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Environmental Compliance in Connecticut

**Prepared for the
Connecticut General Assembly
Committee on the Environment**

**By the
Connecticut Department of
Environmental Protection**

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Attachment I

Naugatuck River Water Quality Monitoring Data

It is the mission of the Department of Environmental Protection to conserve, improve, and protect the natural resources and environment of the State of Connecticut; to control air, land and water pollution in order to protect the health, safety and welfare of the people of Connecticut; and to preserve and enhance the quality of life for present and future generations.

Introduction

Connecticut General Statutes Section 22a-6t, as amended by Public Act 99-225 (28), requires the Department of Environmental Protection ("Department") to submit an annual report to the joint standing committee of the General Assembly having cognizance of matters relating to the environment on compliance and enforcement activities conducted by the Department. Specifically, the statute requires that the report provide information on permit compliance, enforcement actions, compliance assistance activities and an evaluation of environmental performance of entities regulated by the Department.

This report provides the accounting sought by the General Assembly. However, before responding to specific statutory reporting requirements, the Department presents to the reader a larger, more encompassing view of the state of the environment achieved as a result of the agency's activities. Through the determined efforts of its employees the Department continues to make significant and tangible progress in protecting public health and the environment. In recognition of these gains, the first section of the report, titled "Ambient Conditions - State of the Environment" highlights advancements realized by the Department and its partners in fulfilling the agency's statutory mission. It does not attempt to include every act or initiative undertaken by the agency. It does, however, include many of our most significant efforts, if only in an abbreviated fashion.

To provide a better understanding of the depth of effort and resources involved in many of these initiatives, the Department has expanded on a single one - the Naugatuck River Restoration Project. Contrary to some initially misleading press, the Department is successfully executing a strategy to restore and enhance the water quality and ecological integrity of the Naugatuck River after centuries of neglect and abuse. Fortunately, more accurate media coverage followed, presenting the public with a true picture of what can be achieved. Public support of this effort and others like it is critical to the Department's success.

Ambient Conditions - A State of the Environment@

The Naugatuck River Restoration Project – A Continuing Success Story

The Department, in cooperation with federal agencies, municipalities, private industries and local citizen organizations, is engaged in a comprehensive initiative to restore the water quality and ecological integrity of the Naugatuck River. The scope of this restoration effort includes upgrading sewage treatment plants, restoring anadromous fish (fish that migrate up rivers from the sea to breed in fresh water) runs by removing dams or providing passage around them, enhancing tributary habitat, revegetating the river corridor, encouraging creation of greenways, supporting river cleanups, monitoring water quality and inspecting the watershed on a regular basis. Over the past several years, the Department has also required installation and upgrade of industrial wastewater treatment systems and has, since 1992, focused more attention on cleaning up stormwater discharges from industrial and construction sites.

With its headwaters originating in Winchester, Norfolk and Goshen, the main stem of the Naugatuck River forms in Torrington and flows southward for approximately 40 miles through a densely populated landscape to Derby where it empties into the Housatonic River. Draining more than 311 square miles, the Naugatuck River watershed encompasses all or parts of 27 towns (see attached map). Beginning in the 1700's, the Naugatuck Valley became an attractive location for industrial development as the steep gradient of the river and its tributaries offered favorable sites to construct dams and provide waterpower for early mills. Subsequently, the Naugatuck River was also used for industrial water supply and for disposal of industrial and municipal wastes. Over the years, the region has been home to manufacturers producing a wide array of products including buttons, clocks, rubber, textiles, synthetic chemicals and metalworking. Up until the 1970's, the Naugatuck Valley was one of the principal brass manufacturing regions of the world.

Throughout this period of economic development, large quantities of untreated industrial wastes and sewage were discharged into the river. By 1899, the State Sewage Commission reported that the Naugatuck River had reached the limit of permissible pollution. A subsequent report by the State Board of Health in 1915 described the river as badly polluted throughout its length, a condition that remained essentially unchanged until the early 1970's. Then, following the adoption of Connecticut's Clean Water Act in 1967 and the federal Water Pollution Control Act in 1972, legal authority was established to finally begin reversing the process of water quality degradation. By 1976, through a combination of pollution abatement orders and state and federal grants to municipalities, all eight municipal wastewater treatment plants ("WWTP") discharging to the Naugatuck River had installed secondary waste treatment. At the same time, industries were required to begin using "best available technology" to treat their wastewaters. Between 1973 and 1976, Connecticut's newly formed Department of Environmental Protection

issued permits for 35 major industrial and 42 minor industrial discharges to the Naugatuck River or its tributaries. Since the 1970's, the Department has eliminated many direct discharges of industrial and cooling water to the river by redirecting them to WWTPs. More recently, industrial discharges have been reduced even further through the use of wastewater recycling systems.

Wastewater treatment improvements during the 1970's, combined with the general decline of the brass industry and closure of other businesses, led to dramatic improvements in the water quality and aesthetics of the Naugatuck River. Monitoring over the ensuing twenty years showed increased levels of dissolved oxygen (an indicator of improved water quality) and reduction in zinc and copper concentrations. While localized areas of severe degradation persisted, north of Waterbury a relatively healthy aquatic community indicated river recovery. However, from Waterbury south, aquatic life remained extremely limited. Technology based pollution controls did not provide adequate treatment to reduce ammonia and certain heavy metals to acceptable discharge levels during critical periods of low streamflow. Furthermore, dissolved oxygen and ammonia levels continued to fall short of water quality standards at certain times in locations directly downstream of municipal WWTPs.

In 1986, the Department adopted a water quality based permitting strategy to further reduce toxic substances in industrial discharges. This strategy led to a more aggressive permitting program that used biological toxicity testing methods to determine acceptable permit limits and to monitor compliance. In 1988, the Department adopted a water quality based organic pollutant Waste Load Allocation ("WLA") specifically for the Naugatuck River. This was a major milestone in the effort to establish acceptable treatment levels at municipal wastewater treatment facilities necessary to meet water quality goals for the river. The WLA concluded that advanced wastewater treatment ("AWT") would be needed at six of the eight municipal WWTPs, namely: Torrington, Thomaston, Watertown Fire District, Waterbury, Naugatuck and Seymour. To achieve compliance, pollution abatement orders were issued for each of these facilities. AWT facilities were completed in Seymour in 1992, Torrington in 1994, Naugatuck in 1995, and Waterbury in 2000. Also in 2000, the Watertown Fire District eliminated its direct discharge to Steele Brook by linking to the new Waterbury WWTP, the preferred alternative to reconstructing its plant and maintaining a separate discharge. This action also marked the elimination of the last point source discharge to Steele Brook, a significant step toward restoring the water quality of this tributary. Thomaston's AWT facilities are in the final stages of construction. The WLA also caused flows to be restored in the stretch of river below the Kinneytown dam to better assimilate the Seymour WWTP wastewater discharge (the Kinneytown Dam had diverted river flow away from its natural streambed for hydropower production, shunting river flows through a bypass channel for approximately one and one-half miles before rejoining the river).

While upgrades at all of the municipal wastewater treatment facilities mentioned above have been critical to improving water quality in the Naugatuck River, particular emphasis has been placed on the Waterbury WWTP, by far the largest wastewater plant on the river. Costing \$124 million and taking three years (1997-2000) to construct, this

advanced wastewater treatment facility features ammonia removal (significant for the Naugatuck River), total nitrogen removal (significant for Long Island Sound) and ultraviolet light disinfection (eliminating the use of chlorine and associated toxicity in the Naugatuck River). With a 27 million gallon per day ("mgd") design flow, the new plant can also provide treatment for up to 50 mgd during a rainfall event, primary treatment for additional flows in excess of 50 mgd, and up to 80 mgd when Combined Sewer Overflows are active during more significant storm events.

