



**Working as the
Regional Planning
Commission and
MPO for the
Southern New
Hampshire Region**

A Current Assessment of the Water Supply Study

for the

Southern New Hampshire
Region



SNHPC

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Commission Region

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438 Dubuque Street
Manchester, NH

Prepared by

Southern New Hampshire Planning Commission

in association with the
Nashua Regional Planning Commission,
Rockingham Planning Commission and
Strafford Regional Planning Commission.



Introduction

The purpose of this report is to evaluate the current utility and relevance of the Water Supply Study for Southern New Hampshire prepared in May 1990 by Roy F. Weston Associates, Inc. in association with the Nashua Regional Planning Commission, Southern New Hampshire Planning Commission, Rockingham Planning Commission and Strafford Regional Planning Commission. The 1990 Water Supply Study was prepared for the primary purpose of planning for the impact which population growth in southern New Hampshire would have on water supply and distribution in the region.

Today this 15-year-old study remains the only available comprehensive planning study of our region's water supply. Because it is now out of date, many outstanding questions remain. For example, are the results and conclusions of the study still valid? What utility does the study have today? Are the recommendations still relevant? What has or has not been implemented? What still remains to be done?

While the answers to these questions are not readily apparent, it is hoped that this assessment will provide the direction needed for determining whether to replace or update the study and if so, how this should be accomplished.

Water supply planning is an important and complex issue requiring significant data collection. It also requires significant leadership and coordination among all the various agencies, stakeholders, water suppliers and consumers involved. There are also many competing demands that must be resolved. These include protecting and expanding existing sources and developing new supplies as our communities continue to grow and develop.

How much water will southern New Hampshire need in the future? How much water is presently available? Where are best available supplies and how can they be adequately protected? What are the most practical and economic approaches for water supply and distribution in the future – private, municipal, multi-jurisdictional, countywide or regional? Can all of these systems work together to ensure that a safe, adequate and economical water supply is available for everyone?

In truth, we still do not have all answers to these questions. As a result, we need more information and better planning.



Historical Perspective

At the time the 1990 study was prepared, there were a number of state agencies and other organizations involved in water supply planning in the region. Many of these groups focused their efforts only on the water resources to which they were charged. This approach was fragmented and lacked the coordination needed to bring about meaningful change in water supply policy, management and financial issues. It is pointed out in the 1990 study that representatives from some of these agencies felt it would be beneficial to coordinate these separate efforts into one cohesive study of water supply needs (pg. 1-1). This recognition resulted in the formation of the Southern New Hampshire Water Supply Task Force, and ultimately the development of the study.

The key events that occurred in the late 1980's leading up to the development of the 1990 study are outlined below.

- The Water Resources Division of the New Hampshire Department of Environmental Services (NH DES) was drafting rules for registration of water users and development of a water use database.
- The United States Geological Survey (USGS) was completing the first phase of a groundwater-mapping program for the Nashua area and preparing a report.
- The Water Supply Engineering Bureau of NHDES was addressing issues of regionalization, wellhead protection, operator training and others.
- The New Hampshire legislature was reviewing all water laws of the state in preparation for recodification.
- The Office of State Planning (OSP) was finalizing rules for preparation of Water Resources Management and Protection Plans.
- The Public Utilities Commission (PUC) was encouraging regulated water utilities to prepare comprehensive water supply plans and was investigating generic issues affecting assignment of the water franchises.
- The Nashua Regional Planning Commission (Nashua RPC) was about to start work on a regional study of water supply issues that would be funded primarily by regulated utility companies within the Nashua RPC planning region.

This last event sparked the idea of forming a task force to study water supply issues in New Hampshire. Due to the common interests of the NH PUC and the Nashua RPC, joint meetings were held to explore the possibility of expanding the geographic scope of the Nashua study. The NH DES, representatives of the legislature, water companies, and other interested groups were invited to an organizational meeting in May 1987 to begin the larger study. This

meeting represented the formal kickoff of the Water Supply Task Force.

The representatives of the thirteen (13) public and private organizations participating on the Water Supply Task Force are identified below.

Task Force Participants
New Hampshire Water Supply Task Force
August 1989

State Agencies
Public Utilities Commission
Department of Environmental Services
Office of State Planning

Water Utilities
Hampton Water Works, Co.
Manchester Water Works
Pennichuck Water Works, Inc.
Southern New Hampshire Water Company

Regional Planning Commissions
Nashua Regional Planning Commission
Southern New Hampshire Planning Commission
Rockingham Planning Commission
Strafford Regional Planning Commission

Associations
Business and Industry Association of New Hampshire
New Hampshire Association of Commerce and Industry

Currently the Southern New Hampshire Water Supply Task Force does not exist.



Current Perspective and Activities

Fifteen years after development of the 1990 water study, there are still a number of state and federal agencies involved in water supply planning whom function with no coordinated water supply planning mission in mind. The specific duties and current activities of these agencies are identified below:

The Water Division of NHDES is responsible for over seeing the operation of about 125 municipal water systems, 600 small community water systems and over 1100 systems that provide water for restaurants, motels, and campgrounds. Consistent with the criteria of the federal Safe Drinking Water Act, the Water Division conducts engineering reviews of all proposals to develop or expand public water supplies. Additionally, it conducts regular water quality sampling, water facility inspections, facility operator licensing and educational programs, and technical assistance. It also administers a source water protection regulatory and educational program.

Wastewater control activities also comprise a large portion of the division's operations. It oversees and extensive loan and state grant program for wastewater treatment facilities, reviews the engineering designs for such facilities, and ensures their proper construction and operation. Other responsibilities of the Water Division include monitoring and protecting surface water quality, managing the network of state dams, protecting wetlands, and regulating water quality activities, including a septic system, and subsurface wastewater disposal systems. The Water Division is also responsible for managing the Water Well Board program which oversees the regulation of private wells in New Hampshire.

State Geologic Survey, NH DES

The mission of the NH Geological Survey (NHGS) is to “collect data and perform research on the land, mineral, and water resources of the state, and disseminate the findings of such research to the public through maps, reports, and other publications”. One of the principal activities of NHGS is to map the surficial and bedrock geology of the state through the cooperative STATEMAP program. The NHGS also administers the following programs:

- **NH Water Well Inventory program** – builds and manages a database containing over 100,000 well records and georeferences well locations on an ongoing basis.
- **Water User Registration and Reporting program** – collects data on monthly water withdrawals, returns, and transfers by facilities whose water use exceeds an average of 20,000 gallons per day.
- **Statewide Groundwater-Level Monitoring Network** – measures water table elevations in a network of 20 wells on a monthly basis
- **National Hydrography Dataset development initiatives** – serves as the state’s steward of the high resolution hydrography network data layer and promotes new GIS applications that take advantage of network functionality.

At present, NHGS is compiling basic hydrogeologic data and developing analytical methods to map potential groundwater recharge as part of the cooperative Seacoast Groundwater Availability study. Current STATEMAP efforts are focused on creating a seamless GIS data layer of surficial geology within the I-93 highway corridor as part of a cooperative project with the NH Department of Transportation.

United States Geological Survey (USGS)

The United States Geologic Survey NH/VT district office provides regional hydrologic data, investigative studies, and research needed for the characterization and management of water resources in the two States. USGS works in cooperation with many Federal, State, and local agencies to evaluate the source, distribution, use, quantity, quality, and biology of water resources. Current regional studies are focused on specific water quality concerns such as nitrogen and other nutrients, mercury, arsenic, and radionuclides. In NH, USGS is investigating MTBE in ground water drinking sources and the impacts on the quality of surface water due to urbanization and susceptibility to invasive species. USGS is also participating in the cooperative Seacoast Groundwater Availability study by developing a regional numerical groundwater flow model and estimating water use within individual towns.

Office of Energy and Planning (OEP)

OEP provides information, data and guidance to assist decision makers on issues pertaining to development, land protection, energy use and community planning. OEP is responsible for guiding the future growth of the state through public policy development, education, research, and partnership building. This site provides information on our many programs:
<http://www.nh.gov/oep/index.htm>



Public Utility Commission (PUC)

The Gas & Water Division of the Public Utilities Commission regulates 33 water utilities and six sewer utilities in New Hampshire. The 33 water utilities own approximately 100 separate systems, ranging in size from 20 customers to about 22,000. Pennichuck Water Works is the largest, serving the greater Nashua area as well as a number of smaller systems in the southern part of the state. Until recently the PUC also regulated Manchester Water Works with regard to the customers it served outside the City of Manchester. This was because Manchester chose to charge its outside customers a higher rate than its Manchester customers. A change in state law in 2002, which now permits a rate premium of up to 15% over municipal rates without PUC regulation, led Manchester recently to seek and receive exemption from regulation from the Commission.

Regional Planning Commissions (RPCs)

The Regional Planning Commissions in the state were formed under Chapter 36 of the New Hampshire state statutes. The purpose of this legislation was to enable municipalities and counties to join in the formation of regional planning commissions whose duty it shall be to prepare a coordinated plan for the development of a region, taking into account present and future needs with a view toward encouraging the most appropriate use of land, such as for agriculture, forestry, industry, commerce, and housing; the facilitation of transportation and communication; the proper and economic location of public utilities and services; the development of adequate recreational areas; the promotion of good civic design; and the wise and efficient expenditure of public funds. Regional planning commissions also provide many services to the region including transportation planning, environmental planning, land use planning, and local planning assistance. Regional planning commission's also serve as a clearinghouse and conduit of federal and state data and as a forum for state and local officials to discuss issues of regional concern.

Each municipality which shall be a member of a regional planning commission is entitled to 2 representatives on said commission. A community with a population of over 10,000, but less than 25,000 is entitled to three representatives. A community over 25,000 is entitled to four representatives. A regional planning commission's powers shall be advisory, and shall generally pertain to the development of the region within its jurisdiction as a whole. There are currently nine regional planning commissions in the state. The Southern New Hampshire Planning Commission and the Nashua Regional Planning Commission lie primarily within the watershed of the Merrimack River and the I-93 corridor.



