

**CONNECTICUT GENERAL ASSEMBLY
LEGISLATIVE PROGRAM REVIEW AND INVESTIGATIONS COMMITTEE**

The Legislative Program Review and Investigations Committee is a joint, bipartisan, statutory committee of the Connecticut General Assembly. It was established in 1972 to evaluate the efficiency, effectiveness, and statutory compliance of selected state agencies and programs, recommending remedies where needed. In 1975, the General Assembly expanded the committee's function to include investigations, and during the 1977 session added responsibility for "sunset" (automatic program termination) performance reviews. The committee was given authority to raise and report bills in 1985.

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LEGISLATIVE PROGRAM REVIEW
& INVESTIGATIONS COMMITTEE

Stream Flow

DECEMBER 2003

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STREAM FLOW

DIGEST

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Introduction

In February 2003, the Legislative Program Review and Investigations Committee voted to study the issue of stream flow. Stream flow is generally defined as the overall volume and velocity of water within a watercourse. Proper stream flow is important for many purposes, including public water supply, waste assimilation, maintaining instream ecosystems, industrial cooling, agriculture, and recreation.

The study focused on whether the state has a coherent and comprehensive policy, planning process, and management structure to govern minimum stream flow. The study also tried to determine whether the policy achieves a responsible balance between protecting present and anticipated water supply needs and maintaining a viable stream and riverbed ecosystem as a natural resource largely dependent on the same water sources. In support of this focus, the study utilized various methods to:

- identify and analyze existing standards governing stream flow;
- outline consumption requirements on the part of water suppliers;
- assess the overall efficiency and effectiveness of the planning and management structures in place to support and oversee stream flow, including enforcement of laws and regulations;
- verify whether accurate/appropriate stream flow data are collected, analyzed, and reported;
- evaluate the Water Diversion Act and its relevancy to stream flow, focusing on the permitting and enforcement processes and the extent to which the system affects the balance between consumptive and non-consumptive purposes;
- assess the level of interagency communication, cooperation, and coordination among entities responsible for stream flow planning and management; and
- evaluate the progress made in implementing the action steps in the Water Planning Council's (WPC) report to the legislature and examine any other reports.

Water resources are relatively abundant in Connecticut. The state usually has ample rainfall to meet water-related needs, particularly when compared with more arid states in other parts of the country. Problems typically arise, however, because water is not always available where or when it is needed. To address such problems, proper planning is necessary. The importance of a comprehensive water management plan is to provide the state with a way to proactively identify any approaching water resources problems, in order to address them in a strategic, informed, and timely manner. The absence of such planning leaves the state more vulnerable to any unexpected impact on water resources.

Overall water resource management, which includes stream flow and “properly” balancing water supplies with the myriad of other demands for water, has been a long-standing issue that has received a lot of study in the state over the last several decades. The program review committee believes stream flow, as focused on in this study, cannot be examined in

isolation from overall water resource management. Stream flow is one component of a much more comprehensive water resource policy and planning system.

State law acknowledges an adequate supply of water for various uses is essential for the state's citizens. Proper stream flow is a key component of ensuring an adequate amount of water is available for instream and out-of-stream purposes. State law also specifies Connecticut's policy is to balance competing and conflicting needs for water equitably and at a reasonable cost to all citizens.

At times, the balance between protecting the public water supply in the state and maintaining an adequate flow of water from the same water sources for a viable river and stream ecosystem may be at odds. The legislature recognized this concern and passed the following bills over the last five years to deal with the issue:

- Public Act 98-224 required the Department of Environmental Protection (DEP) to examine and report on the state's water allocation policies;
- P.A. 01-177 created the Water Planning Council and required it to examine the state's water policies and management system, including stream flow (the council issued its main findings and recommendations to the legislature in early 2003);
- P.A. 02-76 made the council a permanent body that reports annually to the legislature; and
- P.A. 03-141 required the Water Planning Council to issue recommendations by February 2004 on: 1) a water allocation plan based on water budgets for each watershed; 2) funding for water budget planning, giving priority to the most highly stressed watersheds; and 3) the feasibility of merging the data collection and regulatory functions of DEP's Inland Water Resources Division and the public health department's Water Supplies Section.

The committee believes a comprehensive and coherent water resource and stream flow system must include several components to properly balance competing demand on water resources, including: 1) distinct legislative and regulatory mandates and directives recognizing the importance of stream flow and the role adequate stream flow plays in overall water resource management; 2) specific programmatic goals and objectives; 3) proper short- and long-range planning; 4) an appropriate management structure with the necessary resources to fully implement the state's stream flow policies; 5) proper program development and implementation, including data collection and analysis; and 6) an adequate oversight and enforcement process. Each component must be properly coordinated for a seamless system to exist. This report highlights, however, the statutes are either limited or silent in terms of identifying a cohesive and comprehensive system, including providing a responsible balance of competing water resource users through proper resource planning and allocation.

This report is divided into five chapters: Overview, Organization, and Policy; Planning and Data; Water Planning Council; Water Diversions; and Findings and Recommendations.

Chapter One

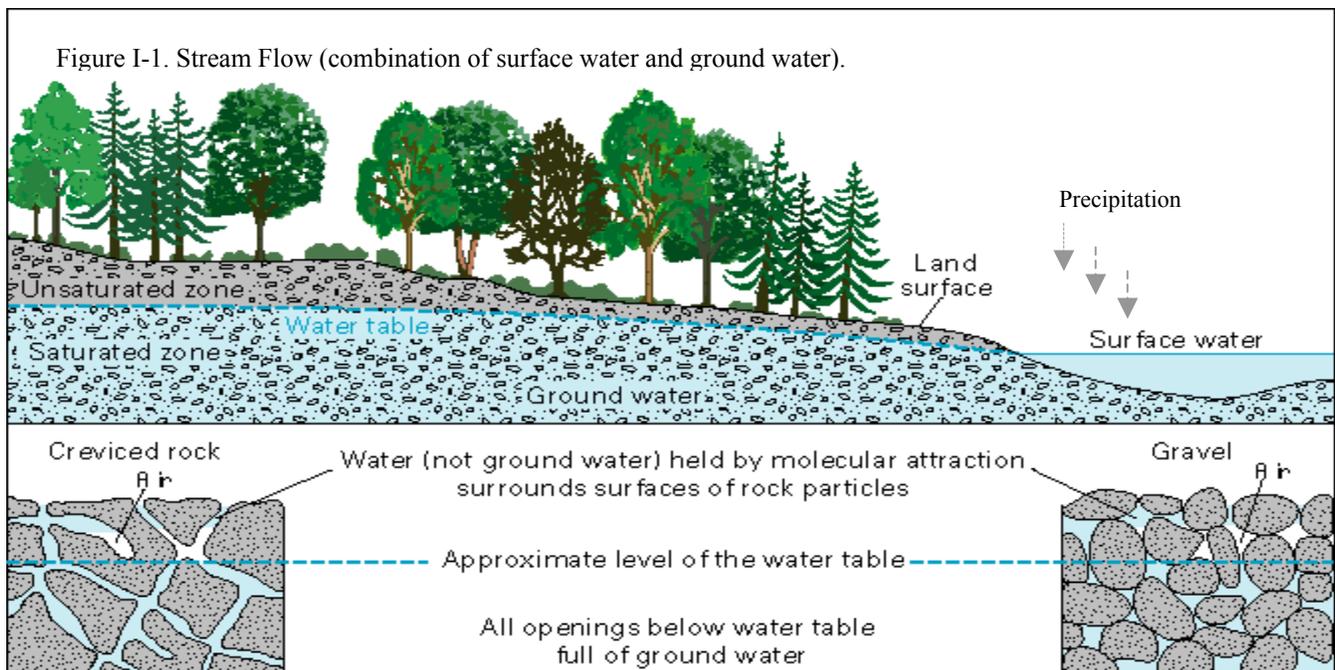
Overview

The literal definition of “stream flow” refers to the volume of water flowing in a stream or river at a given point in time as measured in cubic feet per second. Water moving at one cubic foot per second equates to just under 7.5 gallons of water.

Stream flow includes both surface water and ground water, as shown in Figure I-1. Surface water, from sources such as rain, snow, and watershed runoff, is combined with ground water to form watercourses. Ground water contributes to the overall amount of water in a stream or river via subsurface sources by providing the “base flow” for such watercourses.

The amount of water flowing through streams and rivers is vital for both “in-stream” and “out-of-stream” purposes. Waste assimilation, fishing, recreation, and sustenance of the myriad of plants and animals within and along watercourses, depend on the flow of water in the state’s various rivers and streams. In-stream flow is also described as “non-consumptive” use of stream water. This means water is not taken out of its natural locale for alternative purposes, or, if it is taken out, it is returned to a water source at some other location in the same basin.

Adequate stream flow is also important for out-of-stream – or “consumptive” – purposes. Several thousand sites around the state, including public drinking water supply, manufacturing, agriculture, and recreation (e.g., golf courses) depend on water diverted from rivers and streams for their operation. Water used for consumptive purposes is taken from its source and used in its entirety, without being returned to the original watercourse or one within the same basin.



The natural flow of watercourses can be modified through damming, diversion, withdrawals, or development. The flow of a river or stream can be increased or decreased by altering the amount of water diverted from its natural course, as discussed in Chapter Four.

It is important to realize stream flow is one component of a much larger water resource system involving planning, allocation, and management. This makes the issue of stream flow difficult to consider outside the larger realm of water management within the state. As such, stream flow is affected by a host of other influences when water supply and demand are examined in their totality.

Organization

Stream flow planning, program implementation, and oversight are carried out by several state agencies. No single agency has overall responsibility for “stream flow” in the state.

The Departments of Environmental Protection and Public Health administer the bulk of stream flow initiatives and overall water management. The state’s Office of Policy and Management and the public utility control department also have stream flow responsibilities to a certain extent – mainly through overall planning and regulation of water companies. Federal agencies including the United States Geological Survey (part of the U.S. Department of the Interior) and the Environmental Protection Agency play a role in stream flow in Connecticut, as well.

Water companies, the state’s universities, municipalities, and non-profit agencies are involved in helping the state plan for stream flow. They contribute to various state-level planning bodies; help organize and participate in conferences; and some affect planning and program implementation on a de facto basis through their involvement in actual stream flow programs (i.e., water diversions.)

Department of Environmental Protection

The Department of Environmental Protection administers the bulk of stream flow-related initiatives at the state level in its role as the state’s chief environmental agency. DEP’s main responsibility for stream flow has been to develop the state’s minimum stream flow standards and ensure the standards are enforced. The department’s Inland Water Resources Division along with the Fisheries Division, are jointly responsible for enforcing the state’s minimum stream flow standards (although the standards are not being enforced, as highlighted later in the report.) The department also implements the water diversion permitting process, as described in more detail in Chapter Four.

DEP is also charged with reviewing and commenting on water supply plans. The plans, submitted to DPH by larger water companies, as described below, incorporate stream flow-related issues and are important in the overall stream flow process.

The “Fish Distribution Report,” published by DEP’s Fisheries Division, describes where fish stocking occurs in the state. This is significant because the minimum stream flow standards only apply to rivers and streams (and their tributaries) stocked with fish by DEP. The report is limited because it only highlights certain fish. Although required annually, the most recent report was published February 2002. The department also publishes an annual “anglers guide” describing the various streams and rivers stocked with fish by DEP.

Rivers Protection Advisory Committee. A Rivers Protection Advisory Committee assists the department with its river protection efforts. The committee has multi-agency, multi-stakeholder representation, meets periodically, and reports to the DEP commissioner.

In 1996, the advisory committee formed a Water Allocation Task Force to study the various problems associated with water quantity in streams and rivers. The task force examined how water is used in Connecticut for in-stream and out-of-stream purposes. The group acknowledged “the ability to evaluate such uses and plan for future uses requires three essential types of information:

- 1) clear, accurate, and accessible information on existing water withdrawals and returns of water to watercourses;
- 2) accurate, reliable data on how much water is actually in a stream at any given time; and
- 3) a methodology for calculating how much water should remain in-stream for ecological, dilution and waste assimilation, and environmental purposes.”

The 27-member task force issued a draft report in late-2002 with findings and recommendations in a multitude of areas, highlighting the following:

- Connecticut lacks much of the necessary data and an approved methodology for calculating in-stream flow in the state’s rivers to effectively allocate its water resources;
- the state’s river and stream protection planning/management role is based on insufficient and possibly inaccurate information; and
- evaluating whether watercourses have sufficient water available for additional withdrawals (i.e., diversions) or if they are incurring low stream flow rates is difficult.

Water allocation report. P.A. 98-224 required DEP to examine the state’s water allocation policies by January 2002. Specifically, the act required the department to include an inventory of water diversion registrations, an inventory of known withdrawal quantities for registered diversions, and identification of active registered diversions.

DEP issued its report to the legislature in March 2000. The comprehensive document makes numerous findings (and recommendations), and primarily concluded:

- 1) under present law, the state does not have a comprehensive water allocation policy;
- 2) the Water Diversion Policy Act (described in Chapter Four) is the state's primary water management tool, but the act has various water allocation limitations;
- 3) the state is prevented from developing and implementing a comprehensive water allocation program due to statutory exemption of the vast majority of water diversions from oversight and regulation; and
- 4) the water diversion permitting process for consumptive diversions is lengthy.

Department of Public Health

The public health department is responsible for ensuring the purity and adequacy of the state's drinking water. Specifically, the department – through its Drinking Water Division – has jurisdiction over:

- 1) all matters concerning the quality of any water supply source used by municipalities, public institutions, or water companies for obtaining water;
- 2) the safety of any distribution plant or system for public health purposes;
- 3) the adequacy of methods used to assure water purity; and
- 4) matters regarding the construction and operation of water distributing plants and systems that may affect public health.

DPH also has the authority to declare a water emergency. Such declaration must be done in consultation with the Departments of Environmental Protection and Public Utility Control.

Specific water companies are required to submit water supply plans to DPH, as described below. The plans include stream flow-related information and DPH, with concurrence from DEP and DPUC for the water companies it regulates, approves the plans. Copies of the plans are also sent to OPM for information and comment.

Department of Public Utility Control

The Department of Public Utility Control is required to set water rates that assure safe, reliable service at the lowest possible cost and that allow utilities to maintain their financial integrity. DPUC has jurisdiction over private entities supplying water to fifty or more consumers.

DPUC regulates all aspects of private water company operations that affect a company's ability to supply water at a reasonable price, including rates, franchises, financing, mergers/acquisitions, and new or expanded water systems. DPUC also reviews water supply plans, and chairs the Water Planning Council (as discussed in Chapter Three.)

Office of Policy and Management

The Office of Policy and Management has general responsibility to coordinate all activities of DEP, DPH, and DPUC with respect to the state's water resources policies as outlined in Chapter One. OPM also reviews and comments on water company water supply plans, participates in the Water Planning Council process, develops a statewide drought plan, and coordinates the statewide conservation and development plan.

Stream Flow Policy

State statutes generally refer to stream flow in the context of broader water planning and management in the areas of the environment and public health. State law also provides for a diversion permit program within the state, which has a direct impact on stream flow. The program is largely shaped through state regulations, as discussed later in the report.

State regulations and various planning documents also serve to define the state's policies regarding stream flow. An overview of the recent state Supreme Court case involving of stream flow in the Shepaug River is also provided below.

Relevant Legislative Findings and Policy Declarations

There are "legislative findings" and policy declarations throughout state statutes directly addressing water policy and, in general, stream flow. The findings outline the state's various policy initiatives regarding stream flow issues. The most relevant of these legislative findings and policy declarations are summarized below, and a more detailed description is found in Appendix A.

- Improvement of stream flow is recognized as a part of overall responsible water management.
- Water is a finite resource worth preserving and is essential to public health, welfare, and safety.
- A goal of water management is to equitably balance competing and conflicting demands on water resources.
- Preservation and protection of watercourses is emphasized for the health and benefit of the state's citizens, fish, wildlife, and other aquatic organisms.

- An adequate supply of water for domestic, industrial, and recreational use, and for fish and wildlife, is essential.

Relevant Statutes

Stream flow policy is also developed through various state statutes referencing stream flow and stream flow-related initiatives. The relevant statutes help outline and define the state's stream flow goals, objectives, and strategies as summarized below. A more detailed description provided in Appendix A.

- The Office of Policy and Management (OPM) is required to coordinate the activity of DPH, DEP, and the Department of Public Utility Control (DPUC) regarding overall water resources policy.
- Any public water system with water reserves in excess of those required to maintain abundant water supply may sell the excess water to any other public water system upon approval of DPH.
- DEP is required to establish, operate, and maintain stream gauging stations in cooperation with the United States Geological Survey.
- Connecticut's Water Diversion Policy Act outlines a process for diverting water in the state.
- The Water Planning Council is established to address state water-related issues and policies.
- DEP may develop water flow standards whenever any dam or other structure is maintained that impounds or diverts a river or stream stocked with fish by DEP, or if the structure affects the flow of water in such stocked river/stream.

Regulations

A further refinement of the state's stream flow policies and, to a larger extent, overall water management system, is provided in various state regulations. For example, regulations governing minimum flow release standards exist for rivers and streams, as do general regulations for the state's water diversion program. Such regulations could arguably have the greatest direct impact on stream flow in Connecticut.

Minimum Stream Flow Standards

State law provides that DEP may develop stream flow regulations whenever any dam or other structure in the state affects the flow of water of a river and stream system stocked with fish by DEP. The standards were developed in the late 1970s.

The minimum stream flow standards were intended to preserve stocked fish dependent upon stream flow. The standards were also designed to promote and protect the usage of such water for public recreation and be consistent with the needs and requirements of public health, flood control, industry, public utilities, water supply, public safety, agriculture, and other lawful uses of such water, as required by law.

DEP's fisheries division is responsible for monitoring the fish-stocking program. The division is required to publish an annual "Fish Distribution Report" as part of its functions. The report is intended to show the rivers and streams DEP stocks with fish. The report, however, does not include all fish species that are stocked and the most recent report available from DEP was published February 2001. DEP also publishes an annual "Anglers Guide," which seems to be more timely and comprehensive. It is unclear whether either of these publications serves as an "official" stream-stocking document for minimum stream flow standards.

DEP's water diversion program, implemented by the Inland Water Resources Division, is also designed to ensure the minimum stream flow regulations are followed as discussed in Chapter Four. The program is responsible for permitting and monitoring the various entities diverting or impounding water from the state's rivers and streams affecting natural stream flow.

Jurisdiction. The minimum stream flow regulations apply to any structure that impounds or diverts water from watercourses – or their tributaries – stocked with fish by DEP. Exceptions to the minimum stream flow standards include impoundments or diversions which:

- have locations with drainage areas of less than three square miles in area;
- are government operated flood control dams;
- discharge directly to (or through) a stream less than one mile long into a reservoir, lake, pond, or tidal waters unless DEP finds such stream has a unique value to the natural or stocked wildlife;
- return substantially all the daily inflow to the same watercourse in the immediate vicinity or in the case of existing impoundments and diversions (as of 1979) in the locations where releases normally occur;
- have no capability of controlling the discharge; or
- are exempted by a variance granted by DEP.

Release requirements. State regulations include the actual daily amounts of water for release from impoundments or diversions subject to the minimum flow requirements. The amounts, as shown in Tables I-1 and I-2, are computed using a complex methodology depending on whether the impoundment/diversion existed before or after the regulations were initiated in the late-1970s. Although the methodology for calculating minimum stream flow release amounts is complex, the standards are moot because they are not enforced by DEP and have not been for some time.

Table I-1 provides the release amounts for impoundments existing prior to the adoption of the minimum flow regulations in 1979. The actual stream flow release rate is calculated by determining the “percent of safe yield utilized” (x axis) and the return frequency (y axis). Safe yield can be described as a statistically-derived number pertaining to the lowest amount of water in a reservoir – accounting for incoming water from natural sources and the amount of storage required by the impoundment operator – necessary to meet outflow based on the driest year occurring every 100 years. DEP told committee staff the water quantity threshold for impoundment or diversion operators to meet “safe yield” is low. In other words, operators routinely withdraw more water from impoundments without affecting safe yield requirements because the safe yield standard is based on such a low frequency of occurrence (1 in 100). Return frequency can be described as the water surface elevation level for the current month. Water surface elevation is a monthly standard based on elevation-level data from multiple previous years. The release amounts are cubic feet per second per square mile of drainage area.

Table I-1. Required Daily Average Releases (in Cubic Feet per Second per Square Mile of Drainage Area)						
<i>Existing Impoundments (pre-1979)</i>						
Percent of Safe Yield Utilized*	0%	75%	85%	95%	100%	
100%	.20	.15	.10	.05	.01	100%
50%	.15	.10	.05	.01	.01	50%
20%	.10	.05	.01	.01	.01	20%
10%	.05	.01	.01	.01	.01	10%
5%	.01	.01	.01	.01	.01	5%
0%						0%

* Safe yield is defined in the DEP minimum flow regulations as the maximum continuous supply which can be anticipated from the watershed with the available storage during a period of years in which occurs a year as dry as one in twenty. The department, however, uses the DPH standard for water supply plans as a critical dry period with a 1 in 100 occurrence.

** For impoundments, percent chance of occurrence of water surface elevations being equal to, or lower than, the elevation of the first day of the current month. For diversions, percent chance of occurrence of water surface elevations being equal to, or lower than, the elevation of the first day of the previous month. Another term for this is "return frequency."

Source: Conn. State Regs. Sec. 26-141a-6.

Table I-2. Required Daily Average Releases (in Cubic Feet per Second per Square Mile of Drainage Area)						
<i>New Impoundments (post-1979)</i>						
Percent of Safe Yield Utilized*	0%	75%	85%	95%	100%	
100%	.25	.20	.15	.10	.05	100%
50%	.20	.15	.10	.05	.02	50%
10%	.15	.10	.02	.02	.02	10%
5%	.10	.05	.02	.02	.02	5%
0%						0%

* Safe yield is defined in the DEP regulations as the maximum continuous supply which can be anticipated from the watershed with the available storage during a period of years in which occurs a year as dry as one in twenty. The department, however, uses the DPH standard for water supply plans as a critical dry period with a 1 in 100 occurrence.

** Percent chance of occurrence of corrected calendar month water surface elevations being equal to, or lower than, the elevation of the first day of the current month. For diversions, percent chance of occurrence of water surface elevations being equal to, or lower than, the elevation of the first day of the previous month. Another term for this is "return frequency."

Source: Conn. State Regs. Sec. 26-141a-6.

Specific freshet releases (releases required every Spring) are also specified by regulation. The standard used for the freshet release amount is the flow rate equal to or exceeding the mean flow rate for the month of March (based on multiple years of March stream flow data as calculated by USGS.) Such rate must be released from any regulated impoundment or diversion for five consecutive days between February 15 and March 15 of a given year. If the required daily average release is below .20 cubic feet per second per square mile of drainage area, as calculated using Tables I-1 and I-2 above, the number of days release based on the March mean inflow is reduced in accordance with Table I-3.

The required water release must be at a constant rate throughout the day, unless the operator has received a variance from DEP, as described below. The release is made in the watercourse immediately below the impoundment or diversion – or in the case of diversions *existing* as of July 1982, in the locations where the releases normally occur.

All impoundments or diversions occurring after the minimum flow standards were adopted are to include discharge devices with adequate controls to provide the required releases. Typically, no impoundment or diversion operator is required to release water amounts in excess of the natural flow of water into the impoundment or diversion on that day.

Table I-3. Spring Freshet Release Reduction Amounts if Daily Average Release is Below .20 Cubic Feet/Second per Square Mile of Drainage Area	
Required Daily Average Release (measured in cubic feet/second per square mile of drainage area)	Required Number of Days of Release of March Mean Inflow
0.15	4
0.10	3
0.05	2
0.01	1
Source: Conn. State Regs. Sec. 26-141a-6	

If an impoundment or diversion is downstream from another impoundment/diversion that is not complying with the minimum flow release standards, the required releases may be reduced to the extent of the upstream noncompliance. Discharge devices found unsatisfactory by DEP to discharge water at a rate for the preservation, protection, or safe maintenance of the natural or stocked wildlife may not be used.

Variance. An operator – or proposed operator – of an impoundment or diversion may request an exemption or variance to the stream flow standards from DEP. If the department approves the request, notice of the exemption or variance must be published in a newspaper with circulation in the municipality where the diversion or impoundment structure or river or stream system is located.

DEP must examine certain conditions when reviewing an exemption or variance request. At minimum, the department is to determine whether the structure will:

- 1) prevent the maintenance of viable pools, channels, or other water basins, or allow their undue depletion by normal evaporation and aquifer absorption;
- 2) reduce oxygen content below minimal levels, cause stagnation, or inhibit reproductive cycles where the potential exists;
- 3) prevent preservation, protection and safe maintenance of the river or stream stocking program, the natural aquatic life within the watercourse, and the natural or stocked wildlife dependent upon the flow of water, and the availability of water for public recreation uses; or
- 4) meet the needs and requirements for public health, flood control, industry, public utilities, water supply, water quality, electric power production, public safety, agriculture, and other lawful uses of such water.

DEP can revoke any exemption or variance. The revocation process includes a hearing for the operator to present evidence for maintaining the exemption or variance.

Minimum stream flow standards may be suspended by DEP if a water emergency exists (e.g., a public water drinking supply emergency declared by DPH). A water emergency petition may be brought to DEP's attention by various sources, including the operator, municipality, or another state agency. DEP has three working days after receiving the petition to declare an emergency. The specific criteria used to determine if a water supply emergency exists include:

- 1) current runoff or rainfall amounts for the affected watershed as compared with average rainfall or runoff over the preceding years for comparable periods;
- 2) differences in impoundment levels or diversion volume as compared with levels or volumes at the same time in previous years;
- 3) peculiar or unusual demand situations or requirements to protect water quality;
- 4) peculiar or unusual water capture problems; or
- 5) unusual health, safety, power, or other crises imposing increased demands on water supplies.

DEP may modify the operation of minimum flow standards after incoming supplies or water loss patterns return to normal to correct water deficits during emergency situations. Water emergency declarations must be published, with certified copies of the declaration sent to the operator, affected municipality, state public health commissioner, and the state public utility department.

Conservation and Development: Policies Plan for Connecticut (1998-2003)

The state's conservation and development plan, developed by OPM every five years, is a statement of the state's growth, resource management, and public investment policies. Several parts of the plan address the issue of stream flow and outline related policies and implementation strategies.

Water quality management. The plan identifies management of the state's water resources as an issue that has become complex: "Conflicts in water use, such as water supply development, maintenance of stream flow for fisheries, and waste disposal, have become the norm. Allocation and management decisions are evolving to a more comprehensive manner and from an overall watershed perspective." The plan also notes "... over-allocation of water resources degrades stream health by diminishment of habitat. In the most dramatic cases, streams are virtually eliminated by complete diversion of all water for out-of-stream uses, rendering the stream functionally dead." As such, it is the state's policy to:

- continue to provide for the comprehensive resolution of water resource conflicts;
- balance the competing needs of water for human consumption, waste assimilation, habitat, recreation, power production and transport...;

Several strategies noted in the OPM plan to help implement the above policies, include:

- continuing the comprehensive framework for making water allocation decisions, so as to integrate existing program and procedures;
- having DEP, in cooperation with DPH, formulate an allocation policy for the Department of Environmental Protection and agree upon an instream flow standard;
- implementing mechanisms to ameliorate the demands on water resources through such means as water conservation... and interbasin transfers to maximize multiple uses of water resources;
- providing technical information on methods to minimize wastewater discharge quantities; and
- utilizing water conservation regulations and state guidelines in water management decisions
- maintaining accurate information on water use and water resource availability within each basin to aid water allocation decisions;
- completing a statewide water resources management plan and utilizing it as a means to identify existing water resource capabilities and conflicts, competing needs, and proposed uses of the waters of the state; and
- revising the allocation procedures by having a hearing at the beginning of the process – include conflict resolution in the allocation process, and evaluate the possibility of making the process less expensive for small diversions.

