

**COORDINATED PUBLIC WATER SYSTEM PLAN**

**PART IV: EXECUTIVE SUMMARY**

**Southeast Connecticut  
Public Water Supply Management Area**

**March 2001**

***Prepared for:***

Department of Public Health  
Hartford, Connecticut  
and the  
Southeast Connecticut  
Water Utility Coordinating Committee

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*Appended Tables of Contents:*

- Final Water Supply Assessment (April 1999)
- Final Recommended Exclusive Service Area Boundaries (Revised to March 2001)
- Final Integrated Report (March 2001)

*Appended Figures:*

- Existing Water Service Areas in the Southeast Connecticut Public Water Supply Management Area
- Exclusive Water Service Areas in the Southeast Connecticut Public Water Supply Management Area

## ABBREVIATIONS

CGS	Connecticut General Statutes
COG	Council of Governments
DEP	Department of Environmental Protection
DPH	Department of Public Health
DPUC	Department of Public Utility Control
ECRWC	Eastern Connecticut Regional Water Company
ESA	Exclusive Service Area
gpcd	gallons per capita per day
gpd	gallons per day
gpm	Gallons Per Minute
mgd	Million Gallons Per Day
MMI	Milone & MacBroom, Inc.
NOV	Notice of Violation
OPM	Office of Policy and Management
SCWA	Southeastern Connecticut Water Authority
SID	System Identification Number
SWAP	Source Water Assessment Program
VOC	Volatile Organic Compound
WPCA	Water Pollution Control Authority
WSMA	Water Supply Management Area
WSP	Water Supply Plan
WUCC	Water Utility Coordinating Committee

## ***Summary of Major Findings and Recommendations***

This document presents the Executive Summary of the coordinated public water system planning process in the southeast Connecticut public water supply management area. The region is comprised of 25 municipalities within which over 160 community public water systems and 117 non-community public water systems are in operation. The Southeast Connecticut Water Utility Coordinating Committee (the WUCC) convened on August 5, 1998 and has met at least once per month since that time up to the publication of this document. During this process, the active membership has engaged in discussions involving a variety of topics pertinent to individual public water systems and water supply in the region at large.

In conjunction with the Department of Public Health and its consultant team, the WUCC completed a *Water Supply Assessment* (final document published April 1999), established *Recommended Exclusive Service Area Boundaries* (final document published July 2000, with revisions in December 2000 and March 2001), and developed a comprehensive *Integrated Report* (final document published March 2001). Each of these documents, as well as the subject Executive Summary, have been formally endorsed and adopted by the WUCC. The table of contents for each of these documents is appended.

During the coordinated public water system planning process, the following major findings and recommendations were derived:

***Finding # 1: Municipal involvement in the coordinated public water system planning process has been a defining element of the Southeast Connecticut WUCC.***

WUCC membership and participation has been sought by numerous municipalities that do not meet the definition of a community public water system. The towns of East Haddam, Lebanon, Marlborough, North Stonington, and Salem all petitioned the WUCC for membership based on their status as non-community public water systems. All were recognized as eligible members and all played active roles in the process. This is the first WUCC to recognize municipal representatives of non-community systems as eligible WUCC members.

The Town of Lyme, while not a recognized WUCC member, filed an exclusive service area declaration and was recommended for award of the entire municipality. Only seven of the 25 municipalities in the region did not directly participate in the process (Bozrah, Franklin, Griswold, Hebron, Lisbon, Old Lyme, and Voluntown). Several of these communities have long-standing associations with public water systems that currently provide service in their town. Representatives of some of these municipalities filed written letters of support for exclusive service area award to one or more public water systems that made claims to serve in their community.

It is recognized that a regional approach with respect to water supply source development will be necessary in the future to satisfy demands. Accordingly, the WUCC's evaluation of future supply sources has considered the ability of each potential supply to serve regionally significant needs.

Many of the smaller community public water systems in the region operate with a single source of supply, and no backup supply. This leaves these systems vulnerable to interrupted service due to equipment failures, contamination, and other emergencies. Emergency interconnections would benefit these small systems.

***Finding #4: The two and one-half year planning process in southeast Connecticut has brought together a diverse group of representatives from municipal and state government, public and privately held public water systems, and regional planning agencies. This forum has enabled coordination of planning efforts and an exchange of knowledge and perspectives.***

The following actions are recommended to address the major findings of the southeast Connecticut WUCC:

#### **PLANNING, COORDINATION, AND REGIONALIZATION**

***Recommendation #1:*** Municipalities have a responsibility to address the realities of the water supply issues and needs in their respective community via their municipal Plan of Conservation and Development. In those cases where there is currently not enough water to meet community growth plans, the community can either increase supply or reduce demand. Each municipal Plan of Conservation and Development should describe (1) how water supply sources are to be developed or acquired; and/or (2) how demand (i.e. growth) is to be curtailed. In those municipalities where a non-municipal public water supplier has exclusive service area (ESA) rights, the municipality should work with the ESA provider in developing the municipal Plan of Conservation and Development.

***Recommendation #2:*** Continued communication, coordination, and planning efforts are an ongoing goal of the WUCC. It is the WUCC's intent that formal efforts be augmented by an informal exchange of information and ideas among its members. Representatives of privately held public water systems are encouraged to include local municipal representatives in their system planning efforts and to take an active role in local planning issues. Additionally, the tribal nations' use of the groundwater aquifer in Ledyard may affect the surrounding area and the WUCC intends to work towards forming a relationship with both existing and future Native American tribes in the region to enable an exchange of information in a cooperative regional planning effort.