The 1990 Water Supply Study

The basic problem of water supply planning in southern New Hampshire at the time the 1990 study was developed can be best illustrated by reviewing the following figures (see 6-1 and 6-2). These maps show that in 1990 at least 17 significant water systems were located within the Nashua/Manchester area. In addition to these major suppliers, there were dozens of small “developer-type-systems” serving clusters of homes, multi-family developments, apartment buildings and mobile home parks. If motels, campgrounds, and restaurants are added to this list, there are literally hundreds of entities supplying water in Southern New Hampshire.

It was noted in the 1990 study that the majority of the “developer-type-systems” were probably not constructed out of a sense of mission to supply potable water. Rather, they were constructed for the purpose of developing property. Understandably, a significant number of these systems are neither operated nor maintained as well as they could be. Consequently, some of the users of these systems turned to municipal governments and private water companies requesting them to assume responsibility for their systems. It was evident to the Task Force that this approach to water supply was short term and probably would not meet the long-term needs in an area of rapid growth.

As a result, the Task Force felt it was necessary to develop a comprehensive plan for meeting the immediate and future needs of Southern New Hampshire for safe, economical, and adequate water supplies. Specifically, the purpose of the plan was to provide a strategy for meeting future water needs while addressing the following areas of concern:

- Reliability of Supply
- Operational and Administrative Efficiency
- Financial Viability
- Availability of Trained and Certified Staff
- Just and Reasonable Water Rates
- Economies of Scale

The specific scope of the study as determined by the Task Force is summarized below:

Task	Description
I.	Inventory Existing Use
A.	Conduct interviews of major private and public water suppliers and compile data on:
1.	Water Resources
2.	Water Supply System
3.	Current Water Demand

- II. Project Future Demand
 - A. Determine a methodology to project future demand.
 - B. Utilizing this methodology project demands for the year 2000.

- III. Identify Supply Sources to Meet Future Demand
 - A. Identify limits of expansion of current water supplies.
 - B. Based on available data identify possible supply sources consisting of reservoirs, rivers and groundwater.

- IV. Review Formal and Informal Protection and Control Strategies
 - A. Describe federal programs, state laws and local ordinances concerning water supply issues.
 - B. Identify the federal and state agencies, local officials and informal watchdog organizations, which implement these programs.
 - C. Describe the roles of each of the identified groups including a discussion of any conflicts, gaps, inconsistencies, confusion or other barriers to effective water supply management.

- V. Propose Regional and Local Strategies to Address Existing and Projected Supply Inadequacies and Future Needs.
 - A. Identify communities whose water supply may be inadequate to meet future demands.
 - B. Describe additional data needed to evaluate potential water supplies in a more detailed manner.
 - C. Evaluate local options to meet future water supply needs including consideration of:
 - 1. Regulation, control or removal of incompatible land uses.
 - 2. Land use regulations to protect recharge areas, surface waters and watersheds.
 - 3. Infrastructure maintenance and expansion.

- VI. Regional Concerns
 - A. Evaluate the following:
 - 1. Regulatory conflicts or inconsistencies.
 - 2. The need for coordination of supply, infrastructure and facility development.
 - 3. Need for system interconnections.