Water supply. The OPM plan notes: “Assuring the long-term protection of existing and potential sources and the allocation of adequate amounts of potable water are important goals of the plan. Existing allocation practices have led to significant degradation of many watercourses. In addition, removing water for drinking water purposes may have serious downstream impacts because of reduced stream flows. As a result, where appropriate and feasible, water conservation and comprehensive planning, across localized supply boundaries, may be necessary to effectively reallocate water in over-utilized watersheds.’

‘Conflicts among different water uses must be managed to meet the multiple water resource needs of the state. Using existing water wisely, developing new sources, and conservation are all needed. In some drainage basins the allocation of water resources to different water uses is a major concern. The need for additional water supplies, waste assimilation, low flow augmentation, and water-based recreation must be considered against other needs when determining the allocation of water resources.’”

The plan covers various areas related to water supply. The state’s policies regarding water supply in relation to stream flow include:

- allocating water resources through DEP's diversion permit process by giving high priority to drinking water supply needs that cannot be met by aggressive conservation efforts and after considering other uses and maximizing multiple uses to the extent feasible;
- meeting the needs of other users of water, such as low flow augmentation and waste assimilation, to the extent feasible, when allocating water resources, as long as consideration is given to the impact on the quantity and quality of water available for potable purposes; and
- promoting implementation of cost effective conservation measures in state agencies’ decisions concerning diversions, transfers, and financial assistance.

Shepaug River Supreme Court Case

The case involved multiple facets regarding stream flow in the Shepaug River and was decided in the state Superior Court in early 2000. The case was appealed to the state Supreme Court, which made its final decision in November 2002. Plaintiffs included the City of Waterbury and the Towns of Wolcott, Middlebury and Watertown, while the defendants included the Towns of Washington and Roxbury, the Steep Rock Association, and Roxbury Land Trust. A detailed summary of the court cases is found in Appendix B.

The initial lawsuits were filed in mid-1997. The crux of the case centered around whether Waterbury’s water system was releasing appropriate amounts of water from its impoundments along the Shepaug River to sustain downstream ecosystems and recreation requirements.

The Supreme Court made its final decision in late 2002, reversing the trial court's decision. Pertinent to the stream flow issues, the Supreme Court found:

- the trial court utilized an improper standard to determine whether Waterbury violated the Connecticut Environmental Protection Act;
- the minimum flow statute governs the substantive analysis of whether Waterbury's conduct has resulted in unreasonable impairment of the river and is an applicable standard for determining to what extent the river is impaired under the state's environmental protection act; and
- DEP is free to develop new minimum flow standards if the current ones are unacceptable.

As part of its decision, the Supreme Court also remanded several issues back to Superior Court for decision. At present, the case has not been brought before the Superior Court.

Planning

Most planning for stream flow is done in the broader context of water management. Water management includes activities such as balancing supply and demand for in-stream and out-of-stream uses, conservation efforts, water allocation, aquifer and watershed protection, water rates, and public health and safety.

Major Planning Documents Incorporating Stream Flow

Table II-1 outlines the state agencies with stream flow responsibilities, the major planning documents each agency produces, and how often each document is prepared.

State Conservation and Development Plan (1997-2003): The OPM plan, as discussed above, incorporates various aspects of economic and environmental components from a broad policy and strategic perspective and includes several stream flow goals.

Long range plan for water resource management. Since 1969, under the auspices of OPM, DEP and DPH are required to establish a continuing planning process and prepare and periodically update a statewide long-range plan for managing the state's water resources. The plan is to:

- 1) identify the quantities and quality of water that could be available to specific areas under feasible distribution;
- 2) identify present and projected demands for water;
- 3) recommend the utilization of the state's water resources for their greatest benefit;
- 4) make recommendations for any necessary major engineering work or special districts;
- 5) recommend land use and other appropriate measures to ensure the desired quality and abundance of water;
- 6) account for desired recreational, agricultural, industrial, and commercial use of water bodies; and
- 7) seek to incorporate regional and local plans and water use programs and management and plans for water and sewage facilities in the statewide plan.

Table II-1. Major State Planning Documents Relevant to Stream Flow.					
	How Often Updated	OPM	DEP	DPH	DPUC
State Conservations and Development Plan	5 years	√			
Long range plan for water resource management	Periodic Updates	√	√	√	
Statewide environmental plan	5 years		√		
Environmental quality strategic plan	5 years		√		
Water supply plans (prepared by individual water companies; approved by DPH)	3-5 years			√	
Water Utility Coordinating Committees	10 years			√	
Water planning process report	Annual			√	
Water Planning Council (various reports)	Annual				√
Source: State statutes.					

The general assembly is required to receive a copy of the plan once it is adopted by DEP, DPH, and OPM. According to OPM, this process and plan have not been completed for some time. As such, the function has been folded into the statewide conservation and development planning process, and subsequently the individual water supply plans discussed below.

Statewide environmental plan. This is a five-year environmental plan required by statute since 1971. The plan is to be developed by DEP and outline the management and protection of environmental and natural resource quality.

Environmental quality strategic plan. This plan is an internal DEP document developed in early 2002 to address goals and strategies in areas such as watershed management and conservation and development. One of the plan’s goals is to protect, restore, and enhance the state’s surface water, groundwater, public water supply, water-based recreation, fish propagation, and aquatic life. A strategy outlined in the plan to achieve this goal is to develop a comprehensive water allocation program, as well as collecting and monitoring stream gauging data.

Water supply plan. Since the late 1980s, state law has required water companies serving 1,000 or more people or 250 or more consumers, or as determined by DPH, to submit a “water supply plan” to DPH for approval. The plan must be updated at least every three to five years after approval of the initial plan. Such plans are required from 85 public water systems serving roughly 80 percent of the state’s residential population.

The general purpose of the water supply plans is to present a detailed analysis of the water supplier's operation, evaluate water supply needs, and propose strategies to meet those needs. A listing and mapping of the company's water supply sources; storage, treatment, transmission, distribution systems; and interconnections with other water systems must be in the plan. The plans are also required to include:

- description of existing water supply systems;
- analysis of future water demands;
- assessment of alternative water sources;
- contingency plans for public drinking water emergencies;
- forecast of future land use;
- recommendation for new water system development;
- provisions for strategic groundwater monitoring;
- analysis of water conservation measures;
- data on water consumption rates and non-revenue water use;
- identification of future supplies and demand needed within planning timeframes;
- historic and current water production rates;
- calculations of safe yields;
- evaluation of system performance and hydraulic limitations;
- strategy for implementing supply and demand management measures; and
- evaluation of source water protection measures.

DPH has final approval of all water supply plans, "with concurrence" of DEP and DPUC. The plans are also sent to OPM for information and comment.

The Connecticut Plan. The Water Resources Task Force, created by the legislature in 1982, recommended a procedure to coordinate public water supply planning in the state. Known as the Connecticut Plan, the process requires the public health department, in conjunction with DEP and OPM, to establish public water supply management areas (PWSMA). There are seven supply management areas created throughout the state for coordinated water supply planning. A map of the PWSMAs is provided in Appendix C.

DPH was required to consider the following criteria when establishing the PWSMAs:

- 1) similarity of water supply problems among water companies operating in the primary management area;
- 2) population density and distribution in the area;
- 3) location of existing sources of public water supply, service areas, or franchise areas;

- 4) existing interconnections between public water systems;
- 5) municipal and regional planning agency boundaries;
- 6) natural drainage basins; and
- 7) topographic and geologic characteristics.

A water utility coordinating committee (WUCC) within each public water supply management area must be established by DPH. The water utility coordinating committee is designed as the entity to implement the planning process within each PWSMA. Representation on the coordinating committee is spelled out in statute. At present four of seven WUCCs have been created.

Each WUCC is required to prepare a coordinated water system plan for its particular PWSMA within two years of its first meeting. The plan, submitted to DPH for approval, should detail cooperation and coordination among the public water systems within the public water supply management area. Individual water supply plans, as described above, must be used by WUCCs when formulating their coordinated plans. The water utility coordinating committee plans must be updated at least every ten years.

Annual report on water planning process. Since the late 1980s, DPH has been required to submit an annual status report to the legislature describing the state's water planning process and efforts to expedite the process. The WUCC assessments of water supply conditions and problems for their particular service area must also be examined. The most recent report was sent to the legislature in January 2003.

Water Planning Council. The Water Planning Council, as fully detailed in Chapters Three and Five, is a multi-agency, multi-stakeholder body responsible for examining specific areas regarding water resources, management, and planning. The council was legislatively created in 2001.

Other. A two-day conference on "Instream Flow in Connecticut" was held in 2001. The conference, sponsored in part by the Yale Center for Coastal and Watershed Systems, Rivers Alliance, various water companies, and several non-profit agencies, attracted a large group of presenters and participants to discuss diverse topics involving instream flow in Connecticut. A complete book of the conference proceedings has also been assembled by the sponsors.

Stream Flow Data

A crucial component of stream flow planning is the regular collection, analysis, and reporting of flow information. The physical measurement of water velocity and cross-sectional area is the only true way to adequately determine "stream flow." A system must be in place to gauge stream flow and collect data for proper planning and program development and implementation to occur. Some uses of stream flow information include, but are not limited to:

developing wastewater permits; planning water supplies; allocating water for municipal, industrial, commercial, and agricultural uses; mitigating flood and drought emergencies; and managing fish and wildlife populations. Appropriate data, along with solid science to back up the data, are vital to the state's stream flow system. Without these components, the overall system is rendered ineffective.

Most stream flow data in Connecticut are collected by the USGS in partnership with 14 other state, federal, and local entities, including DPH, regional water authorities, municipalities, and the Army Corps of Engineers. There are currently 51 stream flow gauges throughout the state to collect information. The 51 total gauges is down from a high of 99 in the 1960s. (The Water Planning Council is examining the gauges issue, as described in Chapter Three.)

DEP funds all or part of 30 stream flow gauges in various rivers and streams throughout the state. The USGS contributes half of the cost for gauging stations on watercourses not affected by impoundments or diversions, while the cooperating partners fund the other half. USGS does not fund stations on watercourses with impoundments or diversions.

A cooperative agreement between DEP and USGS for FY 04 specifies USGS to collect and analyzes stream flow, groundwater, water quality, and water use data. The state's cost under the agreement is \$460,000, while USGS is contributing \$300,000, for a total cost of just under \$800,000 for collecting the four types of data. For the stream flow data alone, the state's cost is \$165,500, while USGS's contributes \$94,600. Similar agreements exist with each of the other partners.

The DEP/USGS agreement is for basic data collection. It provides funds to support the operational costs of data collection and publication of statewide water resources data defining long-term trends and conditions. The various tasks include: 1) data collection, analysis, and publication; and 2) record maintenance so estimates can be made of the status of stream flow, groundwater levels, and water quality.

The DEP and USGS agreement calls for the following water resources investigations:

- collection of basic water resources data to define long-term trends and conditions;
- maintain records so estimates may be made on the status of stream flow, groundwater levels, and water quality;
- areal hydrologic studies for water quality and quantity; and
- collecting, monitoring, and analyzing samples from ambient water-quality networks and tributaries to Long Island Sound.

The stream flow gauges measure watercourse height (referred to as “stage”) and stream flow velocity (referred to as “discharge.”) This information is used to develop a “rating,” which is the relationship between the stage and the discharge. The gauges record stage information every 15 minutes and the gauging station computer uses the rating to translate this to discharge.

Forty-four gauges, known as “real-time” gauges, transmit data back to USGS via satellite, while information from the other seven is collected from the specific gauge by USGS staff, approximately every six weeks. Thirty-four of the “real-time” gauges transmit information every four hours, while ten transmit data every 24 hours. The real time stream flow data are available on the USGS website. USGS also conducts periodic field tests to physically measure stream flow.

Gauging stations throughout the state have varying lengths of historical data, depending on when the station was activated. This is important because the more historical hydrologic data available, the more accurate the stream flow statistics on which analysis can be based. Some statistical analyses require at least ten years of data, while others require as much as 30 years of data. Some gauges throughout the state have been collecting stream flow data for only a few years, while others have collected decades worth of information.

The adequate collection and analysis of hydrologic data for stream flow purposes cannot be overstated – not only for in-stream flows, but also for water returned to watercourses after it was originally withdrawn. Without solid hydrologic information, analysis, reporting, and implementation of state stream flow policies and programs are severely hampered. This point has been discussed with committee staff by various entities and individuals involved in the stream flow process. The Water Planning Council is addressing the issue of stream flow gauging in the state, as highlighted in the next chapter.

Chapter Three

Water Planning Council

Purpose

Public Act 01-177 created the Water Planning Council (WPC) in 2001. The enacting legislation required the council to submit a final report to the legislature's Energy and Technology, Environment, and Public Health committees by January 2003, at which time the council would terminate. Public Act 02-76 extended the council indefinitely and required it to report its findings and proposed legislative changes to the three committees on an annual basis every January.

Commissioners from the Departments of Public Utility Control, Environmental Protection, and Public Health, and the Office of Policy and Management secretary (or their designees) form the Water Planning Council. The DPUC representative acts as the council's chairperson and conducts the meetings.

The purpose of the council is to address issues involving water companies, water resources, and state policies regarding the future of the state's drinking water supply. The council is to consult with representatives (i.e., stakeholders) of water companies, municipalities, agricultural groups, environmental groups, and other water users as it addresses water issues. The council's work must be conducted on both a regional and statewide basis.

Specifically, state law requires the Water Planning Council to examine:

- 1) the financial viability, market structure, reliability of customer service, and managerial competence of water companies;
- 2) fair and reasonable rates;
- 3) protection and appropriate allocation of water resources while providing public water supply needs;
- 4) the adequacy and quality of drinking water supplies to meet the state's current and future needs;
- 5) an inventory of water company land and land use;
- 6) the status of current and projected withdrawals, river flows, and the future needs of water users;
- 7) methods for measuring and estimating natural flows in Connecticut waterways to determine standards for stream flows that will protect their ecology;

- 8) the status of river flows and available data for measuring them;
- 9) the streamlining of the water diversion process;
- 10) coordination between the departments of public utility control, environmental protection, and public health in review of diversion permit applications; and
- 11) the procedure for coordinating the planning of public supply systems under the statutes.

The WPC's mission statement, included in its first report to the legislature, states:

The Water Planning Council will identify issues and strategies which bridge the gap between the water supply planning process and water resources management in order that water can be appropriately allocated to balance competing needs while protecting the health, safety and welfare of the people of Connecticut and minimize adverse economic and environmental effects.

The issues under review by the Water Planning Council are diverse and include a detailed review of stream flow-related issues in Connecticut. Although the council has completed comprehensive reviews of the topics highlighted above, its research and analysis in several areas, including stream flow, are ongoing.

Process

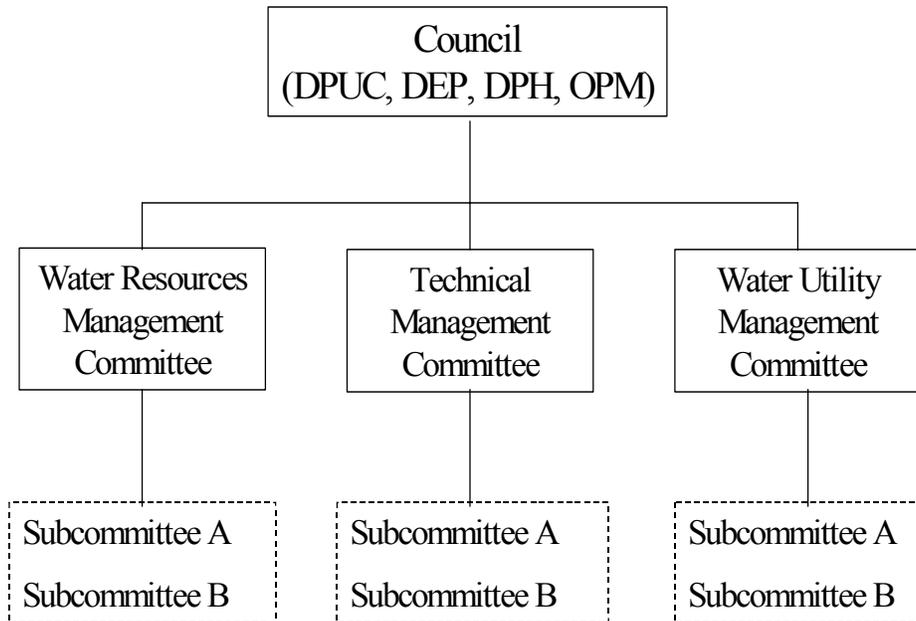
Workplan. The council, initially organized as shown in Figure III-1, developed a workplan following an informational hearing in October 2001. The plan separated each of the 11 issue areas into the following three broad categories:

- 1) Water Resource Management;
- 2) Technical Management; and
- 3) Water Utility Management.

The three categories eventually became the foci of the council's working committees, as described below.

For each issue area, the workplan included a "summary of the current situation, points of consideration, and possible areas to investigate." The plan also highlighted several overarching concerns, namely: 1) Connecticut law on water resources management is complex and fragmented; 2) long-range planning for management of water resources is nonexistent; and 3) integrated statewide policy requiring all major water users to consistently implement conservation measures is lacking.

Figure III-1. Water Planning Council Organization (pre-2003).



Committee/subcommittee structure. The Water Planning Council organized itself using a committee/subcommittee structure to implement its workplan. The three working committees each had two subcommittees. The 11 issue areas were then grouped among the subcommittees for review. The council’s committee/subcommittee structure is shown in Table III-1.

The three committees were co-chaired by technical staff from DEP, DPH, and DPUC. The subcommittees were co-chaired by various stakeholders outside of state government. At least one technical member from DEP, DPUC, or DPH, however, served on each of the subcommittees. Numerous volunteer representatives from utilities, non-profit organizations, government, and academia served as team members on the subcommittees. The teams provided the research and analysis of the subcommittees’ reports. The reports were intended to serve as the core of the council’s annual report to the legislature as described below.

Table III-1. Water Planning Council Committee/Subcommittee Structure.	
Water Resources Management Committee	
Subcommittee A	
Issue 3:	<i>Protection and appropriate allocation of water resources while providing public water supply needs</i>
Issue 4:	<i>Adequacy and quality of drinking water supplies to meet the state's current and future needs</i>
Issue 6:	<i>Status of current and projected withdrawals, river flows, and the future needs of water users</i>
Subcommittee B	
Issue 9:	The streamlining of the water diversion process
Issue 10:	<i>Coordination between the departments of public utility control, environmental protection, and public health in review of diversion permit applications</i>
Water Utility Management Committee	
Subcommittee A	
Issue 1:	<i>The financial viability, market structure, reliability of customer service, and managerial competence of water companies</i>
Issue 2:	<i>Fair and reasonable rates</i>
Subcommittee B	
Issue 11:	<i>Procedure for coordinating the planning of public supply systems under the statutes</i>
Technical Management Committee	
Subcommittee A	
Issue 5:	<i>An inventory of water company land and land use;</i>
Subcommittee B	
Issue 7:	<i>Methods for measuring and estimating natural flows in Connecticut waterways to determine standards for stream flows that will protect their ecology</i>
Issue 8:	<i>The status of river flows and available data for measuring them</i>
Source: Program Review Committee Staff	

Reports

The Water Planning Council has submitted two reports to the legislature's committees of cognizance – a preliminary report in January 2002 and its first annual report in January 2003. The preliminary report was the council's initial workplan. The second report was a synthesis of the subcommittee reports completed for the 11 study areas. (Time constraints precluded a subcommittee report for Issue 8: *The status of river flows and available data for measuring them.*)

The subcommittee reports are detailed and technical. They contain a complex set of recommendations and undoubtedly serve as a comprehensive collection of research and analysis regarding water management in Connecticut, if not the most complete collection. The reports were forwarded to the committee co-chairs who condensed them and submitted an executive summary-type report to the council, along with the full subcommittee reports. A copy of the co-chairs' summary report is provided in Appendix D.

Although some of the subcommittee reports covered issues not technically related to stream flow or the program review committee's study, there are several common themes expressed in the reports related to the scope of this study, including:

- an interim method necessary to estimate ecologically protective median stream flow amounts was suggested;
- further examination is needed to develop a long-term method for determining adequate stream flow amounts;
- an appropriate system based on solid science to allocate water for competing users should be explored;
- adequate flow data are vital and a systematic approach to collect such data is needed;
- basin planning, funding, water utility coordinating committees, and consolidation of agencies' water resource management functions need to be examined;
- greater coordination among regulatory agencies is necessary (with the creation of a water resources department recommended);
- overall water management planning needs more consistency and coordination;
- the process between water supply planning and resource allocation needs attention;
- water conservation can be a "source" of water outside of new or proposed sources; and
- state laws, regulations, and processes regarding water diversion permits and registrations (discussed in Chapter Four of this report) need to be revised.

The Water Planning Council's first annual report to the legislature was submitted January 2003 following an initial draft report developed in mid-December. The draft report generated a lot of comments from different stakeholders who served on the subcommittees. The comments, both written and presented at a public hearing held by the WPC, emphasized that various subcommittee recommendations were either not included or not accurately reflected in the council's draft report, particularly regarding a minimum stream flow standard. The council revised its draft report prior to submitting it to the legislature. A copy of the final report is included in Appendix E.

The WPC's January 2003 report to the legislature notes the council's subcommittee reports are "intended to be the backbone to the recommended approach being made by the committee co-chairs to the WPC. The WPC, legislators, regulators, and other interested parties should recognize these reports..." The overarching findings of the annual report include the need for:

- a revised water allocation procedure;
- securing of adequate, stable resources for water allocation management; and
- reframing the current management structure governing water policy.

The WPC's January 2003 report outlines focus areas with action steps – although not all involved the stream flow issue under study by the program review committee. Specifically, the WPC endorses the following recommendations and action steps applicable to the program review committee's stream flow study:

- 1) adoption of a water allocation policy planning model for developing a comprehensive state water allocation/management program;
 - evaluate and address the state's current authority to develop and implement the subcommittee's recommended water allocation planning model
 - consider possible changes to the water planning and permitting function
 - outline the necessary procedures and funding mechanisms for a revised water allocation program
 - evaluate the requirements for a comprehensive water supply database
 - draft a legislative proposal for the 2004 legislative session regarding registered diversions and modifications to DEP's general permitting process for diversions

2) revise stream flow regulations; and

- DEP will convene a broad-based working group to develop interim approaches to address in-stream flow issues and revise minimum stream flow regulations
- DEP will continue to work with stakeholders in developing a long-term stream flow protocol consistent with the WPC's water allocation model
- WPC will convene a working group to evaluate and report on a scientifically-defensible stream gauging network by January 2004

3) advance the WUCC planning process

- WPC should develop a reasonable timeline and cost estimates for completing the WUCC process and continuing the process of revising all WUCC plans every ten years
- WPC will review existing WUCC laws and regulations – with public input – and make necessary legislative proposals for 2004.

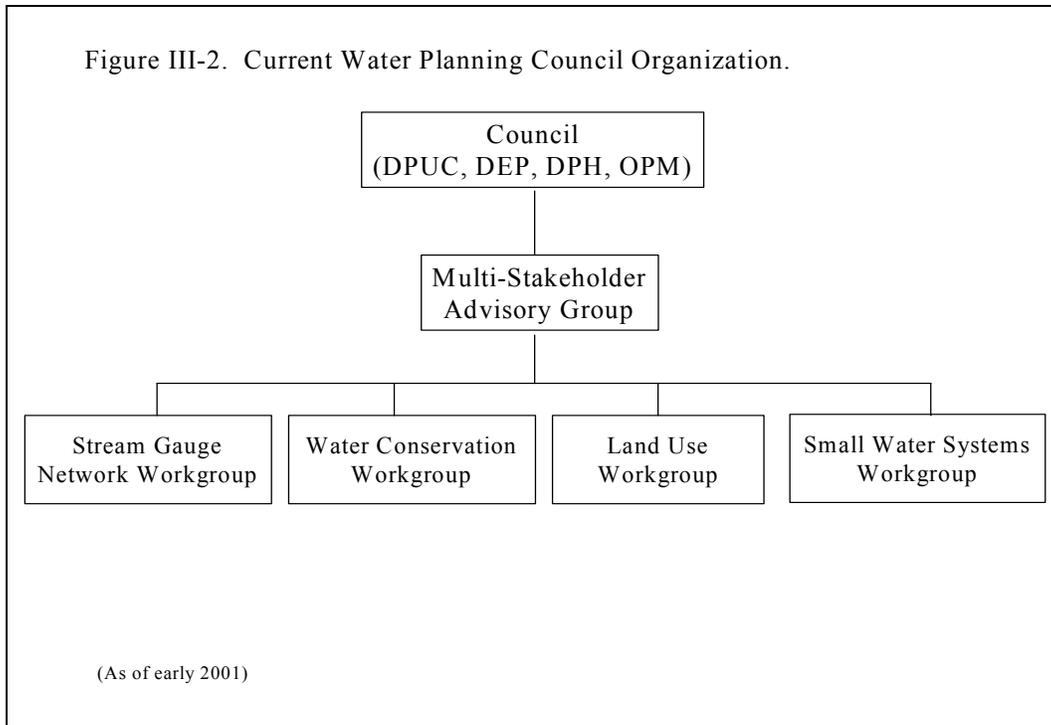
Future Plans

The Water Planning Council reorganized itself after the legislature made it a permanent body effective June 2002. Figure III-2 shows the council's current organizational structure.

The council has established workgroups to assist it in completing the relevant action steps highlighted in its January 2003 report. The workgroups consist of technical staff from DEP, DPH, and DPUC, along with a range of volunteers comparable to the council's subcommittee structure described above. The following workgroups have been established: 1) Stream Gauge Network; 2) Water Conservation; 3) Land Use; and 4) Small Water Systems. The workgroups have been meeting since early 2003 and are due to report their findings, recommendations, and legislative proposals to the council in late 2003.

Advisory group. The council is convening a "Water Planning Council Advisory Group". The group is an ad hoc body formed to assist the council in its new role as a permanent body. It is anticipated the advisory group will review and comment on specific findings and assist the workgroups as necessary. The group's first meeting is scheduled for mid-September 2003.

Figure III-2. Current Water Planning Council Organization.



The Water Planning Council has identified various interests for representation on the advisory group, including: small and large investor-owned utilities; a municipal water utility; a regional water utility; individuals representing the following interests: environment, recreation, fish, rivers, agriculture, power generation, consumers, wastewater and business/industry; and others deemed necessary by the council.