As part of a continued planning effort, the southeast Connecticut WUCC has adopted a schedule wherein a WUCC meeting shall be convened for any one of the following reasons:

1. If the co-chair determine that there is a need for a meeting;
2. If at least nine WUCC members request a meeting (in writing);

3. If the Department of Public Health specifically requests that the WUCC convene a meeting;
4. To address and/or make recommendations on one of the following exclusive service area boundary issues:
  - (a) When an ESA provider agrees to relinquish a portion of its exclusive service area to facilitate the creation of a new public water system in accordance with regulations for the issuance of a Certificate of Public Convenience and Necessity (CGS Section 16-262m-1 through 9), consistent with the Section 25-33h (Regulations Concerning Coordinated Water System Plans), the WUCC must approve the creation of the public water system. Such approval must take place in conjunction with (and not in lieu of) any other requirement established by State statute or regulation;
  - (b) When the Department of Public Health and/or the Department of Public Utility Control have made the determination that an ESA provider is unwilling or unable to provide service within its exclusive service area;
  - (c) When a special meeting is required to resolve conflicting ESA claims on a "reopened" exclusive service area and/or to consider public comment on an ESA award recommendation in accordance with procedures described below; or
5. At least once every six months.

For the WUCC to recommend a change in ESA, a two-thirds vote in favor of such change must be made and at least nine members shall participate in such vote. Otherwise, the WUCC will refer any unresolved conflicts to the Department of Public Health for resolution.

The WUCC Co-chair shall have the authority to grant approval on the following routine matters on behalf of the WUCC, providing (1) all recognized eligible WUCC members are first notified in writing; (2) members are given the opportunity to object (in writing); and (3) no objections are raised.

1. When ESA providers reach a mutual agreement to provide service in all or a portion of their exclusive service areas;
2. When the assets of an ESA provider have been sold or transferred to another entity and the acquiring entity becomes the new ESA provider; or
3. When an ESA provider voluntarily relinquishes its exclusive service area.

In the event that an area becomes available for claim as an exclusive service area, the WUCC, through the Department of Public Health, shall notify all members by mail and through notices and/or press releases in local newspapers. The WUCC shall establish a 30-day period for claims to be made on the open ESA. If there is more than one claim for the open ESA, then the claimants shall have an additional 30-day period to resolve their claims. Following that time, if no agreement is reached among the claimants, the WUCC shall announce a special meeting to be scheduled within 30 days to resolve the ESA claims, following the previously established procedures as presented in Appendix C of the *Final Recommended Exclusive Service Area Boundaries* document (revised to March 2001) with dates suitably modified.

If the WUCC recommends a new ESA provider for an open ESA, the WUCC shall provide for a 30-day public comment period on its recommendation. Following that time, the WUCC shall convene to consider public comments prior to making its recommendation to the Department of Public Health. For the WUCC to recommend a change in ESA, a two-thirds vote in favor of such change must be made and at least nine recognized eligible WUCC members shall participate in such vote. Otherwise, the WUCC will refer any unresolved conflicts to the Department of Public Health for resolution.

**Recommendation #3:** In order for the region to grow in an efficient and effective manner, a strong move towards a regional coalition of exclusive service area providers is essential. It is the WUCC's intent that this coalition work together to plan as a region for new sources of supply, share knowledge and resources, and work together, both within and outside of the formal WUCC process, to solve the future problems facing this region. Even if growth in demand does not occur and the need for new sources of supply is not as great as projected, a coalition group will serve to provide leadership and coordination for southeast Connecticut in the drinking water arena.

**Recommendation #4:** The WUCC membership should play an active role in regulatory developments involving diversion permitting in Connecticut. This program has been under review by numerous entities, including the Department of Environmental Protection. Future changes to the program are likely, and the WUCC should have a voice in the program's direction.

#### **DEVELOPMENT AND DISTRIBUTION OF REGIONAL SUPPLY SOURCES**

**Recommendation #5:** Source development should commence immediately, beginning with preliminary source investigation. Potential source locations should be reviewed with local, state and federal regulatory agencies early in the development process. Early and frequent involvement of regulatory agencies (particularly DPH, DEP, and DPUC) will be critical to the successful development of new sources.

**Recommendation #6:** Investigate the use of regional supplies in conjunction with regional raw and finished water interconnections to better distribute available supplies to meet growing demands. Serious consideration should be given to regional water management vis-à-vis interconnecting raw water supplies as well as the managed use of surface water hydrology and hydraulics to make the most efficient use of the water resources in the region. Optimization of existing storage impoundments should also be considered. This could be accomplished in part through peak flow skimming, particularly in instances where a contributing watershed is undersized in comparison to the storage capacity of the impoundment to which it flows. This will require the cooperation of many entities, both public and private.

**Recommendation #7:** A finished water interconnection of the public water systems in the municipalities of Groton, Ledyard, Preston, Norwich and Montville is recommended as a short-term goal for the region, ideally by the year 2006. This loop could be further extended through Waterford and New London to connect the three urban centers of southeast Connecticut (Groton,

New London, and Norwich). This interconnection loop would allow surplus water from Groton to be routed through Ledyard, Preston, and Norwich for wholesale purchase. Additional long term regional interconnections off a Groton-Norwich-New London loop are recommended along the I-95 corridor, incorporating East Lyme and Old Lyme to the west and Mystic and Stonington to the east.

### **SYSTEM INTEGRATION**

**Recommendation #8:** Small municipal systems should consider expanding their existing public water systems to meet new demands in lieu of developing additional non-community systems.

**Recommendation #9:** Numerous large systems are located within short distances from one another and have either not completed or have not pursued formal interconnections. Such interconnections would provide greater security in case of drought or system problems. Interconnections of systems that have water quality or other operational problems, and those that rely on a single source of supply, should be given a high priority with respect to interconnections. Additionally, those very small systems with operational shortcomings should be considered for interconnection with adjacent utilities.

**Recommendation #10:** Seventy-five community public water systems exist in the four towns of Montville, Ledyard, Old Lyme, and East Hampton. System consolidation in these and other areas in the region is desirable and should be incorporated into individual water supply plans and system expansions.



## ***1.0 The Coordinated Public Water System Planning Process***

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 Department of Public Health (DPH) in consultation with numerous other state agencies was given the charge of developing a coordinated approach to long-range water supply planning to ensure adequate future supplies.