Due to its size, siting complications and related issues associated with constructing Waterbury's new WWTP, Waterbury proposed a plan to allow "enhanced primary treatment" ("EPT") levels at the Waterbury WWTP while the plant was being rebuilt. To compensate for the effects of EPT, the Department, the EPA and the City of Waterbury developed a mitigation plan to otherwise enhance water quality and aquatic ecosystems of the Naugatuck River while construction and EPT was ongoing. The plan contained several elements including: toxicity testing and monitoring; flow augmentation (dry conditions ultimately precluded the use of flow augmentation); dam removal or construction of fish passage facilities at dams within the watershed; the removal of accumulated debris from tributary streams; replanting the river corridor in Waterbury; and the full-time commitment of a Department field inspector to the Naugatuck Watershed. With its partners, the Department identified tributaries below the Waterbury WWTP to be improved by removing obstacles and debris from their confluence with the Naugatuck River. Removing accumulated debris and sediment from these areas allowed fish seeking thermal refuge and spawning habitat to travel more easily up the tributaries from the Naugatuck River. The City of Waterbury completed two enhancement projects for Sled Haul and Fulling Mill Brooks, and the Department is completing designs and permit applications for six others. With regard to replanting the river corridor, eleven areas were identified that would benefit from planting enhancements. Planting enhancements help improve water quality as well as terrestrial and aquatic habitat. This work was completed in the fall of 1999.

In 1998, the Department assigned a full-time field inspector with expanded responsibilities to the Naugatuck River watershed as part of the Waterbury WWTP mitigation plan. Initially, the inspector focused on industrial inspections in the City of Waterbury and the identification of unpermitted discharges. Since that time, the inspector has worked to resolve sewage spills, stormwater and foaming problems, and has responded to numerous general complaints. This inspector also regularly inspects 44 facilities throughout the watershed for compliance. In the past three years, as a result of formal enforcement actions for wastewater discharge violations, six companies within the Naugatuck River watershed have paid penalties and committed approximately \$2,500,000 in additional monies for Supplemental Environmental Projects ("SEPs") throughout the watershed. While many of the SEPs are tied to dam removal and fish passage, SEP monies have also been used to purchase equipment to treat and dispose of grease tank wastes, encourage local river cleanups and for the creation of riverside pocket parks, open space preservation, and public river access. In 2000, the Naugatuck River watershed inspector issued 28 Notices of Violation with regard to wastewater discharges and other water quality issues.

The strategy to remove dams and construct fish passage facilities originated with the 1988 Naugatuck WLA and was reinforced by a 1996 Department Fisheries Division document entitled a "Plan for the Restoration of Anadromous Fish to the Naugatuck River, Connecticut". This plan identified the Naugatuck and its tributaries as having excellent potential for cold water fish habitat and for re-establishing historical anadromous fish runs. These fish runs ceased during the industrial revolution due to construction of numerous dams and poor water quality. However, with substantial water quality improvements anticipated, Department Fisheries biologists could begin to target species for restoration including the American shad, blueback herring, alewife and sea-run brown trout.

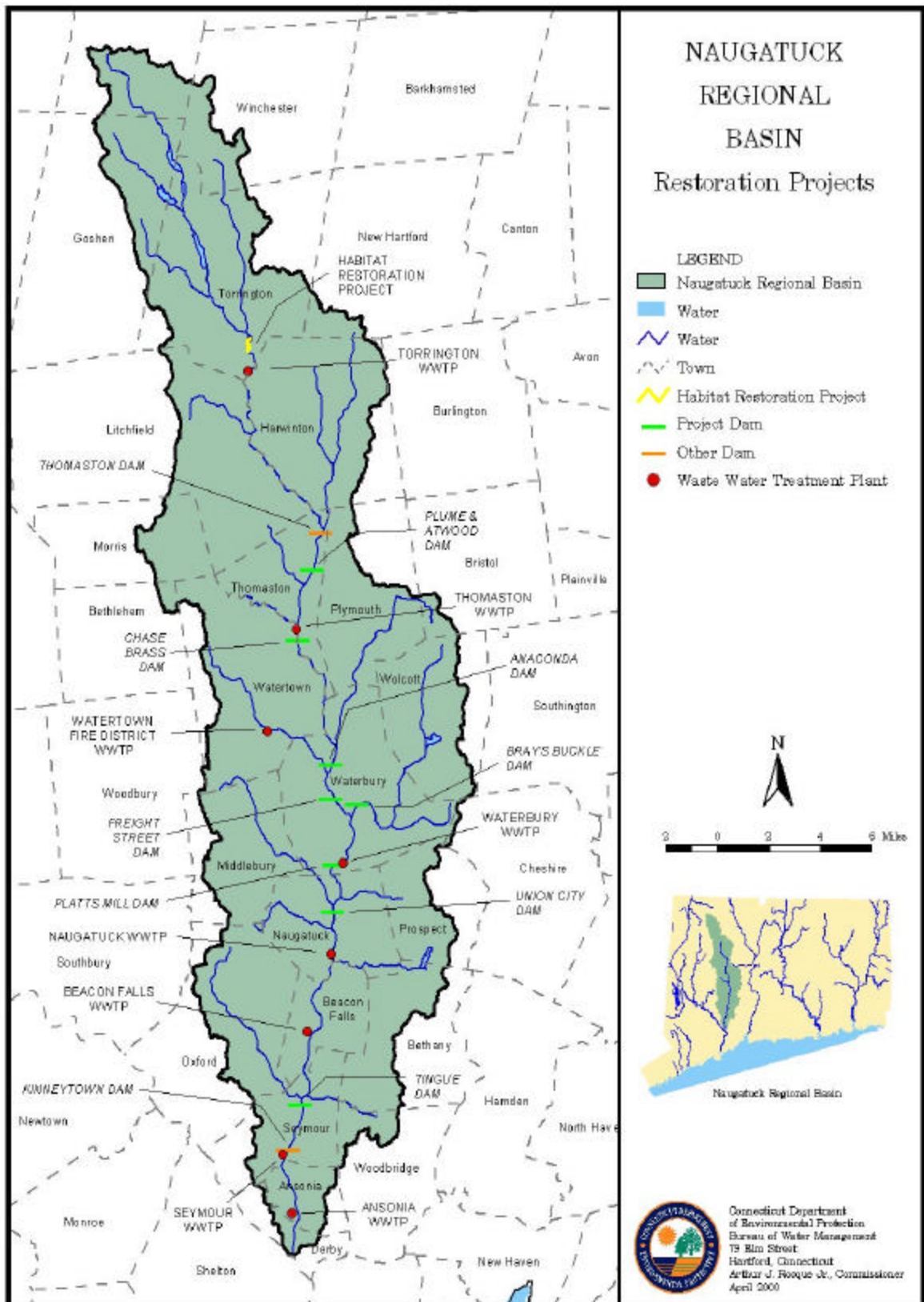
In 1998-1999 a fish ladder for up and downstream fish passage was constructed at the Kinneytown Dam (it was required by the Department as a condition to the issuance of a federal hydropower license). Simultaneously, under the Waterbury WWTP mitigation plan, the Department coordinated a special initiative to identify and either eliminate derelict dams or to build fish passage facilities around historic or functional dam structures (See attached map). In the fall of 1999, three dams in Waterbury (Anaconda Dam, Freight Street Dam and Platt's Mill Dam) and one in the Borough of Naugatuck (Union City Dam) were removed or breached. Plans are underway to remove at least two more (Chase Brass Dam and Bray's Buckle Dam, both in Watertown) and to construct a fish bypass and kayak recreational run around another (Tingue Dam in Seymour). The Plume and Atwood Dam in Thomaston is also being studied for passage options. Once this work is complete, over 30 miles of the lower Naugatuck River up to the Thomaston Flood Control Dam will be opened to anadromous fish species for their annual migration and spawning runs from Long Island Sound for the first time since the industrial revolution.

Not only do the dam removals and fish passage structures provide for fish migration and greater recreational opportunities, but these actions also help improve water quality by increasing velocity and allowing for more natural aeration and pollution attenuation to occur. Through the toxicity testing and monitoring component of the Waterbury WWTP mitigation plan, Department staff has already noted substantial improvements in water quality since dams were removed and the treatment plant began operating (see Attachment II for water quality monitoring data). Greatest improvements have been seen with regard to aesthetics, clarity, ammonia levels, dissolved oxygen levels and chemical constituents. The aquatic biological community has also improved and should continue to improve over time. Real changes in water quality and ecological integrity can only be observed over the long run and monitoring over the next several years will be critical to evaluating the success of the work done thus far.