Recent legislative requirements. Effective July 1, 2003, Public Act 03-141 requires the Water Planning Council to issue recommendations in its 2004 annual report for:

- 1) a water allocation plan based on water budgets for each watershed;
- 2) funding for water budget planning, giving priority to the most highly stressed watersheds; and
- 3) the feasibility of merging the data collection and regulatory functions of DEP's Inland Water Resources Division and the public health department's Water Supplies Section.

The recommendations must be reported by February 1, 2004.

Water Diversions

State law defines a water diversion as “any activity that causes, allows, or results in a withdrawal from or an alteration, modification, or diminution of the instantaneous flow of waters of the state.” Diversions are used for various purposes, including public or private water supply, irrigation, hydropower generation, flood management, and recreation. Water diversions affect stream flow by decreasing the overall amount of water available for downstream purposes.

The legislature first required state permits for specific water diversions in 1982 under the Water Diversion Policy Act. The act made clear that water, as a resource, was a competing interest for consumptive and nonconsumptive uses and subject to environmental review by the state.

Organization

The Department of Environmental Protection administers a permitting process for water diversions through its Inland Water Resources Division. There is no budget line item specific to the permitting function. Two people are responsible for reviewing permit applications, although other staff are currently used on an ad hoc basis to handle an increased number of permit applications resulting from an amnesty program under P.A. 02-102.

Registrations vs. Permits

Prior to the Water Diversion Policy Act in 1982, diversion operators were not required to obtain a state permit to operate their diversions. The act gave diversion operators until July 1983 to “register” their diversions with DEP. When registering diversions, operators had to specify the locations, capacity, frequency, and rate of withdrawals of the diversions, as well as a description of the water use and water system.

Under the diversion act, there were limited withdrawal restrictions for registrations. Diversion operators could register any amount of water withdrawal up to their current diversion machinery’s capacity at that time, even if it exceeded their true needs or historic use. Existing diversions not registered at that time became subject to the permit requirements.

Permit Process

In general, any alteration of surface water flows from a watershed of 100 acres or more and any withdrawal of water exceeding 50,000 gallons per day in a 24-hour period requires a diversion permit from DEP. Such diversions include: relocation, damming, dredging, channelization, bypass of a water course; lake dredging; dam alteration or removal; stormwater runoff collection; water pumping from wells or surface waterbodies; and alterations of registered diversions.

Exemptions. State statutes exempt certain types of diversions from the DEP permitting process. The diversions specifically excepted in statute include:

- 5) one or more wells joined in one system whose combined maximum withdrawal will not exceed 50,000 gallons of water during any 24-hour period;
- 6) the maximum withdrawal of 50,000 gallons of surface water during any 24-hour period;
- 7) discharges permitted under law;
- 8) a storm drainage system which collects the surface water runoff of an area of less than 100 acres;
- 9) water for fire emergency purposes;
- 10) diversions within, extensions and relocation of water supply system distribution mains;
- 11) roadway crossings or culverts which allow for continuous flow or passage of an existing watercourse;
- 12) diversions directly related to routine maintenance and emergency repairs of dams; and
- 13) specific diversions by a water company necessary to protect the security of public water supplies.

State regulations exempt another 19 diversions from DEP permits.

Types of permits. DEP issues “individual” and “general” permits. Individual permits are issued directly to an applicant, whereas a general permit is a blanket permit approved by DEP authorizing similar “minor” activities by one or more applicants. The general permit application process is typically shorter, less involved, and less costly than individual permits. A water diversion under the general permit is typically for five years, compared to 25 years for an individual permit. A diversion under DEP’s General Permit for Consumptive Water Diversions also does not require a hearing or public hearing component as do individual permits. The general permit process for consumptive diversions began in mid-1997.

Eligible *activities* specified under the department’s general permit for consumptive water diversions include those causing: no greater than minimal adverse environmental effects when conducted separately; only minimal cumulative environmental effects; and no greater than a minimal effect on the planning and management of water resources.

There are also specific *diversions* eligible for a general permit, and different criteria within each diversion must be met for eligibility. The particular diversion categories include:

- 1) water supply system interconnections;
- 2) unregistered water supply systems;
- 3) diversions up to 250,000 gallons per day of new water;
- 4) backup wells;
- 5) hydrostatic testing of pipes and tanks;
- 6) restoration of lost capacity;
- 7) drinking water wells under the influence of surface water;
- 8) groundwater remediation; and
- 9) small water supply systems.

Water diversion permits may be revoked, suspended, or modified by the commissioner at any time to “adequately protect human health and the environment.” No permit may be transferred to another person or municipality without the written approval of the commissioner.

Application and review. Applicants for water diversion permits are required to: 1) publish a newspaper notice in the town of the anticipated diversion of their intent to file an application with DEP; 2) voluntarily meet with DEP for a “pre-application discussion; 3) submit a complete diversion application to the department with the appropriate fee; 4) notify the chief elected official in the town where the diversion is anticipated; and 5) provide public notice of DEP’s decision to tentatively grant or deny the application.

In reviewing a diversion application, DEP will: 1) determine if the pre-application notification and the actual application are timely and complete, and notify the applicant and required government officials; 2) conduct a technical review of the application, including a multi-discipline internal review; 3) forward the application to DPH for comment; 4) make a tentative determination to grant or deny the permit and notify the applicant; 5) determine if a public hearing is required and conduct the hearing; and 6) make a final determination on the application based in part on ten criteria specified in statute, including the proposed diversion’s effects on public water supply and environmental conditions.

Enforcement. DEP is not implementing a proactive enforcement program due to limited staff resources and the increased volume of permit applications resulting from P.A. 02-102, as described below. Operators with registered diversions are also not required to submit information on a regular basis to the department showing such things as the actual amounts of water withdrawn for their diversions. This makes it impossible at present for the department to fully know the overall quantities of water withdrawals.

Diversion Database

Water diversion data are critical to the overall stream flow management in the state. Without adequate and timely diversion information, a key component of managing stream flow is missing. Several public acts speak to water diversion data and include the following:

- P.A. 82-402 required DEP to adopt regulations to establish a database to ensure proper planning, management, allocation and use of the state's water resources, and to fulfill the Water Policy Act. To date, no such regulations have been established, although the department is in the process of developing a functional water diversion database for registered diversions.
- P.A. 98-224 mandated the department develop an inventory of registered diversions, including withdrawal quantities and identification of active registrations. As mentioned earlier, the department completed the inventory in early 2000 and submitted the results to the legislature.
- P.A. 01-202 required DEP to collect comprehensive diversion data from operators with registered diversions. DEP completed a data collection form in conjunction with DPH, DPUC, the agriculture department, USGS, and water companies in January 2003.
- P.A. 02-102 extended the timeframe diversion operators to submit their information to DEP to July 2003, including permit applications without penalty.

Registered operators must submit monthly diversion information for 1997-2001. Actual data for diversion frequency and rate of water withdrawals or discharges must be submitted if the diversion is metered. Estimates are required for diversions that are not metered and from any operator maintaining a diversion solely for agricultural purposes. Owners or operators of existing electric generating facilities using fossil fuel are exempt from this requirement provided they comply with state and federal environmental laws and if reports are made to DEP estimating future water use necessary to comply with those laws.

Any diversion operator who failed to register the diversion with DEP back in 1983 but continued to maintain the diversion as of July 2001, or operated a diversion during that period without the necessary permit, must report operating data to DEP since July 1982. The information required includes: 1) location, capacity, frequency, and withdrawal/discharge rates; 2) a description of the water use and water system; 3) the actual or estimated monthly data for 1997-2001 for frequency and rate of water withdrawals/discharges depending on whether the diversion is metered.

The information reported by diversion operators as part of the data collection program required under P.A. 01-202 cannot be used against the operator by DEP for civil penalty purposes. This is provided the operator has filed a permit application with DEP by July 1, 2003.

Database construction. DEP is developing a database using the diversion information submitted by operators. The data have been submitted in both electronic and paper formats, and information from over 1,800 diversions must be collected, entered, and analyzed.

DEP cites several limitations to its water diversion database, as described below. Also, future database maintenance is seen as a problem due to a lack of staff. At present, a staff person with other responsibilities within DEP is being used to develop the water diversion database. Further, P.A. 01-202 did not require diversion operators to periodically update their data, which DEP believes are vital to adequately managing the water diversion process.

Diversion program data. The water diversion program database is not a completely up-to-date accounting of water diversion permit or registration information. According to DEP, the program data are the most current available, but are not fully comprehensive, mainly due to limited staff resources for data input and maintenance. Regardless, committee staff compiled the following water diversion information (1983 to present) highlighted in Table IV-1.

Table IV-1. Water Diversion Program Data (1983 to Present).		
	Registrations	Permits (issued)
Total diversions	1878	483
Total diversion operators	327	344
Main diversion usage	Public Water (40%)	Site Development (28%)
Consumptive	1,324 (71%)	234 (48%)
Nonconsumptive	554 (29%)	249 (52%)
Permit Type	--	--
Individual	N/A	396 (82%)
General	N/A	77 (16%)
Temporary	N/A	10 (2%)
Source of data: DEP		

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FINDINGS AND RECOMMENDATIONS

WATER PLANNING COUNCIL

A broad examination of multiple water resource management issues within the state has recently re-emerged with the creation of the Water Planning Council. Beginning in 2001, the council has assessed and deliberated on many key issues regarding overall water resource management. Although additional research and analysis are necessary, the council, with the assistance of a broad array of stakeholders, has become the state's principal body devoted to finding workable solutions to the myriad of issues within water resource management.

The Water Planning Council's structure and process – and its efforts at addressing key elements of water resource planning, management, and policies – are highlighted below. The committee believes the council is the appropriate structure at this time to examine water resource issues and craft solutions, but questions whether it has the overall resources to fully carry out its mission. Therefore, the committee makes recommendations to strengthen the council's process and its ability to implement solutions.

Structure and Process

Public Act 01-177 created the Water Planning Council in 2001. The enacting legislation required the council to submit a final report to the legislature's Energy and Technology, Environment, and Public Health committees by January 2003, at which time the council would terminate. Public Act 02-76 extended the council indefinitely, requiring it to report its findings and proposed legislative changes to the three committees on an annual basis every January.

Commissioners (or their designees) from the Departments of Public Utility Control, Environmental Protection, and Public Health, and the Office of Policy and Management secretary form the Water Planning Council. The DPUC representative acts as the council's chairperson and conducts the meetings.

The council's original purpose was to address 11 main issues involving water resources, water companies, and state policies regarding the future of the state's drinking water supply. A goal of the council is to appropriately allocate water resources to balance competing needs while protecting the health, safety, and welfare of the people of the state and minimizing adverse economic and environmental effects. To help bridge the gap between water supply planning and water resource management, the council has consulted with water companies, environmental groups, municipalities, agricultural groups, and other water users.

The topics under review by the council are diverse and include a detailed review of stream flow-related issues in Connecticut. Although the council has completed comprehensive reviews of multiple topics, its research and analysis in several areas, including stream flow, are ongoing. Public Act 03-141 further requires the Water Planning Council to issue recommendations on: 1) water allocation plans based on water budgets for watersheds; 2) funding for water budget planning, giving priority to the most highly stressed watersheds; and 3) the feasibility of merging the data collection and regulatory functions of DEP's Inland Water Resources Division and the public health department's Water Supplies Section. The recommendations must be submitted by February 1, 2004. Statewide, the state consists of five major basins, 44 regional basins, 356 sub-regional basins, and several thousand local basins.

The WPC process, as currently designed, requires time to thoroughly research and analyze water resource topics and make decisions. The council has no full-time support staff, no dedicated budget, and consists of state agency commissioners who are adding the council's work to their normal agency responsibilities. The council's current advisory group, created to advise the council as its process moves forward, is also a volunteer group with limited administrative resources.

The council's actual research and analytical work was conducted in 2001-2002 by subcommittees consisting of up to 100 volunteers in total, as discussed in Chapter Three. The subcommittees' comprehensive reports provide an excellent compilation of water management information for the state. The reports include detailed analyses and diverse recommendations. Not all the subcommittees, however, had time to fully examine the issues assigned to them. The council needs to ensure all relevant issues are properly reviewed.

The program review committee believes the council, and its process, is highly valuable in helping identify, analyze, and potentially solve water resource-related issues, including stream flow. The council has filled a void by comprehensively examining water resource issues. The council's work has highlighted relevant water resource topics and included interagency participation at a high level to provide coordination of those topics from a macro perspective. The council has used a multi-stakeholder approach to study complex and involved matters. The committee believes such an approach is vital to building consensus among diverse interests.

Although the Water Planning Council has made solid progress to date, the committee questions whether the council and various stakeholders, as a collective body, can sustain the momentum that was initially created to address the council's mandate. The need for additional research and analysis to fully develop effective, workable solutions to the problems the council has identified, limited power to implement recommendations, and a general lack of administrative resources *may* hinder the council's future progress.

It also is likely the volunteer efforts of private and non-profit sector participants may not continue at the high level seen over the past two years. As such, the committee believes the council needs to: 1) structure itself to effectively prioritize the most critical water resource issues facing the state; 2) develop a strategic plan; and 3) devise solutions relatively quickly. At the same time, additional administrative resources would certainly help the overall efficiency of the council.

A review of the detailed subcommittee reports and the Water Planning Council's January 2003 annual report shows the council is making solid progress in examining relevant water resource issues. There is sentiment among various interests, however, that the council should begin focusing on more broad-based, comprehensive issues, such as implementing a statewide water resource planning and allocation process and examining an alternative governing structure for that activity. Several documents aimed at identifying the most relevant issues and moving the council forward on these issues have recently been developed, as described below.

Workgroups. The council formed four workgroups to assist in completing the relevant action steps highlighted in its January 2003 report: 1) Stream Gauge Network; 2) Water Conservation; 3) Land Use; and 4) Small Water Systems. The workgroups have been meeting since early 2003 and recently submitted their findings, recommendations, and legislative proposals to the council and the council's advisory group (discussed below). The advisory group is currently reviewing and summarizing the reports for the council.

Advisory group report. Along with reviewing the workgroup reports, the council's advisory group has been charged with examining the various subcommittee reports to identify common themes for the council to pursue. The advisory group completed this process and presented a summary report to the council in early December 2003. The report puts forth a set of recommendations for the council to consider.

Committee staff attended the various advisory group meetings over the past several months and has reviewed the group's report to the council. Many of the themes highlighted in the report are similar to those in this report, such as the need for greater water resource planning and allocation and additional thinking about an alternative governing structure for overall water resource management.

Work plan. In December 2003, DEP presented a draft work plan to the council to carry out the action items identified in the council's January 2003 annual report. The council is in the process of reviewing and approving the work plan.

Overall, the program review committee believes the Water Planning Council needs to ensure the efforts put forth by the subcommittees, the four workgroups, the advisory group, and reflected in the draft work plan do not work at cross purposes. After completely reviewing each document, the council needs to synthesize the contents and develop a strategic approach to implementing the most relevant and critical recommendations. The council must also continue its research and analysis of the water resource issues it deems most important.

Summary of Findings

- *The Water Planning Council, and its process, is highly valuable in helping the state identify, analyze, and potentially solve water resource-related issues, including stream flow. The council has filled a void by examining water resource issues on a broad, multi-stakeholder basis.*

- *The council's process includes interagency participation at a high level. Coordination of multiple water resource issues is another important aspect of the council that was previously lacking.*
- *The WPC process, as currently designed, takes time to thoroughly research and analyze water resource topics and formulate solutions. The council has no full-time support staff or dedicated budget and relies primarily on the staff and administrative resources of its member agencies, as well as the volunteer efforts of various stakeholders involved in the process.*
- *The council's subcommittee process involved approximately 80-100 volunteers and resulted in an excellent compilation of water resource analyses with very diverse recommendations.*
- *A question remains whether the council and its various stakeholders can sustain the momentum initially created to meet its original mandate.*
- *The council needs to ensure the vast amount of information developed through its process does not work at cross purposes and can be synthesized into a master strategic plan that can be smoothly implemented.*

Recommendations

- 1) The Water Planning Council should develop a comprehensive, master strategic approach and plan for identifying, analyzing, synthesizing, and implementing the various findings and recommendations set forth in the council's annual report, subcommittee reports, workgroup reports, Advisory Group report, and staff-developed work plan.**
- 2) The Water Planning Council should identify the administrative resources necessary to ensure the overall efficiency and effectiveness of its processes and procedures. Formal requests for any necessary staff or budget resources should be made through the Office of Policy and Management. The council should also include a summary of such resources in its annual reports to the legislature.**

PLANNING AND ALLOCATION

A cohesive water resource system requires proper planning and a structured allocation system based on such planning. Water resource planning occurs in the state, but to a limited degree. State law has also developed a process for evaluating water resources from a quantity perspective (as discussed earlier in the report), yet lacks a fully comprehensive system to allocate such resources.

The state's water resource planning efforts and the Water Planning Council's endeavor to create a comprehensive structure to allocate water resources, are highlighted below. Data collection efforts and the proper governing structure for implementing a comprehensive system are also examined.

Overall Water Planning

State-level water planning, including stream flow, mainly occurs within the Department of Public Health (DPH) and the Department of Environmental Protection. The Office of Policy and Management (OPM) and the Department of Public Utility Control (DPUC) are also involved, but to a lesser degree than DPH and DEP. For example, OPM is charged with developing the state's Plan of Conservation and Development, which includes a stream flow component, and DPUC is responsible for ensuring public drinking water is delivered at a fair rate to customers.

Department of Public Health. The public health department is charged with overseeing the quality of the state's public drinking water supply and ensuring enough water is available for public consumption. There is a specific process in place for public water supply planning on an individual water company basis, as well as for planning on a broader level through regional planning bodies.

Water companies serving more than 1,000 people (or 250 customers) are required to submit individual water supply plans every three to five years for DPH approval. The plans are to be developed according to specific statutory criteria. DEP, OPM, and DPUC must be given the opportunity to review and comment on each plan prior to DPH approval.

The public health department is also responsible for overseeing and coordinating public water systems and water supply planning at a regional level. The state is currently divided into seven water management areas designed to achieve regionalized drinking water supply planning. Each management area is supposed to be served by a Water Utility Coordinating Committee (WUCC) to coordinate planning. The WUCCs, mainly through analyzing the individual water supply plans within their regions, are required to develop a coordinated water supply plan for their management areas. The individual water supply plans coupled with the WUCC plans make up the state's planning structure for public drinking water supply.

Department of Environmental Protection. State-level planning for stream flow primarily occurs within DEP. The water diversion program is the department’s mechanism for “allocating” water resources, with planning taking place as an extension of the diversion process. Natural resource planning also occurs within other areas of DEP, such as fisheries.

Water resource planning for uses other than public drinking water, however, is limited. A critical problem identified by DEP in its “Diversion 2000” report¹ submitted to the legislature and the Water Planning Council is the absence of a process to incorporate all uses of water within a comprehensive planning and allocation structure. There also has been a significant lack of information regarding water diversions within the state, which impedes overall planning. The program review committee concurs with the DEP and Water Planning Council findings and believes the current planning process for public drinking water supply and water necessary for other in-stream and out-of-stream purposes is not comprehensive enough to meet the state’s overall planning requirements for water resource management.

Most water resource planning in the state has concentrated on the public drinking water supply, which has its own problems as outlined below. These problems, coupled with limited natural resource information on a basin-by-basin perspective (as discussed throughout the report) and a lack of comprehensive water diversion data, hamper planning for all other in-stream and out-of-stream uses. At the same time, there is no formal process in place to plan for or determine overall water demand for purposes other than drinking water, such as industrial, irrigation, recreation, and agriculture.

Water Resource Management Plan

The Departments of Environmental Protection and Public Health and the Office of Policy and Management are required by a 1967 state law to develop an ongoing planning process and jointly prepare and periodically update a statewide long-range plan for management of water resources. The statute does not specify which agency has overall responsibility for ensuring the plan is developed. In general, the plan is to:

- identify the availability and demand for water in specific areas;
- recommend how to use the state’s water resources for the greatest benefit; and
- seek to incorporate local, regional, and statewide water use programs and management plans.

To date, no water resource management plan has been developed. Some of the elements of the plan have been incorporated into other state planning processes, such as the state’s conservation and development plan. However, a comprehensive, statewide water resources plan with the specific components required by statute is not in place. As a result, no comprehensive planning document or process exists to fully examine and analyze water resource issues from a

¹ Connecticut Department of Environmental Protection, *Report to the General Assembly on State Water Allocation Policies Pursuant to Public Act 98-224*, January 2000.

macro perspective although, as highlighted earlier in the report, the Water Planning Council is currently examining such issues.

As mentioned above, much of the current planning in the area of water supply is for public drinking purposes. While this planning is vital, it is only one component of comprehensive water resource planning. Planning for other demands on water resources, however, is limited, and there is little to no link between public water supply planning and planning for other uses of water. Without such connection, comprehensive planning for overall water resource management – including water amounts required for adequate stream flow – is deficient. The absence of comprehensive, coordinated planning only perpetuates an ad hoc approach to determining instream and out-of-stream water requirements, not based on a clear direction for meeting all demands on water resources. A structured water resource allocation system with comprehensive planning as a primary component is needed in Connecticut.

The program review committee also believes there are gaps within the current public drinking water supply planning process. For example, DEP does not believe the current water supply planning process fully meets the department's needs for diversion permitting. DEP believes the environmental assessment on potential water supply sources in the initial planning process prior to the diversion application review phase is too limited. The department contends this is a source of disconnect between DPH and DEP planning efforts.

Although the individual supply plans may not wholly satisfy DEP's needs for detailed environmental assessment for diversion permitting, the department has the statutory authority to review and comment on the plans prior to approval by DPH. The committee confirmed individual water supply plans will not be approved by DPH until DEP's most critical concerns about any plan are rectified to DEP's satisfaction. A review process also occurs for proposed diversions whereby DPH can review and comment to DEP on diversion applications. More coordination between DEP and DPH is needed in this area, however, so the water supply planning process produces a product that fully meets the planning requirements of both departments.

DPH recently proposed, through the Water Planning Council, to amend current law by removing the "impact on other water resources" provision from the WUCC planning process. Such a move was seen by DEP as furthering the disconnect between water supply planning and water diversion permitting. DPH, on the other hand, believes more planning efforts are necessary by water users other than public water suppliers. A compromise was struck between the two departments, and the proposed amendment was not in the council's final version changes sent to OPM.

It is also obvious flaws exist in the WUCC planning process. As shown in Table V-1, only four of the seven required WUCCs have been established since the concept was initiated in the mid-1980s. Further, only one of the regional water supply plans for the existing WUCCs has received approval from DPH. This is a process the state has had almost two decades to develop, yet it remains incomplete and underutilized from a statewide water resource planning perspective. DPH and the Water Planning Council have acknowledged problems exist in the WUCC process.

Table V-1. Status of Coordinated Water Planning Process and Water Utility Coordinating Committee Structure.					
<i>Public Water Supply Mgt. Area</i>	<i>Year WUCC* Established/First Meeting Held</i>	<i>Year Initial Coordinated Plan Submitted to DPH</i>	<i>Year Initial Coordinated Plan Approved by DPH</i>	<i>Year Renewal Plan Submitted to DPH</i>	<i>Year Renewal Plan Appvd by DPH</i>
Upper Conn River	3/87	3/89	--	--	--
Housatonic	6/86	9/88	--	--	--
South Central	12/87	4/90	--	--	--
Southeast	8/98	3/01	3/02	--	--
N. West Hills	Not established				
Northeast	Not established				
Southwest	Not established				
* Water Utility Coordinating Committee Source of Data: DPH					

The committee believes DPH plays an important role in protecting the overall quality and adequate supply of water resources for drinking water purposes. The department, however, must focus its efforts on developing the most efficient and effective process for achieving such goals on a regional basis. At the same time, limited natural resource and water diversion planning only compounds the water resource planning issue. A comprehensive water resource planning structure needs to be fully developed, as discussed below.

Summary of Findings

- *The current planning process for water necessary for instream and out-of-stream purposes is not comprehensive enough to meet the state’s overall planning requirements for water resource management.*
- *The long-range water resource management plan required by statute since 1967 has never been developed or implemented by the state. There is no fully integrated planning system in place to develop or implement the plan and the statute does not specify which agency is responsible for implementing the plan. As such, no statewide planning document exists that examines and analyzes water resource issues on a comprehensive, statewide basis.*
- *The state’s current water resource planning process is spread among several state agencies, primarily focuses on water supply for public drinking water purposes, and does not fully integrate planning for all water uses.*

- *The state's public drinking water planning process through the Water Utility Coordinating Committee structure has not fulfilled its original intent and is not adequately aligned with any type of comprehensive statewide water resource management planning.*
- *The Water Planning Council has studied the WUCC process, and recommendations for statutory changes have been developed by DPH.*

Recommendations

- 3) **C.G.S Sec. 22a-352 shall be amended to require the Water Planning Council develop and approve the long-range statewide water resource plan required by law. The council shall integrate individual Water Utility Coordinating Committee plans, the state's Plan of Conservation and Development, and any other planning documents currently available and deemed necessary to develop a statewide plan. Such plan shall include short- and long-range objectives and strategies for achieving those objectives. The initial plan shall be developed by July 1, 2005, and formally updated every five years thereafter. Each plan shall be approved by a unanimous vote of the council. Multi-stakeholder involvement in developing the statewide water resource plan shall be solicited as deemed appropriate by the council. The Water Planning Council shall include a summary of the water resource plan and implementation progress in its annual reports to the legislature.**
- 4) **The Water Planning Council should continue to explore ways to fully integrate comprehensive water resource planning on a statewide basis, taking into account overall water supply and demand. This process should include establishing a more functional regional water resource planning structure than the Water Utility Coordinating Committee system currently in place. The council should further examine whether the current Water Utility Coordinating Committee structure is the most efficient and effective for public drinking water supply planning on a regional basis.**
- 5) **The Departments of Environmental Protection and Public Health should work jointly to determine whether the statutorily-required individual water supply plans and Water Utility Coordinating Committees' integrated water plans include sufficient information to adequately plan for and implement the state's water diversion program within the Department of Environmental Protection, as well as for overall water resource management. The agencies shall convene an initial meeting by July 1, 2004, to begin discussing possible changes. Following the initial meeting, and any subsequent meetings, the agencies shall work cooperatively to implement any agreed upon changes. The Water Planning Council shall be informed of any changes agreed to by the agencies.**

Allocation

Proper water resource planning on a statewide basis cannot take place in a vacuum. Planning incorporating the sources and demands for water resources needs to occur and be adapted into a workable allocation system that balances water resources among various users statewide. The state lacks such a comprehensive, formalized water allocation process. This void was also clearly identified by DEP's *Diversion 2000* report, the Water Planning Council in its various subcommittee reports, and the council's January 2003 annual report to the legislature.