Pursuant to Public Act 85-535 and Section 25-33e of the Connecticut General Statutes, seven public water supply management area boundaries were delineated, each with an associated Water Utility Coordinating Committee (WUCC) charged with developing a coordinated public water system plan for its region. On August 5, 1998, the Southeast Connecticut WUCC was the fourth committee to be convened.

A water utility coordinating committee consists of one representative from each public water system with a source of water supply or service area within the public water supply management area, and one representative from each regional planning agency within such area, elected by majority vote of the chief elected officials of the municipalities that are members of such regional planning agency.

A coordinated public water system plan is comprised of the individual water supply plans of the public water systems within the public water supply management area which serve over 1,000 people or have 250 or more service connections and an areawide supplement that includes a water supply assessment, delineation of exclusive service area boundaries, an integrated report, and an executive summary. Each of these major components of the Coordinated Public Water System Plan is described below:

***Individual Water Supply Plans*** – Each community public water system which serves greater than 1,000 people or 250 service connections is required to prepare an individual water supply plan under Section 25-32d of the Connecticut General Statutes and Section 25-32d of the Regulations of Connecticut State Agencies. The principal goals of individual public water system planning as defined by the Department of Public Health are to: (1) ensure an adequate quantity of pure drinking water, now and in the future; (2) ensure orderly growth of the individual public water systems; and (3) make efficient use of available resources. The individual water supply plans in the southeast Connecticut region are in various stages of development and DPH approval. All but one system has prepared a first-time individual plan that has been approved. Numerous systems have completed five-year plan updates as well.

***Water Supply Assessment*** – The Water Supply Assessment is the first of four components of the areawide supplement. The purpose of the Water Supply Assessment is to evaluate existing conditions and deficiencies within the southeast Connecticut public water supply management area. The Final Water Supply Assessment was completed and approved by the WUCC, with the final document published in April 1999.

***Exclusive Service Area Boundaries*** – An exclusive service area is an area where public water is supplied by one public water system. Numerous regulatory factors are considered in determining exclusive service area boundaries, including existing service areas; land use plans, zoning regulations, and growth trends; physical limitations to water service; political boundaries; water company rights as established by statute, special act, or administrative decision; system hydraulics; and ability of a public water system to provide a pure and adequate supply of water now and into the future. The Final Recommended Exclusive Service Area Boundaries document was completed and approved by the WUCC in July 2000. Revisions were issued in December 2000 and in March 2001.

***Integrated Report*** – The Integrated Report is a long-term planning tool for the region. Various issues are evaluated in the Integrated Report, including existing and future projected population, existing and alternative water supplies, source protection, water conservation, existing and potential interconnections, system ownership and management, satellite management/ownership issues, minimum design standards, financial considerations, potential impacts on other uses of water resources, and land acquisition for proposed stratified drift wells. The Final Integrated Report was completed in March 2001.

***Executive Summary*** – The executive summary, the subject document, provides an abbreviated overview of the Coordinated Public Water System Plan for the public water supply management area. It is a summary of the major elements of the Coordinated Public Water System Plan. The final Executive Summary was completed in March 2001.

## ***2.0 Composition of the Southeast Public Water Supply Management Area***

In total, the Southeast Connecticut WUCC public water supply management area comprises 25 municipalities and approximately 160 community public water systems. Only 20 are considered "major" community public water systems, serving greater than 1,000 people. Two community public water systems do not serve customers in the region but are eligible WUCC members due to the location of a portion of their public water supply watersheds in the region. These are the Metropolitan District Commission (serving greater Hartford) and the Town of Portland. There are five regional planning organizations in the southeast Connecticut public water supply management area. Public water systems in the region range from relatively small systems that serve apartment complexes and rest homes with 25 to 50 people, to large systems such as Groton Utilities, which serves over 30,000 people.

## ***3.0 Summary of Water Supply Assessment***

The Final Water Supply Assessment for the Southeast Connecticut Public Water Supply Management Area was published in April 1999. The document presented an inventory of existing community public water systems with respect to historic water quality; system reliability; service and supply adequacy; firefighting capabilities; and major facilities. A brief summary of that document is presented below.

In 17 of the 25 towns that comprise the region, a recommendation was made by the WUCC for exclusive service area award of all or a portion of the town in favor of the municipal entity requesting such service area. Eight of these award recommendations went to municipalities that do not currently serve a large population (i.e. less than 1,000 people) and that have not previously prepared individual water supply plans. These municipalities will need to develop in-house capabilities and/or contract for qualified, licensed operators and other services within the next year due to changes in the regulations. They will also likely be required to prepare individual water supply plans.

***Finding # 2: Projections of water demand for the public water systems indicate that new supplies will be needed shortly after the five-year planning period (year 2005) in order to maintain a region-wide margin of safety of 15 percent (1.15). Certain individual systems will require new sources even sooner. The region is projected to experience a supply deficit before 2010 if new supplies are not developed. That deficit is projected to grow to almost 16 mgd by the year 2040 unless new supplies are brought on line.***

Based on a planning-level inventory of regionally significant supply sources (i.e. those capable of providing 1.0 mgd or more), a total potential yield of 37 to 39 mgd may be available if all identified sources are developed. Additional sources capable of providing less than 1.0 mgd will be needed to supply geographically remote systems that are in need of water. When compared to the projected 20-year deficit of 0.3 mgd and the 50-year deficit of 15.7 mgd, potential supply is theoretically capable of meeting demands. However, financial, environmental, and regulatory obstacles are significant. The cost, time, and uncertainty of permitting new supply sources are critical issues facing the public water systems in the region.

Upon completion of the Coordinated Public Water System Plan, the WUCC intends to make a formal request to the Southeastern Connecticut Council of Governments (COG) to pursue funding for additional study of regional water supply development and continued work toward resolution of the potential water supply shortfall in the southeast region. Such funding could support planning for future supply sources as well as development of a detailed implementation strategy. Additionally, the Southeastern Connecticut COG in combination with the WUCC could serve as the forum for a coalition of those communities that have potential water supply sources, together with those in need of water. The Southeastern Connecticut Water Authority (SCWA) has had the legislative ability to serve as a regional provider since 1967 and may therefore be a potential vehicle for regional water supply issues.