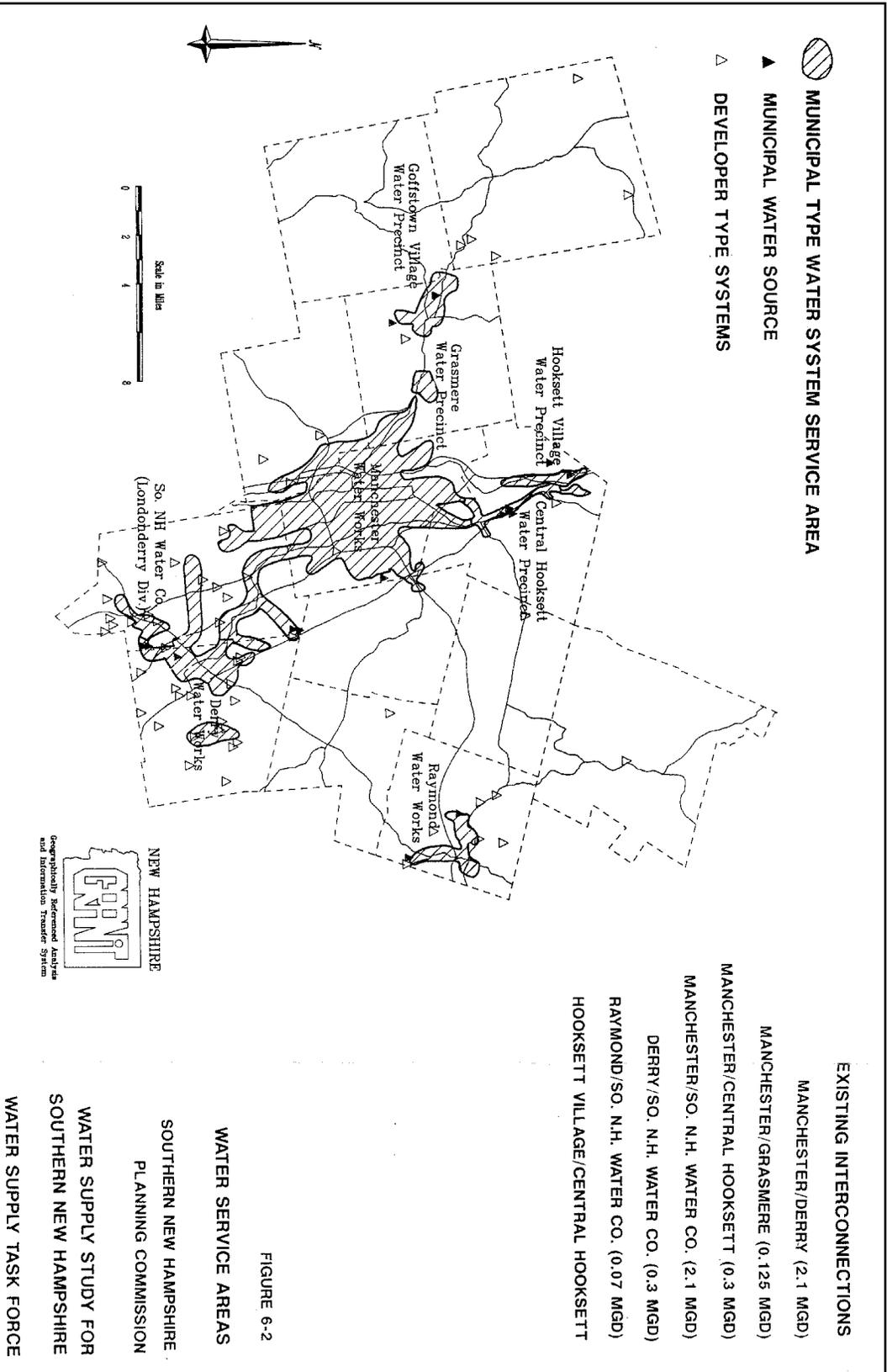


FIGURE 6-2

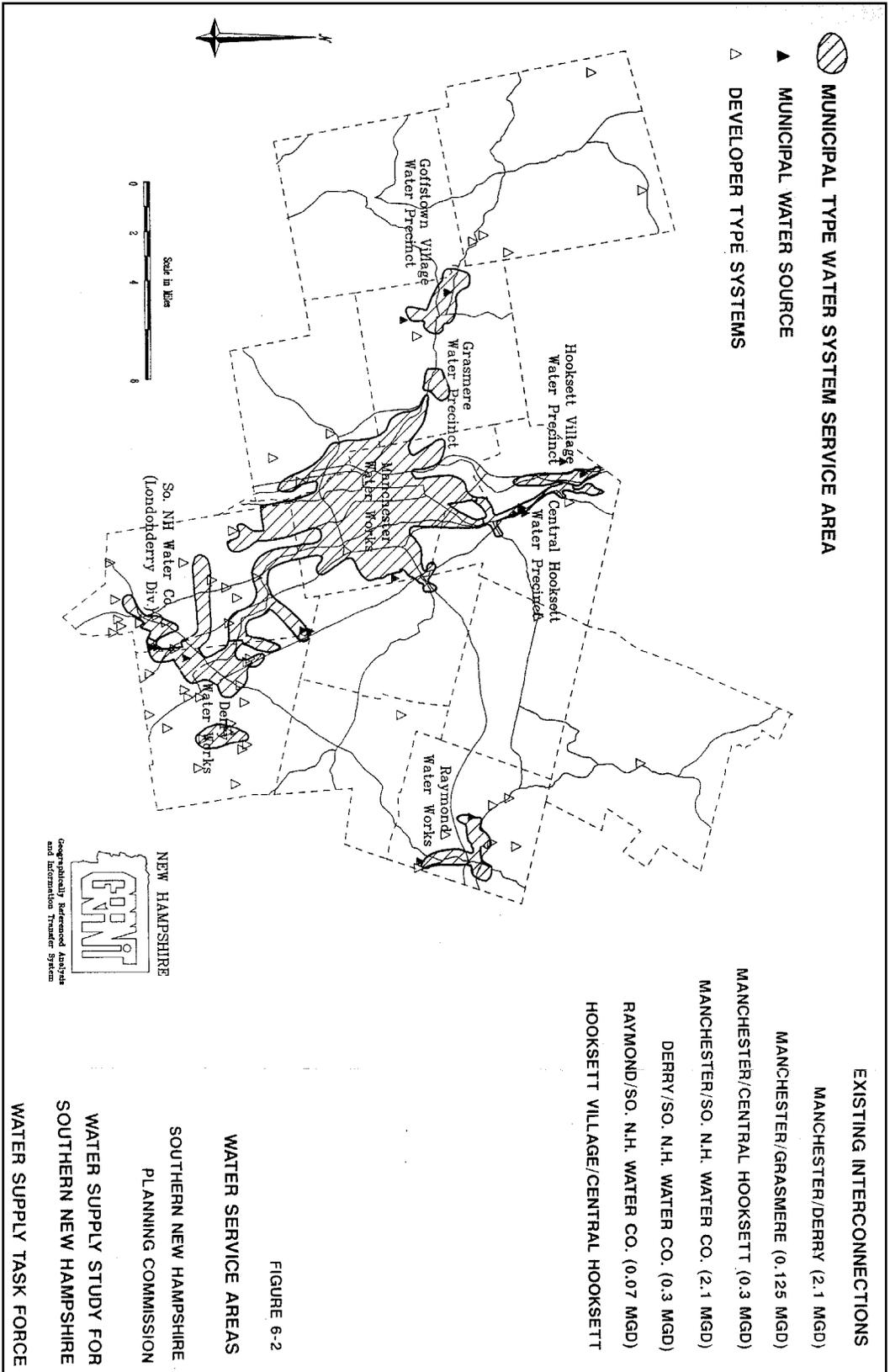


FIGURE 6-2



- VII. Consideration for Implementation
- A. Identify key actors to coordinate the implementation of the plan.
 - B. Develop a list of key actions, which must be taken, and a timeframe for their implementation.
 - C. Identify regional and local advisory bodies to monitor plan implementation and carry out information gathering.
 - D. Identify key issues to be addressed.

Most of these tasks were carried out by the Nashua Regional, Southern New Hampshire, Strafford Regional, and Rockingham Planning Commissions, and Roy F. Weston, Inc. with direction from the Office of State Planning, the New Hampshire Department of Environmental Services, the Public Utilities Commission, and the Water Supply Task Force.

At the present time, it is not known what work tasks would be needed for updating or replacing the 1990 study. It is hoped that this report and a Water Supply Planning Forum scheduled for October 12, 2005 by NH DES, Southern New Hampshire Planning Commission and the Nashua Regional Planning Commission will help to address this need.



Organization of 1990 Study

The 1990 study was developed and organized into two volumes; Volume 1 consists of the main report and Volume 2 contains all the appendices.

Volume 1 contains the following 9 chapters:

1. Background Purpose and Scope
2. Water System Surveys
3. Existing Protection and Control Strategies for Water Resources and Drinking Water
4. Regional Water Resources
5. Population and Water Demand Projections
6. Status of Water Supplies in the Study Area
7. Local Option of Local and Regional Issues
8. Task Force Discussion of Local and Regional Issues
9. Water Supply Plan

Volume 2 contains the following appendices:

1. Description of Questionnaires, Data Collection Protocol, Tabulated Responses to Questionnaires
2. Listing of Small Community Systems
3. Water System Summaries - Nashua RPC
4. Water System Summaries - So. New Hampshire RPC
5. Water System Summaries - Rockingham RPC
6. Water System Summaries - Strafford RPC
7. Demand Projection Methodology
8. Report of the Joint Legislative Committee for Recodifying the Water Laws of the State, November 17, 1988.
9. Potential Threats to Water Supplies
10. Status of Local and Regional Programs.
11. Water Source Identification Strategy.
12. Water Conservation Strategies.
13. Proposed Legislation.

Some of this information has been recently updated primarily as a result of the *Phase I Interconnectivity and Mutual Aid Study* involving five major water suppliers in the Nashua/Manchester region. In addition, the Southern New Hampshire and Nashua Regional Planning Commissions will be mailing out new survey questionnaires to all the municipalities governing boards and public works departments as well as all the major water suppliers and community water systems located in southern New Hampshire to obtain more information about the need for water supply planning in the region.

Information that has already updated includes:

- Current status of the five major water systems in the Manchester/ Nashua region: safe yield of source; plant capacity; average daily flow; maximum daily flow; system storage; water source; treatment; primary disinfectant; corrosion control; and fluoridation
- Specific limitations of these systems related to current and future interconnections;
- General issues and areas of concern regarding future interconnections;
- Mutual aid agreement conditions

The main regional issues identified by these water systems can be summarized as follows:

- How can the flowage expectations for each system be set up so that communities don't get taken advantage of?
- Address emergency storage needs region-wide...how much storage do the other systems have as a backup?
- Concerns about mixing of groundwater and surface water
- Supplying water from old systems to new systems
- Consistency between systems with regard to conservation practices.
- Cost of upgrading system to accommodate additional storage concerns.
- What are the sources that will be used to supply water in emergency situations – various wells, the Merrimack River, and other sources



Water Supply Surveys

The first step in the development of the 1990 study was to survey all the various water suppliers in the region. For purposes of the study, the water suppliers were broken down into three groupings determined by both the size and character of their system. The three groupings were large, small and very small systems and were defined as follows:

- **Large Water Systems:** Water systems serving 5,000 or more individuals or those which function primarily as municipal systems if they serve fewer than 5,000 people and provide fire protection.
- **Small Water Systems:** Water systems serving fewer than 5,000 people but supplying more than 20,000 GPD. These systems do not provide fire protection.
- **Very Small Systems:** All other residential public water systems serving at least 25 individuals. These did not include hotels, motels, restaurants, and campgrounds.

A total of 5 different questionnaires were prepared in 1990. The first questionnaire was sent out to 31 large water systems in the region with a response rate of 97 percent. It asked for basic information regarding ownership, number of services, water use, sources of supply, and system facilities. After the questionnaires were returned, brief interviews took place between the RPCs and the water suppliers. This helped to clear up any unanswered questions. Here is a brief outline of this questionnaire:

- A. System Identification
 1. Name and Location
 2. Communities Served
- B. General Ownership
 1. Ownership
 2. Interconnections
- C. Population and Services
 1. Population Served
 2. Service Connections
- D. Historic Water Demand
 1. Gallons Pumped
 2. Unaccounted for Water
 3. Water Conservation
- E. Sources of Supply
 1. Reservoir
 2. Rivers, streams, and springs
 3. Wells

- F. Source Protection
 - 1. Current Program
 - 2. Land Use Restrictions
- G. Treatment Facilities
- H. Transmission and Distribution
 - 1. Age and Condition
 - 2. Storage
- I. Improvements

It is important to note that the source protection issue is addressed in detail. Land use restrictions, past or present problems, and potential threats still need to be thoroughly examined today. With all the recent development in the region, this is a critical issue. Under the sources of supply section, it might also be helpful to ask the water suppliers if they have recently found any new sources. If they have, the location and size should be recorded for future use. For the most part, it seems that the towns and cities in the region have taken steps in the right direction, but with source protection being so important, it should be considered to be a main topic of any update or replacement of the study.

The second questionnaire was distributed to 57 small water systems in the region with a response rate of 55 percent. It was a much shorter survey and it was only sent to about a quarter of the regional water providers, due to time and funding considerations. The “largest” small companies were chosen from the list and sent a questionnaire. The outline of this questionnaire is as follows:

- A. System Identification
- B. General Information
 - 1. Water pumped
 - 2. Connections
 - 3. Population
 - 4. Age
- C. System Operation
- D. System Management/Policy

Three more questionnaires were also sent out to town and city officials regarding policy and management issues associated with their town or city when it comes to water supply. There was a questionnaire for municipalities without centralized water systems, one for the Boards of Water Commissioners, and one for municipalities with centralized water systems. The three questionnaires were all very similar. A total of 29 questionnaires were mailed to municipalities without a centralized water system, 31 questionnaires were mailed to Boards



of Water Commissioners and a total of 37 questionnaires were mailed to municipalities with a centralized water system. The response rates for the municipal surveys were low between 60 and 65 percent. The response rate for the Board of Water Commissioners was 97 percent. Here is a brief outline of the questionnaires:

A. General Information

1. Name
2. Ranking of issues
3. Regionalization
4. State involvement
5. Organization and Management
6. System operation
7. Financial Policy
8. Rate Structure and Impact Fees
9. Staffing

Updated Surveys

To obtain updated information and feedback regarding today's issues of water supply and policy, a total of four questionnaires will be distributed. Each of these questionnaires will be similar to the 1990 study. One questionnaire will be mailed out to all the large water suppliers in the region (a total of 8), a second questionnaire will be sent out to all the community water systems (a total of 46), a third questionnaire will be mailed out to all the Board of Selectmen/City Councilors in the region with or without centralized water systems (a total of 14), and the last questionnaire will be sent out to all the town planners, public works directors, etc. (a total of 13). In all, 81 surveys will be mailed out.

All four of these new questionnaires will focus on the policy issues that would be helpful in determining the need to update the 1990 study. First, they will provide insight as to what measures municipalities are currently implementing to protect their water resources. Secondly, they will begin a dialogue between town officials and RPCs regarding how important water supply is. This will lead to a clearer picture of what steps will have to be taken to protect and maintain our water supply within the region.



Information and Findings

A. Existing Water Resources

In 1990, each of the four RPCs prepared a water resources inventory for their planning area. These inventories were compiled as part of the 1990 study and contained basic data on and descriptions of watersheds, surface waters, wetlands, floodplains, aquifers existing withdrawals and water quality. In addition to this data, information was also collected depicting the water service areas for each of the municipal water systems as well as the identified system inadequacies, interconnections and alternatives identified by the water suppliers to meet projected deficits.

The USGS also performed extensive work on mapping available groundwater sources at the time the 1990 study was conducted. Data relative to the Southern New Hampshire planning region was identified in the following maps and reports:

- Availability of groundwater in the lower Merrimack River Basin, Southern New Hampshire
- Availability of groundwater in the Lamprey River Basin, Southern New Hampshire

Since the 1990 study, two important water resources studies have taken place. These include:

- *Southern New Hampshire Interconnectivity and Mutual Aid Study, Phase I* prepared by the Nashua Regional Planning Commission with funding provided by NH DES (Phase II of this study is currently being planned)
- *Regulatory Barriers to Water Supply Regional Cooperation and Conservation in New Hampshire. A Report to the New Hampshire Legislature as Required by Chapter 64, Laws of 2000.* This study was prepared by NH DES and the NH Public Utilities Commission.