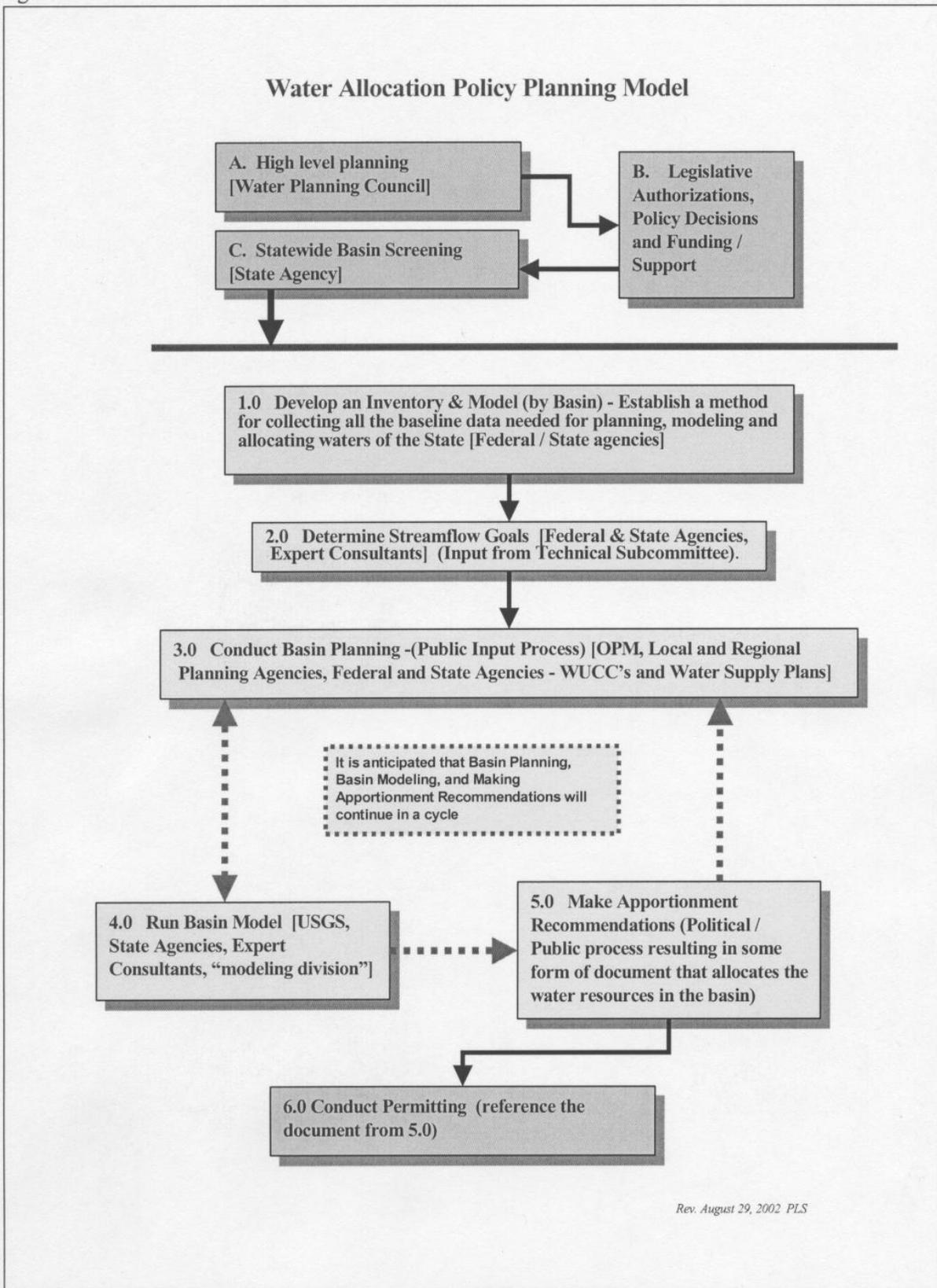
Water resource planning must be formalized into an overall allocation system that fully balances the needs of all water users. Without such a system, proper management of water resources that achieves the state's policy of balancing competing and conflicting needs for water equitably remains deficient. Such a process was a key consideration within DEP's *Diversion 2000* report and by the Water Planning Council since late 2001. The council has spent considerable time and effort on developing a model allocation system that has broad consensus among governmental agencies, water suppliers, environmental interests, and council members. The program review committee believes the council, through its Water Allocation Subcommittee, has devised such a model, as shown in Figure V-1.

The program review committee believes the model illustrated in Figure V-1 establishes the necessary foundation for identifying current and anticipated water sources and needs by watershed, determining stream flow goals based on those water sources and needs, matching water resources with the identified goals using a flexible, scientific methodology derived on a basin-by-basin approach, and implementing a diversion permitting process based on sound planning and data. The model also establishes a framework for prioritizing competing demands on water resources – a process that has been identified as lacking in the state.

The final design and how to implement the allocation model have not been completed by either the council or any state agency. The council has decided evaluating the implementation of the model is a significant element of the council's upcoming agenda. The committee agrees a comprehensive process to plan for and allocate the state's water resources using a balanced and responsible approach is necessary.

An allocation process with specific apportionment capability is not currently authorized in statute or regulation. The Water Diversion Policy Act outlines a process whereby the Department of Environmental Protection is responsible for permitting specific withdrawals from watercourses throughout the state based on specific statutory criteria. The diversion act and the DEP diversion process attempt to strike the necessary balance between interests, but do not explicitly detail, as a matter of policy, whether certain uses of water are more valuable than others, as discussed later in this report.

Figure V-1.



An incremental approach to implementing an allocation model is necessary. Developing a basin inventory, which is one of the first steps necessary in the WPC-endorsed allocation process, is more realistic if accomplished on a basin-by-basin approach, rather than analyzing the entire state at one time. Decisions are needed to determine the level of basin analysis necessary to properly implement the allocation planning process. According to DEP, Connecticut is made up of five major basins, 44 regional basins, 356 sub-regional basins, and several thousand local basins. As such, a structured approach to allocation planning and basin modeling will have to be made at the most feasible, realistic, and cost-effective basin level.

Although focusing initial efforts on selecting and analyzing the state's most highly stressed basins in terms of water resources seems more practical and cost efficient than a wholesale approach, it is also more time consuming. Developing an accurate inventory and resource management model by basin is a very detailed and highly technical process. As discussed below, several basin studies are currently underway across the state. Committee staff also discussed the process in detail with representatives involved in a study conducted in the Pomperaug River region. In short, the process to develop an overall water resource management plan within the Pomperaug watershed using quantitative analysis through computer modeling will be several years in the making. However, as basin analyses become more refined, it will be highly likely efficiencies realized as part of this, and other studies, can be translated to other basins.

Summary of Findings

- *There is no structured water allocation system based on a formalized planning process currently in place within the state, nor does state law provide for such a process.*
- *A water allocation planning model has been developed by the Water Planning Council. The model has broad consensus among governmental agencies, water suppliers, environmental interests, and council members.*
- *The council's model establishes a formal process for identifying water sources (current and anticipated) and needs by watershed, determining stream flow goals, and methodically/scientifically matching the stream flow supply/demand with the goals on a basin-by-basin approach.*
- *The model is under consideration by the Water Planning Council and has not been fully developed. Further, the council lacks the necessary statutory authority to implement a statewide water allocation system.*
- *There are several basin studies either completed or underway to examine overall water resource management within various basins statewide, including the Pomperaug River study, which emphasizes developing an integrated water resources management plan based on specific water resource data and scientific modeling.*

Recommendations

- 6) **C.G.S. Sec. 25-33o shall be amended to require the Water Planning Council to develop, operationalize, and oversee implementation of a structured approach for water resource planning and allocation on a comprehensive statewide basis. Such a system shall authorize the Water Planning Council to identify stream flow goals based on proper planning and scientifically quantifiable data, prioritize/apportion water among users, and oversee an efficient water diversion permitting process to effectively allocate water resources.**
- 7) **The Water Planning Council shall establish a multi-stakeholder group by July 1, 2004, to begin developing short- and long-term strategies for implementing a comprehensive water allocation planning process. The council shall prioritize the steps necessary to implement a water allocation system, outline the resources required to fulfill those steps, and formulate/submit any requisite legislation and funding requests. The council shall describe its progress in its annual reports to the legislature.**

Data Collection

The basis for proper water resource planning and allocation depends on accurate and timely data. The state's current data for water resource needs and demands are not adequate to support a formal planning and allocation system, although efforts are being made to address this issue. How much water is available, how much is being used, and how much may be needed in the future are all important elements about which to collect data, albeit a difficult and highly technical task.

Water diversions. DEP has not consistently maintained up-to-date data on overall water usage for registered diversions (as discussed in Chapter Four.) The department noted it did not have the statutory or regulatory means to collect such data from operators with registered diversions. The committee believes without such information, proper planning is not possible.

In 2001, the legislature required DEP to begin developing a formal database for registered diversion information, which the department has started. Water usage data for diversions with state permits are more readily available to DEP. Diversion permit holders are required to submit information about their diversions to the department on a regular basis as a condition of their permits.

Basin data. A primary component of the water allocation planning model shown in Figure IV-1 is the development of a basin-by-basin inventory. The inventory includes information on all consumptive and partially-consumptive water diversions and discharges within a particular basin based on actual basin data. Such data will serve as a baseline for planning and developing the necessary quantitative models for allocation purposes. The Water Planning Council has identified the overall lack of water data by basin as a key hindrance to an overall water management system.

Several studies to examine overall water resource management within various basins statewide are either underway or have been completed. As mentioned, the Pomperaug River basin study, for example, is developing an integrated water resources management plan based on specific water resource data derived from scientific modeling. The computer models will be used to help guide water resource management planning and balance water allocation within the basin – exactly what needs to be done for basins statewide.

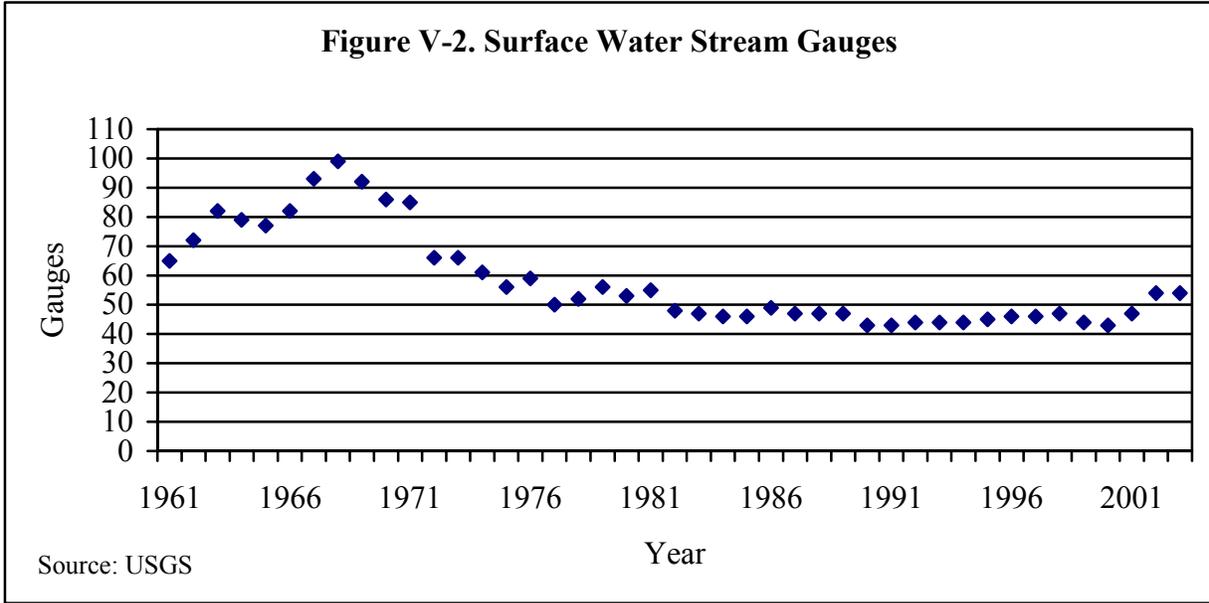
Stream gauges. Stream gauges, as discussed earlier, are vital to the actual measurement of stream flow within watercourses. The data collected from gauges are essential for planning and program purposes.

Stream gauge information, collected primarily by the United States Geological Survey, provides the quantitative water volume and velocity information necessary for stream flow analysis. The USGS maintains stream gauges at various sites throughout the state and supplies stream flow data to state agencies and the general public. For state-level data purposes, the stream gauges are primarily funded through a cooperative arrangement between USGS and DEP.

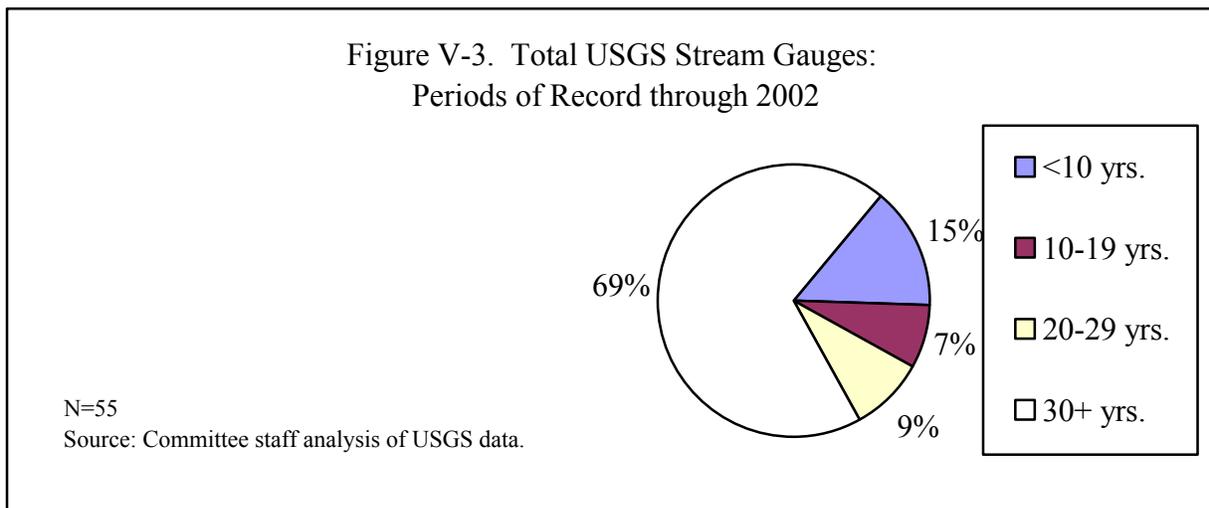
Figure V-2 illustrates the number of surface water stream gauges in Connecticut remained relatively steady for the past 20 years. This was possible by USGS including more funding partners. For example, in 1995 there were only six partners and in 2003 there were 14. The number of gauges over the last 40 years reached its peak in 1968 when 99 gauges were in operation.

Historical stream flow information is available for analysis from approximately 170 sites statewide since gauging began in the state in the early 1920s. The data collected from these sites cover at least one year of continuous recording at a specific stream gauge. Of the 170 sites, 90 have 10 or more years of recorded information.

Committee staff analyzed data from the current stream gauge system to determine how long the gauges have been operating (i.e., “period of record”). Figure V-3 shows the results. Of the 55 gauges operating during 2002, eight have been collecting data for less than 10 years, four for 10-19 years, and five for 20-29 years. The vast majority of USGS gauges (69 percent) have been collecting stream flow data for 30 or more years. This is important because stream flow data for 30 or more years is considered the most beneficial for analytical purposes.

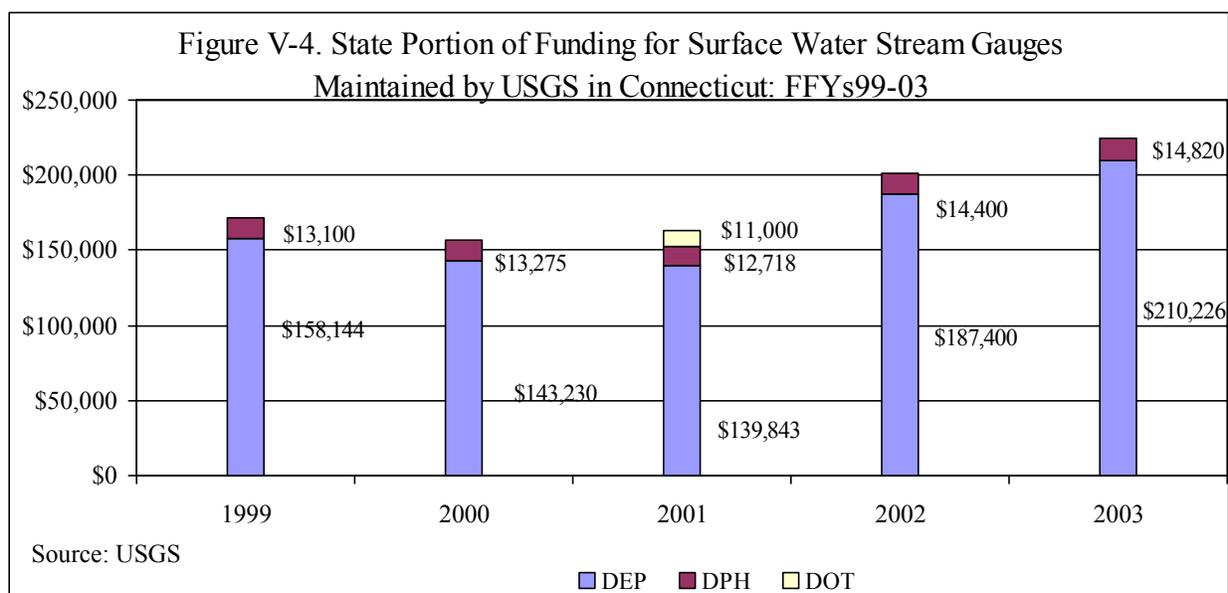


The network to physically measure stream flow and collect stream flow data has been examined by the Water Planning Council. The council established a workgroup to “evaluate the cost and feasibility of maintaining a scientifically defensible stream gauging network.” Due to a lack of time and resources, the group could not meet the original charge of the planning council. Instead, the group focused exclusively on the current monitoring network. In-depth scientific studies need to be performed to determine the appropriate number and location of gauges. The committee believes the central question – what is the most appropriate stream gauging system necessary for fully implementing the proposed water resource allocation model (Figure V-1) – still needs to be answered by the council.



State funding for stream gauge operation has increased 31 percent over the past five federal fiscal years, as shown in Figure V-4. The figure also shows DEP provides the bulk of state funding for operating stream gauges statewide.

Although not illustrated in the figure, state funding has accounted for roughly one-third of the overall cost necessary to operate stream gauges statewide since 1999. The total cost to maintain stream gauges in Connecticut totaled \$652,400 in FY 03. Of the total, DEP contributed a third, a third was borne by USGS, and the rest by other federal and local partners.



Summary of Findings

- *The collection of stream flow information, including the overall amount of water withdrawn through registered diversions, remains an issue.*
- *The aggregate number of stream gauging stations statewide has remained relatively constant over the last 20 years at approximately 50 gauges. This is down from a high of 99 gauges in 1968. State funding for such gauges has increased 31 percent since 1999, and currently accounts for roughly one-third of the USGS expense to operate stream gauges statewide.*
- *Almost 70 percent of USGS surface water gauges in operation during 2002 had 30 or more years' worth of stream flow data.*

- *The Water Planning Council has not fully examined the issue of an optimal stream gauge network, but has preliminarily found:*
 - *Only 20 percent of the current gauges measure naturally-flowing streams that are not influenced or impacted by human activities such as impoundments or diversions. (Stream flows from naturally-flowing watercourses are the most beneficial to analyze from a biological perspective.)*
 - *Statewide, 80 gauges with at least three years of stream flow data have been discontinued over time; 50 of these had information from 10 or more years.*
- *The issue of stream gauging and determining an optimal stream gauging network that works in conjunction with a comprehensive water planning and allocation system needs to be analyzed further by the Water Planning Council.*
- *The state has contributed roughly one-third of the cost to operate stream gauges statewide over the past five years. In 2003, the operating costs for stream gauges totaled just over \$652,000, of which the state contributed \$225,000. The bulk of state funding for stream gauges comes from DEP.*

Governing Structure

No single state agency has explicit authority or responsibility for aggregating comprehensive water quantity and demand data for planning purposes or acting as a clearinghouse for water management data related to stream flow. DEP, DPH, DPUC, and OPM are all involved to varying degrees.

There has been a lot of discussion within the Water Planning Council about the creation of an “overarching authority” to manage water resources. Multiple WPC subcommittees recommended water resource management, planning, and allocation be implemented by an entity without the institutional bias of any single state agency. Such a governing structure would incorporate various responsibilities and functions of DEP and DPH regarding water resource management, with ultimate accountability resting in one place.

Several states reviewed by committee staff are organized whereby one entity is responsible for implementing a comprehensive, centralized system for water resource management. For example, in Florida five Water Management Districts exist, each accountable to an independently appointed governing board. The districts have special taxing authority and are responsible for the various components of a unified water management process, including planning, permitting, and data collection and analysis. In New England, several states including Massachusetts and Vermont combine public drinking water planning within their environmental/natural resource agencies.

The committee believes the concept of an overarching governing authority for water resource management that would include stream flow has merit and should be explored in more detail. Under the current system, water management and planning occur in multiple state agencies, with no comprehensive statewide plan. Several Water Planning Council subcommittee reports, as well as various state studies, have concluded the current governing structure is not conducive to coordination, effectiveness, or efficiency for water resource planning. The fact the WUCC structure is 20 years in the making and still not completed, plus the absence of a comprehensive statewide water resource plan, supports this claim.

Although most of the Water Planning Council subcommittee reports advocated a new approach to governing water resource management in the state, the full council did not support the concept of a new state water resource department in its January 2003 report to the legislature. The council noted the interrelationship of disciplines required to manage water resource allocation mitigated against a single agency approach. The council agreed streamlining the current functions of agencies was necessary and could be done through “more interagency coordination and coalescing of agency functions.” The council reported it will establish a group with a broad array of stakeholders to address this issue, but this has not happened as of early December 2003.

The committee concurs with the council and its subcommittees that interagency coordination is vital for an efficient and effective water resource system. There are several initiatives underway to address interagency coordination through a more streamlined governmental process. Public Act 03-141 requires the Water Planning Council to examine the feasibility of merging the data and regulatory functions of DEP’s inland water division and DPH’s water supply section. DEP is also developing a work plan for the council’s consideration on this matter and others. The work plan was presented to the council at its December 2003 meeting.

The Water Planning Council Advisory Group has also been discussing the issue over the past several months. The group presented its first set of recommendations to the WPC in early December proposing use of a neutral party to facilitate discussion among various entities about the overarching authority concept. Given the reluctance on the part of the council for a separate water resource agency and the subcommittees’ assessments that a different management structure is necessary, the committee believes the neutral facilitator approach could be beneficial in helping achieve consensus.

The initiatives outlined above are warranted and the Water Planning Council, as well as the respective state agencies, needs to begin acting on the important issue of comprehensive water resource management and integrating varied processes that currently exist. Other governing models, including those that centralize functions, also need to be examined and possibly applied to water resource management.

The committee has concerns regarding implementation of the apportionment process outlined in Figure V-1. It is unclear which entity would have the responsibility for making apportionment decisions within the state’s current management structure for water resources once a final allocation structure is approved through the council. The WPC’s allocation

subcommittee recommended a third party oversee the apportionment process; the committee believes such a structure has merit. An independent water resource authority to implement and oversee the state's water resource planning and allocation system, as proposed in Figure V-1, is a worthwhile alternative to examine. Until the system becomes more coordinated, the Water Planning Council needs to unify the disparate agency functions to ensure their efficiency and effectiveness.

It is obvious such a change in the overall governing structure of water resource management needs additional detailed discussion, thorough analysis, and careful planning. Recommending the specifics of such a structure is outside the scope of this study. However, given the amount of attention the issue of restructuring the management of water resources has received within the Water Planning Council, further study is warranted.

Recommendation

- 8) The Water Planning Council should establish a multi-stakeholder workgroup by July 1, 2004, to study the issue of increased interagency coordination regarding water resource management and planning, as recommended in the council's January 2003 report to the General Assembly and the November 2003 report of the council's advisory group. At minimum, the workgroup shall, with advice from the council, address and make recommendations for establishing a revised management structure to oversee and coordinate water resource matters, including stream flow. The group should also identify any statutory language, regulatory changes, and resources necessary for proper implementation. The workgroup should make a report to the council by October 1, 2005. The Water Planning Council should detail the workgroup's findings, recommendations, and rationale in its January 2006 annual report to the legislature.**

DIVERSIONS

The state has devised a process for "allocating" water resources whereby specific diversions from watercourses must be reviewed and approved by the Department of Environmental Protection. The process, however, is based on a first-come, first-served principle, and not on a formal allocation process established through sound planning. The committee examined the state's water diversion process, including the difference between "registered" diversions and diversions for which DEP grants permits and enforcement as discussed below.

Diversion Act

State law defines a water diversion as "any activity that causes, allows, or results in a withdrawal from or an alteration, modification, or diminution of the instantaneous flow of waters of the state." Diversions are used for various purposes, including creation/augmentation of public or private water supply, industrial cooling, irrigation, hydropower generation, flood management, and recreation. Water diversions can affect stream flow by decreasing the overall amount of water available for downstream purposes.

State permits from DEP are required for specific water diversions. The legislature first required diversion permits in 1982 under the Water Diversion Policy Act. The act made clear that water, as a resource, was a competing interest for consumptive and non-consumptive uses and subject to environmental review by the state. However, neither the diversion act nor its accompanying regulations establish stream flow standards or a process whereby water resources are allocated among competing demands based on specific criteria.

The 1982 act also states that diversions must be compatible with long-range water resource planning. As found earlier in the report, the state lacks the comprehensive long-range water resource plan required by C.G.S. Sec. 22a-352. The act further recognizes an adequate supply of water for domestic, agricultural, industrial, and recreational use and for fish and wildlife is essential, yet no formal planning process is in place to comprehensively examine how much water is necessary to meet various resource demands.

Permitting Process

The diversion permitting program within DEP is viewed as the state's primary tool for managing water quantity. In general, any alteration of surface water flows within a watershed of 100 acres or more or withdrawal of water exceeding 50,000 gallons per day in a 24-hour period requires a diversion permit. Examples of such diversions include: relocation, damming, dredging, channelization, or bypass of a watercourse; lake dredging; dam alteration or removal; storm water runoff collection; water pumping from wells or surface waterbodies; and alterations of registered diversions.

Diversion applications are considered on a first-come, first-served basis by the department. Multiple exemptions to the permitting process are defined by statute and regulation, as described in earlier.

Although a full program review of the diversion program was not conducted, the current permitting process is not based on adequate long-range planning, as required by law, or how diversions fit into the context of a formal water allocation process based on comprehensive, scientifically-derived basin data, as discussed in Chapter Two. These conclusions were also borne out by the Water Planning Council and DEP's Water Allocation Policies report submitted to the legislature in 2000.

The diversion permitting process is generally viewed as lengthy and expensive with unpredictable results not based on a formal allocation system or comprehensive information. Committee staff analyzed basic diversion program data from several perspectives to quantify the average length of time it takes DEP to issue permits. To account for differences in the types of permits issued, committee staff analyzed timeframes for consumptive and non-consumptive permits, and whether the permit was an individual permit or a general permit (as described in the briefing report.) This was done because individual permits for consumptive purposes are typically more complex and take longer to review than general permits for non-consumptive purposes. Table V-2 shows the results.

