to the maintaining of high quality drinking water. Salt, chlorides, and emerging contaminants such as cyanotoxins and per- and polyfluorooalkyl substances (PFAS) will increasingly present challenges for drinking water supplies. Vigilance and care in monitoring source input locations and concentrations in drinking water is necessary to prevent public health impacts. This continued planning effort to address all potential impacts to source water will support Connecticut’s dedication, as identified in the State Water Plan, to maintaining the highest standard for drinking water quality.

EXCLUSIVE SERVICE AREAS

ESA boundaries delineate existing and potential service areas for a public water system. Numerous water companies and utilities were granted charters or otherwise authorized by acts of the state legislature beginning in the late 18th century, resulting over time in areas where water service could be provided by more than one utility in the same area. ESA boundaries are designed to eliminate overlapping franchise and charter service areas, to prevent situations where more than one large public water system serves the same area (to avoid duplication of service), and to identify responsible service providers to meet future service needs. A statewide map of generalized ESA boundaries is presented on the following page.

Establishment of boundaries for ESA holders is intended to ensure that safe and adequate drinking water is available to areas of the state where public water supply is needed. ESA designations are established based upon regulatory criteria as well as the agreement by a utility or municipality to serve, as necessary, previously identified unserved areas in accordance with applicable state statutes and regulations. Existing service areas (i.e., areas where service is currently being provided) were maintained and automatically received ESA designations via the delineation process. As part of this process, each public water system and municipality was provided the opportunity to request ESA designations beyond their existing system boundaries that cover areas currently unserved by public water supply.

Being an ESA holder is a commitment to ownership and service for newly constructed “community” (residential) public water supply needs and, in general, a right of first refusal for “non-community” (non-residential) public water supply needs. An ESA designation therefore conveys both a right and a responsibility to provide public water service pursuant to applicable state law.

Although an ESA provider is designated, actual development and service expansion should support the direction set by municipal land use and development goals while being cognizant of the impacts that such land use and development goals have on protecting water resources, timely water service, water quality, economically priced water, and strong professional management of water supplies. Municipalities retain their ability to control development within their borders through their local government structure and planning documents, such as municipal plans of development, ordinances, and zoning regulations. When a project is proposed at or near an ESA boundary, such boundary should be evaluated relative to the most appropriate supply solution, and if warranted, the ESA boundary should be adjusted.
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Bethel Water Department  New Britain Water Department  Town of Coventry
Bristol Water Department  New London Dept. of Utilities  Town of Durham
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Capitol Region Council of Gov’ts (COG)  Noank Fire District  Town of Franklin
Colchester Water & Sewer Comm.  Northeastern Connecticut COG  Town of Goshen
Connecticut DEEP  Northwest Hills COG  Town of Hampton
Connecticut DPH  Norwalk First Taxing District  Town of Lebanon
Connecticut OPM  Norwich Public Utilities (NPU)  Town of Lisbon
Connecticut River Watershed Council  Oxford WPCA  Town of Mansfield
Connecticut Rivers Council BSA  Photronics, Inc.  Town of Marlborough
Connecticut Water Company (CWC)  Pomperaug River Watershed Coalition  Town of New Fairfield
Countryside Drive Association  Portland Water Department  Town of New Hartford
Cromwell Fire District  Putnam WPCA  Town of New Milford
Danbury Water Department  Quinnipiac River Watershed Association  Town of Newtown
East Hampton WPCA  Rivers Alliance of Connecticut  Town of Pomfret
East Lyme Water & Sewer  Rogers Corporation  Town of Preston
Farmington River Watershed Assn.  Rosalund Terrace Water Association  Town of Scotland
Groton Long Point Association  Save Our Water – CT  Town of Thompson
Groton Utilities  Sharon Water Department  Town of Weston
Hazardville Water Company  South Central CT Reg. Water Authority  Town of Woodstock
Hideaway Cove Family Campground  South Central Region COG  University of Connecticut
Jewett City Water Company  South Norwalk Electric & Water  Valley Water Systems, Inc.
Laurel Loch Campground  Southbury Training School  Wallingford Water Division
Ledyard WPCA  Southeastern Connecticut COG  Waterbury Water Department
Lord Thompson Manor  Southeastern CT Water Authority  Waterford Utility Commission
Lower Connecticut River Valley COG  Southington Water Department  Watertown Fire District
Members of the Public  Sterling Water Commission  Western Connecticut COG
Manchester Water & Sewer  Tolland Water Commission  Willington Oaks
Meriden Water Division  Torrington Water Company  Windham Water Works
Metropolitan Connecticut COG  Town of Barkhamsted  Winsted Water Works
Metropolitan District Commission  Town of Bethlehem  Wolcott Water Department
Middletown Water & Sewer  Town of Bolton  Woodlake Tax District