***Finding # 3: Inter- and intra-regional interconnections must be considered as a potential means of supplying water. In most instances, potential new supply sources of significant volume are geographically remote from the demand centers. Interconnections may be less expensive than developing additional sources. Interconnections can also provide supply to areas where source development is not feasible.***

***Water Quality***

Most water quality violations in the region have been due to lack of testing and/or reporting of water quality data, and almost all actions have been taken against small community systems. As of April 1999, eight community public water systems had not met the requirement of employing a certified water supply treatment plant operator, and one had not complied with the Surface Water Treatment Rule for groundwater potentially under the influence of surface water.

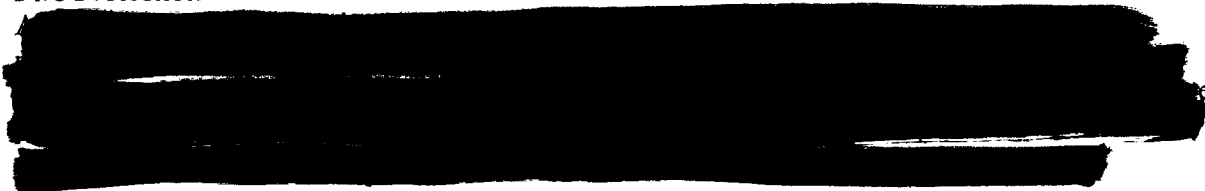
Elevated levels of iron and manganese are common throughout the southeast Connecticut region. Iron and manganese sequestering has been implemented by many community public water systems to reduce metals and turbidity levels. Adjustment for pH has also been added to many treatment operations for the larger community public water systems to correct for the low pH levels often reported. Many smaller systems are finding it necessary to provide the same measure of treatment. Bacteria contamination has been detected in several community public water systems in the region, with exceedances ranging from chronic problems to sporadic outbreaks. However, many systems, both large and small, have remained without water quality degradation and/or problems for many years.

***System Reliability, Service, and Supply Adequacy***

Most of the larger systems either have emergency supplies or multiple sources of supply. Most have emergency power capabilities. However, many of the larger systems, and some of the smaller ones, are within close proximity of one another with no interconnection. Based on available information, 68 of the small systems rely on a single source of supply and 72 systems have more than one source of supply. Four systems receive 100% of their supply through interconnections.



***Fire Protection***



***Assessment of Major Facilities***

Most water community public water systems in the region utilize groundwater sources as their primary means of supply. However, several of the larger community public water systems maintain

reservoirs for primary or emergency supply. New London, Norwich, and Groton are the only large community public water systems that rely solely on surface water for drinking water supply. All of the systems serving less than 1,000 people utilize well water as their source of supply.

#### ***Assessment of Future Water Supply Sources***

Many of the systems serving greater than 1,000 people need to secure new sources of water in order to satisfy projected demands and maintain an adequate margin of safety. Most, but not all, of these systems have identified potential supply sources. Several are currently involved in source exploration or permitting. Others have identified a future need, with no immediate plans. Given the time and potential expense associated with development of new supplies, some of these systems may be in jeopardy of not meeting system demands with an adequate margin of safety.

#### ***Existing Service Areas***

Existing service areas within the region are delineated on the appended figure entitled *Existing Water Service Areas in the Southeast Connecticut Public Water Supply Management Area*. These boundaries were determined based upon individual water supply plan mapping, legal documents, and information from community public water systems.

#### ***Status of Public Water System Planning***

As of April 1999, 18 of 19 individual water supply plans had been submitted and approved, representing 95% completion. Several of the individual community public water systems have completed more than one round of water supply planning. Numerous systems are preparing to submit their second water supply plan and three have already completed this process.

Most community plans, such as zoning regulations and plans of conservation and development, also include pertinent information that defines allowable and anticipated uses in watershed areas. These plans often designate land uses in critical areas associated with public supply groundwater wells.

Smaller non-municipally owned community public water systems tend to have less opportunity for inclusion in broader planning objectives. Protection of these smaller systems often depends entirely on ownership of the land surrounding the source and state regulations that have established minimum allowable distances between a point source of pollution and a community groundwater supply.

#### ***Issues, Needs, and Deficiencies in the Region***

Various issues, needs, and deficiencies were identified for the southeast Connecticut WUCC region via data research, correspondence, and discussions with WUCC members, agency staff, and interested parties. Some of the issues that are currently facing the region include the need for future supply sources, the need for water supply planning coordination, the reliable quality of groundwater supplies, source protection, vulnerability of single source suppliers, viability of small community public water systems, discontinuity of service, growth trends and impacts, the impact of existing and future anticipated regulations, the need to balance raw and finished water supplies throughout the region, interconnections, and land use compatibility.

#### 4.0 *Exclusive Service Area Boundaries*

Establishment of exclusive service area boundaries is intended to ensure safe and adequate supply of potable water to every resident of the State. Exclusive service areas are based on regulatory criteria and on the agreement by a public water system to serve, as necessary, previously identified unserved areas. Existing service areas are maintained and become exclusive service areas via the delineation process. As part of this process, each individual public water system was provided the opportunity to request or not request expanded service areas. The chief administrative officials, chief elected officials, planning and zoning commissions, and local health directors were also notified of the process prior to the initial claim deadline. Additionally, one non-WUCC member (the Town of Lyme) was allowed to make an ESA claim and was recommended for exclusive service area award.

Designation of an exclusive service area requires a commitment on the part of the ESA provider to provide service. These are not areas of "right-of-first-refusal." They convey a right as well as a responsibility to serve. The requirements of the *Certificate of Public Convenience & Necessity* (CGS 16-262m) are not circumvented by the WUCC process. In fact, the certificate process recognizes the exclusive service areas through the DPH review process. A public water system may develop water supply sources in areas *not* within its exclusive service area, assuming all pertinent federal, State, and local requirements are adhered to, but it may not provide service outside of its exclusive service area.