Also, the USGS and the New Hampshire Geologic Survey have prepared the following reports and information:

- Water Use Registration and Reporting
- Water Well Inventory and Groundwater Level Measurement Network
- Surficial Geology and Stratified Drift Aquifer Maps
- Groundwater Availability Assessment

None of this information was available when the 1990 study was prepared and it would now be beneficial for conducting a new water supply study for the region.

B. Pollution Sources

Included in Appendix I of Volume II of the 1990 study is a detailed discussion of the potential pollution sources within the study area and how they might impact water supplies within the region. The discussion is organized on a RPC basis and it references the 1988 DES-WSPCD 305 (b) Water Quality Report to Congress, which identifies “the major sources of non-point pollution which are impacting the surface waters and ground waters of the state.

This data has now been updated by NH DES and is available as source water assessment information. The drinking water source water assessment information details existing threats to water systems and has been maintained by DES since 1999. Each water supply threat has been classified as “high”, “medium” or “low”. Maps and assessment reports can be reviewed on the NH DES Drinking Water Source Protection Program’s website at <http://www.des.nh.gov/DWSPP/dwsap.htm>.

C. Historic and Projected Population

The 1980 census was utilized as a baseline condition and as data for the various model and projection components of the 1990 Study. Specifically, when the 1990 Water Study was prepared, it was anticipated that by the year 2000, the population of Southern New Hampshire, including the Rockingham, Strafford, Nashua and Southern planning commission regions would increase by 250,000 people from 634,646 in 1987 to 883,597 in 2000. This is a 39 percent increase.

Approximately 60 percent of this increase or 147,000 people was expected to occur within the existing municipal water systems. The remaining 40 percent was expected to occur in areas served by private wells and/or very small water systems. Overall, most of this growth was expected to occur in the Rockingham and Nashua RPC planning areas, and to a lesser extent in the Southern and Strafford RPC planning areas.

Today, utilizing 2000 census data, it is projected that over the next 20 years, the population of Southern New Hampshire will grow by 250,482 people from 747,911 in 2000 to 988,393 in 2020. This represents an increase of 32 percent. Along with this population increase, it is anticipated that the daily demands for water use will continue to increase and it will become increasing difficult for the major water suppliers and municipal systems within the region to



supply potable drinking water. Therefore, in order to plan and prepare for continued growth and development of the region, there must be accurate build out, population, water supply and water distribution data.

D. Water Demand Projections

The 1990 study basically considered water demand and water use to be numerically equivalent. Therefore, water demand was defined in the study as the quantity of water consumed by the customers of the water system.

The year 2000 water demand projections provided in the study assumed that per capita consumption would remain at a constant level. The results indicated that an increased water demand of approximately 38 MGD would occur in Southern NH. Of this total, approximately 30 MGD was projected to occur in areas served by municipal systems. The Nashua area was expected to see the largest increase in municipal water use (12.2 MGD) followed closed by Southern NH (11.2 MGD). The largest increase in non-municipal water use was projected to occur in the Southern NH and Rockingham planning areas (3.1 and 2.7 MGD, respectively). All the water suppliers were in agreement with the water demand projection methodology and these findings.

Total water demand for the region based on the 1987 population of 634,646 was estimated to be 66.65 MGD and the projected water demand for the year 2000 based on a population of 883,597 was estimated to be 104.59 MGD.

It is not known today what the current and future water demands are for the region. It is hoped that this can be determined through the responses received to a series of four new questionnaires which have been mailed out to all the towns and communities, the large water suppliers, and all the small or community water systems in the region. For more information about the questionnaires contact the Southern and Nashua RPCs.

E. Status of Water Suppliers in the Study Area

The 1990 study next evaluated the population projections in light of the capacity of the water sources currently being used by the major municipal water suppliers in the region. This evaluation of source capacity vs. projected demand was based upon both estimates and assumptions.

The study estimated that the useable source capacity of the existing major municipal water supplies is approximately 96 MGD. This quantity includes only those supplies that are presently being used on a routine basis. It does not take into consideration the availability of emergency supplies, bulk purchases

purchases from neighboring suppliers, and potential withdrawals from the Merrimack River. In addition, the study was not able to make a determination relative to the ability of the aquifers in the region serving private wells and small systems to meet these future demands.

The study also estimated projected year 2000 average and maximum day demands for the major municipal water systems at 82 and 141 MGD, respectively (see the following table).

Major Municipal Systems	Useable Source Capacity	Water Demand Year 2000		
		Avg. Day Demand	Max. Day Demand	Surplus (Deficit)
Nashua RPC	33.66	29.58	50.13	(0.37)
Southern RPC	24.79	27.76	49.82	(4.56)
Rockingham RPC	22.01	14.65	27.08	(5.07)
Strafford RPC	15.41	10.43	14.11	1.30
Subtotal	95.87	82.42	141.14	(8.70)

Thus, it was anticipated that the existing sources should be able to supply the projected average day demands, but not the projected maximum day demands. The data indicates a study area wide deficit of approximately 9 MGD.

While this may at first glance give the impression that the water supply situation in the southern portion of the state is not a major problem, a closer examination of the table above indicates that there are deficits ranging from a low of 0.4 MGD in Nashua to a high of 5.0 MGD in Rockingham. The Southern RPC is projected to have a deficit of 4.56 MGD. The conclusion reached is that while water can be found in the region, it does not exist where it is needed the most based upon population and growth.

As indicated in the table above, it should be noted that useable source capacity was determined by treatment plant capacity and not the actual safe yield of the supply.

Specific water demand data and source data for small systems and individual wells were not reported in the 1990 study. In addition, at the time the 1990 study was developed, data was not available to make a determination relative to the ability of aquifers serving private wells and small systems would be able to meet estimated demands. The study therefore assumed that current demands were being satisfied and thus no deficits would occur for this segment of the population.



With regard to future supplies, the study assumed that no new supplies would exist in the Southern NH and Rockingham RPC planning areas. Only Nashua and Strafford were identified as having identified future supplies. These are supplies that were identified by the supplier that are available for use but have not received formal authorization to use.

Considering the availability of future supplies, the study concluded that the identified future supplies for Pennichuck and Southern New Hampshire Water Co. would be needed to satisfy the projected deficit in the Nashua RPC planning area. Likewise a proposed withdrawal by Manchester Water Works of 20 MGD from the Merrimack River would satisfy the projected deficit in the Southern New Hampshire planning area.

Some of the specific findings of the 1990 study are summarized below. Updates to the 1990 findings are provided, where appropriate.

- Pennichuck Water Works is limited by the capacity of the Merrimack River pumping station – However, improvements are being made.
- Manchester Water Works is planning to construct a 20 MGD intake on the Merrimack River to meet projected demands – In progress.
- Southern New Hampshire Water Company has proposed to construct an intake on the Merrimack River in Litchfield – Litchfield system now owned by Pennichuck. A Litchfield/Merrimack River intake has not been constructed and is not believed to be planned at this time.
- Approximately 50 percent of the suppliers are planning improvements to their distribution system ranging from new storage facilities to replacement of undersized mains to extensions of the distribution system.
- Salem currently uses an untreated surface supply – Salem has constructed a new treatment plant that can treat water from Canobie Lake and Arlington Pond.
- Three water suppliers, Derry, Southern New Hampshire Water Company (Londonderry Core) and Grasmere depend entirely on the bulk purchase of water from neighboring suppliers to meet their demands. – Pennichuck now operates the Londonderry Core System

- Newmarket, Exeter and Somersworth are planning to upgrade their surface water treatment facilities – Newmarket made upgrades, but now have discontinued use of the plant and either needs to construct a new plant or develop other sources of water. For the last two years, voters have turned town warrant articles to construct a new water treatment plant. Currently, Exeter and Somersworth are re-evaluating its future water needs and water supply alternatives.
- An extensive number of interconnections exist between Manchester and the surrounding communities as well as between Pennichuck Water Works and the surrounding water systems.
- Interconnections exist in the seacoast area but not to a significant degree – A study is currently being finalized that will assess the technical and financial feasibility of constructing new interconnections
- Raw water quality problems were identified in 40 percent of the water supplies. These were mainly non-health related; iron (Fe), manganese (Mn) and pH problems in one or more wells used by the water supplier. Most suppliers are either treating their water or limiting use of the supply to emergency periods only.
- Thirteen communities were identified as having insufficient supplies. All thirteen communities are making progress toward securing the additional supplies needed. Rye and Newfields have secured well sites and will connect them to their systems in the future. Others have identified a solution and are implementing it. Others are still searching for a solution.
- A number of communities having a projected surplus also have identified future supplies (Wilton, Raymond, Farmington and Somersworth).



Local and Regional Issues

An integral part of the 1990 study was identifying and addressing local and regional issues as they relate to water supply planning, development and implementation. The questionnaires were the first step taken toward this goal. In addition, the Task Force held an all-day Policy Seminar or forum to discuss local opinions and concerns. Prior to the seminar the Task Force identified specific issues and problem areas and then formulated draft position statements. The issues identified in the study were divided into the following policy areas:

- A. Regionalization
 - 1. State actions to encourage regionalization
 - 2. Regionalization vs. interconnections
 - 3. Role of state owned facilities
 - 4. Should towns be made to discuss regional issues?
 - 5. Bulk transmission of water.

- B. Interconnections
 - 1. Emergency stand-by interconnections.
 - 2. Small developer systems tie into municipal systems.

- C. Bond Guarantees
 - 1. State bond guarantees.
 - 2. Cost analysis of options.

- D. Land Use Planning for Water Supply
 - 1. Zoning policies encourage diffusion of growth
 - 2. Town role in protecting investor owned wells and recharge areas.