In addition to the projects pursued under the Waterbury WWTP mitigation plan, there are many other Department activities occurring throughout the Naugatuck River watershed designed to further watershed restoration goals. For example, because of improved water quality, the Fisheries Program has decided to expand its fish stocking program in the Naugatuck River. Since the late 1980's, brown trout have been stocked in the

Campville section of the river from Route 118 at the Litchfield/Harwinton town line downstream to the Thomaston Dam. This past fall, 2,000 additional brown trout were stocked in various locations from Route 118 to Seymour. This winter, Fisheries is working on plans to expand levels of stocking below Waterbury, especially near Naugatuck State Forest. Fisheries is also proposing regulations that would designate the Naugatuck River as a "Trophy Trout Area." In addition to brown trout, surplus Atlantic salmon broodstock were released during fall and early winter to provide recreational fishing opportunities in the river in the Campville section and near Beacon Falls. Surplus salmon have been released into the Naugatuck River annually since 1992. Fisheries expects to continue releasing broodstock salmon in future years.

Citizen groups and communities along the river have played a key role in driving the Naugatuck River Restoration Plan forward. They have also undertaken additional improvements of their own. River advocacy groups have conducted river cleanups, fish stocking, revegetation projects, river celebrations and have volunteered to conduct water quality monitoring. In 1999, the Town of Beacon Falls, with the help of King's Mark Resource Conservation and Development Program, completed a small park along the banks of the Naugatuck, the first step toward creating a greenway along the river. Since then, the Department has been working with Trout Unlimited and the Town to establish another small park that would provide additional fishing and canoeing access to the river. The greenway work underway in Beacon Falls is part of a larger vision to create a greenway along the entire length of the Naugatuck River from Torrington to Derby. With the help of organizations such as the Housatonic Valley Association and Central Naugatuck Valley Council of Governments, as well as the support of the Connecticut Greenways Council, other towns throughout the watershed are also working on greenway plans. At the northern end of the river, the City of Torrington has been working with the Army Corps of Engineers, Fisheries and others for the past four years to increase habitat value in a section of Naugatuck River which had been channelized for flood control. During the Summer of 2000, more than 300 boulders were installed within a 4,000 foot stretch of the river in downtown Torrington to help restore fisheries. From one end of the Naugatuck River to the other, incremental improvements are contributing to make the Naugatuck a healthier watershed. The Department will continue to leverage regulatory activity with advocacy group support in this and other watershed settings to restore and improve Connecticut's environment.



Air

Thirty years ago, the citizens of Connecticut were exposed to a host of air pollution problems. Increases in energy consumption, industrial expansion, population, and the use of private motor vehicles produced unparalleled levels of air pollution. By the early 1970s, Connecticut's air quality exceeded the health-based standards of all six criteria pollutants - particulate matter, sulfur dioxide, nitrogen dioxide, ozone, lead and carbon monoxide. Recognizing the need to clean the air, state and federal administrators began addressing the primary causes of the poor air quality.

Since then the State has made remarkable progress in improving air quality. Despite continued increases in vehicle miles traveled and business productivity, Connecticut is now classified as "attainment" for carbon monoxide, lead, nitrogen oxides, and sulfur oxides. This means that for these pollutants, monitoring data from all regions of the State show continued compliance with the applicable ambient air quality standards. Further, only the New Haven area remains classified as "nonattainment" for particulate matter less than ten microns. Available monitoring data indicate that New Haven achieved compliance with the particulate matter standard in 1997. Therefore, the State is currently pursuing redesignation of the New Haven area from nonattainment to attainment.

Despite real progress, ozone exceedances remain a problem in the State. Nitrogen oxide emissions contribute to unhealthy surface level ozone throughout the northeast, including Connecticut. Surface level ozone plays a part in many respiratory health problems including shortness of breath, coughing, nausea, throat irritation and increased susceptibility to respiratory infections. An ozone "nonattainment" classification applied to an area reflects to what degree pollutant measurements have exceeded the ambient air quality standard. For example, the entire State is designated as "nonattainment" for ozone, but the classification varies from serious to severe. The area comprising Fairfield County (excluding Shelton), plus the towns of New Milford and Bridgewater, is classified along with New York City and northern New Jersey as **Asevere nonattainment@** for ozone, while the remainder of the state is classified as **Aserious nonattainment.@** The difference is explained by higher ozone concentrations that have been historically measured in the southwest part of Connecticut.

The following pages provide graphic illustration of the long downward trend in ambient concentrations of all six criteria pollutants in Connecticut:

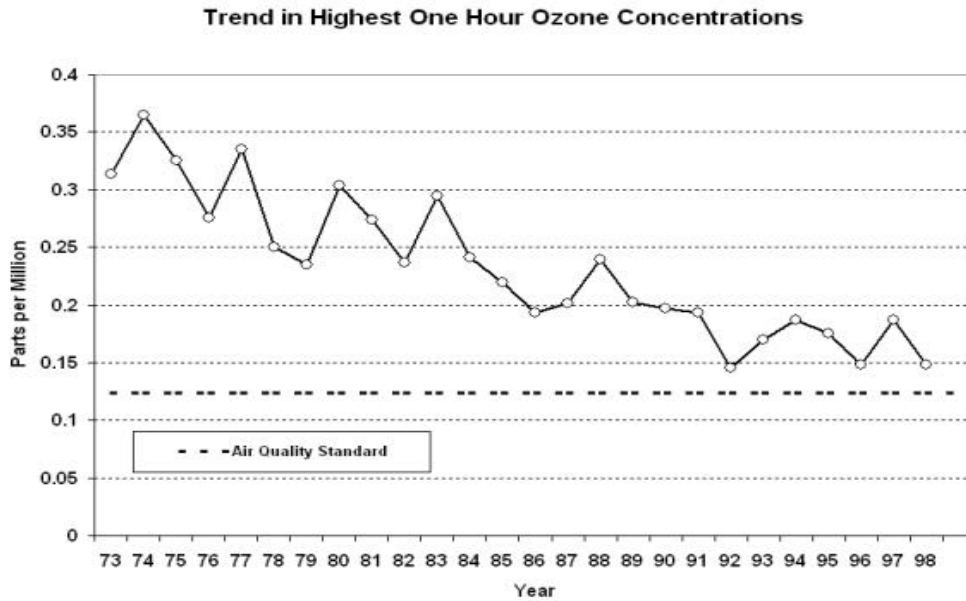
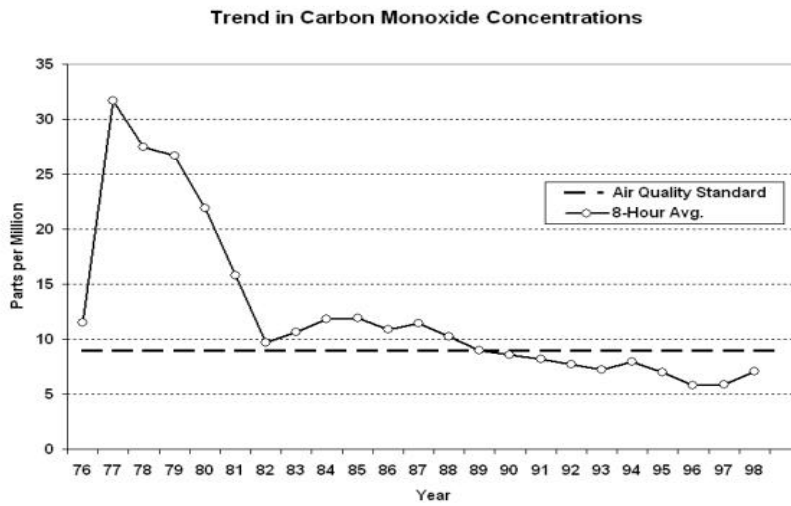
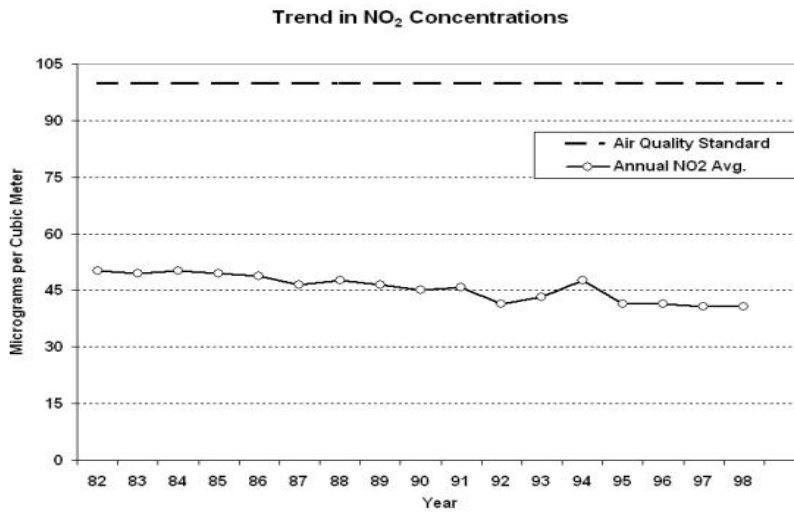