Although an ESA provider is designated, actual development and service expansion should support the direction set by municipal and State land use and development goals, as well as 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 provide guidance for development within their borders through their local government structure and planning documents, such as municipal plans of development, ordinances, and zoning regulations.

Municipal membership has been a pivotal issue for the southeast Connecticut WUCC. Several municipal representatives raised the issue that municipalities should be voting WUCC members, with the ability to claim their own town as an exclusive service area, regardless of whether they currently operate a public water system. Although some WUCC members agreed with this concept (others did not), the current regulations are very specific regarding the eligibility of WUCC members and the WUCC is not at liberty to change the criteria. Several municipalities, including Salem, East Haddam, North Stonington, Lebanon, and Marlborough, have become "recognized members" by demonstrating they own public (non-community) water systems.

Table 1 presents the recommended Exclusive Service Area providers by municipality. Recommended exclusive service area boundaries are delineated in the appended mapping entitled *Exclusive Water Service Areas in the Southeast Connecticut Public Water Supply Management Area*.

**TABLE 1**  
**Recommended Exclusive Service Area Providers by Town**

Geographic Area	ESA Provider for Currently Unserved Areas
Bozrah	Norwich Department of Public Utilities.
Colchester	Colchester Department of Public Works.
East Haddam	Town of East Haddam with the exception of the area immediately surrounding existing systems and an expanded area around Lake Hayward to be served by ECRWC.
East Hampton	Town of East Hampton with the exception of two areas awarded to ECRWC. These are an expanded area surrounding ECRWC's Baker Hill Division and a portion of land in northern East Hampton near its border with Portland, Glastonbury, and Marlborough.
East Lyme	East Lyme Water Department.
Franklin	SCWA, except for an area in the southern part of Franklin to be served by the Norwich Department of Public Utilities.
Griswold	Jewett City Water Company in the northern portion of Town and Connecticut Water Company in the southern portion of Town.
Groton	Boundaries have been delineated, acceptable to all parties, which split Groton into three ESA areas to be served by Groton Utilities, Noank Fire District (in the southeastern portion of Town), and Connecticut-American Water Company (in the eastern portion of Town).
Hebron	ECRWC (AquaSource).
Lebanon	Town of Lebanon, with the exception of the area immediately surrounding existing systems and a small area by Norwich Department of Public Utilities in the southernmost portion of Lebanon.
Ledyard	Ledyard WPCA with the exception of the area immediately surrounding existing systems.
Lisbon	Boundaries have been delineated, acceptable to all parties, which split Lisbon into two ESA areas to be served by Jewett City in the majority of the Town and by Norwich Department of Public Utilities serving the southwestern portion of the Town along its border with the City of Norwich.
Lyme	Town of Lyme.
Marlborough	ECRWC (AquaSource) except for those properties that are now or in the future owned by the Town, are the exclusive service area of the Town of Marlborough.
Montville	Eastern portion of the Town (east of Route 395) plus the Route 163 corridor by Montville WWPCA, the western portion (west of Route 395) less the Route 163 corridor to SCWA, and a small area in the southern part of Town by Norwich DPU.
New London	New London Water Department.
North Stonington	The Town of North Stonington.
Norwich	Norwich Department of Public Utilities.
Old Lyme	Connecticut Water Company.
Preston	Town of Preston.
Salem	SCWA except for a small area in the northwest portion of Town near Lake Hayward, which will be in the ECRWC ESA.
Sprague	Sprague Water & Sewer Authority.
Stonington	Town of Stonington in the eastern portion of Town, Connecticut-American Water Company in the western portion of Town, and Connecticut Water Company at Mason's Island.
Voluntown	Connecticut Water Company.
Waterford	Waterford WPCA.

## 5.0 Population and Water Supply Demand

Historical population figures are shown in Table 2. This data shows consistent growth throughout the region until the 1980's and 1990's. At that time, the urban areas began to lose population, while the suburban and rural municipalities, for the most part, kept increasing.

Table 3 presents future projections by municipality for the southeast region. This data has been published by the Office of Policy and Management and is a combination of data obtained from Series 95.1 and 95.2.

**TABLE 2**  
**Historic Population by Municipality for the Southeast Region**

Municipality	Population							
	1920	1930	1940	1950	1960	1970	1980	1990
Bozrah	858	859	904	1,154	1,590	2,036	2,135	2,297
Colchester	2,050	2,134	2,338	3,007	4,648	6,603	7,761	10,980
East Haddam	2,312	2,114	2,217	2,554	3,637	4,676	5,621	6,676
East Hampton	2,394	2,616	2,955	4,000	5,403	7,078	8,572	10,428
East Lyme	2,291	2,575	3,338	3,870	6,782	11,399	13,870	15,340
Franklin	552	611	667	727	974	1,356	1,592	1,810
Griswold	4,220	6,010	5,343	5,728	6,472	7,763	8,967	10,384
Groton	9,227	10,770	10,910	21,896	29,937	38,244	41,062	45,144
Hebron	915	879	999	1,320	1,819	3,815	5,453	7,079
Lebanon	1,343	1,436	1,467	1,654	2,434	3,804	4,762	6,041
Ledyard	1,161	1,144	1,426	1,749	5,395	14,837	13,735	14,913
Lisbon	867	1,097	1,131	1,282	2,019	2,808	3,279	3,790
Lyme	674	546	717	857	1,183	1,484	1,822	1,949
Marlborough	303	319	476	901	1,961	2,991	4,746	5,535
Montville	3,411	3,970	4,135	4,766	7,759	15,662	16,455	16,673
New London	25,688	29,640	30,456	30,551	34,182	31,630	28,842	28,540
No. Stonington	1,144	1,135	1,236	1,367	1,982	4,219	4,280	4,884
Norwich	29,685	32,438	34,140	37,633	38,506	41,739	38,074	37,391
Old Lyme	946	1,313	1,702	2,141	3,068	4,964	6,159	6,535
Preston	2,743	3,928	4,206	4,775	4,992	3,593	4,644	5,006
Salem	424	403	504	618	925	1,453	2,335	3,310
Sprague	2,500	2,539	2,285	2,320	2,509	2,912	2,996	3,008
Stonington	10,236	11,025	11,002	11,801	13,969	15,940	16,220	16,919
Voluntown	656	651	723	825	1,028	1,452	1,637	2,113
Waterford	3,935	4,742	6,594	9,100	15,391	17,227	17,843	17,930
<b>Total</b>	<b>110,535</b>	<b>124,894</b>	<b>131,871</b>	<b>153,596</b>	<b>198,565</b>	<b>249,685</b>	<b>262,862</b>	<b>284,675</b>