- E. Water Source Development
 - 1. Riparian rights vs. state control.
 - 2. Surface water withdrawals.
 - 3. Impact Analysis.
 - 4. Water source approval.
 - 5. Water supply decisions to balance all interests.

- F. Franchise Policy
 - 1. Should water resource plans specify who would provide water to growing areas?
 - 2. Municipal water extensions.
 - 3. State role in promoting growth of centralized water systems.
 - 4. Proliferation of small developer systems.

- G. Private Well Policy in Areas Without a Public Water Supply
 - 1. Regulation of private wells.
 - 2. Effect of groundwater withdrawals.
- H. Miscellaneous Issues
 - 1. Privatization of bulk water supply.
 - 2. Quality Control during construction.
 - 3. Centralized data collection.

The general discussion relative to each issue area and the adopted policy statements of the Task Force are summarized as follows:

Regionalization

In the 1990 Water Supply Study, the Task Force discussed the issue of regionalization and the ramifications such a proposal would have on towns, water suppliers, and state laws and regulations. The main items of discussion among Task Force members included the following:

- Unwillingness of towns to join with their neighborhoods or a regional entity except during their own emergency periods.
- Economies of scale.
- Potential impact of the formation of a Regional Water Utility on the growing concern over state mandated water allocations.
- Policy actions, which the State of New Hampshire should take to encourage regional water supplies.
- The need for financial and other incentives to regionalize.
- Whether systems should be compelled to join a regional system.
- Potential loss control over the rate and intensity of development.

The term regionalization means many things to many people. Within the 1990 Water Supply Study, the following three forms of regionalization were discussed: (1) wholesale purchase of water; (2) retail sale of water; and, (3) management/contract operations.

Wholesale purchase of water involves one town or water system purchasing water from a neighboring supplier and in turn distributing it to its customers. The connection between the two suppliers is for all intents and purposes a source of supply similar to a well or treatment plant. The terms of the agreement are defined within a contract between the two parties. This contract would spell out the quantities of water to be purchased, the price of the water as well as any other conditions of sale. Individual systems would retain responsibility for distribution system management, repairs, meter reading, billings and customer complaints. According to the 1990 Water Supply Study, Manchester



Water Works and Derry best illustrated this type of regional system in the region.

The wholesale purchase of water is another form of regionalization. However, the term “regionalization” usually infers a much higher degree of “connectedness” between systems as illustrated by the retail sale of water. The retail sale of water involves one utility selling water directly to individual customers in more than one municipality. According to the 1990 Water Supply Study this arrangement was best illustrated within the region by Manchester Water Works selling water directly to customers in Bedford. Under this arrangement, the water supplier would also be responsible for the distribution system maintenance, meter reading, billing and handling customer complaints.

The third form of regionalization involves the management and operation of distinct water systems by one central water company. Usually the separate systems are not interconnected due to the distance between them. As separate independently owned and operated systems, management and maintenance of these systems is frequently lacking due to an absence of financial and personnel resources. Combining these systems via management services provided by a central water company takes advantage of economies of scale resulting in a much better managed and more efficiently operated system. For example, each small system may not have sufficient resources to support a licensed operator. However, if their resources are combined, then the group could support a “circuit rider” operator. According to the 1990 Water Supply Study, this type of regionalization was best illustrated in the region by Southern New Hampshire Water Company operating many “developer” type water systems. (Note: In 1988 Southern New Hampshire began a program to physically interconnect these systems into one integrated grid).

As pointed out in the 1990 study, the above regionalization arrangements could be implemented by a variety of entities: Three are mentioned below:

- Regional Water Authority
- State Agency
- Investor Owned Water Utility.

From a historical perspective, regional solutions to the projected water supply deficits in the region have been discussed in at least twelve previous studies prior to the 1990 Water Supply Study. According to the 1990 study, each of the twelve previous studies, in one form or another cited the following reasons for recommending a regional approach to the water supply issue in the region. (It should be noted that all of these reasons are still valid today).

- Water supply needs are exceeding the capacity of local public water supply systems to meet those needs.
- There is an uncertainty regarding the adequacy of developing water supplies on a community-by-community basis.
- Costs associated with expanding or developing a regional water supply is significant and perhaps prohibitive in areas of sparse development.
- More efficient use of limited resources could be attained.

A review of the responses to the 1990 Water Supply Study questionnaires concerning regionalization indicated that 60-70 percent of small developer type systems were not in favor of affiliation with a large water supplier. Also, regionalization was given a low priority by 68 percent of the towns responding to the survey that did not have a water system. Likewise they did not favor the development of a central water system serving only their town and viewed the potential of one being constructed as unlikely. Responsibility for implementing a regional water supply was seen as a state function by 50 percent of the respondents. The remaining saw it as a local responsibility.

Among water commissioners, regionalization was given a high/medium rank of importance by 61 percent of the respondents. Fifty percent ranked insufficient water quantity as high in importance. Eighty-two percent felt that regionalization had merit in general with 67 percent indicating that it had merit for their system. Sixty-one percent indicated that they had discussed regionalization with adjoining communities. Seventy percent saw a trend toward increasing the system boundaries to provide for growth. Water commissioners were split evenly between state and local responsibility for regionalization. Similar results were obtained from the Selectmen in towns with a central water supply system.

Interconnections

Regarding the issue of interconnections, the 1990 Water Supply Study identified the following interconnections known at the time of the study:



Interconnection	Quantity (MGD)/Purchaser
Pennichuck - Milford	2.0/Milford
Pennichuck - Amherst	0.5/Amherst
Pennichuck - Merrimack	1.0/Merrimack
Manchester - Grasmere	0.125/Grasmere
- Derry	2.1/Derry
- Central Hooksett	0.3/Central Hooksett
- So. N.H. Water Co.	2.1/So. N.H. Water Co.
Derry - So. N.H. Water Co.	0.83/So. N.H. Water Co.
Salem - Methuen Mass.	0.5/Salem
Portsmouth - Rye	-- Both
Hampton - Seabrook	-- Both
Raymond - So. N.H. Water Co.	0.07/So. N.H. Water Co.

The study concluded that based upon this list that interconnections are taking place in the region and that they are primarily used for the bulk purchase of water rather than the mutual sharing of water between two systems on a more or less equal basis.

In the recently conducted Southern New Hampshire Phase I Interconnectivity Study (May 2005), the Nashua Regional Planning Commission evaluated five water systems for interconnectivity and mutual aid. These systems were the Pennichuck Water Works, Manchester Water Works, the Merrimack Village District, the Town of Milford Water System, and the Town of Hudson Water System.

The study found that each system had their own set of issues related to interconnectivity and mutual aid and among the five systems there were two different types of water sources. The Merrimack Village District and the Hudson and Milford Water Systems obtain water from separate groundwater wells. Pennichuck Water Works and Manchester Water Works obtain their water from separate surface waters, the Pennichuck Brook Watershed and Lake Massabesic, respectively. In addition to two different sources of drinking water (ground vs. surface water) each of the individual systems have separate issues relating to infrastructure including: water quality, location of source water, age of water distribution system, amount and type of storage and sustainability of the source.

In terms of the responses received to the questionnaires in the 1990 Water Supply Study, among small system operators 25 percent indicated that they had or would be willing to construct interconnections with other systems to

supply water in the event that their supply became contaminated. Fifty percent would support a direct connection to a municipal water supply if it were offered. In addition, roughly 25 percent of the towns having a central water system have a policy, which requires the developer to tie into the town system for any project under construction.

Bond Guarantees

As described in the 1990 Water Supply Study, water system improvements in New Hampshire are typically funded by local governments and investor-owned utilities. Investor-owned utilities utilize industrial and revenue bonds, bank loans and sale of equity or property to finance improvements while municipalities have relied upon tax exempt and general revenue bonds, user fees, tax assessments, impact fees and intergovernmental aid.

In response to the questionnaires received, the 1990 Water Supply Study reported that among the water commissioners responding to the survey, 82 percent felt that the state should provide bonding guarantees for major water supply projects. However, when the question was asked concerning grant funding only 50 percent were in favor of state grants. Similarly, 87 percent of the Selectmen at the time supported bond guarantees while 71 percent supported grants.

In general, in the 1990 study, the Water Supply Task Force felt that bond guarantees were a high priority item. They were viewed as making lower interest rates available to towns thus lowering the project cost so that more projects could be implemented. The disadvantages associated with bond guarantees were seen as the relinquishing of local control, how to set priorities for projects, the effect it would have on the state debt limit and the potential for delaying the project. Other questions raised by the Task Force as reported in the 1990 study had to do with eligibility of the investor owned utilities and the mechanics of setting up the program. The recommendation of the Task Force was to encourage the implementation of a bond bank.

Land Use Planning for Water Supply

Another issue discussed by the Water Supply Task Force is how local land use planning and regulation is affecting the protection of water resources and the efficient supply of drinking water. Local zoning ordinances have a major impact on both groundwater and surface water supplies by adopting zoning policies which place emphasis on maintaining a "rural" character. This often takes the form of large lot zoning, which in turn causes development to be spread out over a large area. Cluster zoning also allows housing to be



concentrated in a small area with the remainder of the site preserved as open space.

As reported in the 1990 study, responses to the questionnaire regarding the importance of land use controls to protect water source quality, 73 percent of the municipalities gave it a high rating. In addition, forty-three percent of the water superintendents and 95 percent of the Selectmen also gave this a high rating. The pollution of water supplies also was given a high ranking. When asked who should have primarily responsibility for aquifer protection and through land use, 57 percent of the respondents indicated it is a local issue. Sixty-one percent of the Selectmen felt that their town was doing enough to ensure safe and abundant supplies of water for the community's needs.