**Table V-2. Average Length of Time for DEP to Issue Diversion Permit
After Application Received
January 1998-November 2003**

Diversion Type →	Consumptive	Non-Consumptive
Permit Type ↓		
Individual	454 days (n=33*)	443 days (n=19)
General	169 days (n=68)	67 days (n=10**)
* Excludes 10 temporary permits ** Includes only construction permits Source of data: DEP Permit Application Management System		

From January 1998 through November 2003, the time between the application submittal date and when DEP took final action on the application for individual permits for consumptive diversions (those taking water out and not returning it to the watercourse/basin) averaged 454 days. The average time to approve general permits for consumptive diversions averaged 169 days, which is almost two-thirds the time of individual consumptive permits.

The timeframes for non-consumptive permits were also analyzed. (Non-consumptive diversions withdraw water from a stream or river, but return the water to the same, or generally the same, area after it is used and are considered more “environmentally friendly.”) The average time for DEP to review and approve a non-consumptive, individual permit was 443 days, while non-consumptive, general permits averaged 67 days. It should be noted, the only types of non-consumptive general permits issued by DEP between 1998 and 2003 were permits for construction projects, which are generally reviewed and issued relatively quickly.

Quantifying the overall expenses associated with diversion permits was difficult without formally surveying applicants regarding their expenses, which was not done. However, according to several permit holders and DEP the costs of applying for a diversion permit range from several thousand dollars to hundreds of thousands of dollars, depending on the complexity of the diversion and the ecological impact analyses and studies necessary for the permit. The committee believes a comprehensive allocation planning process, as recommended earlier, and adequate long-range planning with scientifically-derived water resource supply and demand data from a basin perspective, also recommended by the committee, would lessen the overall costs of diversion applications and reduce the turnaround time for DEP to make a diversion decision.

Registered Diversions

Prior to the Water Diversion Policy Act, diversion operators were not required to obtain a state permit to operate their diversions. The act gave existing operators until July 1983 to “register” their diversions with DEP. When registering diversions, operators had to specify the locations, capacity, frequency, and rate of withdrawals of their diversions, as well as a description of the water use and water system. As of September 2003, DEP had 1,878 registered diversions on record, which represent 80 percent of all diversions statewide, either registered or permitted.

In terms of withdrawal restrictions under the act, diversion operators could register any amount of water withdrawal up to their current diversion machinery’s capacity at the time of registration, even if it exceeded their true needs or historic use. Existing diversions not properly registered became subject to state permit requirements.

As mentioned below and in various water resource reports, DEP has not kept an up-to-date accounting of registered diversion information. Recent legislation required the department to compile important registered diversion information, including whether a diversion was still operating, where registered diversions were located, and the quantities of water diverted. Without such vital information, a comprehensive water resource planning/allocation system, including whether diversions exacerbate low-flow watercourses and what impact diversions have on water resources from a macro perspective, cannot be adequately developed.

Water quantities. Since the registration process allowed an operator to register diversions at the maximum capacity, registered amounts may not depict current actual usage, possibly leading to inflated withdrawal quantities within particular watercourses. DEP, however, uses the diversion quantities originally registered in the early-1980s when reviewing diversion permit applications. The department believes this is prudent because registered diversion operators are allowed to withdraw their lawfully-registered quantities at any time, even if such amounts do not reflect actual need or relevancy at the present time. The department is also using the registered diversion quantities when making decisions whether watersheds are “overallocated,” meaning there is not enough water supply to meet demand. Water purveyors, on the other hand, view permit decisions as being made based on “paper quantities” that may not truly reflect current usage. Regardless, there is no mechanism in place requiring DEP to determine actual withdrawal quantities for registered diversions or have diversion operators periodically amend registered withdrawal quantities to reflect current diversion rates.

Environmental review. DEP has no authority to review registered diversions for environmental purposes. Various interests claim eliminating registered diversions and requiring each diversion to go through the permitting process would be beneficial for proper planning and environmental purposes. Eliminating diversion registrations would certainly be advantageous for developing a truly comprehensive water allocation planning process. However, wholesale elimination of approximately 1,900 registrations that would have to be replaced by DEP-issued diversion permits based on environmental assessments would paralyze the permitting process given its current resources. At present, the division generally has one to two analysts reviewing diversion applications on a regular basis and handles approximately 50-70 applications a year.

Some have advocated a staggered environmental review process. The committee believes this approach has credibility for water allocation planning purposes, but would require thorough and prudent analysis, planning, and resources.

Water utilities depend on the registered diversion process originally allowed under law. Infrastructure has been built and capital investment made around the registered diversion system in place for the past two decades. Exempting registered diversions from state permitting requirements also has allowed water utilities to plan their future water supplies unencumbered by state regulation. A unilateral elimination of registered diversions replaced with state permits would disrupt past and future planning and water utilities' investment. The committee believes diversion operators would not easily relinquish their statutorily-granted registrations, particularly given the state's lack of comprehensive water resource planning to determine how much water is actually needed for natural resource purposes, the absence of a formal water allocation process, and the relative expense of the current diversion permitting process.

The debate around eliminating diversion registrations needs further attention. The allocation subcommittee of the Water Planning Council briefly touched on the topic, but did not reach consensus on solutions. In the meantime, registered diversion operators should not be wholly exempt from supplying DEP with periodic data on aspects of their diversions. Such information, if properly collected, managed, and analyzed by the state, is vital for comprehensive water resource planning and allocation purposes.

The water diversion act does not grant DEP the authority to require operators to meter their diversions or incorporate conservation measures into their operations. As a result, the department says it has no way of quantifying the amounts of water diverted on which to base future planning efforts. However, until recently required by the legislature, DEP had not proactively requested or collected quantitative data from registered diversion operators.

Unused registrations. There is no provision under the water diversion act allowing the state to "retire or modify" unused or unwanted registrations. Registrations may be transferred among operators as long as the new operator diverts for the same use. Otherwise, a diversion must go through the state's permitting process.

There is no incentive for diversion operators to contact DEP if a diversion is no longer used or wanted. Registrants are not required to inform DEP of unused/unwanted diversions, and the department has no statutory or regulatory leverage to require such information. There are also no state fees associated with maintaining registered diversions, as there are for permitted diversions.

Data. State law required all registered diversion operators to submit operating data to DEP for each registered diversion in use as of July 1, 2001. Monthly diversion information for 1997-2001 was required, including diversion frequency and rate of water withdrawals or discharges if the diversion was metered. Estimates were required for diversions that were not metered and from any operator maintaining a diversion solely for agricultural purposes. (Owners or operators of existing electric generating facilities using fossil fuel were exempt from this

requirement, provided they complied with state and federal environmental laws and if reports were made to DEP estimating future water use necessary to comply with those laws.)

In addition, any diversion operator who failed to register a diversion with DEP back in 1983 but continued to maintain the diversion as of July 2001 or who operated a diversion during that period without the necessary permit, was required to report operating data to DEP back to July 1982, including location, capacity, frequency, and withdrawal/discharge rates and a description of the water use and water system. Actual or estimated monthly data for 1997-2001 on frequency and rate of water withdrawals/discharges (depending on whether the diversion is metered) were also required.

The information reported by diversion operators as part of the data collection program required under C.G.S. Sec. 22a-368a cannot be used against the operator by DEP for civil penalty purposes, provided the operator filed a water diversion permit application with DEP by July 1, 2003.

Database construction. DEP is developing a database using the diversion information submitted by operators. The required data have been submitted in both electronic and paper formats. Of the 1,900 total registered diversions, information from approximately 500 non-consumptive registered diversions was not expected by DEP, because diverted water is eventually returned back to the watershed. Data from the remaining 1,400 diversions was required and must be entered and analyzed.

DEP cites several limitations to its water diversion database, including the response rate to the data request, the integrity of some data, and the limited staff resources available to develop and maintain a workable database. Future database maintenance is also seen as a problem by the department due to a lack of staff. At present, a civil engineer typically used for water diversion enforcement efforts is developing the database. The department notes this person has been devoted to the database project for approximately one year.

The state law initially requiring the diversion data does not require periodic updates of the data. The committee believes the collection, maintenance, and analysis of current registered diversion information is vital to adequately managing the water diversion process. Proper water resource planning and allocation depend on up-to-date registered diversion information. The committee, however, questions DEP's internal capacity to regularly collect, maintain, and analyze such data given the department's lack of staff resources to keep up with current water diversion responsibilities.

DEP has tabulated the responses to the data required by P.A. 01-202. Some of the key results include:

- 1,380 diversion reports were expected from registered operators;
- 1,082 reports were submitted for a 78 percent response rate;
- 39 registrants have abandoned approximately 100 registered diversions; and
- 35 registrants transferred 87 diversions to other entities.

Enforcement

Table V-3 highlights water diversion enforcement statistics for the past five fiscal years. As the table shows, there are several types of enforcement actions available to DEP for handling water diversion complaints. The most frequently used action is for the department to issue a notice of violation to the proposed offender. This notice identifies the alleged offense(s) and requires it be corrected to avoid further enforcement. The department may also unilaterally impose solutions to rectify problems, issue consent orders, or refer cases to the attorney general's office. Civil penalties may also be levied.

The enforcement process has historically been based more on responding to complaints filed with the department than administering a more proactive approach, such as regular spot inspections for diversion permit holders. Over the last several years, however, the department has been referring complaints to local authorities to handle, if the department believes the alleged violation does not have statewide environmental significance. DEP also requires each permit holder to submit annual reports showing how well the permit holder has complied with various conditions of the permit. The department uses this information for enforcement purposes, as well as for permit renewal purposes.

Table V-3. Water Diversion Enforcement Statistics						
FYs 1999-2003						
Fiscal Year	Complaints Received	Notice of Violation	Unilateral Order	Consent Order	Attorney General Referral	Penalties Assessed*
1999	53	9	1	0	2	\$11,474
2000	68	17	2	1	0	\$25,500
2001	28	10	2	7	1	\$1,106,700**
2002	29	12	0	6	2	\$13,000
2003	26	8	1	5	0	\$113,420
Totals	204	56	6	19	5	\$1,270,094
* Includes penalties assessed under multiple statutory authorities available to DEP, not only water diversion. Includes amounts assessed, not those actually collected.						
** Includes one penalty of over \$800,000.						
Source of data: DEP						

Summary of Findings

- *Neither the Water Diversion Policy Act nor its accompanying regulations establish stream flow standards or a process whereby water resources are allocated among competing demands based on basin-specific criteria.*
- *The Water Diversion Policy Act requires diversions be compatible with long-range water resource planning, yet the state lacks the comprehensive long-range water resource plan required by C.G.S. Sec. 22a-352. No formal planning process is in place to comprehensively examine how much water is necessary to meet various resource demands, including water diversions; consequently, the water diversion act is not fully implemented.*
- *Information about water diversions plays a critical role in overall water resource planning and policy development, yet current information about registered diversions has not been routinely collected by the state. No requirement currently exists for diversion operators to regularly submit operating data to the state.*
- *Water withdrawal quantities for registered diversions are based on maximum capacity amounts set in the early-1980s. Registered diversion amounts may not fully reflect current use, although there is no mechanism in place requiring the state to determine actual withdrawal quantities for registered diversions or to have diversion operators periodically amend registered withdrawal quantities to reflect current diversion rates.*
- *DEP does not have statutory authority to retire unused or unwanted registrations; no state fee(s) exist for registered diversions comparable to diversions with state permits.*
- *Registered diversions are exempt from any regulatory review for environmental purposes.*
- *Diversion operators view registrations as a method of guaranteeing water as a resource for their operations and are reluctant to relinquish their statutory-granted registrations, particularly given the lack of a comprehensive system to determine how much water is actually needed for natural resource purposes and the overall effort and expense of the current diversion permitting process.*
- *The committee questions DEP's internal capacity to properly collect, maintain, and analyze registered diversion data within current resources, but such information is vital to proper water resource planning and allocation.*

- *For calendar years 1998-2003, the average time between submittal dates and when DEP took final action on applications for individual permits for consumptive diversions was 454 days. The average time to approve general permits for consumptive diversions was 169 days. The average time to review and approve a non-consumptive, individual permit was 442 days, while non-consumptive, general permits averaged 67 days.*
- *Enforcement of water diversion requirements is limited to responding to complaints.*

Recommendations

- 9) **The Water Diversion and Policy Act shall be amended to require any person or entity maintaining a lawfully registered water diversion to periodically file with DEP diversion information the department deems necessary for proper planning/allocation purposes and, to the extent feasible, in a compatible electronic format determined by the department. The information shall at least include water withdrawal quantities by time of year and the purpose of the diversion.**
- 10) **The Water Diversion and Policy Act shall be amended to require DEP, in conjunction with other appropriate state agencies, to annually report on the status of all water diversions statewide. Such report shall be submitted to the legislative committees of cognizance and the Water Planning Council each January 1. DEP shall also develop key performance measures for its water diversion program and report its progress in meeting such measures.**
- 11) **The Water Diversion and Policy Act shall be amended to require registered diversion operators to periodically re-register their diversions with DEP through a process developed by the department. A registration fee shall also be required as part of the re-registration process. Failure to submit the fee shall result in forfeiture of the diversion's registered status, requiring a DEP-issued diversion permit. Fees collected through the re-registration process shall be deposited into a fund managed by the Water Planning Council and dedicated for water resource planning and program purposes. Registrations shall be considered renewed immediately upon receipt of payment.**
- 12) **The Water Diversion and Policy Act shall be amended to allow for unused or unwanted water diversion registrations to be retired through a process established by DEP.**

MINIMUM STREAM FLOW

A major issue among competing interests for water resources is how much water is actually needed for “proper” stream flow. Stream flow, as noted earlier, generally means water volume and velocity, which are necessary to meet instream and out-of-stream demands. The state has minimum stream flow standards, but such standards only apply to watercourses DEP stocks with fish. There are no uniform stream flow standards in place for all watercourses statewide. Such a process, as discussed in this report, must be based on a comprehensive planning system, which currently does not exist in the state.

The Water Planning Council’s work regarding minimum stream flow is highlighted below. The council has not been able to thoroughly complete its review of the minimum stream issue due to various factors, including the complexity of devising minimum stream flow standards. The state’s current stream flow standards were also examined in terms of their applicability and enforcement.

Minimum Flow

Determining how much water is required to meet multiple uses (demand) and establishing how much water is actually available (supply) in various watercourses throughout the state, requires technical analysis and thoughtful planning. Public water supply, instream ecosystems, waste assimilation, industry, agriculture, recreation, and the overall aesthetic quality of a watercourse all depend on adequate stream flow. Low flow, as well as dramatically increased flow (i.e., flash flooding), can have adverse impacts on instream and out-of-stream water uses as well.

Determining the overall water resource availability and stream flow rates depends on multiple factors. Precipitation patterns, topography, evaporation and transpiration rates, groundwater recharge rates, and diversions along a watercourse all affect stream flow. Water availability and stream flow also vary depending on the time of year. Stream flow typically diminishes during the peak demand times of summer and early fall and is replenished during winter and early spring. Researchers have identified five components critical to the overall flow process and ecological condition of watercourses: magnitude of flow; frequency of flow; duration of flow; timing of flow; and rate of change of hydrologic conditions.

A variety of methods have been developed to determine ecologically-protective stream flow rates within watercourses. Factors affecting stream flow, as outlined above, along with basin characteristics and whether a watercourse is “regulated” (i.e., includes an impoundment, diversion, or other condition altering the natural flow of water), are examined as part of the various methodologies.

Information collected from stream gauges placed at strategic points along watercourses is the preferable method to quantify actual flow within a watercourse. Gauges collecting long-term data (i.e., 20 or more years) allow more precise statistical analyses for quantifying stream flow.

Gauged streams also serve as “proxies” for watercourses without gauges. Adequate stream flow for ungauged streams can be estimated by using flow data from gauged watercourses with comparable characteristics. The information is then extrapolated to represent conditions on comparable streams without gauges. This process can be done through various statistical analyses using computer models. The sophistication of such models is developing as researchers learn more about stream flow and specific basin characteristics.

A widely used standard for determining how much water should be available within various streams and rivers in the Northeast is the New England Aquatic Base Flow (ABF) standard. The standard was developed by the U.S. Fish and Wildlife Service in 1981 and specifies a minimum stream flow rate in cubic feet per second deemed “ecologically protective.” Planning, diversion permitting, and other decisions regarding stream flow utilize this methodology.

Despite its use in New England, the minimum flow rates identified by the ABF methodology are based on water data primarily from other New England states, with limited data from Connecticut. As such, the standard is not considered wholly representative of this state’s watershed and stream flow characteristics. The ABF standard, however, has been used in Connecticut for stream flow planning and diversion permitting purposes in the absence of a more refined methodology specific to this state’s characteristics.

The state uses other stream flow standards to a lesser extent than ABF to establish “adequate” water flow, including minimum stream flow release standards outlined in state regulation for watercourses stocked with fish. However, that standard is not considered effective for various reasons highlighted below. Applicants for diversion permits through DEP can also conduct their own stream flow studies determining flow rates subject to review by the department.

Stream Flow Methods Identified by the Water Planning Council

As part of the Water Planning Council’s original charge, a 22-member subcommittee of the council examined the issue of minimum steam flow in 2002. The subcommittee specifically analyzed methods for measuring and estimating natural stream flows in Connecticut for use in determining overall flow standards. Any standards devised by the subcommittee were to help achieve a balance between protecting the ecology of rivers and streams and satisfying the demand for water resources from other users.

Stream flow methods and standards. The subcommittee determined that developing long-term stream flow standards required lengthy study and analysis, most likely taking multiple years. Adequate long-term standards should also be based on specific basin characteristics for various watercourses. Some basin-specific studies have been conducted in the state, but not on the scale necessary to establish sufficient long-term flow standards statewide.

The subcommittee, therefore, focused its efforts on developing an interim process for establishing natural stream flows through relatively quick and inexpensive methods of collecting flow information. The subcommittee noted, however, flows calculated using an interim approach are not considered to have the same ecological value as flow requirements derived from basin-specific characteristics that include thorough analysis of factors such as precipitation, hydrology, geomorphology, and diversion information. Until long-term rates/standards can be developed using more sophisticated methods, flow values derived using an interim method were viewed by the subcommittee as beneficial for the following purposes: 1) developing water quantity goals; 2) water resource planning; and 3) as a basis for applying professional judgment in environmental analyses and permitting.

The vast majority of subcommittee members endorsed consideration of the Apse¹ method (also termed Connecticut Aquatic Base Flow) on an interim basis within the state's watercourses to estimate stream flows presumed to be protective of instream ecology until more refined information becomes available. According to the council's stream flow subcommittee, "the information derived from applying the methodology may aid in determining future stream flow standards." The Apse method was developed using specific data from 10 sites throughout the state making it more representative of Connecticut's water resource characteristics than other methodologies, including ABF.

The full Water Planning Council agreed the Apse method "is a reasonable approach to estimating ecologically protective instream flow" for October through June. Consensus was not reached, either by the subcommittee or the council, on a specific method to assess the flows necessary to meet various resource demands during the low-flow months of July, August, and September. As such, the state continues to lack a method for establishing stream flow during low-flow months that is more representative of Connecticut's watershed characteristics than the methods that currently exist.

In terms of the low-flow months, the subcommittee discussed two methods to better collect information and develop the basis for stream flow rates for those months. The committee was informed the subcommittee was close to endorsing a low-flow methodology, and believes the Water Planning Council, through additional work, can bridge this gap and establish a satisfactory interim stream flow methodology for year-round use until a more refined long-term standard(s) can be established.

The subcommittee considered the Apse methodology a "reconnaissance-level" technique to estimate stream flows that are presumed to be protective of natural habitat. Reconnaissance-level techniques are viewed as relatively quick, inexpensive, appropriate tools for stream flow planning purposes. However, according to the subcommittee, these techniques are seen as having "little predictive function, are based on relatively generic information, and do not support negotiated solutions."

¹ *Instream Flow Protection in New England: Status, Critique, and New Approaches to Standard-Setting*. Colin D. Apse, in fulfillment of the Masters of Environmental Management, Yale University School of Forestry and Environmental Studies, December 22, 2000.

The subcommittee was unwilling to fully endorse any of the various methods it analyzed as a regulatory standard without comprehensive evaluation. Some preliminary analysis of applying the Apse methodology as a regulatory standard was conducted for the subcommittee. The analysis showed potential impairment to safe yield levels within public water reservoirs to the point of possibly creating drinking water shortages due to having to release greater amounts of water during low flow months than the current standard. The results of this analysis were considered preliminary and not supported by the full subcommittee.

Environmental interests, including DEP, contend the Apse method can be used as an interim minimum flow standard until a more refined process is developed. The department believes regulations can be crafted with appropriate safeguards for public water supply if low flow conditions existed and the flow release requirements adversely affected safe yield levels. Others contend any regulatory stream flow standard must be based on individual basin characteristics from scientifically-derived collection and computer modeling techniques.

Because the Apse methodology is a relatively new, untested technique published in late-2000, the committee believes additional quantifiable analysis of applying the methodology as a regulatory standard is required. The committee also believes recommending the stream flow rates in Apse – or any methodology – as a specific regulatory standard for stream flow is beyond the scope of the study and best left to professional scientists and engineers to determine. It seems apparent, however, additional work is needed to more thoroughly understand the overall impact of applying any stream flow methodology, as either an interim or long-term minimum stream flow standard. More work is also needed to determine stream flow rates necessary during the low-flow months of summer.

Another issue expressed to the committee is the reluctance to use one stream flow standard on a statewide basis, a one-size-fits-all approach. Various interests indicated flow standards should be developed using the unique characteristics of individual basins, rather than applying a broad standard that may not be entirely appropriate within different basins.

Conducting site-specific studies within the state's various water basins, which would be part of the allocation planning process outlined in Figure IV-1, can be a relatively time consuming process requiring additional expenses depending on a variety of factors, including the basin level examined (e.g. major, regional, sub-regional, local). A policy decision has to be made as to whether the long-term benefits of such a process outweigh the time and resources necessary to implement it. The program review committee believes the most logical way to begin would be to conduct a pilot study whereby basins considered most highly stressed in terms of stream flow are analyzed first.

Progress. A key element to establishing stream flow standards is adequately determining how much water is necessary to support the various instream and out-of-stream uses. To date, this process has not been fully accomplished to the satisfaction of all parties involved.

Environmental interests claim more water is needed to support instream needs, yet site-specific quantitative data and analyses to support the claim are limited. This is due partly because the methods for collecting quantitative data, particularly on watercourses without formal stream gauges, have not been fully developed or applied to the satisfaction of the various water resource users. At the same time, water purveyors are reluctant to implement new or revised minimum flow standards until such scientifically-defensible data are developed establishing site-specific relationships between stream flow and habitat value for all months of the year.

The council's stream flow subcommittee also agreed on a framework for "quantifying the relationship between instream flow and habitat suitability to create and implement a long-term instream flow protocol for Connecticut's rivers and streams." The framework outlines seven factors to examine and "takes into account unique basin characteristics and provides more accurate and refined data for use in water resources planning, regulatory decision making, and working toward achieving long-term water quantity goals. This may provide the basis for establishing future water standards within the context of a balanced water allocation process." Although the framework for quantifying the relationship between stream flow and habitat value developed by the subcommittee was not formally referenced or endorsed by the Water Planning Council in its January 2003 report to the legislature, the council believes a long-term protocol for stream flow needs to be consistent with the water allocation model outlined in Figure IV-1.

The council also established a stream gauge network workgroup to examine how to establish a comprehensive system to collect stream flow data. The group submitted its report to the council in late October 2003. The current network to monitor stream flow was identified, yet the group said more time was needed to thoroughly resolve what an optimal strategic stream and ground-water gauging network should entail. The council is currently reviewing the report and has not made a decision on how to proceed in this area.

As mentioned earlier, several basin-specific studies have already been completed or are underway. The studies are vital to identifying the elements affecting stream flow within a specific basin and then estimating the stream flow rates necessary for balancing instream and out-of-stream water resource demands. Such studies have usefulness in planning, identifying stream flow goals, and helping establish long-term stream flow standards.

Current State-Required Minimum Releases

State law allows DEP to establish minimum stream flow release requirements on watercourses stocked with fish by the department. Stream flow regulations mandate minimum flow amounts on such watercourses and their tributaries. As such, the state's current policy of regulating only streams stocked with fish by DEP places a greater emphasis on those watercourses rather than working towards a stream flow balance for all watercourses statewide.

Committee staff tried to quantify the actual mileage of stocked streams. When compared with the total mileage of all watercourses statewide, the stocked-stream figure would provide context for the magnitude of streams and rivers regulated under the state's minimum flow requirements. DEP was not able to provide this figure, either through its Fisheries Division or Inland Water Resources Division.

The department, however, notes there are various ways the “stocked stream and its tributaries” standard can be interpreted. For example, if DEP stocks part of the Connecticut River, which it does at the river’s lower end, do all the river’s tributaries come under the standard? If so, DEP says the argument could be made that the entire watershed forming the river, which is extremely large, should be regulated.

Consensus within the department on which watercourses should be regulated under the minimum flow requirements has not been reached, which contributes to the department’s decision not to proactively enforce the minimum flow regulations. DEP testified at the committee’s recent public hearing that the state’s current minimum stream flow regulations are of limited nature and limited value. The department, therefore, has chosen to concentrate its efforts in other areas of water resource allocation and management, rather than rigorously enforcing the minimum flow regulations as they currently exist.

At the same time, water purveyors believe the current regulations are satisfactory and have concerns that applying a new minimum stream flow standard without fully analyzing any possible effect on required margin of safety and safe yield could have a detrimental impact. The end result is the state’s policy of balancing water resource needs is not being implemented.

The committee believes more work needs to occur in this area for a meaningful minimum flow standard to exist. The council, along with a good-faith effort on the part of a representative group of agencies and stakeholders impacted by this issue, must continue analyzing the minimum stream flow release topic and reach a meaningful, reasonable conclusion on both a short- and long-term basis.

Stocked-stream standard. A comprehensive stream flow policy aimed at achieving a responsible balance between protecting present and anticipated water supply needs and water necessary for the natural environment should not differentiate which watercourses are protected by minimum stream flow requirements. At the same time, such standards should be based on current scientific research and thorough analysis for determining the water quantity necessary to sustain a responsible balance among competing water demands. Otherwise, the state’s minimum stream flow standards are rendered useless, particularly without full enforcement.

It seems counter-intuitive to only apply minimum flow standards to stocked watercourses when state law recognizes an adequate supply of water for domestic, industrial, and recreational use and for fish and wildlife is essential to the health, safety, and welfare of the state’s citizens. This policy, unlike current regulatory stream flow requirements, does not differentiate between stocked and non-stocked watercourses in terms of requiring sufficient water supply. The committee believes this statutory requirement and the state’s minimum flow regulations run at cross-purposes. What is unclear, however, is the impact applying specific minimum flow standards to all watercourses would have on the margin of safety and safe yield requirements of public water supply reservoirs.

It was evident throughout this study that water suppliers and environmental groups are divided on the minimum flow standard issue. DEP and environmental interests maintain the current minimum stream flow standards are inadequate. The claim has been made that the amounts of water required for release from impoundments are not based on any current scientific methodology and may provide minimal to no ecological benefit for some watercourses. This point was testified to by DEP in the recent Shepaug River court case (described in Appendix B), where the state Supreme Court ultimately determined the department was free to seek changes to the minimum release standards through the normal regulations process, if it so desired.