Source: Office of Policy and Management Census Data



**TABLE 3**  
**Population by Municipality for the Southeast Region**

Municipality	1990 <sup>1</sup> (Census)	1995 <sup>1</sup> (Projected)	2000 <sup>1</sup> (Projected)	2005 <sup>1</sup> (Projected)	2010 <sup>1</sup> (Projected)	2015 <sup>1</sup> (Projected)	2020 <sup>1</sup> (Projected)	2030 <sup>2</sup> (Projected)	2040 <sup>2</sup> (Projected)
Bozrah	2,297	2,310	2,320	2,340	2,360	2,390	2,420	2,500	2,500
Colchester	10,980	12,600	13,600	14,400	15,200	16,000	16,800	18,500	20,300
East Haddam	6,676	7,000	7,350	7,880	8,570	9,320	10,100	11,100	12,200
East Hampton	10,428	10,830	11,190	11,560	11,990	12,430	12,840	13,800	14,800
East Lyme	15,340	15,420	15,440	15,490	15,570	15,630	15,660	15,800	15,900
Franklin	1,810	1,710	1,660	1,650	1,710	1,780	1,860	1,900	1,900
Griswold	10,384	10,220	10,120	10,350	10,850	11,390	11,910	12,500	13,100
Groton	45,144	44,360	43,810	44,880	46,910	48,780	50,560	52,600	54,700
Hebron	7,079	7,420	7,720	8,060	8,480	8,970	9,470	10,400	11,500
Lebanon	6,041	6,340	6,620	6,940	7,320	7,750	8,200	9,000	9,900
Ledyard	14,913	15,880	16,780	17,180	17,480	17,780	18,080	19,300	20,600
Lisbon	3,790	3,830	3,850	3,910	4,000	4,100	4,200	4,300	4,500
Lyme	1,949	1,930	1,910	1,890	1,880	1,870	1,860	1,900	1,900
Marlborough	5,535	5,680	5,780	5,930	6,120	6,320	6,530	6,900	7,300
Montville	16,673	16,900	17,400	17,900	18,200	18,500	18,800	19,600	20,400
New London	28,540	26,920	26,050	26,160	27,900	29,480	31,020	32,000	33,000
No. Stonington	4,884	4,960	5,000	5,050	5,150	5,280	5,430	5,600	5,800
Norwich	37,391	36,030	35,060	35,440	36,850	38,240	39,550	40,400	41,200
Old Lyme	6,535	6,680	6,800	6,960	7,140	7,330	7,500	7,900	8,200
Preston	5,006	5,340	5,780	6,540	7,530	8,560	9,640	10,600	11,700
Salem	3,310	3,620	3,750	3,890	4,070	4,290	4,540	5,000	5,500
Sprague	3,008	3,100	3,220	3,390	3,590	3,780	3,940	4,300	4,700
Stonington	16,919	16,670	16,340	16,210	16,260	16,460	16,750	16,800	16,800
Voluntown	2,113	2,190	2,260	2,360	2,490	2,630	2,760	3,000	3,300
Waterford	17,930	17,880	17,860	18,120	18,630	19,170	19,750	20,400	21,100
<b>Total</b>	<b>284,675</b>	<b>285,820</b>	<b>287,670</b>	<b>294,480</b>	<b>306,250</b>	<b>318,230</b>	<b>330,170</b>	<b>346,100</b>	<b>362,800</b>

<sup>1</sup>Series 95.1 Data  
<sup>2</sup>Series 95.2 Data

Table 4 presents a summary of demand projections and surplus/deficits for each of these planning periods. Table 5 presents a summary of systems requiring additional supplies in excess of 100,000 gpd in the 50-year planning period and identifies potential future sources/providers. Population and demand projections for each recommended exclusive service area were generated based on information supplied by representatives of the public water systems recommended for expanded exclusive service area. Demands were analyzed for existing conditions as well as the five-, 20- and 50-year planning periods. Projected deficits and margin of safety are based on a comparison of projected demands to existing safe yields. The projected deficits therefore indicate the necessary supply source yield that will need to be developed within the various planning horizons. Existing conditions are based on year 2000 data. The 20- and 50-year planning periods correspond to the last available census data, in this case 1990.

**TABLE 4  
Summary of Demand Projections and Surplus/Deficits**

Planning Horizon	Existing/Projected Demand	Existing/Projected Surplus/(Deficit)	Existing/Projected Margin of Safety

**TABLE 5  
Summary of Systems Requiring Additional Supplies in Excess of 100,000 gpd  
in the 50-Year Planning Period and Identification of Potential Future Sources/Providers**

Deficit Area	Potential Future Source/Provider
<i>East Region</i>	
<i>West Region</i>	

- Note:
1. Source identified in studies completed by East Hampton WPCA
  2. Not regionally significant supplies

Without the development of new supplies, the region-wide margin of safety will drop below 15% shortly beyond the five-year planning period. A region-wide deficit of 0.3 mgd is projected within the 20-year planning period. This is forecast to increase to almost 16 mgd by the year 2040 if new supplies are not developed. Table 6 presents a summary of public water system deficits for the five-, 20-, and 50-year planning periods.