It is also important to note that the 1990 study found that 95 percent of the municipalities without a central water system gave the development of a municipal water system a low importance rating. Similarly extensions from neighboring systems were ranked low in importance. The overwhelming majority also did not favor or had no opinion on having an investor owned utility (92 percent) or a municipal water system (33 percent) serve their water needs. Only one town anticipated the development of a municipal water system while three gave creation of a municipal water system a high likelihood of occurring in the future.

As reported by the 1990 study, the consensus from the questionnaires was that those municipalities wanting a central water system have one in place, and those not wanting a central water system do not have one.

The Water Supply Task Force expressed their opinion in the 1990 study that local communities could best address these issues through the development of water management plans. The Task Force also recommended that towns should play a very strong role in protecting recharge and wellhead areas from development.

Water Rights and Water Source Development

The 1990 study found as a result of the questionnaires that water supply planning was viewed as a local and state responsibility by equal numbers of respondents. However, system construction and operations was viewed strongly as a local responsibility. Some of the issues that the Water Supply Task Force addressed included whether existing rights over surface waters should be replaced by state control over water withdrawals. Specifically, questions regarding the withdrawal of water from the Merrimack River were discussed both pro and con. The Task Force concluded that control over water

withdrawals could be addressed through co-operative inter-municipal agreements and should not be by direct control of the state.

Secondarily, public water systems have expressed a need to increase the use of the Merrimack River and other surface waters for water supply purposes. Questions related to the process for gaining approval of these surface waters withdrawals was not clear. Also, large water withdrawals from surface or groundwater supplies can have significant impacts on other water uses. The Task Force concluded that, in general, an impact analysis should be performed for all water withdrawals. However, there was no agreement regarding the size of the withdrawals that would require an impact analysis. The Task Force pointed out the need for improvements and clarification of existing laws.

Franchise Policy

According to the 1990 study no other issue is more important to the region, with the exception of water allocations than the issue of awarding franchise areas to water utilities. The 1990 study reported that the current situation is one of uncoordinated expansion of water systems. Municipalities have little or no incentive to expand beyond their present water service areas. In fact significant local and political disincentives hamper this situation. On the one hand, investor owned utilities desire to expand if it is economically feasible to do so. Therefore, there are two different forces at play regarding franchise policy. The first is a resistance and/or apathy to expand on the part of the municipal water supplier. The second is a strong desire to expand by the investor owned utilities as a normal part of business.

In addition, the 1990 study reports that local policies or the lack of local policies have lead to the construction of many stand alone developer systems and the patchwork franchising of the region to investor owned utilities. The surveys of the 1990 study contained several questions related to this issue. The responses indicated unwillingness on the part of developer type systems to serve areas outside their development even if the costs were fully reimbursed. The majority of these systems also were against:

- The voluntary affiliation of existing small systems with major water suppliers (59 percent against).
- The affiliation of proposed small systems with major water suppliers prior to the approval of system construction (54 percent against).
- The mandatory affiliation of their system with a major water supplier (66 percent against).
- The creation of a town or countywide utility operations district to operate small systems (46 percent against).



When asked if they felt the municipality where they are located had an obligation to assume responsibility for their system in the event their water source became contaminated, 72 percent replied in the negative. However, the study found that 48 percent of these small systems would support a direct connection to a municipal water supply if it were offered.

Private Well Policy in Areas Without a Public Water Supply

As reported in the 1990 study, private wells have been and continue to be a reliable source of water for rural New Hampshire. Current policy regarding private wells states that an individual has a right to obtain water for reasonable use from the land, which he or she owns. The individual also has an obligation not to pollute the groundwater. State administrative rules establish separation distances between wells and potential sources of contamination. However, there are no state mandated water quality standards or tests for private wells. Water quantity tests are required to be performed on all new wells by the well contractor. However, these tests are no guaranty of long-term yields.

As the state grows and develops, sources of pollution are expanding. While there are a number of naturally occurring pollutants such as iron, manganese, arsenic, fluoride, radon and mineral radioactivity, there are also man-made pollutants resulting from improper disposal of wastes and storm runoff.

The Water Supply Task Force in the 1990 study discussed these issues and recommended that testing of private wells whenever a property is sold would be an appropriate strategy to protect well water users. In addition, the Task Force considered the lack of state laws addressing the impacts of new groundwater withdrawal adversely affecting nearby wells. As noted by the study there is virtually no case law of groundwater interference in New Hampshire and no administrative mechanisms to compensate an aggrieved party.

Miscellaneous Issues

Other issues addressed in the 1990 study included the following:

- Privatization of bulk water supply
- Lack of control and inspection of pipeline construction and distribution systems
- Establishing a centralized, computerized source of water data



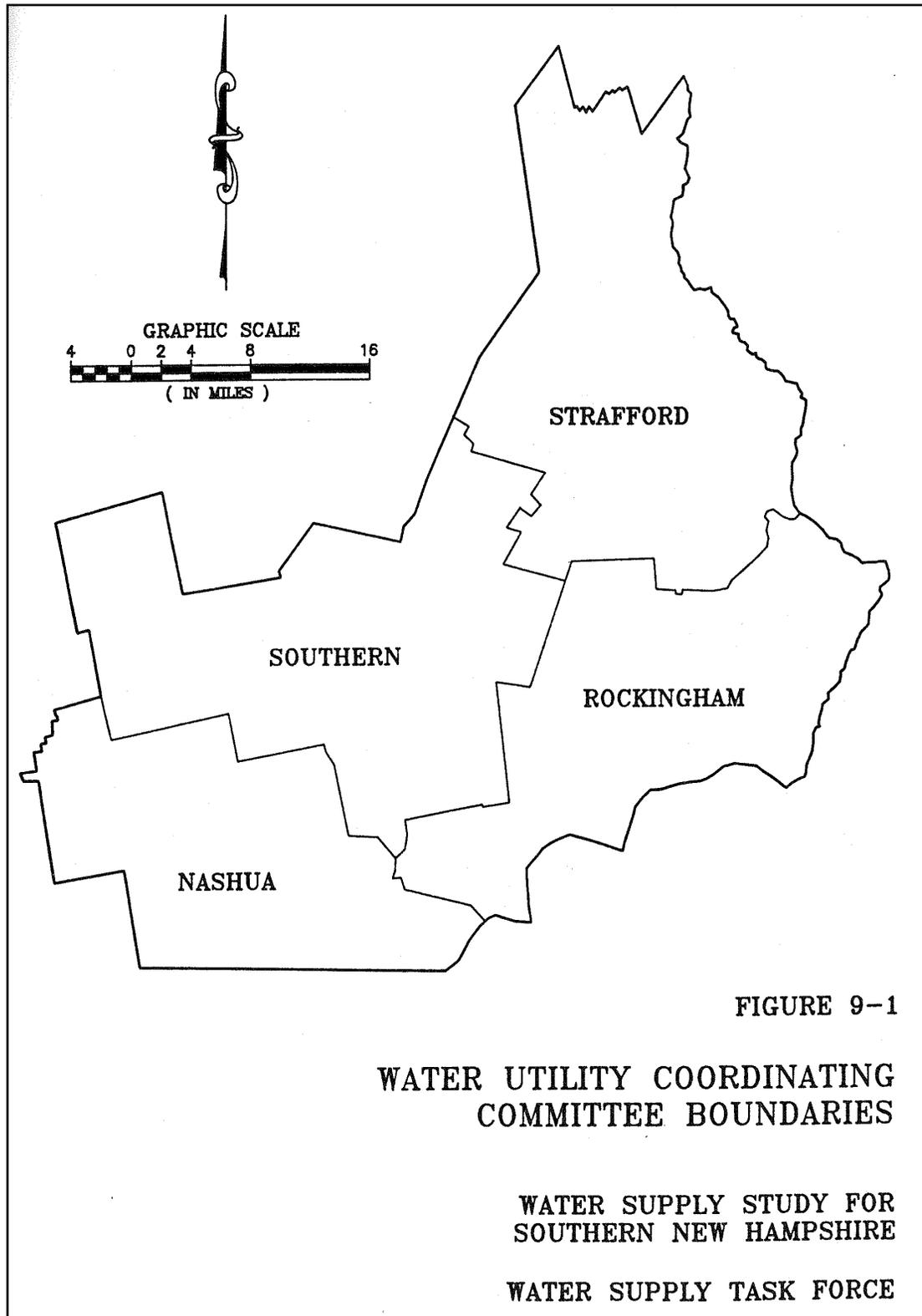
Task Force Recommendations

One of the key findings of the 1990 Water Supply study is that while the region as a whole appears to be in reasonably good condition through the year 2000, approximately sixty-four percent (64 percent) of the major municipal water suppliers are projected to have deficits if they continue to rely solely on their “useable source capacity”. The study also concludes that if the “additional available sources” of water were brought on-line the number of municipal systems with projected deficits would drop from sixteen to eleven. This number is reduced even further if the “identified future suppliers” are pursued, developed and brought on-line. In addition, the study found that users of private wells and small systems consume 22.2 MGD of water. The study envisioned that a portion of this quantity might have to be supplied by the major municipal water suppliers in the future.

As pointed out in the 1990 study, it was the conclusion of the Task Force that water supply planning and decision-making in the study area should be conducted with a more regional point of view in mind. Specifically, to address this need as well as both the projected water deficits and the water policy issues, the Task Force recommended the formation of Water Utility Coordinating Committees.

Water Utility Coordinating Committee:

The 1990 study proposed that Water Utility Coordinating Committees (WUCCs) be formed to address water supply planning in the region and to find a solution to the region’s water supply problems. The WUCCs would be composed of members from the towns, water districts/precincts and investor owned utilities. Each WUCC would exist as a special committee formed by and operating within the regional planning agencies. Thus, the geographic extent of the individual WUCCs would be to more or less follow the boundaries of the RPCs (see Figure 9-1).