Absent a formal process to properly determine stream flows necessary to support downstream ecosystems, water suppliers believe the minimum stream flow regulations are adequate. This does not negate the fact that a workable interim solution identifying flow requirements, particularly for low-flow months, cannot be devised through additional examination and analysis until an appropriate system to develop long-term minimum release standards based on credible basin planning and scientifically-derived basin data is implemented.

The committee believes limiting the minimum flow release standards to watercourses stocked with fish by DEP by its very nature may not provide adequate stream flow necessary for other instream and out-of-stream users of water resources. The relevant task that needs to be formalized by the state is determining how much water is needed to meet those other demands. Such a process is vital to developing appropriate stream flow standards.

If adequate stream flow for all watercourses statewide is a matter of state policy, minimum release standards from impoundments to support such stream flow should be applicable to all watercourses, regardless of whether they are stocked with fish by DEP. Prior to revising or developing new standards, however, the state needs to formalize a system to establish stream flow goals for its various watercourses, verify how much water is available within those watercourses, and determine how much stream flow is required to adequately support water resource demands within those watercourses.

Enforcement. As highlighted by DEP's testimony at the committee's recent public hearing on this topic, the department is not proactively enforcing the minimum stream flow release standards. There is also a dichotomy within DEP as to which division actually has responsibility for enforcing minimum flow regulations. Although the law granting the department authority to establish minimum flow standards is within the fisheries section of state statutes, operationally the DEP fisheries division is more focused on its stocking program than enforcing minimum flow regulations. Similarly, the inland water division, which oversees the state's water diversion process, is more focused on water allocation than applying the minimum flow standards. As a result, enforcement of minimum stream flow standards is not occurring outside of investigating complaints.

Minimum flow data. Neither state law or minimum stream flow release regulations require water companies to regularly submit data showing whether their impoundment operations meet flow requirements. DEP also does not unilaterally require the information. As such, there is no structured approach within the department – outside of responding to ad hoc complaints – for collecting minimum stream flow release data, analyzing the data, establishing

key performance measures, and making sure such performance indicators are met through enforcement. The committee believes one of the main reasons for this lapse is the department's view that the regulations are baseless in terms of scientific calculation and serve a limited purpose in their current form.

Summary of Findings

- *Consensus has not been reached – at least within the Water Planning Council process – on a specific long-term standard for maintaining “proper” stream flow necessary to support the many demands on water resources within the state’s watercourses.*
- *Environmental interests and water purveyors are presently at odds on creating either an interim or long-term minimum stream flow standard until such standard is based on scientifically-derived data establishing the relationship between flow and habitat value. This requires formal basin-specific inventories and quantitative modeling processes to develop such data.*
- *The Water Planning Council has endorsed an interim stream flow methodology (except for low-flow months) as a reasonable process to use for estimating stream flow required for ecological purposes, until a more refined system based on basin-specific analysis is developed. Progress on moving the process forward on this issue has been slow.*
- *The estimated stream flow rates developed through the Water Planning Council-endorsed interim method are not viewed as regulatory standards or applicable to the low-flow months of July, August, and September, but can serve a function such as planning and identifying water quantity goals.*
- *The Water Planning Council’s stream flow subcommittee developed a formal framework for establishing long-term stream flow standards, but the framework has yet to receive endorsement by the full council.*
- *DEP believes the current minimum stream flow release regulations for “stocked” watercourses are outdated and not scientifically based. As such, standards are not actively enforced and the department uses its resources for other water resource purposes.*
- *The state Supreme Court has ruled the state’s minimum stream flow release standards are legitimate for specific purposes, and observed DEP could change the regulations if the department thought it necessary. The Water Planning Council has recommended DEP work toward revising the state’s minimum flow regulations.*

- *A dichotomy exists within DEP between the fisheries and inland water divisions as to which division is responsible for implementing/enforcing the state's minimum stream flow release regulations. The authority to establish minimum flow release regulations falls under the fisheries section of the statutes, yet the department's inland water division is responsible for the water diversion permitting process.*

Recommendations

- 13) The Water Planning Council should adopt an interim stream flow methodology by July 1, 2005, that can be used for all months of the year for planning, environmental analyses, and permitting purposes.**
- 14) DEP shall convene a representative workgroup, as recommended by the Water Planning Council, to examine revising minimum stream flow regulations (and establishing a long-range stream flow protocol consistent with the WPC stream flow subcommittee's recommendation and the council-endorsed water allocation planning model.) As part of this process, the Department of Public Health shall prepare a report by January 1, 2005, identifying the overall effects on margin of safety and safe yield levels of all impoundments used for public drinking water purposes statewide if the stream flow rates identified in the Apse methodology were applied as regulatory standards. DEP shall use the report, and any other information it deems appropriate, to devise any recommended changes to minimum stream flow regulations. (Such changes shall include minimum flow release cutback amounts based on various drought triggers.) DEP shall report its findings and recommendations to the Water Planning Council by January 1, 2006. The council shall use the information to propose any revised interim regulatory minimum stream flow standards it deems necessary and begin the process to having such regulations modified.**
- 15) The Water Planning Council, state agencies, and various stakeholders shall continue to work towards developing long-term stream flow rates for all months of the year. Any long-term stream flow standards applied through such methodology shall be developed through scientifically-defensible means and thorough data collection for a better understanding of the relationship between stream flow, water resource demands, and ecological value. This work should be coordinated with development and implementation of the water resource allocation model devised by the council.**
- 16) Any revised stream flow rates developed through the Water Planning Council, or any other state agency, and specified in state law or regulation as standards, shall be applicable to all watercourses throughout the state regardless of whether or not they are stocked with fish by the Department of Environmental Protection.**

- 17) **By July 1, 2004, the Water Planning Council shall convene a workgroup to plan an optimal strategic stream gauge network. The optimal system, devised by the workgroup by October 1, 2005, shall be compared with the current system to identify gaps and resource needs. The Water Planning Council shall then develop an appropriate plan to begin implementing the optimal stream gauging network, including any necessary legislative requests. The relevant components of the plan shall be included in the council's January 2006 annual report to the legislature.**

- 18) **C.G.S Sec. 26-141 shall be amended to require diversion operators subject to minimum stream flow release regulations regularly submit release data to DEP showing whether the flow regulations are met on a consistent basis. The data requirements shall be determined by DEP.**

- 19) **DEP shall develop and maintain an appropriate database for minimum stream flow release information and begin a proactive enforcement process to ensure full compliance with minimum stream flow release amounts based in part on information received from water purveyors.**

Appendix A: Stream Flow Policy – Overview

Relevant Legislative Findings and Policy Declarations

- Connecticut Environmental Policy Act (C.G.S. Sec. 22a-1-1i):
 - conserve, improve, and protect the state’s natural resources and environment;
 - water is recognized as a finite and precious resource; and
 - use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill social, economic, and other requirements of present and future generations.
- Connecticut Environmental Protection Act (C.G.S. Sec. 22a-15):
 - there is a public trust in water of the state and each person is entitled to the protections, preservation, and enhancement of the state;
 - it is in the public interest to provide all persons of the state an adequate remedy to protect such water from unreasonable pollution, impairment, or destruction.
- Wetlands should be preserved and their despoliation and destruction prevented. (in-as-much as stream flow contributes to wetlands) C.G.S. Sec. 22a-28
- Watercourses and inland wetlands of the state are an indispensable and irreplaceable, but fragile, natural resource, which citizens of the state have been endowed. (C.G.S. Sec. 22a-36)
- Many watercourses have been destroyed or are in danger of destruction because of... the diversion or obstruction of water flow. (C.G.S. Sec. 22a-36)
- The preservation and protection of the watercourses from disturbance or destruction is in the public interest and is essential to the health, welfare, and safety of the state’s citizens. (C.G.S. Sec. 22a-36)

- The loss of fish and other beneficial aquatic organisms, wildlife, and vegetation should be prevented; the quality of watercourses for their conservation, economic, aesthetic, recreational, and other public/private uses and values should be protected; the state's potable fresh water supplies should be protected from dangers of drought, overdraft, pollution, misuse and mismanagement by providing a process to balance economic growth with environmental and ecological protection to guarantee citizens safe resources for their benefit and enjoyment. (C.G.S. Sec. 22a-36)
- Aquifers are an essential natural resource and a major source of public drinking water; reliance on ground water will increase because opportunities for development of new surface water supplies are diminishing due to the rising cost of land and increasingly intense development. (C.G.S. Sec. 22a-354g)
- The state's waters are precious, finite, and invaluable resources in ever-increasing demand for present, new and competing uses. (C.G.S. Sec. 22a-366)
- An adequate supply of water for domestic, agricultural, industrial, and recreational use and for fish and wildlife is essential to the health, safety and welfare of the state's citizens. (C.G.S. Sec. 22a-366)
- The necessity, public interest, and protection of water resources are matters of legislative determination. As such, diversion of the waters is only permitted when necessary, compatible with long-range planning, proper management and use of the water resources, and consistent with the state's policy against harmful diversions and with the state plan of conservation and development. (C.G.S. Sec. 22a-366)
- Goals and policies of the state (C.G.S. Sec. 22a-380):
 - 1) balance competing and conflicting needs for water equitably and at a reasonable cost to all citizens;
 - 2) preserve and protect water supply watershed lands and prevent degradation of surface water and groundwater;
 - 3) protect groundwater recharge areas critical to existing and potential drinking water supplies;
 - 4) make water resources conservation a priority in all decisions;
 - 5) conserve water resources and eliminate wasting of water;

- 6) prevent contamination of water supply sources or reduction in the availability of future water supplies; and
 - 7) reduce or eliminate waste of water through water supply management practices.
- Water pollution is: 1) adverse to public health, safety, and welfare; 2) a public nuisance and harmful to wildlife, fish, and aquatic life; and 3) impairs domestic, agricultural, industrial, recreational, and other beneficial uses of water and public funds may be used to control or eliminate such pollution. (C.G.S. Sec. 22a-422)
 - An adequate supply of potable water for domestic, commercial, and industrial use is vital to the health and well being of the people of the state. Readily available water for use in public water systems is limited and should be developed with a minimum of loss and waste. (C.G.S. Sec. 25-33c)
 - Minimum flow standards shall: 1) apply to all river and stream systems within the state which DEP finds are reasonably necessary to keep a sufficient flow of water to protect and safely maintain the stocked fish; 2) preserve and protect the natural aquatic life contained within such waters; 3) preserve and protect the natural and stocked wildlife dependent upon the stream flow; 4) promote and protect the usage of such water for public recreation; 5) be consistent with the needs and requirements of public health, flood control, industry, public utilities, water supply, public safety, agriculture, and other lawful uses of such water. (C.G.S. Sec. 26-141b)

Relevant Statutes

- OPM is required to coordinate the activity of DPH, DEP, and DPUC regarding overall water resources policy to ensure there is no overlap in responsibilities or authority. OPM oversight is intended to avoid inconsistency and redundancy and the office may ensure coordination through a memorandum of understanding among the agencies. (C.G.S. Sec. 4-67e)
- An action may be brought to Superior Court for the protection of the public trust from pollution, impairment, or destruction. (C.G.S. Sec. 22a-16)
- DEP is authorized to carry out a ten-year program detailing geological and hydrological studies, groundwater investigations and reports throughout the state. The department can use test drillings, observation wells, and any other means necessary to determine the state's groundwater resources, quality and potential supplies. The information may be used to establish an inventory of

groundwater resources, as well as surface water resources. (C.G.S. Sec. 22a-351)

- Whenever any public water system has water reserves in excess of those required to maintain abundant water supply to its customers, it may sell the excess water to any other public water system upon approval of DPH. (C.G.S. Sec. 22a-358)
- DEP is directed to establish, operate, and maintain stream gauging stations in connection with the investigation of water resources in the state in cooperation with the United States Geological Survey (USGS.) (C.G.S. Sec. 22a-364)
- Connecticut Water Diversion Policy Act outlines a process for diverting water in the state. (C.G.S. Secs. 22a-365-378)
- DEP is required to adopt water quality standards consistent with the federal Water Pollution Control Act. Such standards shall help: 1) protect public health and welfare; 2) promote economic development; and 3) preserve and enhance water quality for public water supplies, fish propagation, aquatic life, and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses. (C.G.S. Sec. 22a-426)
- Creation of the Water Planning Council to address issues involving water companies, water resources, and state policies regarding the future of the state's drinking water supply. (C.G.S. Sec. 25-33o)
- DEP is responsible for statewide river policy and comprehensive protection of rivers and may establish a river management and protection program designed to improve the management and protection of the state's rivers. If such a program is established, a River Protection Advisory Committee shall be created to assist him in developing the program. (C.G.S. Sec. 25-102qq(c))
- Protected Rivers Act: Requires DEP to adopt a list of rivers (with surrounding land) considered appropriate for designation as a protected river corridor. DEP must establish a river committee to plan for designation, protection, and preservation of eligible river corridors. The committee is required to prepare an inventory of all resources within a specified local drainage basin, a statement of objectives for protecting/preserving those resources, a map defining the boundaries of the protected river, a report on all federal, state, and municipal laws, plans, programs and proposed activities which may affect the river corridor, and a river protection plan setting forth a strategy for achieving the protection and preservation objectives (as approved by the participating towns and DEP.) DEP shall request the legislature designate such river

corridor protection plan in statute. Requires all municipal, regional, and most major state conservation plans be consistent with the specific river protection plan. (C.G.S. Secs. 25-200-210)

- DEP may develop water flow standards whenever any dam or other structure is maintained that impounds or diverts a river or stream stocked with fish by DEP, or if the structure affects the flow of water in such stocked river/stream. (C.G.S. Sec. 26-141a)

Appendix B: Shepaug River Court Case Summary

Below is a broad summary of the issues surrounding the case. Brief synopses of the decisions made by the trial court and the Supreme Court are also provided.

Superior Court

The defendants made the following claims as to Waterbury's dam along the Shepaug River and its diversion of the river's water:

- The city breached certain provisions of the 1921 agreement in that it diverted excessive amounts of water from the river and diverted water even when its "distributing reservoirs were full and overflowing."
- The city violated the public trust component of CEPA by excessively diverting water from the river and the extent to which it limits flow in the summer months.
- Such diversions constituted a public nuisance, private nuisance, and interfered with the rights of riparian owners.
- The defendants did not claim Waterbury's actual maintenance of the dam was a CEPA violation. Rather, the violation was the method and extent of the river's flow limitation.

The City of Waterbury claimed its water diversion from the Shepaug River and the release of water from its dam for stream flow into the river:

- complied with the terms of a 1921 agreement negotiated with the Town of Washington. The agreement, in part, specifies if Waterbury diverts water from the Shepaug River via a dam or viaduct on a certain point of the river, it must maintain a minimum stream flow of at least 1.5 million gallons per day (mgd) from May to November. This agreement was made following an 1893 legislative act which gave Waterbury exclusive rights to take water from Litchfield and New Haven counties for its public water supply; and
- did not constitute a nuisance or violation of riparian rights or violates the Connecticut Environmental Protection Act (CEPA)(C.G.S. Sec. 22a-16).

The city further claimed:

- there was no feasible or prudent alternative to its diversion;
- its conduct was consistent with reasonable requirements of public health, safety, and welfare;
- the diversion was authorized by the 1893 Act;

- supplying water was authorized by the 1921 agreement;
- the diversion was exempt from review under CEPA; and
- the city had a prescriptive right² to divert water from the river.

The Departments of Environmental Protection and Public Health also intervened in the case to assert their interests. DEP noted if the court found injunctive relief was necessary to remedy unreasonable impairment of the public trust in a natural resource, then the terms should be consistent with the public water supply needs of Waterbury and the region. DPH noted the outcome should recognize the need for sufficient water supply for the city and the towns deriving water from the river. The Connecticut Fund for the Environment (CFE) also intervened as a defendant.

Main conclusions. Following six weeks of testimony and after deciding on the points of law in the case, the court made the following conclusions:

- Water from the Shepaug River is necessary for the Waterbury Water Bureau to meet the needs of its customers for water.
- The city's diversion of water from the Shepaug River is subject to the requirements and prohibitions of the Connecticut Environmental Protection Act.
- The manner in which the city operates its water system in the summer months constitutes an unreasonable impairment of the public trust in the Shepaug River as a natural resource, substantially impairing the river's natural flow.
- The city has feasible and prudent alternatives available to it that will enable it to continue to maintain an ample water supply without imposing unreasonable impairments on the public trust of the Shepaug River (mainly through increased water conservation measures.)
- The city breached certain provisions of its 1921 agreement with the Town of Washington.
- The rights of riparian owners have been violated by the city's diversion of the river.
- The court found in favor of the city regarding the nuisance claims.
- The specific statutory and regulatory guidelines governing stream flow release amounts have not been shown to apply in this case because the evidence

² According to C.G.S. Sec. 47-37, no person may acquire a right-of-way or any other easement from, in, upon, or over the land of another, by the adverse use or enjoyment thereof, unless the use has been continued uninterrupted for 15 years.

presented does not establish the particular part of the Shepaug River in question is a stream regulated under such statutes or regulations.

Court imposed relief measures. The court realized that any requirements on the parties must take place promptly and remain in force. As part of the decision, a stream gauge used to measure and verify the amount of flow in the river must be obtained and operated. The court also imposed several other measures on the city, including:

- minimum flow requirements during June through October and May;
- a deadline of May 1, 2002, for alterations to the existing water system to comply with release requirements;
- a provision for reduced or suspended flow requirements in the event of a declaration of a water emergency as outlined in statute;
- temporary reduction of releases during time to make safety repairs or modifications approved by the DEP commissioner;
- a restriction on diversions from the Shepaug watershed at any time specific city reservoirs are full and overflowing;
- required the city to submit certain filings with DEP and DPH; and
- Waterbury should make efforts to contact the United State Geological Survey (U.S.G.S.) to install and monitor a stream gauge at a designated point along the Shepaug River by March 1, 2002 – if not installed by that date, defendants may cause a gauge to be installed and monitored, and Waterbury shall incur the cost.

Supreme Court

The Shepaug River case was argued before the state Supreme Court in late-2001. The court's unanimous decision was made in November 2002.

In its appeal, Waterbury generally claimed the trial court improperly concluded: 1) the City violated the Connecticut Environmental Protection Act; 2) the relief granted under CEPA did not constitute a taking of Waterbury's vested rights; and 3) Waterbury failed to establish a prescriptive easement to use the Shepaug River and interfered with the riparian rights of the defendants. The city also claimed it did not breach certain provisions of the 1921 Agreement with the Town of Washington, it had not unreasonably polluted, impaired, or destroyed the public trust, and its conduct did not constitute a public or private nuisance.

A cross-appeal by the Town of Washington claimed the trial court's decision did not sufficiently cure Waterbury's breach of the 1921 Agreement between the city and the town.

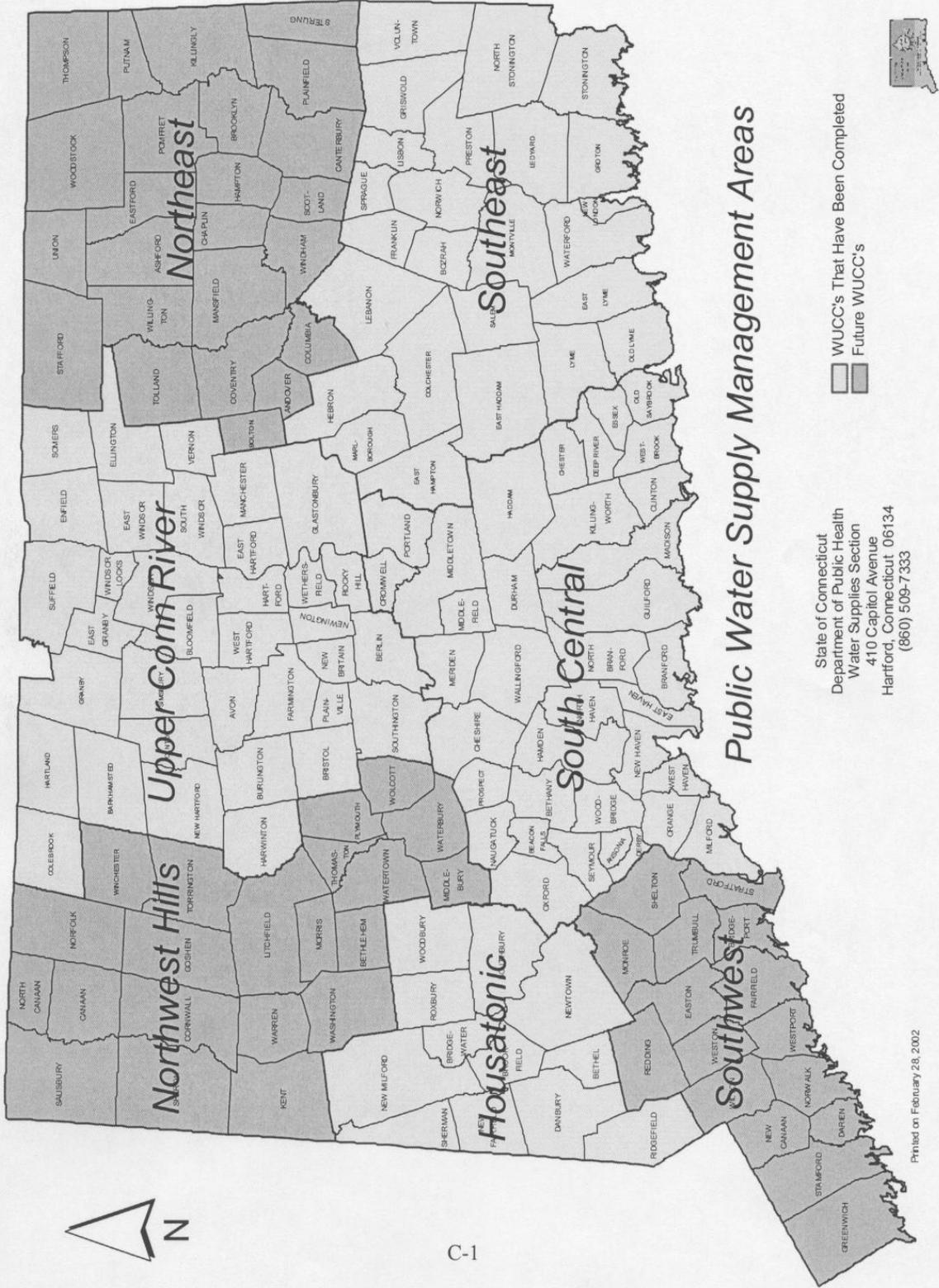
The Supreme Court made the following conclusions:

- the trial court utilized an improper standard to determine whether Waterbury violated CEPA and that it improperly declined to apply the minimum flow statute;
- the trial court improperly concluded that Waterbury had not established a prescriptive easement against the riparian rights of the defendants;
- its position regarding the CEPA and the riparian rights issues undermines the trial court's order for Waterbury to release water, including the remedy ordered on Waterbury's breach of contract claim;
- the trial court's finding of unreasonable impairment to the river is not consistent with the statutory scheme that the legislature has established in the area of water management; and
- the minimum flow statute governs whether Waterbury's conduct resulted in the unreasonable impairment of the Shepaug River.

Although the Supreme Court's decision favored Waterbury, several issues involved in the case were remanded back to the trial court for decision. Among those issues were: 1) the extent of Waterbury's prescriptive easement and whether Waterbury exceeded the scope of its easement without gaining a new easement; and 2) imposition of a new relief order regarding Washington's cross appeal contending the trial court's original decision did not provide the town with specific performance of the 1921 contract, even though it ruled Waterbury breached the contract.

Appendix C: Public Water Supply Management Areas

Appendix C. Public Water Supply Management Areas for Water Utility Coordinating Committees.



APPENDIX D

Committee Co-Chair Reports to the Water Planning Council September 20, 2002 DRAFT

Section I: Overview

Public Act 01-177 (P.A. 01-177), An Act Establishing a Water Planning Council as modified by Public Act 02-76, established a Water Planning Council (WPC) consisting of the Chairperson of the Department of Public Utility Control (DPUC), the Commissioner of Environmental Protection (DEP), the Secretary of the Office of Policy and Management, and the Commissioner of Public Health (DPH), or their respective designees. The Water Planning Council (WPC) was charged with addressing issues involving the water companies, water resources and state policies pertaining to the future of the state's drinking water supply.

The Council decided to move forward in the limited time given under a Committee/Subcommittee format. The Council established three Committees in its draft work plan submitted to the respective legislative committees recognized in P.A. 01-177. The three Committees were co-chaired by technical staff members of the DPUC, DEP, and DPH. The three committees are as follows, Water Resource Management Committee, Water Utility Management Committee, and the Technical Management Committee. Each of the three Committees had two subcommittees co-chaired by stakeholders performing the research and analysis laid out in the WPC Issues Work Plan dated January 28, 2002. The charge given to the subcommittees was to address the issues in the workplan and draft a report following the points of consideration and the possible areas to investigate, including but not limited to specific recommendations.

The subcommittees have been extremely busy, generally meeting at the DPUC on a biweekly basis beginning in March 2002 and continuing their very aggressive schedule of meetings through the end of August. The WPC feels it was extremely beneficial to move forward on the eleven issues addressed in the Public Act with the heavy involvement of stakeholders. Having a diverse group of interested stakeholders at one table to address several issues is in itself a valuable mechanism as we move forward in the ever-evolving water sector. The subcommittees submitted their reports to the respective Committee Co-Chairs during the first week of September. At that point the Committee Co-Chairs have put together a report to present to the WPC for its consideration at its September 20, 2002 meeting. The Committee report contains summaries of the subcommittees' efforts and recommendations. The subcommittee reports are intended to be the backbone to the recommended approach being made by the Committee Co-Chairs to the WPC. These reports should be recognized by the WPC, legislators, regulators and other interested parties as we move forward in what has now become an ongoing process under P.A. 02-76.

The three Committees met on a monthly basis receiving progress reports from the subcommittees and guiding those members on a number of administrative and technical issues. Given the previous time restrictions to perform such studies and issue a final report, the Committee Co-Chairs recognized that some issues would receive limited review and recommend the approach outlined in Section II.

Section II: Recommendation to Council as to Processing Committee Information

Public Act No. 01-177 requires that "The Council shall, not later than January 1, 2003, report its final findings and any proposed legislative changes to the joint standing committees of the General Assembly..." and; Public Act No. 02-76 Sec. 4. repealed Public Act 01-177 Subsection(c) and substituted the following:

“(c) The Council shall, not later than January 1, 2002, and annually thereafter, report its preliminary findings and any proposed legislative changes to the joint standing committees of the General Assembly...”

The Co-Chairs of the Committees appointed by the Water Planning Council (WPC): Water Management, Water Resource Management and Technical Management, make the following recommendations to the Council to consider in satisfaction of Public Act No. 01-177.

1. Section 4 of Public Act No. 02-76, passed in the 2002 legislative session, requires the Council to exist permanently. This arguably allows the WPC additional time to address the complex implications of the issues presented in Public Act 01-177 and detailed in the Water Planning Council Issues Work Plan of January 28, 2002. Further, the final report previously required by January 2003, has been eliminated and replaced with a mandate to report preliminary findings annually.