Figure 1

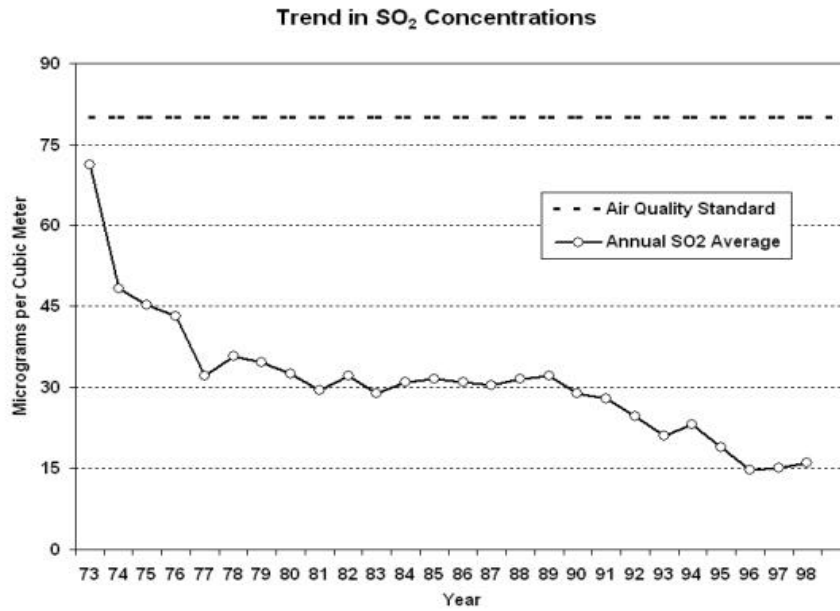
Ozone exceedances have decreased over 50% since the early 1970s (Figure 1). In addition to large reductions in the number of unhealthy days due to high ozone, peak ambient concentrations are also declining, which means that the amount by which Connecticut exceeds the ozone standard on unhealthy days has been greatly reduced. Data collected since the 1970's indicates that the number of days on which temperatures exceed 90 degrees has a direct relationship to the number of health standard exceedances. Due to regional transport of air pollutants, Connecticut's highest ozone concentrations occur on days when surrounding states also record high concentrations. Further, Connecticut experiences its highest ozone concentration when prevailing winds are from the southeast and midwest regions of the United States.



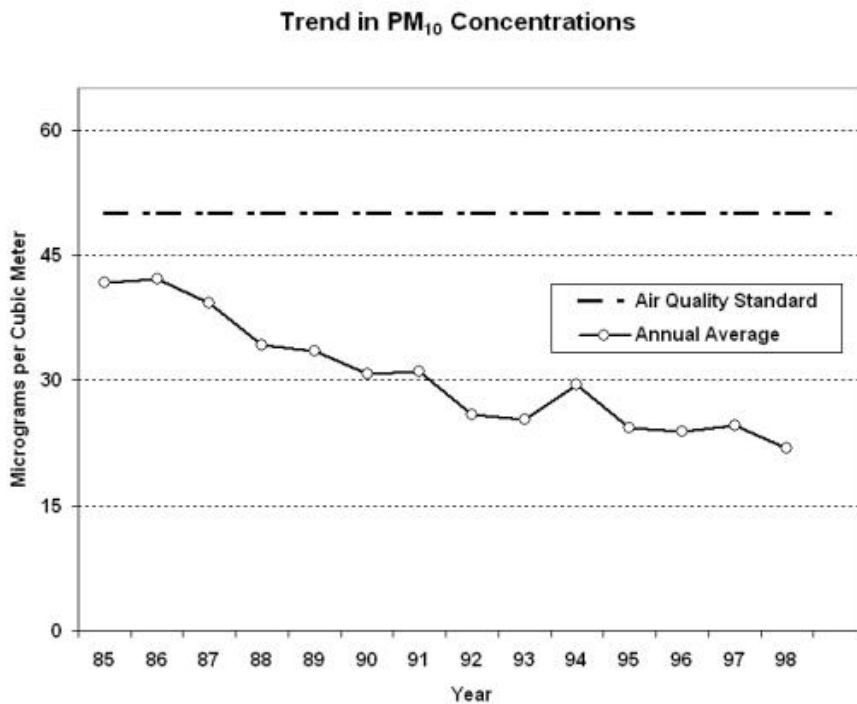
Carbon monoxide levels have dropped by more than 50% since the late 1970's. (Figure 2)



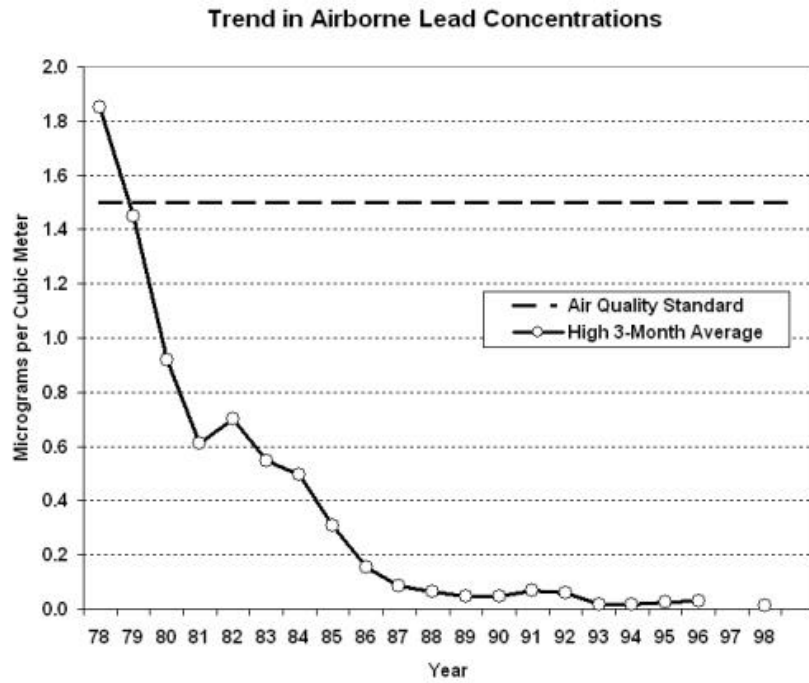
Nitrogen dioxide levels have dropped as much as 45% since 1975 and are consistently less than half the air quality standard since the late 1980s. (Figure 3)



Sulfur dioxide levels have declined by more than 60% since the early 1970s. (Figure 4)



Particulate matter (10 microns or less) levels have dropped by more than 20% since the mid 1980s. (Figure 5)



Lead levels have declined by more than 90% since the mid 1970s. (Figure 6)

Water

Rivers and Streams

Connecticut's Clean Water Act became law in 1967. A comprehensive assessment of the health of Connecticut streams for that year classified 663 miles of major waterways as not meeting minimum water quality standards. Some rivers were referred to then as "open sewers", unfit for swimming and unable to support healthy biological communities. Available state and federal pollution control resources subsequently focussed on untreated sewage and industrial waste discharges. State and federal agencies, municipalities, business, environmental groups, and many individuals participated in a massive effort to restore these waters. As a result, by 2000, miles of major waterways classified as not meeting minimum standards has dropped by 56% to 291. (See Figure 7).