**TABLE 6**  
**Summary of Public Water System Deficits without New Source Development**

Water Supplier	5-Year Planning Period (2005) Projected Deficit (mgd)	20-Year Planning Period (2010) Projected Deficit (mgd)	50-Year Planning Period (2040) Projected Deficit (mgd)
East Hampton WPCA	1.075	1.700	2.600
CT-American Water Co.	0.622	0.692	1.222
Town of Stonington	0.395	0.668	0.965
Town of East Lyme	0.358	0.631	1.495
Town of Preston	0.171	0.814	3.991
Montville WPCA	0.124	0.208	1.786
Norwich DPU	0.664	2.325	4.316
SCWA	-----	0.036	0.885
New London Water Department	-----	-----	1.120
Colchester DPW	-----	-----	0.992
Town of North Stonington	-----	-----	0.504
Town of East Haddam	-----	-----	0.271

### ***6.0 Future Potential Water Supply Sources and Potential Impact of the Coordinated Public System Plan on Other Uses of Water Resources***

A comprehensive review of existing water resources in southeast Connecticut was performed to identify potential potable water sources. Table 7 presents a list of future water supply sources recognized as having the greatest potential to provide needed future supplies in the southeast Connecticut Region. This listing has been prioritized based upon input and comment from the Department of Environmental Protection as well as proximity to existing and projected water demands. These aquifers and watersheds should receive the greatest attention with respect to source protection. Figure 1 is a reference map of the potential groundwater and surface water supply sources.

Development of future supply sources can potentially have impacts on water quality, minimum streamflows, flood management, recreation, hydropower, aquatic habitat, riparian rights, and waste load allocations. Each of these issues will require careful evaluation prior to the development of any new supply source.

**TABLE 7**  
**Recommended Future Water Supply Development Areas**

Basin ID	Subregional Basin	Regional Basin	Type of Supply	Estimated Reservoir Yield (mgd)	Estimated Run-of-River Yield (mgd)	Estimated Ground Water Yield (mgd)	Environmental Sensitivity
<b>TOTAL</b>				<b>68.5</b>	<b>8.6</b>	<b>28.8 - 30.3</b>	

**7.0 Interconnections, Joint Use Facilities, and Satellite Management**

In the southeast Connecticut public water supply management area, several public water systems receive their water from an interconnection with another system. Those systems that receive water from a neighboring system include: Montville and Waterford (supplied by New London); Connecticut Water Company and Latimer Point Fire District (supplied by Connecticut-American Water Company); and Ledyard WPCA, Groton Long Point Association and Noank Fire District (supplied by Groton Utilities).

None of the public water systems in southeast Connecticut are interconnected for the purpose of balancing supply and demand in a regionally beneficial manner. A diversion permit application for a pipeline interconnecting Groton, Norwich, others was submitted in 1999, however due to a determination of application insufficiency by DEP, potential opposition, and the lack of follow-up by the applicants, the project has not gone forward.

Many of the smaller community public water systems in the region operate with a single source of supply, with no backup supply. This leaves these systems vulnerable to interrupted service due to equipment failures, contamination, and the like.

While it is recognized that future regional interconnections will be critical to the efficient conveyance of supplies to the demand centroids, the regulatory and participatory process involved in creating regional interconnections can be costly and time-consuming. It also requires the cooperation of many municipal and private entities for its success. A lack of cooperation on the part of one or more entities could necessitate the installation of parallel transmission piping. Additionally, the regulatory review process of interconnections can be extensive, with the potential to prevent the timely implementation of these projects.

C.G.S. Section 16-262k (Interconnection of Public Water Supply Systems to Relieve Site-Specific Water Shortages) states the following: *The Department of Public Utility Control may require any water company as defined in Section 16-1 to connect its public water supply system with that of another water company or municipal utility if it finds that such a connection would be an effective means of relieving site-specific water shortages.* However, there are currently no mandates for systems that are not regulated by DPUC to interconnect or for systems to act as a vehicle for pass-through transmission of water.

The joint use or ownership of facilities for public water systems in the southeast Connecticut region is not well documented. However, based on local system knowledge, joint use or ownership of major infrastructure such as supply sources, storage, treatment, or water mains is not currently practiced in the region. More common is the arrangement where one public water system sells water to a neighboring system through an interconnection.

Given the forecast water supply deficit in the southeast region, there is a potential for future shared ownership and use of supplies beyond routine interconnections. This type of shared use would require formal agreements among the stakeholders. Large-scale regional interconnections of future water supplies could be fed by a jointly owned supply source. This may become more common if water supply development trends towards regional supplies to meet the needs of several systems.

Satellite management can be a cost-effective means of operating a small system because it takes advantage of the "economy of scale" factor that larger water suppliers can offer. Table 8 presents a summary of satellite management needs and opportunities of major providers in the region.

**TABLE 8**  
**Satellite Management Needs and Opportunities of ESA Providers**

ESA Provider	Intend to Operate Their Own Satellite Public Water Systems	Potential Need for Contract Operation by Other Providers	Available to Operate Satellite Public Water Systems for Other Providers
Colchester DPW	X		
Connecticut-American Water Co.	X		X
Connecticut Water Company	X		X
Town of East Haddam		X	
Town of East Hampton	X	X	
Town of East Lyme	X		
ECRWC/AquaSource	X		X
Groton Long Point Water Dept.	X		
Groton Utilities	X		X
Jewett City Water Company	X		X
Town of Lebanon		X	
Town of Lyme		X	
Town of Marlborough		X	
Montville WWPCA		X	
City of New London	X		
Town of North Stonington		X	
Noank Water Company		X	
Norwich DPU	X		X
Town of Preston		X	
SCWA	X		X
Town of Stonington		X	
Sprague Water & Sewer		X	
Waterford WPCA	X		