In light of this, it is recommended that the WPC take cognizance of this legislative change and consider the January 2003 report issued by the WPC to be its preliminary findings in reporting to the General Assembly the reports of the Committees and Subcommittees are presented in Section III & IV.

2. The Committee Co-Chairs, in reviewing the reports by the Subcommittees, have concluded that most issues presented in the Subcommittee report’s recommendations can be consolidated in the three (3) General Issues of Concern defined by the WPC in the Water Planning Council Work Plan submitted on January 28, 2002, to the Legislature. These general issues of concern are: Connecticut Law on Management of Water Resources, Long Range Planning for Management of Water Resources, and Implementation of Water Conservation. Some significant observations and recommendations made by the Subcommittees lend themselves as possible action items that can be considered by the WPC in addressing the eleven (11) legislated issues in a concise, cumulative manner. These Subcommittee recommendations, however, require further considerable study and evaluation.

The Committee Co-Chairs recommend that the WPC consider establishing a mechanism that would allow continuation of the work of the WPC in reviewing the Subcommittee recommendations and formulating action items under the 3 General Issues of Concern. It is further recommended that at a minimum the following overarching items be considered: funding, basin planning and the WUCCs and consolidation of agencies water resource management functions.

3. The Committee Co-Chairs recognized considerable dedication and effort by individuals representing a cross section of stakeholders during the Committee and Subcommittee processes. The individuals brought considerable knowledge to the process and also provided cross sectional, educational opportunities to the forums. It has been noted that there is an excellent understanding of the issues and interests by these individuals as displayed by the substance and quality of the Subcommittee reports.

The Co-Chairs recommend that the WPC develop a workplan and appoint individuals as appropriate to investigate further the key overarching issues. In addition the WPC may wish to consider establishing work groups to address, at the WPC’s direction, various items identified for further investigation within this report (see sections III and IV). The work groups should include designated Agency staff and be charged with reporting progress and issues for the Council’s deliberation on a regularly scheduled basis.

4. The Committee Co-Chairs have noted that within the Subcommittee recommendations, there are certain suggested areas for legislation or proposed legislative language. These proposals could be considered for possible individual legislative proposals in the current legislative session.

The Co-Chairs recommend to the WPC that the Agencies currently charged with regulating the subject areas of the proposed legislation, comment on the suitability of this legislation to the Council at its November 2002 meeting. Should the Council decide that certain proposals have merit, it could direct that Agency to put forward the proposed legislation on January 1, 2003.

5. The Committee Co-Chairs have noted that there is considerable value in all the documents accumulated by the forums preparatory to this report. It is also considered important that these materials be available to the proposed standing work group and legislative committees charged with matters relating to public health, the environment and public utilities.

The Co-Chairs recommend that the WPC provide not only the required report of preliminary findings to the General Assembly, but also make available the full text of subcommittee reports and meeting minutes.

Section III: Committee Co-Chair Summary Reports

Water Utility Management Subcommittee A Co-Chair Summary Report

Subcommittee A of the Water Utility Management Committee investigated two issues:

Issue 1: *The financial viability, market structure, reliability of customer service and managerial competence of water companies; and*

Issue 2: *Fair and reasonable rates, and B. Water Conservation*

Issue 1: Recommendations:

Improvements to Enhanced Viability Models (EFVM)

- Initiate filing of annual reports and actual 5-year debt retirements on computer disc and hard copy.
- Make EFVM user-friendly, enhance EFVM presentation, and include measuring of the system's managerial/ technical competencies. Simplify EFVM/develop another model.
- DPH, during the Sanitary Survey process, should discuss the availability of viability models.
- Study technical issues that could cause a system to become nonviable.

Drinking Water State Revolving funds (SRF) and Other Financing Resources

- Investigate if there is a way to relend paid back SRF.
- Provide exemptions for small systems
- Develop a guidebook of process and general assistance.
- Provide legal assistance.
- Create a list of approved vendors and contractors.
- Train the Trainer programs to train teachers on the loan process so they can assist small systems.
- Develop a principal forgiveness and/or negative interest rates program to provide grants to small systems and an informative, encouraging outreach program.
- Establish a \$500,000 per year set-aside fund to be used as low interest loan monies for small systems.

- Simplify the requirements in the regulations currently modeled around wastewater requirements.
- Investigate using funds for technical assistance for small systems.
- OPM, DEP, DPH and DPUC Commissioners should express to Connecticut Congressional delegation and EPA the need for revision of the SRF loan fund application process and eligibility requirements to enable easier access by small water companies.
- Establish a partnership with Connecticut Economic Resource Center's (CERC) Business Response Center to assist small water companies.

Failing Water System Takeovers

- The State should exercise eminent domain proceedings against small water systems to eliminate any perception that an unfair price is being paid.
- Develop DPH as the one stop agency for identifying companies with viability problems.
- DPH should explore partnerships for small water companies who want to remain viable.

Solutions to Rate Case and Staff Assisted Rate Case (SAR) Obstacles for Small Systems

- Explore relaxation of ex parte communication restrictions for Class B and C companies to allow technical meetings and/or pre-hearing conferences at the onset of a rate proceeding or SAR.
- Improve Staff Assisted Rate Case (SAR) form and encourage paperless applications.
- Hold symposiums to communicate policy decisions and changes as well as publishing newsletters.
- Conduct general dockets to provide guidance on new issues such as security expenses.
- Establish additional step in rate case process. Prosecutorial (PRO), DPUC and OCC staffs and the Company discuss issues after DPUC's application review. Revise and resubmit application.
- Redefine "small water companies" to simplify filing of rate cases to exempt small companies from filing rate cases under certain circumstances. (Rewrite Conn. Gen. Stat. § 16-10a, 16-20(b), 16-21.)
- Develop the use of a surcharge for infrastructure improvements, similar to the Construction Work in Progress surcharge that is used for Safe Drinking Water Act mandated projects, for Class B, C companies.

Issue 2A: Recommendations

Improvements to DPUC Ratemaking Process

- Simplify determination of rate of return on equity (ROE). Three specific recommendations.
- Explore relaxation of ex parte communication limitations for pre-application meetings.
- Establish a range annually for the ROE to be granted at rate proceedings.
- Establish statewide Depreciation Rate Schedule (possibly 3%) for all regulated public water utilities.
- Apply standard rate filing requirements to only large and medium size water companies.
- Provide periodic educational programs to explain the rate case process.
- Investigate the impact of property taxes on IOU's water rates

Rate Structure

- Investigate whether regional/municipal water utilities have eliminated minimum allowances.
- Investigate a thorough analysis of current rate structures of private, regional and municipal water companies to determine if minimum allowances and declining rate structures have been eliminated.

Education Programs

- Develop a public/private partnership outreach initiative for water supply, conservation, etc.
- Investigate funding mechanisms, possibly a bottle deposit bill, for above initiative.

Metering and Billing

- Encourage full metering wherever economically feasible.
- Conduct a survey of all water companies to better determine the rate of metering, meter maintenance and testing by water companies and create a best management practices guidance document.
- Require supply side production master metering on sources and within a distribution especially for companies seeking additional sources of supply and diversion permits.
- Explore a state initiative to help water utilities reduce unaccounted for water by possibly lowering the state benchmark and offering financial incentives/funding for all water utilities.

Commodity Charges, Seasonal Rates, Surcharges

- Further study of the effect of surcharges on rates is needed.

Water Use Audits

- Investigate how to provide incentives for companies to conduct water use audits.
- Establish a legislative conservation goal that is in agreement with state water conservation policies for Connecticut facilities.

Drought Management

- Use public service announcements to heighten awareness of water restrictions during droughts.
- Enact enabling legislation and/or regulations to provide a municipality or IOU with enforcement powers in times of drought, eminent health risk, danger to the system or depletion of supply.
- Amend emergency contingency plans included in Water Supply Plants (WSP) to include lists of drought stages and mandatory drought restrictions that recommend specific use curtailment.
- Examine drought restriction regulations (§ 25-32d), specifically environmental triggers such as ground water levels, and if river discharge rates are considered when restrictions are determined.

Issue 2B: Recommendations

- DPUC should develop a comprehensive document describing conservation requirements for IOU with regard to metering, conservation, leak detection, etc.
- Establish Best Management Practice guidance for water conservation to be used by all water companies, especially before companies seek new diversion permits.
- State agencies should develop conservation standards or Best Management Practices for irrigation systems and other consumptive use diverters.
- Enact legislation requiring all new lawn irrigation systems to be installed with rain detectors.
- Investigate new water saving technologies and state support of those technologies that help manage summer peak demand and applicability of in Connecticut.
- Develop a water conservation rebate program similar to the Energy Star program.
- Investigate water efficient rebate, "feebate," and other water conservation practices.
- Review existing statutes and administrative rules and their impact on water conservation practices.
- Develop a public/private partnership outreach initiative for water conservation, water supply subjects.
- Establish a pre-approved list of water conservation activities eligible for rate reimbursement.

Water Utility Management Subcommittee B
Co-Chair Summary Report

Issue 11: *The procedure for coordination of planning of public water supply systems*

Background

The Legislature, as a result of the recommendations of the 1982 Water Resource Task Force, passed Public Act 85-535, which gave rise to Connecticut General Statute's § 25-33e through § 25-33j. The statutes laid out the framework for the establishment of Public Water Supply Management Areas (PWSMA), Water Utility Coordinating Committee (WUCC) membership as well as the requirements for the Area-wide Assessment, including the establishment of Exclusive Service Areas (ESA) and the Coordinated Plan, which includes the integration of water Utilities Individual Water Supply Plans. These statutes were subsequently promulgated into regulations that contained the Public Health Code in § 25-33h.

Additionally, as a result of Public Act 84-502 "an Act Concerning Individual Water Supply Plans", DPH promulgated regulations contained in § 25-32d-1 of the Public Health Code. These regulations stipulate the requirements for the content of the Individual Water Supply Plan required from the water utilities. The Water Supply Regulations have subsequently been amended to reflect various public acts.

Summary

The subcommittee concluded that, while the current WUCC process may have flaws, there are merits to providing a mechanism for coordinated water supply planning. It was agreed that there can and should be improvements to the water supply planning process. It was clear that the current process is not perceived by all as being effective and that there are concerns that not all stakeholders are adequately represented in the process. However, it was understood that without some coordinated approach to water supply planning, decisions about water supplies and utility service areas would be left primarily to political processes, with little consistency or continuity, and with the risk of duplication, redundancy or gaps in service.

Options about the extent and context of proposed changes to the water supply planning process were explored by the subcommittee, with consideration given to improving the current WUCC process as well as to a more comprehensive approach that would impact all aspects of water supply planning and water resource allocation. The subcommittee developed several detailed process and Water Supply planning programs.

However, one of the major recurring issues is the need for greater coordination between the regulatory authorities of the various state agencies. The subcommittee is concerned that even if the various recommendations are implemented, but retained in the context of the current regulatory structure, the process will be improved but the full value and benefits of the water supply planning and water resource allocation efforts will not be realized.

Recommendations

- The four state agencies on the Water Planning Council should develop a reasonable timeline and cost estimates for (a) completion of the WUCC process in the three remaining Water Supply Management Areas that have not yet been convened, and (b) continuing the process of revising all WUCC plans every ten years as legislatively required.
- There needs to be a means to provide a more coordinated process between water supply planning and resource allocation and a stronger statutory link between the coordinated water supply planning process and the water resource allocation process.
- A mechanism needs to be developed to re-evaluate and possibly consolidate the existing PWSMA's.

- The obstacles (financial, staffing and regulatory) that have limited the completion, approval and/or updates of the WUCC plans to date need to be eliminated.
- Participation on the WUCCs should be reviewed to determine the level of participation and role of various stakeholders in the process.
- Procedural Guidelines for WUCCs should be provided to make the process more efficient and allow the WUCC that is being convened the benefit of previous WUCCs' experience.
- The general process by which ESAs are established and conflicts are resolved needs to be reviewed and revised to ensure consistency.
- There needs to be a mechanism to ensure consistency between claimed ESAs and utility water supply plans.
- There were concerns raised about whether there needs to be a better mechanism to ensure coordination and consistency with the WUCC plans and local planning documents and the State's Plan of Conservation and Development.

TECHNICAL MANAGEMENT COMMITTEE
Co-Chair Summary Report

Subcommittee A (the Lands Subcommittee) of the Technical Management Committee was given the responsibility to review Issue #5 regarding land and land-use by water companies. Non-utility owned lands were determined to be of equal or greater concern related to the protection of public water supplies and as such were also included. The Subcommittee also reviewed Issue #3, which was originally assigned to the Water Resource Management Committee, since the issue pertains to lands and source protection concerns.

Issue #5: *An inventory of land and land use by water companies*

Issue #3: *Protection and appropriate allocation of the state's water resources while providing for public water supply needs*

The Subcommittee developed the following major recommendations:

- A digital inventory of all land and land uses within water supply watershed and aquifer areas should be undertaken. The data base inventory would provide information to help guide state agencies, land trusts and other organizations for prioritization of land acquisitions and effectiveness of state and local source protection programs.
- There are many source water protection programs, regulations and statutes that are administered by both the DEP and the DPH. One possible solution that emerged is to have public water supply regulation and enforcement activities under one overarching regulatory framework to provide coordinated protection of this critical water resource. A Geospatial Data Center should be created for the repository and clearinghouse of all geospatial data. A Geographic Information Council should also be created to provide input and oversight to the Center on technical standards, data collection protocols and quality assurance.
- Connecticut is fortunate to have many state regulations and statutes in place for source water protection efforts related to public water supplies. However, some of the existing state regulations and statutes are very dated and need to be revised to clarify their intent, to enhance source water protection, and to have consistency with new regulations. Specific revisions to existing state regulations and statutes pertaining to source water protection are recommended. Three further issues that still need to be addressed were also identified.
- The Source Water Assessment Program (SWAP) evaluates the susceptibility of all of Connecticut's public drinking water supply sources, both surface water reservoirs and ground water supply wells, to potential contamination. These assessments will provide information that can be used to reduce the

potential for contamination to sources of public water supply sources. Funding to support SWAP staff from both DEP and DPH under a set-aside of the DWSRF ends in May 2003. Funding to support implementation of future source protection initiatives is needed.

- A water supply watershed protection model ordinance should be developed for towns to adopt on a voluntary basis.
- Better coordination is needed between town and state Conservation and Development Plans to address infrastructure management within water supply watershed and aquifer areas and the associated development concerns.
- The DEP Aquifer Protection Land Use Regulations be adopted.

TECHNICAL MANAGEMENT COMMITTEE **Co-Chair Summary Report**

Subcommittee B of the Technical Management Committee is charged with addressing Issues 7 and 8 of the Water Planning Council Issues Work Plan.

Issue 7: *Recommended methods for measurement and estimations of natural flows in Connecticut waterways in order to determine standards for streamflows that will protect the ecology of the state's rivers and streams*

Issue 8: *The status of river flows and available data for measuring river flows*

The recommendations of this subcommittee include methods for the estimation of natural flows to aid in determining future standards that will protect the ecology of the state's rivers and streams. The Subcommittee reviewed a variety of instream flow methods. It was decided that both an interim and long-term method is necessary.

The majority of the Subcommittee recommended consideration of a reconnaissance-level technique as a reasonable interim method, which identifies flows that are presumed to be protective of instream ecology until more detailed and sophisticated methods are developed. There is agreement by the majority of the Subcommittee that the approach developed by Apse (2000), the median of daily flows for each of the months of October through June for unregulated rivers throughout Connecticut, is a reasonable reconnaissance-level approach to estimating ecologically protective instream flow in those months. The area where the Subcommittee did not reach consensus was regarding the specific technique to generate the monthly statistics for the low flow season of July, August, and September. A variety of approaches could be used, some more conservative than others. An outline of an approach to applying an interim method was recommended.

Incremental techniques were determined to be appropriate long-term methods. The Subcommittee recommended a framework for development of a long-term instream flow protocol.

1. Target Fish Community Regions: Determination of a set of target communities and their spatial validity. Delineate the state into four or five zoogeographical sub-regions and define a target fish community (or communities) for each region, for big and small rivers separately.
2. Habitat selection criteria: For every community, define the habitat selection criteria of the dominating species and life stages for each season to develop a regionally valid set
3. Fish Habitat Regions: Delineation of the state into hydro morphological regions based on available hydrological, geological, landform and land use data.
4. Habitat model: Development of a habitat-flow relationship for each watershed followed by establishment of a MesoHABSIM type model.

5. Habitographs: Generate target habitographs for each fish habitat region.
6. Application in individual cases: To determine the deviation from target habitograph for any watershed in the region, habitat time series are converted to hydrological time series and compared with hydrographs applying the Range of Variability Approach. Improvement in impacted streams could be achieved in two ways: either by changing the flow schemes or by optimization of habitat structure, by for example channel restoration or dam removals can be utilized first.
7. Impact simulator: Provide a quantitative simulation computer package, built upon MesoHABSIM, that could be used by resource managers and users to and serve as a comprehensive tool for analyzing the impact of various resource-use scenarios. It will predict the habitat quantity and quality for definable portions of the river ranging from individual reaches up to an entire watershed

Various application and implementation issues were identified which need to be carefully considered in applying the recommended instream flow methods. These issues include: analysis of costs and benefits, groundwater diversions, flow reduction triggers during drought, development impacts on flow, and establishment of a water quantity goals framework.

The Subcommittee recommended implementation of a number of management approaches to ensure the sustainability of the region's water supply, while restoring flows needed to preserve and protect aquatic life.

- a) Adaptive Management - Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form—"active" adaptive management—employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.
- b) Water conservation as a “source” of water in lieu of new or proposed sources;
- c) Mandatory water use restrictions and other adaptive/demand management measures, based on flow triggers, to protect both water supply capacity and natural resources during low-flow periods;
- d) Optimizing the rate and timing of withdrawals from multiple sources and using storage where available to balance water supply needs with riverine ecological needs.
- e) Increased infiltration of stormwater through use of Best Management Practices to improve recharge ratios for new development and retrofitting of existing development to improve groundwater recharge while protecting water quality;
- f) The use of short-term “pulsed” releases should be evaluated as an alternative to continuous releases to reduce the impact of releases on water supply capacity while still providing downstream habitat benefit.
- g) A provision to include flushing flows for channel and riverine habitat maintenance purposes should be considered on a watershed by watershed approach.

The Co-Chairs of the Committee ask the WPC to take note of Appendix A - Water Allocation Task Force Report 7/2/02 Draft, Ecological Needs Section.

Sub-Committee B did not have adequate time to address Issue 8 but did establish a proposed consensus approach to addressing this issue that is below. The overarching component is to identify the optimal stream gage network for instream flow and allocation management in Connecticut, and determine how to achieve it.

1. Review the existing status of Connecticut's stream flow and groundwater data collection network.
2. Identify an optimal strategic stream-gauging network for instream flow and allocation management in Connecticut. Compare such a network to the existing conditions and identify an approach to achieve an optimal network.
3. Identify an optimal strategic groundwater-monitoring network for instream flow and allocation management in Connecticut. Compare such a network to the existing conditions and identify an approach to achieve an optimal network.
4. Develop an approach to use the optimal stream-gauging network to synthesize stream flows for ungauged streams.
5. Identify funding needs for establishing optimal networks and statistics along with the strategies to achieve such funding levels.

WATER RESOURCE MANAGEMENT COMMITTEE
Co-Chair Summary Report

Subcommittee A (the Allocation Subcommittee) of the Water Resource Management Committee was charged with addressing Issues 3, 4 and 6 of the Water Planning Council Issues Work Plan:

Issue 3³: *Protection and appropriate allocation of the State's water resources while providing for public water supply needs*

Issue 4: *The adequacy and quality of the State's drinking water supplies to meet current and future needs*

Issue 6: *The status of current withdrawals, projected withdrawals; river flows and the future needs of water users*

Critical elements of an effective allocation process were organized into a process flow chart (see attached flow chart) that integrates all aspects of water resource planning and management in a manner that allows for reasonable, well-balanced resource allocation decision-making. If properly executed, this allocation process should protect the public's health, safety, and welfare by addressing conflicts among competing water users, preventing degradation of natural environments, encouraging water conservation, mitigating the harmful effects of drought, and achieving balance between consumptive and non-consumptive uses of water.

The Allocation Subcommittee identified several high-level, or overarching principals necessary to guide the allocation process and support balanced, well-reasoned and effective decision making. These principals include:

- An adequate and stable source of funding,
- An affirmation to the commitment to natural resource protection,
- An affirmation to the commitment to protect the public's health and safety,
- The need to engage a diverse variety of stakeholders in the process,
- The alignment of planning and allocation of water resources.

³ Technical Subcommittee A agreed to review Issue 3, Protection and appropriate allocation of the State's drinking water supplies to meet current and future needs, since this issue pertained to lands and source protection concerns.

One of the most contentious issues addressed by the Allocation Subcommittee was Registered Diversions. A primary concern that was not addressed is the lack of environmental review for registered diversions (this subcommittee did attempt to address this issue). It is important that further discussions take place in the near future to identify strategies or mechanisms that can be used to address substantial or avoidable damage to a water resource by a registered diversion. Recommendations representing general consensus between the stakeholders participating in the Allocation Subcommittee address some of the concerns with diversion registrations:

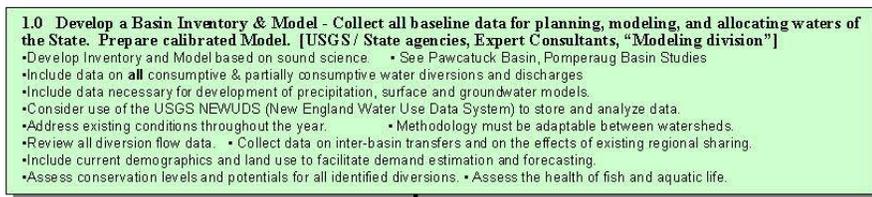
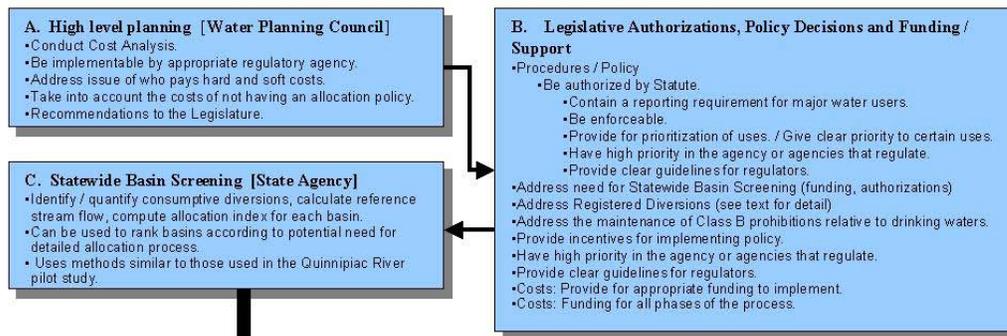
- Retire unused registered diversions with no plans for future use
- Adopt standard methods for measuring flow from registered diversions.
- Adopt a requirement for annual reporting of monthly cumulative withdrawal data
- Develop conservation standards (or Best Management Practices (BMPs) for use of water that is diverted by Registration.
- Require annual (or other frequency) fees for registered diversions

Expanding the existing permitting process to become a true allocation planning process, as proposed will require a significant financial commitment on the part of the State. The ultimate social and environmental costs of the lack of an integrated, rational water allocation and protection process may be far greater than the costs of implementing such a process now.

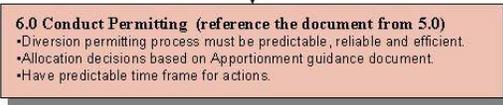
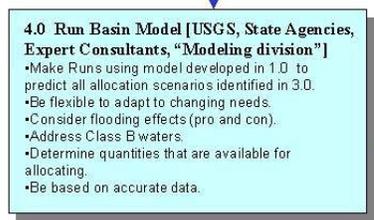
The Allocation Subcommittee also had general agreement on the following items:

- Source water quality protection is a critical component of public water supply planning. As such, the current prohibitions regarding use of Class B waters for public water supply should be maintained. In order to preserve the availability of Class A waters for public water supply, the use of Class B waters for non-potable needs should be encouraged wherever feasible.
- A facilitated conflict assessment approach is needed to achieve resolution and develop areas of common understanding and mutual gain on remaining allocation issues.
- In order to effectively implement the proposed Water Allocation Policy Planning Model the allocation process should be managed by an organization that has equal responsibility to the environment and public water supply and has all the necessary resources to function properly.
- There should also be consideration of the concepts of "apportionment" as described in Report to the General Assembly on State Water Allocation Policies Pursuant to Public Act 98-224, and further exploration of alternatives such as "shared adversity", "priority setting" models and other alternatives.
- A thorough legal review of the issues pertaining to water law and water rights in the State would be helpful to set the context for future allocation planning initiatives.

Water Allocation Policy Planning Model



It is anticipated that Basin Planning, Basin Modeling, and Making Apportionment Recommendations will continue in a cycle.



Rev. August 30, 2002 PLS

WATER RESOURCE MANAGEMENT COMMITTEE
Co-Chair Summary Report

Subcommittee B (Permit Streamlining) of the Water Resources Management Committee was charged with addressing Issues 9 and 10 of the Water Planning Council Issues Work Plan.

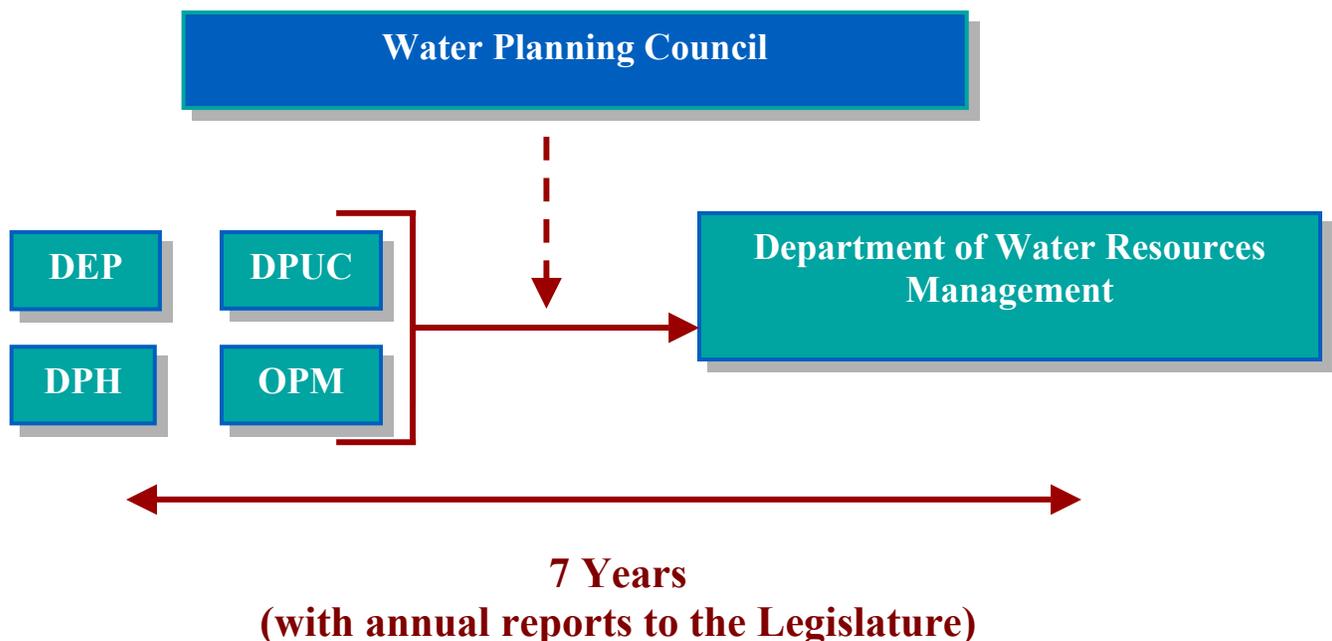
Issue 9: *Streamlining the water diversion permit process*

Issue 10: *Coordination between DEP, DPH, and DPUC in review of water diversion applications*

The subcommittee identified three fundamental flaws of the existing water allocation process:

- Different legislative mandates that segregate functions and responsibilities in different agencies,
- Lack of funding and staff to dedicate to water resource and water supply planning and permitting programs,
- Lack of background data and modeling capability to allow applicants to adequately present their applications and for regulators to evaluate requests in a comprehensive and science-based manner.