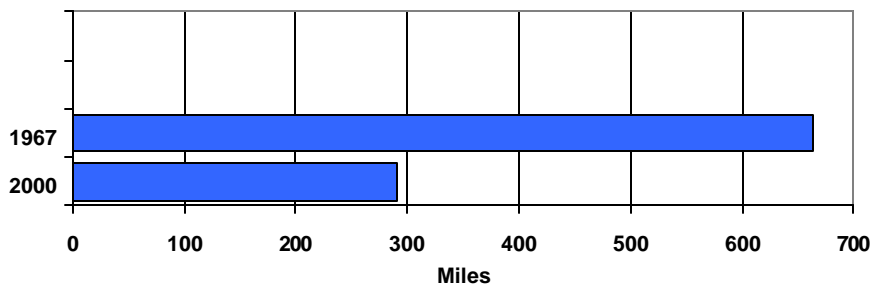


Figure 7 - Miles of Major Rivers Not Meeting Minimum Standards

Although gross pollution of Connecticut rivers and streams has been eliminated, in the years since 1967 the public's expectations regarding what constitutes "clean" water has also changed. Connecticut's Water Quality Standards and Criteria ("WQS") have been modified numerous times to account for newly identified problems with pollutants such as ammonia and heavy metals whose impacts were previously masked by the gross pollution of some waters. Other pollutants such as PCBs and dioxin were not a concern in 1967 but are treated now as major water quality issues. Many waters thought to be "clean" in 1967 would probably not meet the tightened standards of today. Effective management of diffuse sources of pollutants ranging from atmospheric deposition to storm water runoff are now viewed as critical to fully restoring the waters which remain classified as "impaired".

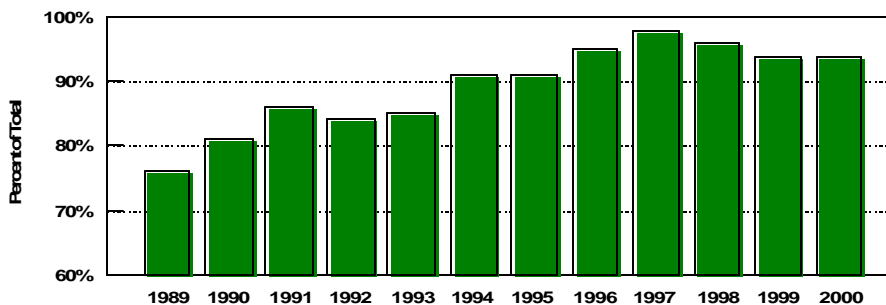


Figure 8 - Percent of Sewage Treatment Plants Tested to be Non-Toxic

In 1987, Connecticut adopted new regulations to address the threat posed by toxic pollutants in industrial and municipal sewage treatment plant discharges to aquatic life. This program involved establishing permit limits for toxicity and routine toxicity testing of discharge effluents. Toxicity tests expose sensitive aquatic organisms to samples of a discharge in the laboratory thus providing a direct measure of the potential for the discharge to impact aquatic life. In 1989, the first full year of monitoring, nearly 25% of Connecticut sewage treatment plants reported measuring toxicity in their discharge. Today, greater than 90% of the 96 facilities which routinely monitor discharge toxicity are non-toxic (Figure 8). Five of the six municipal treatment plants that reported toxicity in 2000 investigated the problem and resolved it. Four of the five municipalities investigating toxicity found that it was related to ongoing reconstruction activities to upgrade their facilities while the other concluded it resulted from sewer conveyance system improvements. The sixth plant reporting toxicity in its wastewater investigated the problem but could not identify the cause. However, the toxicity problem lasted only three months and has not recurred since.

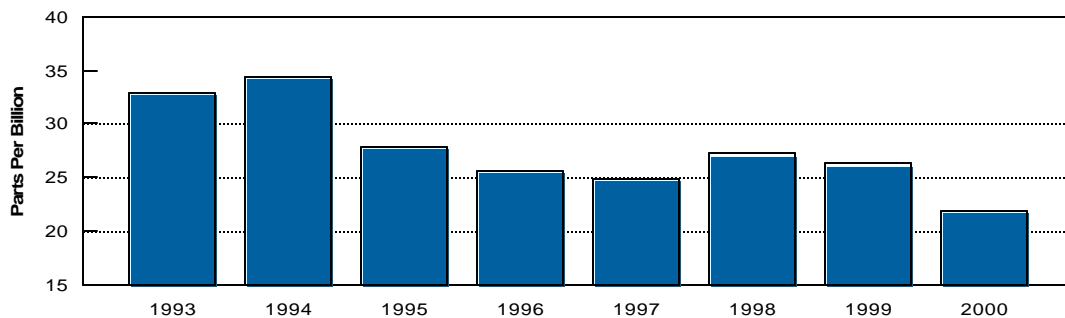


Figure 9 - Average Concentration of Copper Sewage Treatment Plant Discharges

Connecticut's WQS were modified in 1992 to include numeric water quality criteria for heavy metals and other toxic pollutants. This program establishes discharge permit limits to reduce concentrations of contaminants to levels which can support a healthy aquatic community. Although criteria were adopted for over 100 pollutant parameters, attention has been principally focussed on the heavy metal copper. Copper is a problem in Connecticut because it can be highly toxic to aquatic organisms at low concentrations. Copper is a common contaminant in sewage treatment plant and industrial discharges due to its widespread use in plumbing applications and its highly soluble nature in water. Stringent permit limits on copper have been imposed in numerous industrial and municipal discharge permits while copper monitoring of effluent streams has been a universal requirement in all permits issued since 1992. Management efforts have focussed on imposition of tighter controls on industrial sources, reducing corrosion of household copper piping, and strict enforcement of prohibitions on use of copper-based sewer additives to control root growth. Additional benefits have been derived from improved treatment at several facilities which upgraded wastewater treatment technology. Since 1993, these efforts have resulted in a decrease of approximately one-third of the average concentration of copper in treated municipal sewage discharges (Figure 9).

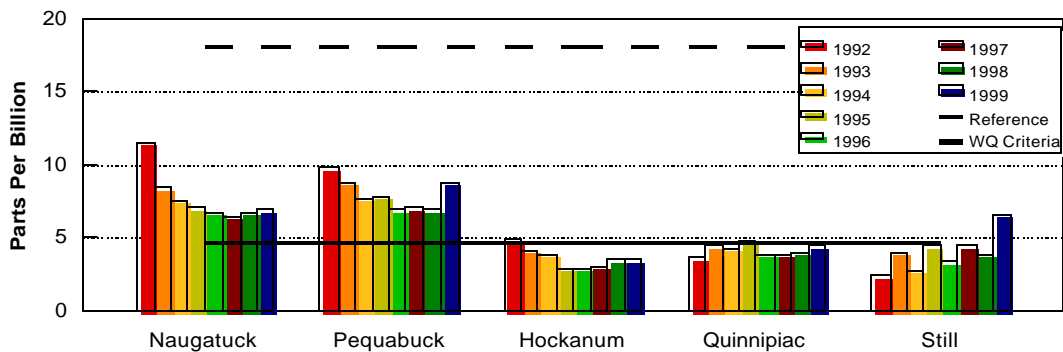


Figure 10 – Average Concentration of Copper in Major Discharge Receiving Streams

Efforts to reduce copper concentrations in wastewater discharges are reflected in a decreasing trend in copper concentrations in several of Connecticut’s major rivers (Figure 10). Annual average dissolved copper concentrations have decreased since 1992 in the Naugatuck, Pequabuck and Hockanum Rivers with the exception of 1999, an exceptionally dry year. The lack of precipitation in 1999 caused smaller streams to become uncharacteristically "discharge dominant". It is noteworthy that three of Connecticut’s five major wastewater receiving rivers typically exhibit average concentrations below levels observed in Connecticut streams which have never been polluted. All of these streams, even during severe drought conditions, are well below the Water Quality Criteria.

Lakes, Ponds and Reservoirs

Connecticut has approximately 3,280 lakes, ponds, and reservoirs. The Department and water utilities annually assess 115 recreational lakes and 150 water supply reservoirs for water quality. The major water quality concerns for Connecticut’s lakes and reservoirs include eutrophication caused by excessive enrichment from nutrients, organic matter, and sediment accumulation; and the quality of lake, pond and reservoir waters used for swimming and drinking. In addition, the infestation of many lakes with nuisance exotic plant species, especially Eurasian water milfoil, is a new and growing concern throughout the state. Symptoms of eutrophication include dense algae blooms, nuisance weed beds, and depletion of oxygen in bottom waters. Principal sources contributing to eutrophication include storm water runoff, septic systems, land development, agriculture, lawn care fertilizers, and waterfowl.