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*Appendix*

**COORDINATED WATER SYSTEM PLAN**  
**PART I: FINAL WATER SUPPLY ASSESSMENT**

**Southeastern Connecticut  
Public Water Supply Management Area**

**April 1999**

***Prepared for:***

Department of Public Health  
Hartford, Connecticut  
and  
Southeastern Connecticut  
Water Utility Coordinating Committee

***Prepared by:***

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**COORDINATED WATER SYSTEM PLAN**  
**PART II: FINAL RECOMMENDED EXCLUSIVE**  
**SERVICE AREA BOUNDARIES**

**Southeast Connecticut**  
**Public Water Supply Management Area**

**July 2000**  
*Revised December 2000*  
*Revised March 2001*

***Prepared for:***

Department of Public Health  
Hartford, Connecticut  
and the  
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Water Utility Coordinating Committee

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## DEFINITIONS

***Areawide Supplement*** – A part of a coordinated water system plan which addresses areawide water system concerns pertaining to the public water supply management area which are not otherwise included in each water company's individual water system plan. The supplement identifies the present and future water system concerns, analyzes alternatives and sets forth a means for meeting those concerns. An areawide supplement consists of a water supply assessment, exclusive service area boundaries, integrated report, and executive summary.

***Community Water System*** – A public water system that serves at least 25 residents.

***Coordinated Water System Plan*** – The individual water system plans of each public water system within a public water supply management area, filed pursuant to section 25-32d of the Connecticut General Statutes, and an areawide supplement to such plans developed pursuant to Connecticut General Statute 25-33h, which addresses water system concerns pertaining to the public water supply management area as a whole.

***Exclusive Service Area (ESA)*** – An area where public water is supplied by one system.

***Integrated Report*** – An overview of individual public water systems within the management area which addresses areawide water supply issues, concerns, and needs; and promotes cooperation among public water systems.

***Non-Transient Non-Community Water System*** – A public water system that is not a community system and that regularly serves at least 25 of the same persons over six months per year.

***Public Water Supply Management Area*** – An area for coordinated water supply planning determined by the Commissioner of Public Health to have similar water supply problems and characteristics.

***Public Water System*** – Any private, municipal or regional water company supplying water to fifteen or more service connections or 25 or more persons.

***Satellite Management*** – Management of a public water supply system by another public water system.

***Transient Non-Community Water System*** – A non-community water system that does not meet the definition of a non-transient, non-community water system.

***Water Utility Coordinating Committee (WUCC)*** – A committee consisting of one representative from each public water system with a source of supply or service area within the public water supply management area and one representative from each regional planning agency within the public water supply management area, elected by majority vote of the chief elected officials of the municipalities that are members of such regional planning agency.



## ABBREVIATIONS

CGS	Connecticut General Statutes
COG	Council of Governments
CT-AM	Connecticut-American Water Company
CWC	Connecticut Water Company
DEP	Department of Environmental Protection
DPH	Department of Public Health
DPUC	Department of Public Utility Control
ECRWC	Eastern Connecticut Regional Water Company
ESA	Exclusive Service Area
LLC	Limited Liability Corporation
MHP	Mobile Home Park
MMI	Milone & MacBroom, Inc.
OPM	Office of Policy and Management
SCWA	Southeastern Connecticut Water Authority
WPCA	Water Pollution Control Authority
WSMA	Water Supply Management Area
WUCC	Water Utility Coordinating Committee

# **COORDINATED PUBLIC WATER SYSTEM PLAN**

## **PART III: FINAL INTEGRATED REPORT**

### **Southeast Connecticut Public Water Supply Management Area**

**March 2001**

*Prepared for:*

Department of Public Health  
Hartford, Connecticut  
and the  
Southeast Connecticut  
Water Utility Coordinating Committee

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## LIST OF ABBREVIATIONS

CGS	Connecticut General Statutes
COG	Council of Governments
DEP	Department of Environmental Protection
DPH	Department of Public Health
DPUC	Department of Utility Control
ESA	Exclusive Service Area
GIS	Geographic Information System
gpcd	gallons per capita per day
gpd	gallons per day
mgd	million gallons per day
MMI	Milone & MacBroom, Inc.
OPM	Office of Policy and Management
SCWA	Southeastern Connecticut Water Authority
WPCA	Water Pollution Control Authority
WUCC	Water Utility Coordinating Committee



## DEFINITIONS

***Areawide Supplement*** – A part of a coordinated water system plan which addresses areawide water system concerns pertaining to the public water supply management area which are not otherwise included in each water company's individual water system plan. The supplement identifies the present and future water system concerns, analyzes alternatives and sets forth a means for meeting those concerns. An areawide supplement consists of a water supply assessment, exclusive service area boundaries, integrated report, and executive summary.

***Community Water System*** – A public water system that serves at least 25 residents.

***Coordinated Water System Plan*** – The individual water system plans of each public water system within a public water supply management area, filed pursuant to section 25-32d of the Connecticut General Statutes, and an areawide supplement to such plans developed pursuant to Connecticut General Statute 25-33h, which addresses water system concerns pertaining to the public water supply management area as a whole.

***Exclusive Service Area (ESA)*** – An area where public water is supplied by one system.

***Integrated Report*** – An overview of individual public water systems within the management area which addresses areawide water supply issues, concerns, and needs; and promotes cooperation among public water systems.

***Non-Transient Non-Community Water System*** – A public water system that is not a community system and that regularly serves at least 25 of the same persons over six months per year.

***Public Water Supply Management Area*** – An area for coordinated water supply planning determined by the Commissioner of Public Health to have similar water supply problems and characteristics.

***Public Water System*** – Any private, municipal or regional water company supplying water to fifteen or more service connections or 25 or more persons.

***Satellite Management*** – Management of a public water supply system by another public water system.

***Transient Non-Community Water System*** – A non-community water system that does not meet the definition of a non-transient, non-community water system.

***Water Utility Coordinating Committee (WUCC)*** – A committee consisting of one representative from each public water system with a source of supply or service area within the public water supply management area and one representative from each regional planning agency within the public water supply management area, elected by majority vote of the chief elected officials of the municipalities that are members of such regional planning agency.