However, if logical water supply boundaries overlap the regional planning agencies boundaries, the Task Force would encourage cooperation between the two neighboring areas and would assist in modifying the WUCC boundary to recognize this situation. Participation in the WUCC would be voluntary. However, the Task Force recommended participation by all water supply districts, villages and towns. The responsibilities of the WUCC would include the following:

- Assist the RPCs in the development and/or adoption of a regional water supply plan for the area;
- Act in an advisory capacity to the NH DES and NH PUC and other interested agencies, regarding planning, implementation of the plan, franchising within the area, construction standards and other items as appropriate;
- Act as a clearing house to provide comments and recommendations on proposed water system development plans to assure consistency with the adopted regional plan; and,
- Advise the appropriate state agencies of any water supply development proposals within their area.

Certain state agencies would provide oversight of the WUCC planning activities as follows:

- NHDES – Review for consistency with statewide water resources management plan;
- NHPUC – Service area franchising;
- NH OEP – Review for consistency with state development plans and existing water resources plans.

The 1990 study assumed that the Regional Water Supply Plans would provide a framework for the logical development of water resources in the region. In order to fully address the water supply issues in the area such as resource protection, distribution needs and franchising, it was recommended that each regional water supply plan meet certain minimum goals and that each plan adopt a strategy to deal with the anticipated water deficits within the region. The goals identified by the Task Force are described below. In addition, the Task Force identified five strategies for addressing the anticipated water deficits in the region

Regional Plan Goals:

- Reliability of Supply – The water supplies should be sufficient in quantity and quality such that as many needs as possible can be supplied with potable water. Groundwater supplies should be protected to a high enough degree to not need treatment for contamination and be monitored on a frequent enough basis to determine when and at what level treatment is required.
- Reduction of Unnecessary Water Use and Waste – The regional water supply plan should include conservation, leak detection and repair, and drought management.
- Universal Planning of Water Supply – The plan should address all needs for potable water in the region. The needs of all present and future users, whether served by community systems, individual wells or other means, should be addressed.
- Operational and Administrative Efficiency – The plan should maximize efficiency of operation and administration through minimizing duplication of efforts and combining closely related functions to the maximum degree possible.
- Financial Viability – The water suppliers in the regional plan area should be able to provide the level of investment necessary to ensure that adequate raw water supplies are secured and protected, water is treated to the degree required, sufficient analytical work is performed to assure the production of quality water, necessary infrastructure management and repair practices are in place and functioning and that staff training is provided.
- Availability of Trained and Certified Staff – The regional plan should promote the training and certification of staff to oversee the water systems in the regional plan area. Clean water is becoming an increasingly expensive and technically difficult commodity to produce. Trained, certified and technically competent staff is critical to the success or failure of any water system.
- Capital Construction Economies of Scale – The regional water supply plan should consider economies of scale and use of existing facilities and plans wherever feasible. In general, this means that it may be more economical to construct or modify an existing large system than it would be to construct many small systems to serve the same need.



Strategies to Address Water Supply Deficits

The Task Force proposed that the regional plans adopt one or more of the following strategies to address the water supply deficits in the region:

1. Continue existing policies of suppliers meeting their system growth needs, where appropriate.
2. Establish programs to reduce demand and encourage water conservation.
3. Encourage the use of interconnections between systems.
4. Encourage development of regional water systems.
5. Encourage source augmentation, new source development and protection of future supplies.

Key Task Force Recommendations

The key recommendations of the Task Force in the 1990 study are identified and briefly discussed below.

1. Introduce and adopt legislation authorizing the creation of Water Utility Coordinating Committees acting within the existing Regional Planning Agencies. These Committees would be formed for the express purpose of coordinating the efforts of individual water suppliers to assure the logical development of water supplies on a region wide basis. The WUCCs would be organized and given responsibilities as described above.

Outcome: This recommendation was never implemented and the creation of the WUUCs was never formed.

2. Recommend that legislation be enacted which would divide the study area into regions. The legislation also would encourage participation in the water supply region by all communities in the region. Non-participating communities could be held responsible for inadequate availability of water due to poor planning. Each region would determine the most efficient and beneficial means of supplying water to the population of that region. This would include an analysis of costs/benefits associated with regionalization as well as the necessity for state owned water supply facilities.

Outcome: This recommendation was never implemented and the study area was never divided into regions encouraging participation in water supply planning. However, the Legislature has authorized a Seacoast Water District, subject to the provisions of RSA 53-A, to enable voluntary participation by communities in southeastern New Hampshire to address drinking water

issues (Chapter 42, Laws of 1995).

3. Emergency interconnections should be encouraged.

Outcome: Improvements have been made to encourage and establish emergency interconnections among most of the large water suppliers in the region. The Nashua Regional Planning Commission documents this in the recent Interconnectivity and Mutual Aid Study, Phase I prepared. In addition, the State Legislature adopted SB 437 of the 2002 Legislative Session and HB 738 of the 2003 Legislative Session which provides for protection of public water supplies during emergency conditions and established a grants program for assessing and constructing new interconnections among water systems (see attached copy of SB 0437 and HB 738).

4. The regional water supply plan should identify appropriate locations for interconnections and determine the cost of them.

Outcome: This has been completed and documented in the recent Interconnectivity and Mutual Aid Study, Phase I prepared by the Nashua Regional Planning Commission. A similar study has been completed for water systems located in the Seacoast region.

5. Regulations should be promulgated which would require developer systems to obtain a certificate of need prior to being issued a permit for construction. The regulations would require the developer to examine options other than the development of a well to supply water to his development. These options could include direct connection or affiliation with an established water company or municipal water department. A starting point for this might be the Connecticut regulations governing the creation of small systems.

Outcome: This recommendation has been implemented. The, NHDES has adopted administrative rules (see Env-Ws 372.04 Concept Approval For a Small Water System) which requires that no well drilling nor final design shall commence on a proposed public water system until a concept approval is issued by the division. The issuance of concept approval for a proposed water system is based on the following factors:

- (1) The absence of water service from another approved and capable water system. Such availability shall be determined based on the willingness of the potential extender to offer service and a comparison of the overall extension cost versus the overall cost of creation of an independent system;



- (2) The method and adequacy of operation of the proposed public water system;
- (3) The consistency of the proposed system with state, regional or local water resource/water supply management plans for the area;
- (4) The consistency of the proposed system ownership and operation with other public utility commission franchises in the area; and
- (5) Use of the best source feasibly available.

6. Given the fact that some small systems will continue to suffer operational and managerial problems, the WUCC regional water supply plan should examine the potential for the creation of an operational and technical assistance organization offering such services as managerial assistance, centralized meter reading and billing, circuit riding operators, financial assistance and construction services. The organization would be similar to the cooperative extension service for farmers.

Outcome: This recommendation has not been addressed or completed because WUCCs have not been established. However, other state and region wide organizations such as the Northeast Rural Water Association and The North East Rural Community Assistance Program (RCAP) do provide technical assistance for either rural community water systems or low income water systems.

7. Existing small systems should continue to be encouraged to become affiliated with or connected to an established water supplier.

Outcome: This recommendation has been implemented. New capacity assurance rules (Env-Ws 363) require that water systems with significant outstanding deficiencies develop a business plan and implement the plan once approved by NH DES. Often, systems with significant deficiencies will seek to connect to an existing water system, contract with professional water system operators, or to sell the water system to a reputable private water company.

8. Regional water supply plans should contain a capital needs study to quantify the costs of water suppliers will incur for necessary system improvements and to determine the feasibility of forming a vehicle to assist in the financing of these needs.

Outcome: This recommendation has not been addressed or completed because regional water supply plans are not currently being developed.

9. Planning and zoning boards should continue to be educated concerning the impacts which different zoning requirements have on water supply issues.

Outcome: NH DES and all the Regional Planning Commissions are implementing this recommendation on an ongoing basis across the state.

10. Local wellhead protection programs should be encouraged through the NH DES Wellhead Protection Program.

Outcome: NH DES and all the Regional Planning Commissions are implementing this recommendation on an ongoing basis across the state. Laws (RSA 485.48) and regulations (Env-Ws 421, 378, 379, and 386 developed in the 1990s require that water systems developing new sources of water implement Source Water Protection Programs.

11. The WUCC regional water plans should incorporate and coordinate local wellhead protection programs.

Outcome: This recommendation has not been addressed or completed because WUCCs have not been developed. However, throughout New Hampshire, certain communities have come together to develop and implement source water protection plans.

12. An advisory committee should be formed to assist the NH DES in the formulation of water policy in the basin and regulations concerning resource development as well as review of proposed withdrawals and other plans affecting water use. This committee would be composed of appointed representatives from appropriate regulatory agencies, major water suppliers and environmental groups.

Outcome: While this recommendation has not been addressed at the regional scale, the State Legislature has both a statutory committee that focuses on comprehensive water resource management for the state, and a commission that focuses on issues pertaining to the management and regulation of groundwater withdrawals.

13. NH DES should perform an in-dept analysis of river flows, aquatic base flow needs, recreational and hydropower needs as well as existing withdrawals for water supply purpose and the impact which proposed future withdrawals will have on these needs within the Merrimack River Basin.



Outcome: Portions of this recommendation have been implemented. First, NH DES has developed a model of the Winnepausakee River basin which ultimately supplies the Merrimack River with water. This model is used to optimize the operation of water releases at Lake Winnepausakee.

Secondly, the cities of Manchester and Nashua, New Hampshire, Lowell and Haverhill, Massachusetts, and the Greater Lawrence Sanitary District, Massachusetts in conjunction with the USACE, are jointly funding the Merrimack River Watershed Assessment Study to develop a comprehensive assessment of the current river and watershed conditions.

The overall purpose of the Merrimack River Watershed Assessment Study is to develop a comprehensive Watershed Management Plan for the Merrimack River watershed. The Plan will be used to guide investments in the environmental resources and infrastructure of the basin and will be aimed at achieving water quality and flow conditions that support designated uses, such as drinking water supply, recreation, and aquatic life support, in addition to other uses such as hydropower. The assessment study is divided into two phases, only the first of which is currently funded.