The Department’s annual status and trends analyses for the 115 lakes monitored shows that most have maintained stable water quality conditions despite continued development within their tributary watersheds. Credit is due to public education and pollution control efforts targeting improved land use practices by homeowners, municipalities, and the agricultural community. Seven large public recreation lakes have shown significant improvements in trophic characteristics due to point source controls and/or publicly funded in-lake restoration projects. Five lakes have experienced degradation in trophic

characteristics due to exotic plant infestation, land development, and/or burgeoning populations of Canada geese.

Connecticut is one of only two states in the country that prohibit surface water discharges to all waters tributary to its drinking water reservoirs. This level of protection for Connecticut's drinking water supplies ensures the safety of drinking water served to more than one million state residents.

Ground Water

Connecticut's ground water resources are the source of drinking water for approximately one million residents of the state. The Department anticipates that future demands related to growth in water supply systems will be satisfied predominantly by ground water. In addition, ground water is the source of all baseflow in the streams and rivers in Connecticut and therefore the quality of Connecticut's surface water resources is directly linked to the quality of its groundwater.

The quality of natural ground water in Connecticut is generally excellent. Of the more than 250,000 private drinking water wells and over 1,600 public water supply wells in the state, fewer than 10% are known to have been affected by pollution. However, ground water resources have been affected in very localized areas by a variety of pollution sources, ranging from historic industrial and commercial activities, the use of pesticides and fertilizers, leaking underground storage tanks, unlined landfills, salt storage facilities, road salt application, countless accidental spills of chemicals at commercial, industrial and residential properties, and numerous waste disposal practices including septic system discharges.

Identifying and eliminating sources of ground water contamination, most of which affect only very localized areas of ground water, poses many challenges to achieving the state's goal of protecting and restoring ground water resources. The Department has established several programs to manage the problems created by ground water pollution. Of most significance to public health is the Potable Water Program. It has successfully provided or required that polluters provide a safe supply of water to the more than 241,232 people that have been affected by more than 2,147 contaminated drinking water wells. In addition, the Department has developed a number of other programs that encourage or require the remediation of contaminated sites. For example, the State Superfund program is designed to address sites which are high environmental priorities. Others, such as the Urban Site Remediation Program and the Property Transfer Program are designed to encourage voluntary remediation or clean up of sites that are an economic priority. The Department has expanded the amount of staff resources available to review and approve voluntary remedial action plans for the clean up of polluted sites through the Licensed Environmental Professional ("LEP") Program. There are now over 244 licensed environmental professionals that have the authority to approve and oversee the clean up of contaminated sites, sites that the Department could not address and which would otherwise not have been cleaned up. As of December 31, 2000, LEPs have been assigned the responsibility for reviewing and approving remediation at 334 clean up sites.

Wetlands

Connecticut's wetlands resources provide significant fisheries and wildlife habitat, act as buffers between terrestrial and aquatic environments, moderate the effects of flooding and drought and provide recreational opportunities to the citizens of the state. The role of wetlands in sediment and pollutant renovation, especially in attenuating the effects of nutrients, are important to the protection of water quality for all water bodies of the state, including Long Island Sound. Connecticut has approximately 450,000 acres of inland wetlands and 85,000 acres of freshwater watercourses. Roughly 17,500 acres of the State are tidal wetlands.

Tidal wetlands are an indispensable part of the Long Island Sound ecosystem, serving such functions as waterfowl and wildlife habitat, pollution control, floodwater storage, and nurseries for fish and shellfish. Until the late 1960's, tidal wetlands were generally considered swamps and wasteland, useful only when dredged, drained or filled. As an unfortunate result, approximately 30 percent of Connecticut's tidal wetlands have been lost since colonial times. A significant portion of the remaining wetlands was degraded by tidal flow restrictions through draining by tide gates, undersized culverts, and ditching, before modern-day understanding operating through the Tidal Wetlands Act halted this type of degradation.

A growing public awareness of the importance of protecting tidal wetlands coalesced into law with the passage of the Tidal Wetlands Act in 1969. Since that time, permitted losses of tidal wetlands have virtually ceased, except for unavoidable losses associated with highway improvements and other public works projects. A 1991 amendment to the Act insured that all tidal wetlands will receive full regulatory protection, and tidal wetland policies are also incorporated into municipal land use decisions through the Coastal Management Act.

Intensive efforts to reverse the historical trend and restore tidal wetlands began in 1980 under the Department's newly created coastal management program. Using a wide variety of funding sources, including mosquito control funds and federal grants from the Intermodal Surface Transportation Efficiency Act and the United States Environmental Protection Agency, the Department has developed a dedicated wetland restoration unit with specialized equipment and expertise. By methods such as re-establishing tidal flow, creating ditches and ponds, filling mosquito ditches, and controlling invasive plant species, the Department has become recognized as a national leader in tidal wetlands restoration, with over 2,200 acres in Connecticut restored.

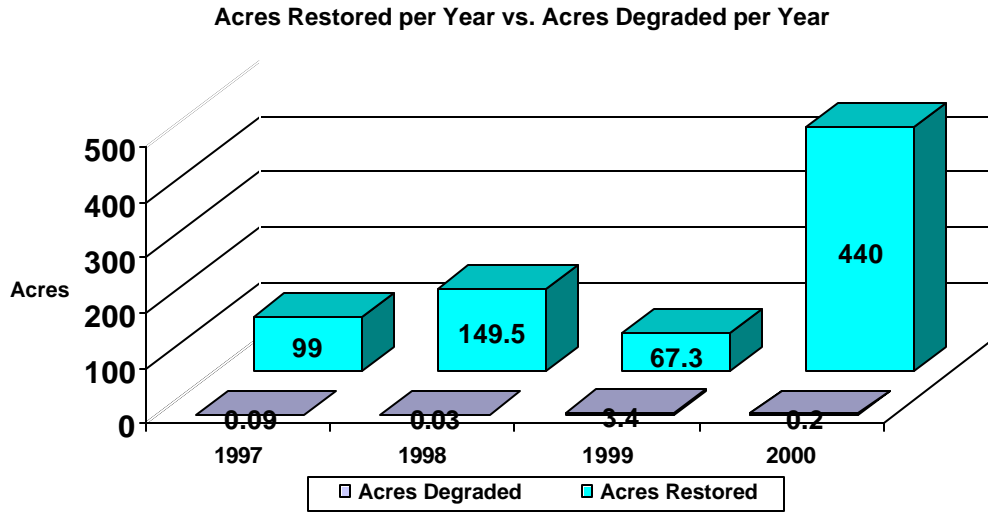


Figure 11- Connecticut Tidal Wetlands Restored 1997 - 2000

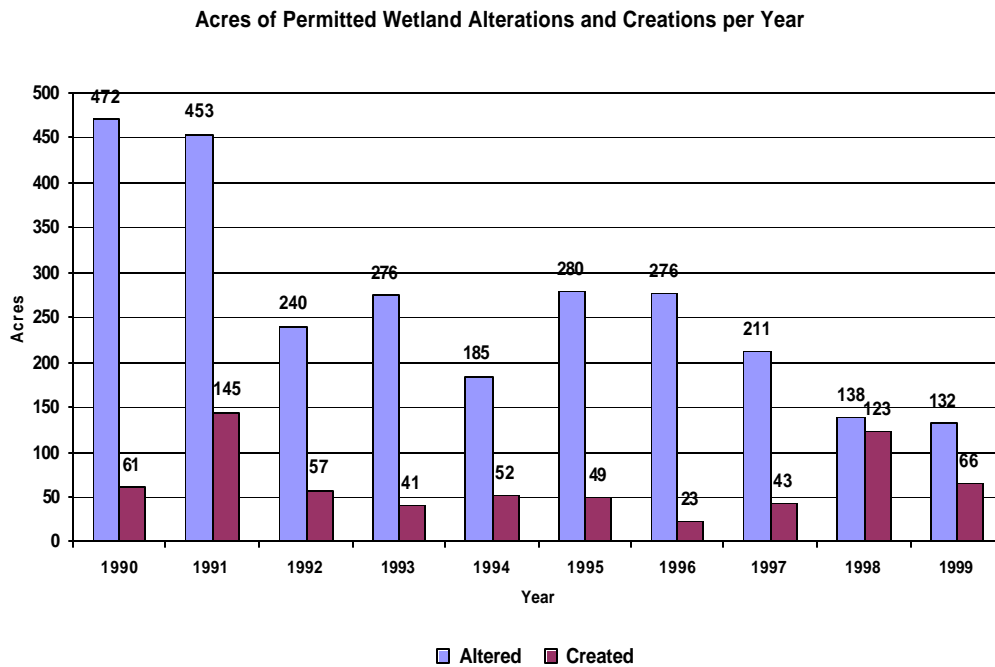


Figure 12- Permitted Alterations to Inland Wetlands and Watercourse 1986-1999

In 1986, Connecticut began its wetland status and trends reporting program to track statewide wetland losses permitted by the Department and municipal wetland commissions. Data gathered under the tracking program indicates that permitted inland wetlands alterations have been steadily declining from approximately 470 acres in 1990 to approximately 132 acres in 1999. While there may be outside variables affecting the