The committee primarily focused on an overall water allocation process and major structural changes in the management of diversions, rather than the streamlining of the existing diversion permit process. The creation of a new state agency was to bring all aspects of water resource management under one roof. While the committee reached consensus on consolidation of water resource management and planning functions, there was not full agreement that the creation of a new state agency was the best approach due to the complexities and overlap of environmental programs. Under the proposed scenario, (see diagram below) the Water Planning Council would continue to serve for an initial seven year period, reviewing and developing policy related to water resource issues and the formation and operation of the new state agency. Specific functions and responsibilities from each agency would be merged under the Department of Water Resources Management (DWRM). Other functions such as Clean Water Act, Safe Drinking Water Act, etc. remain with existing respective organizations.



Other specific recommendations included:

Resources Inadequate number of staff. Among immediate measures are a review of the DEP fee schedule relating to permitting, in order to increase funding to be used for water-planning administration.

Pre-application Meetings. DEP and DPH should hold joint pre-application meetings with applicants, when a proposed new diversion is in the concept stage, prior to selection of a site or source.

Threshold for Permit Requirement. Consideration should be given to regulating withdrawals on a seasonal or monthly average withdrawal as the threshold and/or setting a cumulative monthly withdrawal. Additionally, the basis for the 50,000 gpd threshold should be reviewed and compared with other states' programs to determine if there is a more appropriate minimum threshold that would result in the staff and resources being focused on activities that require the review.

Licensed Water Resource Professional. The Subcommittee suggests that developing a program for a Licensed Water Resource Professional might serve to reduce the demand on agency staff and expedite the application review process.

Timelines. Set time goals for permit processing, and give meeting those time goals priority. Currently the time to arrive at a complete application is often extended and uncertain.

Projected Sources of Water Supply. Develop database that identifies all potential future sources of supply cited in Water Supply Plans, WUCC Plans, and other documents. Consider these in the context of other state and local plans and development.

Individual Permits: Consider a two-phase permit approach in which a developer first receives a consumptive-use permit and then applies for a construction diversion permit.

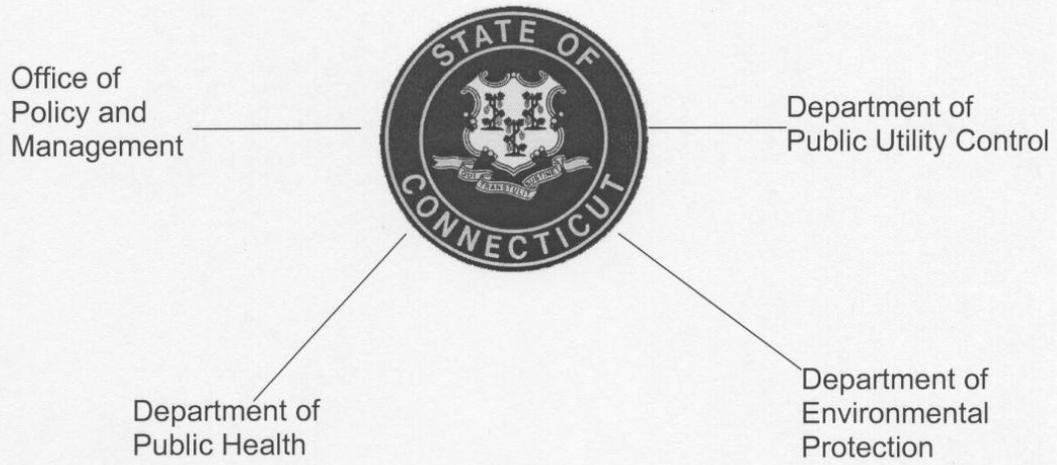
General Permits: Items identified as proposals for modifying the general permit program for diversions are:

- Adding new categories for activities eligible for general permits.
- Developing a more coordinated, less burdensome permit process for permitting interconnections and authorizing sale of excess water permits.
- Identify which types of interconnections would be candidates for a much simplified general permit process.
- Add flexibility to the general permit authorization by creating a three-tiered approval approach, similar to that used in other types of general permit programs in Connecticut. Proposed tiers would be (I) automatic coverage, (ii) filing of notification required, and (iii) approval required.
- Consideration should be given to the length for coverage under the general permit.

Areas for Further Investigation

- The pre-application process and how best to solicit stakeholder involvement.
- Funding. The lack of adequate funding and staff resources was a recurring theme in all the subcommittees.
- Staffing needs. Agency staff needs to better define staffing needs to effectively run programs.
- Proposed revisions to the general permit.
- Licensed Water Resource Professional.
- A study of the obsolete, redundant or overlapping statutes

APPENDIX E



**STATE OF CONNECTICUT WATER PLANNING COUNCIL
2003 ANNUAL REPORT TO THE GENERAL ASSEMBLY
PURSUANT TO P.A. 01-177 AND P.A. 02-76**

JANUARY 29, 2003

SECTION I: Overview

Public Act 01-177 (P.A. 01-177), An Act Establishing a Water Planning Council as modified by Public Act 02-76, established a Water Planning Council (WPC) consisting of the Chairperson of the Department of Public Utility Control (DPUC), the Commissioner of Environmental Protection (DEP), the Secretary of the Office of Policy and Management, and the Commissioner of Public Health (DPH), or their respective designees. The Water Planning Council (WPC) was charged with addressing issues involving the water companies, water resources and state policies pertaining to the future of the state's drinking water supply.

The Council decided to move forward in the limited time given under a Committee/Subcommittee format. The Council established three Committees in its draft work plan submitted to the respective legislative committees recognized in P.A. 01-177. The three Committees were co-chaired by technical staff members of the DPUC, DEP, and DPH. The three committees were, Water Resource Management Committee, Water Utility Management Committee, and the Technical Management Committee. Each of the three Committees had two subcommittees co-chaired by stakeholders performing the research and analysis laid out in the WPC Issues Work Plan dated January 28, 2002. The charge given to the subcommittees was to address the issues in the workplan and draft a report offering an analysis and recommendations.

The subcommittees were extremely busy, generally meeting at the DPUC on a biweekly basis beginning in March 2002 and continuing their very aggressive schedule of meetings through the end of August. The WPC feels it was extremely beneficial to move forward on the eleven issues addressed in the Public Act with the heavy involvement of stakeholders. Having a diverse group of interested stakeholders at one table to address several issues is in itself a valuable mechanism as we move forward in the ever-evolving water sector. The subcommittees submitted their reports to the respective Committee Co-Chairs during the first week of September. At that point the Committee Co-Chairs had put together a report to present to the WPC for its consideration at its September 20, 2002 meeting. The Committee report contains summaries of the subcommittees' efforts and recommendations. The subcommittee reports are intended to be the backbone to the recommended approach being made by the Committee Co-Chairs to the WPC. The WPC, legislators, regulators and other interested parties should recognize these reports as we move forward in what has now become an ongoing process under P.A. 02-76. It is the WPC'S intention to take up other findings and recommendations of the subcommittee reports as time and resources allow. The major policy recommendations that follow were determined by the WPC to be necessary prerequisites to additional activities and a robust work program for the foreseeable future.

SECTION II: Major Policy Statements/Recommendations

Upon consideration of the recommendations of the WPC Committees and Subcommittees, public comment, and staff recommendations, the WPC proposes in this report a set of action steps and proposed policy changes for state agency implementation or legislative consideration.

Each set of recommendations, however, are premised upon three general and overarching findings that are necessary for full implementation of system changes as contemplated and researched by the Council and its subcommittees. These findings include the need for a revised water allocation procedure, the securing of adequate, stable resources for water allocation

management, and a reframing of the current management structure governing water policy. Each of these findings must be viewed as long-term changes requiring further research and planning, and likely having staged implementation.

The first finding recognizes the need for the development of a comprehensive and streamlined water allocation process for all water uses, based on sound science and accurate data on all water uses. The WPC endorses the concepts proposed in the Water Allocation Policy Planning Model (see attachment 1) developed by the Water Resource Allocation subcommittee. This model identifies the critical components of a water allocation policy that integrates aspects of water resource planning and management necessary for a reasonable and well-balanced process for decision-making. A water allocation process must protect the public's health, safety, and welfare, address conflicts among competing water users, prevent degradation of natural environments, encourage water conservation, mitigate the harmful effects of drought, and achieve a balance between consumptive and non-consumptive uses of water. Development of this process should be pursued.

The second finding highlights the need for adequate, stable resources with which to implement all components of water allocation management. The WPC recognizes that development and implementation of such a process will require a substantial and sustained financial commitment. The WPC notes, however, that the costs of the lack of an integrated, rational water allocation and protection process must be weighed and considered against the costs of implementing such a process.

Finally, a number of the subcommittees recommended a comprehensive restructuring of the current water management structure, and one subcommittee directly recommended the creation of a new state water management agency. The WPC agrees that more needs to be done to coordinate water policy, but has serious concerns regarding the formation of a new state agency. The interrelationship of disciplines required to appropriately manage water allocation militates against a single agency approach. However, many of the functions and much of the coordination and streamlining that are desirable outcomes, could be achieved through better coordination of existing agencies and coalescing of interagency functions. This is achievable by the WPC's oversight, which has been given permanency by the legislature. The WPC will establish an advisory group comprised of a broad array of stakeholders.

SECTION III: Focus Issues

Recommendation 1

Adoption of a Water Allocation Policy Planning Model

The WPC agrees with the Water Resources Management Committee, (Water Allocation Subcommittee and Diversion Permit Streamlining Subcommittee), that adoption of a Water Allocation Policy Planning Model like that developed by the Water Allocation Subcommittee (see attachment 1) should be considered as a blueprint for developing a comprehensive state water allocation/management program. The WPC recognizes the financial considerations involved in committing to developing and implementing the model approach. The principles determined to be necessary to guide the allocation process are:

- A commitment to protect the public’s health and safety,
 - A commitment to natural resource protection,
 - The need to engage a diverse variety of stakeholders in the process,
 - The alignment of planning and allocation of water resources and a scientifically defensive basis for determining water allocation.
 - The need to maintain the quality of our drinking water supply, and maintain the current prohibitions regarding the discharge of wastewater’s to waters used for public water supply.
 - To preserve the availability of Class A waters for public water supply, the use of Class B waters for non-potable uses should be encouraged wherever feasible.
- Action Item: The WPC will evaluate and address the capacity of the states existing authorities to develop and implement the recommended water allocation-planning model. Accordingly, the WPC shall review with appropriate stakeholder representation current water resource management programs and consider possible changes to the water planning and permitting functions, including adjustments to existing authorities, program functions or organization as may be deemed appropriate.
 - Action Item: Recruit a select workgroup to more fully describe (in detail) the procedures that are necessary for implementation of a Water Allocation Policy Planning Model.
 - Action Item: The WPC will assign a select workgroup of stakeholders previously involved in WPC subcommittees to identify methods and mechanisms to adequately fund the proposed statewide water allocation planning process.
 - Action item: Each state agency represented on the WPC will report on the requirements necessary to create a comprehensive database that identifies all potential future sources of supply cited in Water Supply Plans, WUCC Plans and any other planning documents.
 - Action item: DEP will draft and present back to the Council a legislative proposal for the 2004 session that will implement the following Water Allocation subcommittee recommendations regarding registered diversions:
 - Retire unused registered diversions with no plans for future use,
 - Adopt standard methods for measuring flow from registered diversions,
 - Adopt a requirement for annual reporting of monthly cumulative withdrawal data, and
 - Require annual (or other frequency) fees for registered diversions.
 - Action Item: DEP will draft a legislative proposal consistent with consensus of the subcommittee report that will implement recommendations regarding modifications to the DEP’s General Permit for Consumptive Diversions.

Recommendation 2
Continuation of Source Water Assessment Program

The Source Water Assessment Program (SWAP) evaluates the susceptibility of all of Connecticut's public drinking water supply sources, both surface water reservoirs and ground water supply wells, to potential contamination. These assessments will provide information that can be used to reduce the potential for contamination to sources of public water supply sources. Funding to support SWAP staff from both DEP and DPH under a set-aside of the DWSRF ends in May 2003. Funding to support implementation of future source protection initiatives is needed.

- Action item: The WPC supports the continuation of the Source Water Assessment Program (SWAP). To assure continued protection of the state's high quality drinking waters, the WPC will request continued funding from EPA SDWA for SWAP.

Recommendation 3
Improve Water Supply Planning and Source Protection

The WPC agrees with the implementation of the following recommendations consistent with the water allocation model of the Technical Management Subcommittee (Lands Use) for the purpose of improving water supply planning and source protection.

- Action item: The WPC recommends DEP move forward with the adoption of the Aquifer Protection Land Use Regulations. In addition, the WPC recommends DEP proceed with adoption of revisions to the Level A Mapping regulations to incorporate more accurate modeling of wellfields which will establish more accurately mapped boundaries in accordance with advice from technical experts.
- Action item: The WPC will recruit a workgroup to investigate a potential mechanism and to conduct a land use inventory of land within water supply watersheds and aquifer protection areas.

Recommendation 4
Revise Stream Flow Regulations

The WPC endorses the need for both an Interim Stream Flow Method and a Long-Term Stream Flow Method as recommended by the Technical Management Subcommittee (Stream Flow) to protect Connecticut streams while balancing the needs of major water users.

There is agreement by the WPC that, for an interim method, the approach developed by Apse (2000), the median of daily flows for each of the months of October through June for unregulated rivers throughout Connecticut, is a reasonable reconnaissance-level approach to estimating ecologically protective instream flow in those months. The area where the Subcommittee did not reach consensus was regarding the specific technique to generate the monthly statistics for the low flow season of July, August, and September. A variety of approaches could be used, some more conservative than others. The two basic approaches are: 1) to continue to use the median of daily flows for each of the low flow months (July, August,

September), or 2) use the presumably more conservative median of monthly means. The somewhat less conservative approach of the median of daily flows for each of the months substantially provides for the protection of the environment and its use will more readily move forward adoption of an interim method. The WPC recognizes that flow estimation methods should not be directly applied as a rigid standard and that potential impacts on water uses, particularly public water supply, must be carefully evaluated.

- Action Item: The DEP will convene a working group consisting of other state agencies, the scientific community, and affected stakeholders to develop a framework for establishing an interim approach for regulating minimum stream flows. The goal of the working group is to develop interim approaches to address instream flow issues and revision of the minimum stream flow regulations.
- Action Item: DEP will continue to work with a broad range of stakeholders to develop a long-term instream flow protocol consistent with the WPC's endorsed water allocation model and including an assessment of cost and feasibility of implementation.
- Action item: The WPC will recruit a working group (February 2003) to evaluate the cost and feasibility of maintaining a scientifically defensible stream gaging network. The workgroup will report on findings and recommendation to the WPC by January 2004. The following approach is outlined for the work group:
 - Review the existing status of Connecticut's stream flow and groundwater data collection network.
 - Identify an optimal strategic stream and groundwater-gaging network for water resource management needs in Connecticut. Compare such a network to the existing conditions and recommend a scientifically feasible and prudent gaging network.
 - Develop an approach to use the recommended gaging network to synthesize stream flows data for use in analysis of ungaged streams.
 - Identify funding needs for establishing gaging networks and statistics along with the strategies to achieve such funding levels.

Recommendation 5

Enhance Conservation Measures

Water Utility Management Subcommittee A (Fair & Reasonable Water Rates)

- Action Item: The WPC directs the Multiple Agency Drought Committee to proceed with work on the Draft Drought Management Plan with WPC Subcommittees to finalize a Drought Management Plan for the State Of Connecticut with all deliberate speed. The prepared Draft Drought Management Plan was released for public comment on January 6, 2003 with comments due on February 7, 2003.
- Action Item: The DPUC shall propose legislation requiring all new lawn irrigation systems to be installed with rain detectors. (January 2004)

- Action Item: The DPUC shall host an annual educational water symposium, incorporating rate cases and conservation issues, beginning in 2003.
- Action Item: The WPC shall establish a workgroup to specifically investigate and consider the development of a water conservation rebate program similar to the Energy Star Program.

Recommendation 6

Improve Business Relationship between Water Utilities and State Regulatory Agencies

- Action Item: The DPUC shall begin initiating the filing of Water Company annual reports and actual 5-year debt retirements electronically. The WPC further directs the DPUC to enhance enforcement of violators.
- Action Item: The WPC assigns the DPUC to study and revise the existing Enhanced Financial Viability Model (EFVM) or consider the development of an entirely new EFVM.
- Action Item: The WPC assigns the DPH to make available viability models, both existing and pending, during the Sanitary Survey process.
- Action Item: The WPC shall create a workgroup to review the procedures for the purchasing and/or takeover of small water systems to eliminate any perception that an unfair price is being paid. Specifically, determination of what level of oversight the DPUC should be granted on a takeover or purchase that involves a regulated company and an unregulated company.

Recommendation 7

Improve Small System Assistance

The Utility Management Subcommittee developed recommendations on solutions to rate case and staff assisted rate case (SAR) obstacles for small systems. One of the recommendations was to explore relaxation of ex parte communication restrictions for Class B and C companies to allow technical meetings and/or pre-hearing conferences at the onset of a rate proceeding or SAR. While the existing rules do not prohibit noticed pre-hearing conferences, there may be a limit to the usefulness, as there may be issues in conflict that can not be discussed which require further adjudication.

- Action Item: The WPC will establish a work group to explore relaxation of ex parte communication restrictions.
- Action Item: The WPC assigns the DPH to investigate creating a list of approved vendors and contractors.
- Action Item: OPM, DEP, DPH and DPUC Commissioners will recommend to the State's Congressional delegation and EPA the need for revision of the SRF loan fund application process and eligibility requirements to enable easier access by small water companies.

- Action Item: The WPC assigns the DPH and DPUC to jointly develop a protocol requiring supply side production master metering on sources and within distribution especially for companies seeking additional sources of supply and diversion permits. This shall be investigated and considered for the 2004 legislative session.
- Action Item: The DPUC shall investigate and consider for the 2004 legislative session, the development of a surcharge for infrastructure improvements, similar to the construction work in progress surcharge that is used for safe drinking water act mandated projects, for class B and C companies.

Recommendation 8

Advance Water Utility Coordinating Committees Planning Process

Water Utility Management Subcommittee B (WUCC's)

The four state agencies on the Water Planning Council should develop a reasonable timeline and cost estimates for (a) completion of the WUCC process in the three remaining Water Supply Management areas that have not yet been convened, and (b) continuing the process of revising all WUCC plans every ten years as legislatively required. The specific recommendations brought forth by Water Utility Management Subcommittee B is as follows:

- There needs to be a means to provide a more coordinated process between water supply planning and resource allocation and a stronger statutory link between the coordinated water supply planning process and the water resource allocation process.
- A mechanism needs to be developed to re-evaluate and possibly consolidate the existing Public Water Supply Management Area's (PWSMA).
- The obstacles (financial, staffing and regulatory) that have limited the completion, approval and/or updates of the WUCC plans to date need to be addressed.
- Participation on the WUCCs should be reviewed to determine the level of participation and role of various stakeholders in the process.
- Procedural Guidelines for WUCCs should be provided to make the process more efficient and allow a convening WUCC to benefit from previous WUCCs experience.
- The general process by which Exclusive Service Areas (ESA) are established and conflicts are resolved should be reviewed and revised to ensure consistency.
- A mechanism to ensure consistency between claimed ESAs and utility water supply plans should be established.
- There were concerns raised about whether there needs to be a better mechanism to ensure coordination and consistency with the WUCC plans and local planning documents and the State's Plan of Conservation and Development.
- Action Item: The WPC recognizes the considerable comments and interest focused on the Water Utility Coordinating Committee (WUCC). The Council will have relevant existing legislation and regulations reviewed with public participation for the purpose of proposing constructive changes in both the WUCC and the associated Certificate of Public Convenience and Necessity processes for potential legislation in 2004.

Agency Response

APPENDIX F

STATE OF CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION



February 24, 2004

Carrie E. Vibert, Acting Director
Legislative Program Review and Investigations Committee
State Capitol Room 506
Hartford, CT 06106

Dear Ms. Vibert:

Thank you for extending the deadline for comments to February 24, 2004 and allowing the Department to comment on your final report regarding stream flow. As you know this is an issue with which the department has been dealing for many years both as a basic regulatory matter and a matter critical to the long term health of the state's ecosystems. We would also like to commend Brian Beisel for the work he has done in capturing the essence of the difficulties, both scientifically and programmatically, in addressing this issue.

Among the key aspects of addressing stream flow, particularly as a component of a more comprehensive water allocation system, is the need to know how much water is currently being used over various time frames, by whom and for what purposes. Many of the recommendations, which begin to address this need, concerning water allocation and data collection from holders of registered diversions that were adopted by the Legislative Program Review Committee on December 17, 2004 are consistent with the goals of the Department of Environmental Protection as well as the Water Planning Council. Similarly, your report re-enforces the findings of the Department's first investigation into the status of water allocation submitted to the General Assembly in January of 2000 and is entitled Report to the General Assembly on State Water Allocation Policies Pursuant to Public Act 98-224. All investigations of water policy in the past several years point to the need for stronger regulatory authorities and more resources to adequately manage our water resources.

The Department of Environmental Protection supports the legislative proposals embodied in recommendations #9, 10, 11, & 12 of your final report. You will find the Department's recently proposed amendment to the Diversion Act is consistent your recommendations and, we believe, provides additional necessary detail regarding the implementation of those proposals. The Department will of course need additional resources to carry out the additional data collection from registered diverters and collection of annual fees. This is why we have proposed that collected fees for registered diversions be deposited in the Department's Environmental Quality Fund just as annual fees collected from permittees are collected and deposited into this fund to support the resources needed to implement the diversion permit program and why we do not support

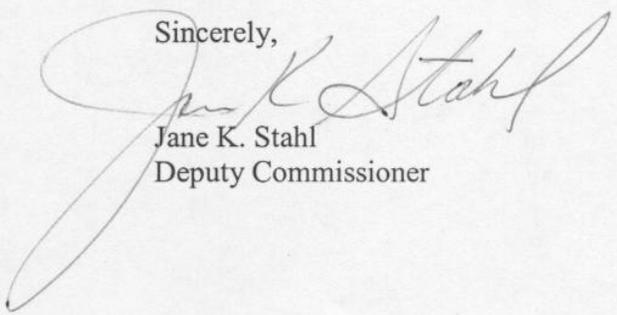
the report's recommendation that fees collected through the Department's work be diverted to the Water Planning Council. Collection of diversion data is a DEP function, supported technically and administratively by other functions and resources of DEP. Since collection of data precedes planning, it follows that the means to fund the collection and analysis of water diversion data within DEP should be given the highest priority.

The Department agrees with your conclusions regarding the role of the Water Planning Council (WPC) in examining water resource issues and crafting solutions. We have in fact been supporting these efforts, as have our sister agencies, through the assignment of staff funded by a variety of sources apropos to each agencies relevant water resources management authorities. We do not support strengthening the WPC process by diverting funding resources of any of the four agencies represented on the Council.

Finally, I would like to take this opportunity to correct a factual error in your report regarding reporting requirements for holders of diversion permits. In Chapter Four of your report under the section on the Permit Process and subheading Enforcement, your report states "... Diversion operators, whether registrants or permit holders, are also not required to submit information on a regular basis to DEP showing the actual amounts of water withdrawn under their diversions." This statement is incorrect. Holders of diversion permits are in fact required as a standard permit condition to install totalizing flow meters on their diversions, keep daily records of water withdrawals, and to submit those records to the Department on an annual basis. It is true that there are currently no requirements imposed on holders of registered diversions to submit information on a regular basis. The Department's legislative proposal is intended to remedy this gap in data collection from holders of registered diversions.

Again, thank you for the opportunity to comment on this report and recommendations. If you have any questions or wish to discuss any of these issues further please feel free to contact me at (860) 424-3009.

Sincerely,



Jane K. Stahl
Deputy Commissioner

cc: Commissioner Arthur J. Rocque, Jr.
Commissioner John Betkoski
Deputy Commissioner Norma Gyle
Undersecretary David LeVasseur



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

OFFICE OF COMMISSIONER

February 27, 2004

Carrie E. Vibert, Acting Director
Legislative Program Review and Investigations Committee
State Capitol, Room 506
Hartford, CT 06106

Dear Ms. Vibert:

Thank you for providing the opportunity for the Department to comment on the final report: Stream Flow prepared by the Legislative Program Review and Investigation's Committee. My staff appreciated the time that Brian Beisel spent in investigating the difficult issues germane to stream flow and water allocations.

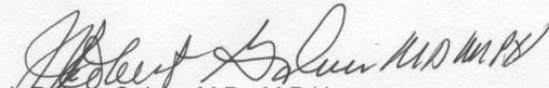
I am gratified that the report recognizes the critical role that the Water Planning Council had in completing a comprehensive review of water supply planning and water resource management. Recognition that the Water Planning Council has become the state's principal body devoted to finding workable solutions to the various and complex issues surrounding water resource management, is testament to the effort each of the partnered state agencies have devoted to these items.

The Water Planning Council, in its 2003 and proposed 2004 Work Plan, and Annual Report to the Legislature, has addressed or is proposing to address the majority of the report's recommendations. There is compatibility between the Water Planning Council work plan elements and the recommendations of the Committee's report. There is concurrence, for example, that the development of an appropriately resourced strategic plan for water allocation is critical to the efficient and effective multiple use of the State's water resources.

The Department believes that the Water Planning Council is the best mechanism to address the recommendations in the Committee's report. I suggest that the report recommend that the Water Planning Council continue to develop their work plan elements that include stream flow and the management of the water resources of the State and provide a report to the Legislature in this regard in 2005. The Department also recommends that the Committee takes into account the Water Planning Council's Work Plan for 2004 and it's Annual Report to the General Assembly.

Thank you again for this opportunity to comment.

Sincerely,



J. Robert Galvin, M.D., M.P.H.

Commissioner

JRG/ek



PHONE: (860) 509-7101 FAX: (860) 509-7111

410 CAPITOL AVENUE - MS#13COM, P.O. BOX 340308, HARTFORD, CONNECTICUT 06134-0308

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