The general purpose of each phase is discussed below:

Phase I (Funded): The primary purpose of Phase I is to identify the relative causes and impacts of pollution problems in the Merrimack River basin as they pertain to designated uses. This will be accomplished through research, field monitoring, simulation modeling, and planning-level review of alternative pollution abatement and management strategies. Ultimately, the output from Phase I should help decision makers understand the relative contributions of pollutants from various sources and the basin-wide impacts of these pollutants as measured against water quality standards. This information will be used to guide decisions about how best to direct funding to yield the greatest overall benefits with respect to the designated uses of the river.

Phase II (Not Yet Funded): Phase II will build on the results from Phase I through additional field monitoring to investigate specific areas of interest or concern identified during Phase I. Additionally, a detailed cost-benefit analysis will be conducted for a wide array of possible abatement, control, and restoration initiatives. Ultimately, the output from Phase II will be a prioritized list of recommended investments throughout the Merrimack River watershed aimed at improving beneficial uses and restoring ecosystems.

Third, legislation has been passed that requires NH DES to protect the instream flow of two designated reaches of the Merrimack River. Pending the availability of funding and the success of two ongoing instream flow pilot projects, a comprehensive watershed management plan may be prepared for the entire Merrimack River Basin to ensure the instream flows are protected in the designated river reaches as required by law.

14. NH DES should update and refine the statewide water resources management plan incorporating related efforts into a comprehensive approach to protecting and managing our water resources.

Outcome. Currently, NHDES is working with a statutory committee consisting of senators and representatives to study issues pertaining to water resources. The committee has developed an outline for a proposed water resource plan, and has identified all available data pertaining to water resources in New Hampshire. Recently, the Federal Government has provided New Hampshire with \$100,000 to initiate work on a water resource plan for the State.

15. The regional water supply plans should determine the best method of supplying water to the region which balances all affected interests.

Outcome: This recommendation has not been addressed or completed.

16. That it be a requirement of the regional water supply plans to determine how to supply water to growing areas and the need for expansion of centralized water systems.

Outcome: This recommendation has not been addressed or completed.

17. There should be a financial incentive for a municipal or investor owned utility to assume ownership and operational responsibilities of troubled small developer systems if it is in the user's best interests to do so.

Outcome: While direct incentives have not been developed for investor owned utilities to assume ownership and operational responsibilities of troubled small developer systems, the PUC allowed investor owned utility to blend rates among multiple small water systems. This allows investor owned utilities to make costly improvements in a small system, but to distribute costs over a large customer base. This also allows investor owned utilities to reduce accounting and other administrative costs that would be associated with maintaining separate water rates for each water system it owns.



18. Legislation should be enacted or regulations promulgated to require a private water system developer to obtain a franchise from PUC prior to construction of the system.

Outcome: This recommendation has been implemented. RSA 374:22 I states, “No person or business entity shall commence business as a public utility within this state, or shall engage in such business, or begin the construction of a plant, line, main or other apparatus or appliance to be used therein, in any town in which it shall not already be engaged in such business, or shall exercise any right or privilege under any franchise not theretofore actually exercised in such town, without first having obtained the permission and approval of the commission”

19. Legislation should be enacted which requires a comprehensive water quality analysis and quantity test of any property served by a private well prior to the sale of that property.

Outcome: This recommendation has not been addressed or completed. Some municipalities in New Hampshire have regulated this at the local level. NH DES has worked with real estate agents and developed an aggressive public outreach campaign to promote private water quality testing through its Private Well Initiative.

20. Parties severely impacted by withdrawals from new wells should be compensated for damages if the aggrieved party can demonstrate that the changed characteristics of his well were caused by withdrawals from a new well.

Outcome: This recommendation has been implemented and expanded upon by the passage of SB 374 of the 1998 legislative session which required that any entity developing a new groundwater withdrawal that exceeds 57,600 gallons in any 24 hour period obtain a large groundwater withdrawal permit. NH DES has adopted Env-Ws 387 and 388 to implement the permitting program required by law.

21. Standard pipeline construction specifications for use by small developer systems should be developed and jointly adopted by both the NH DES and NH PUC through joint rulemaking.

Outcome: Currently, regulations maintained by NH DES and PUC are generally consistent. Both Env-Ws 372 and PUC 606 are generally compatible and reference specifications maintained by American Water Works Association. Minor discrepancies exist regarding system pressure requirements.

22. The NH DES should institute a policy which requires an engineer to certify that a water distribution system has been inspected, tested and constructed in accordance with the project specifications.

Outcome: Pursuant to Env-Ws 372.26, this recommendation has been implemented.

23. The NH DES computerized database of public water suppliers should be expanded and completed. Given the diversity of needs and the diversity of water systems in the state, the department should conduct an in-house study to determine the most efficient way to accomplish this task.

Outcome: This recommendation has been implemented. Furthermore, database information can be accessed on NH DES' website. NH DES is currently exploring current and future database needs for water systems and will be developing a new database over the next few years.



Conclusions

In summary, the 1990 Water Supply Study for Southern New Hampshire identified and evaluated the problems facing water suppliers in the region and advanced a number of recommendations developed through the Southern New Hampshire Water Supply Task Force. A total of 23 recommendations were identified in the study for the purpose of improving the reliability of public water supplies and advancing regional water supply planning in southern New Hampshire.

Over the last 15 years, a number of the issues and recommendations raised in the study have been addressed, including:

- The operation, maintenance and long-term financial viability of new and existing developer-built community water systems have improved due to NH DES's "capacity assurance" regulations. These systems are also now more likely to be affiliated with established water utilities.
- Wellhead protection programs have been expanded and implemented for virtually all community public water systems.
- The criteria for siting new large groundwater withdrawals have been detailed in statute and rule to establish a regulatory mechanism for well development outside of the municipal boundaries of the water supplier. This serves to balance the need for new water supply wells with the potential impacts on the environment and existing water users near a well site.
- The Legislature has authorized a Seacoast Water District, comprising of voluntary participation by communities in southeastern New Hampshire to address "intersectional distribution, source location, and other issues related to water resources (Chapter 42, laws of 1995). (?? Has this district convened and has the scope of the district been defined yet??
- Senate Bill 440 adopted in 2002 now puts into place water conservation rules for water users, which also apply to certain new water withdrawals, approved after the effective date of the bill.
- Senate Bill 437 adopted in 2002 provides for the protection of public water supplies during emergency conditions and establishes a committee to study the formation of regional water systems and the eligibility of such systems for state construction grants.
- House Bill 738 adopted in 2003 adds regional water systems to the water systems eligible for state aid.

- Senate Bill 437 was adopted in 2002 which amended RSA 362:4 to allow municipalities to provide water service outside its political boundaries with a 15% surcharge without being subject to PUC regulation.
- Senate Bill 437 was adopted in 2002 which amended RSA 378:30-d to allow investor owned utilities to recover costs associated with participating in regional planning studies and/or development of new water sources.

In summary, a total 14 of the study's 24 recommendations have been addressed or are currently being addressed in one form or another by the State Legislature.

However, one of the key recommendations not implemented (no# 1) is to develop *“an overall planning process to meet the potential water supply deficits in a logical manner through the use of regional water supply plans compiled by Water Utility Coordinating Committees.”* The Task Force recommended that these committees be created by statute to operate in close conjunction with the Regional Planning Commissions to develop and help implement regional plans. These committees were never formed and the proposed regional water supply plans were not created. Consequently, many of the needs and recommendations in the 1990 study are still applicable today.

In fact, many of the needs and recommendations in the 1990 study were recently evaluated by the NH DES and NH PUC in a report on the *Regulatory Barriers to Water Supply Regional Cooperation and Conservation in New Hampshire: A Report to the New Hampshire Legislature As Required by Chapter 64, Laws of 2000*. This report identifies that the following major issues still exist in the region:

- As highlighted in the 1990 study, there still remains a need to develop a more systematic approach to plan for and consider regional water supply issues.
- Many municipal water suppliers have a parochial view of their current water supplies and will not readily extend services beyond municipal borders even when this might be part of the “optimum” alternative from a regional perspective. For example, some municipal water suppliers have refused to serve customers beyond their boundaries even to address relatively small, localized water shortages or quantity problems in neighboring municipalities; other municipalities have contested water development within their boundaries by public utilities and others.



These decisions are frequently driven by (1) the desire to ensure that water is available for future growth within a municipality with existing surplus supply and (2) the competitive advantage that ample water supply provides to attract future industrial and commercial development to communities with surplus capacity.

- This parochial view is fostered by uncertainty about the availability of future sources of supply. This uncertainty is focused in three areas:
 - Public Trust vs. Riparian Rights: RSA 481:1 expresses the State's role as the trustee of all waters within its borders, and that these waters shall be managed and conserved for maximum public benefit ("the Public Trust Doctrine"), broadly defined as water quality and quantity sufficient to protect the public's interest. The right to use water in New Hampshire is also based on the Riparian Doctrine, which generally means that property owners have the right to reasonable use of water resources on or abutting their property, and historically deeded water rights. There is uncertainty about when a riparian use may be limited by the state's need to protect the public trust.
 - There has been a hierarchy of water users established by law, so that one user's riparian right to water is equal to another's. For instance, current law treats water needed for recreation or commercial purposes such as bottled water, the same as drinking water supply.
 - There is uncertainty about long-term future supply due to state regulations of surface and groundwater withdrawals that ensures the protection of existing water resources and users.
- Emergency interconnections do not exist in most locations, even where they are viable and add to the overall reliability and integrity of individual water systems and a regional water supply as a whole.

In short, to achieve regional water supply cooperation, the 2001 report to the Legislature recommends that DES and PUC reconvene the Southern New Hampshire Water Supply Task Force.

In addition, there are also a number of recommendations to enhance and promote water conservation that affect the planning, use and management of the state's water resources. However, by far reconvening the Southern New Hampshire Water Supply Task Force remains the first priority.