trends depicted in Figure 12, increased awareness, technical assistance and training has certainly contributed to the downward trend of acres impacted in recent years. Based on inland wetland agency reporting for the years 1990 through 1999, approximately 1027 acres of inland wetlands or watercourses were restored or created as a direct result of wetland permit proceedings.

As a result of these and other program initiatives, Connecticut citizens today enjoy clean and safe water resources which support healthy communities of aquatic life and offer excellent aesthetic quality.

Long Island Sound

Long Island Sound ("LIS") is an estuary, a place where salt water and fresh water mix. Unlike most other estuaries, it is open at both ends - through The Race to the Atlantic Ocean at the eastern end and through the East River and New York Harbor at the western end. Bounded by the State of Connecticut and New York State's Westchester County on the north and by Long Island on the south, LIS is 110 miles long (east to west) and about 21 miles across at its widest point, with mid-Sound depths between 60 and 120 feet. LIS has an area of approximately 1,300 square miles in Connecticut and New York; roughly 600 square miles are within Connecticut. The Sound's watershed, which is all the land that drains into the Sound, extends into Canada, and covers an area of about 16,000 square miles. The LIS watershed is inhabited by more than 8 million people. Any pollutants entering the water as a result of human activities in this vast area can ultimately harm the Sound.

In the late 1960s, LIS and its coastal waters suffered from gross pollution caused by sewage and industrial wastewater discharges. Continuous dry weather overflow of raw sewage existed in Norwalk, Bridgeport, New Haven and Norwich Harbors. Much of the wastewaters discharged were either not treated, or were inadequately treated, as operation and maintenance problems at treatment plants were common. Those gross sources of pollution have been eliminated and the quality of Connecticut's harbors, embayments, and other coastal waters are considerably improved. Industrial wastewater treatment has also vastly improved; no known untreated discharges of significance remain.

In 1985, the federal government and the States of Connecticut and New York initiated the Long Island Sound Study ("LISS"), a landmark cooperative endeavor designed to analyze and correct the Sound's most pressing environmental problems. In 1987, Congress established the National Estuary Program ("NEP") and in 1988, at the request of the states of Connecticut and New York, EPA designated Long Island Sound an *Estuary of National Significance* and convened a Management Conference.

Hypoxia, or low dissolved oxygen, affects the western half of LIS (Figure 13) as well as several coastal harbors and embayments and has emerged as the most important water quality problem in Long Island Sound.

The LISS has linked much of the hypoxia problem to excessive nitrogen loading. While nitrogen is a necessary nutrient in a productive ecosystem, too much nitrogen fuels the

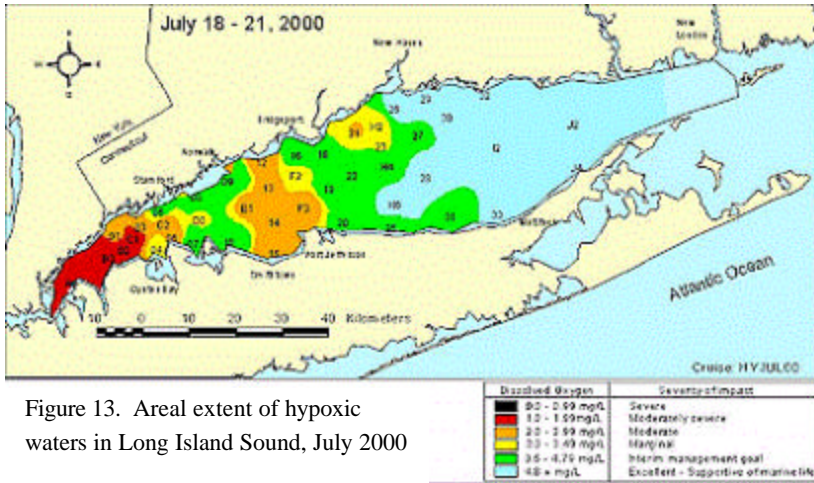


Figure 13. Areal extent of hypoxic waters in Long Island Sound, July 2000

excessive growth of planktonic algae. The dense algae blooms cloud the water and shade the bottom. When the algae die and settle to the bottom of the Sound they are decayed by bacteria, a process that uses up available oxygen. Oxygen in short supply impairs the feeding, growth, and reproduction of the Sound's aquatic

life. In extreme conditions, some organisms may suffocate and die, while others flee the hypoxic zones. As a result, excessive nitrogen impairs the function and health of Long Island Sound.

Natural sources of nitrogen are estimated to contribute 40,000 tons per year to LIS from the entire drainage basin including import from the Atlantic Ocean. Nitrogen sources in the same geographic area associated with human activities add an estimated 58,000 tons per year. As a result of the nitrogen enrichment, hypoxic events are more severe and cover a significantly larger portion of the Sound today than would occur under natural conditions estimated in pre-colonial times.

The LISS *Comprehensive Conservation and Management Plan* ("CCMP") for LIS proposed to mitigate hypoxia by reducing nitrogen inputs through the installation of advanced wastewater treatment facilities to control nitrogen and by controlling nonpoint sources of pollution. Since the CCMP was issued in 1994, Connecticut and New York have completed a total maximum daily load analysis ("TMDL") for nitrogen control that calls for a 58.5% reduction of nitrogen from baseline conditions by the year 2014.

Point sources dominate the nitrogen load to Long Island Sound from Connecticut and New York, representing more than 73% of the total nitrogen input. Therefore, significant improvement can be realized by upgrading sewage treatment plants to biologically remove nitrogen. Connecticut's baseline load of nitrogen enrichment to LIS from point sources and terrestrial non-point sources was approximately 11,420 tons per year in 1990. According to the proposed strategy, Connecticut must reduce this load by 58.5% (or about 6,670 tons per year) over the next 15 years. Beginning in 1990 Connecticut began making low cost modifications to include biological nutrient removal (BNR) of nitrogen in coastal sewage treatment plants from Greenwich to Branford and is continuing to upgrade and modify other coastal and inland treatment plants. However, to achieve the ambitious levels of nitrogen reduction needed to alleviate hypoxia, many plants will need to be reconstructed.

Certain sanitary water quality problems remain in coastal waters. Indicator bacteria levels vary significantly as a result of precipitation, sewage overflow incidents, and wild and domestic animal population levels. For public health protection purposes, state and municipal coastal beaches are routinely monitored for indicator bacteria (at least weekly) during the bathing season. This state and municipal cooperative effort was strengthened in the early 1990's and has been used to justify temporary beach closures when public health is threatened. Along Connecticut's coastline there are typically a few hundred beach-closure days each year out of a beach user day availability of approximately 16,500 days. For similar health protection reasons, the Connecticut Department of Agriculture's Bureau of Aquaculture monitors shellfish beds for indicator bacteria. More than 100 square miles of the Sound are closed for the direct harvest and consumption of shellfish. Sanitary quality of the Sound's waters will improve as combined sewer overflow abatement projects continue to be implemented and non-point source contributions reduced.

Waste

The Department administers a number of varied programs related to the management and handling of hazardous materials, the prevention, minimization and reuse/recycling of waste materials, and the cleanup of accidental releases. Historically, environmental management focused on pollution control through end-of-pipe treatment and disposal. Although this approach has significantly reduced toxic releases, contaminants continue to be discharged into the land, air and water. Consequently, the overall goal of the State's Waste Management programs has expanded to emphasize waste minimization and pollution prevention.

Pollution Prevention Program

The new cornerstone of the Department's waste management effort is the State's Pollution Prevention Program. The focus of this multimedia (air, water and waste) program is to prevent pollution before it is created by encouraging individuals, business and industry, and government entities to modify purchasing habits and product manufacturing processes in order to minimize emissions, rather than treating and controlling pollution after it has been generated. Pollution conserving energy, water and other natural resources.

Pollution prevention initiatives can help the business and industrial sector realize economic benefits through reduced raw material and disposal costs, eliminated or decreased clean up liability, improved efficiency, reduced regulatory burden, reduced risks to workers and the surrounding community, and an improved public image. The Department's program emphasizes voluntary participation and technical assistance. Its central aim is to increase awareness of the importance of pollution prevention through education, outreach and the formation of partnerships.

Although not a perfect measure of pollution prevention, the increasingly comprehensive reporting of the federal Toxic Release Inventory ("TRI") demonstrates that emissions are decreasing in Connecticut.

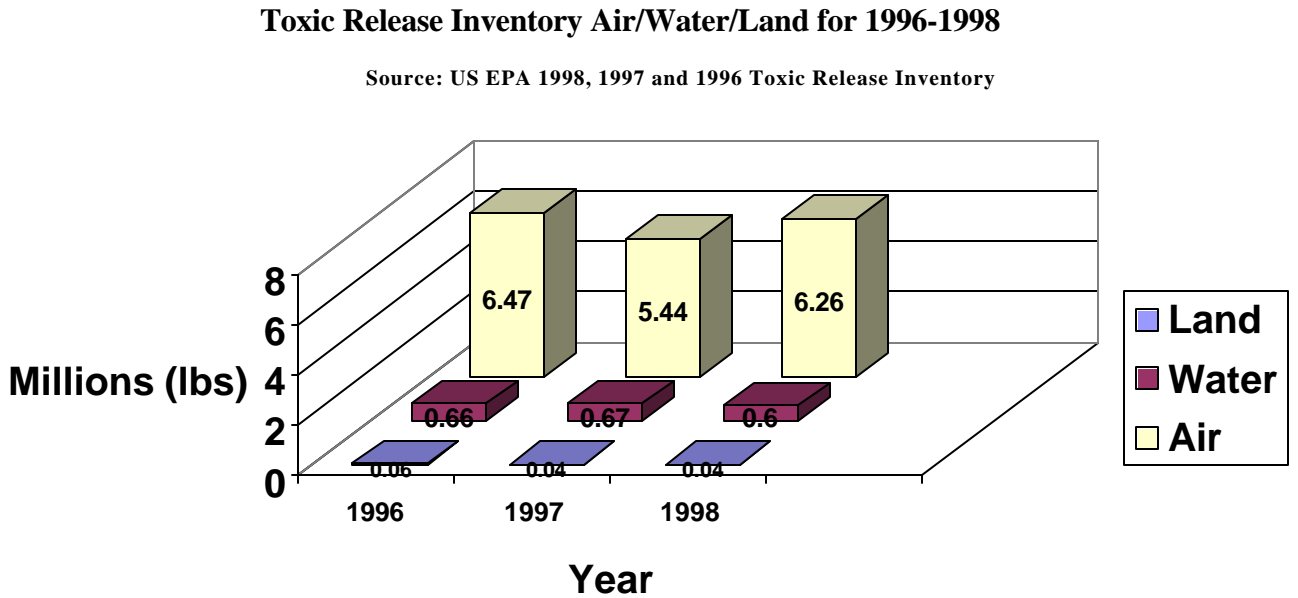


Figure 14

While figure 14 suggests that reported air emissions increased in 1998 from 1997 levels, that is not the case. In 1997, seven new industrial categories that were not required to report in past years were added to the TRI reporting requirements. The categories added were metal mining, coal mining, electric utilities, commercial hazardous waste treatment, petroleum bulk terminals, chemical wholesalers and solvent recovery services. Without the additional categories, the air emissions reported in 1998 decreased from 5.44 million pounds to 4.81 million pounds.

Quantities of Toxic Release Inventory Chemicals in Waste Management Activity in Connecticut

Source: US EPA 1998 Toxic Release Inventory

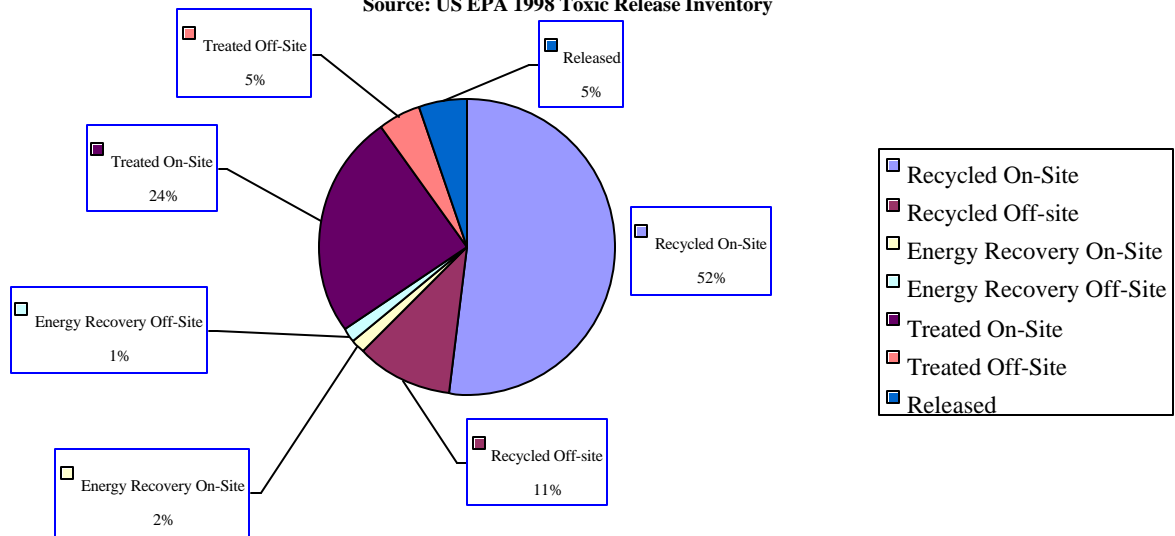


Figure 15

The most recent TRI data indicates that in 1998, 63% of materials required to be reported were recycled and only 5% were released to the environment.

Solid Waste Management Program

Connecticut's solid waste management system is based on the following descending priority for waste management, as required by CGS Section 22a-228: source reduction, recycling, composting of source separated organic materials, bulky waste recycling, resource (energy) recovery, incineration and landfilling. The State has closed nearly all of its Municipal Solid Waste ("MSW") landfills, eliminated most its illegal dump sites, implemented a statewide mandatory source reduction/recycling program, developed a high reliance on resource recovery for MSW volume reduction, and initiated a program for the beneficial use of special wastes. In 1993, 40 MSW landfills accepted waste for disposal; now only one landfill (Windsor) accepts MSW. The Department's 1999 "Proposed Solid Waste Management Plan: Minimizing Disposal in the 21st Century" identifies the three most critical solid waste issues facing the state over the next five to ten years. They are:

- To dramatically increase the source reduction and recycling of MSW and the source-separated composting of organics in order to minimize the need for additional MSW disposal capacity as population grows.
- To develop an infrastructure and markets for increased source reduction and recycling of bulky waste and other types of special waste in order to minimize the need for additional disposal capacity for these wastes.

- To develop additional disposal capacity for bulky and other types of special waste because even with aggressive source reduction and recycling there will be a need for additional disposal capacity for these waste streams.

Today, there are no incinerators processing MSW in Connecticut; the vast majority of our 169 municipalities have long-term contracts with one of the State's six resource recovery facilities. Based on reports submitted to the Department, in FY99 approximately 5% of the MSW generated in Connecticut was landfilled in Connecticut, 62% was processed at Connecticut resource recovery facilities, 9% was disposed of in out-of-state facilities, 24% was recycled and 1% was source reduced through backyard composting and grasscycling (i.e. that material never reached the MSW stream). It is estimated that the actual MSW recycling rate (including reported and unreported material recycled) is actually closer to 30%.

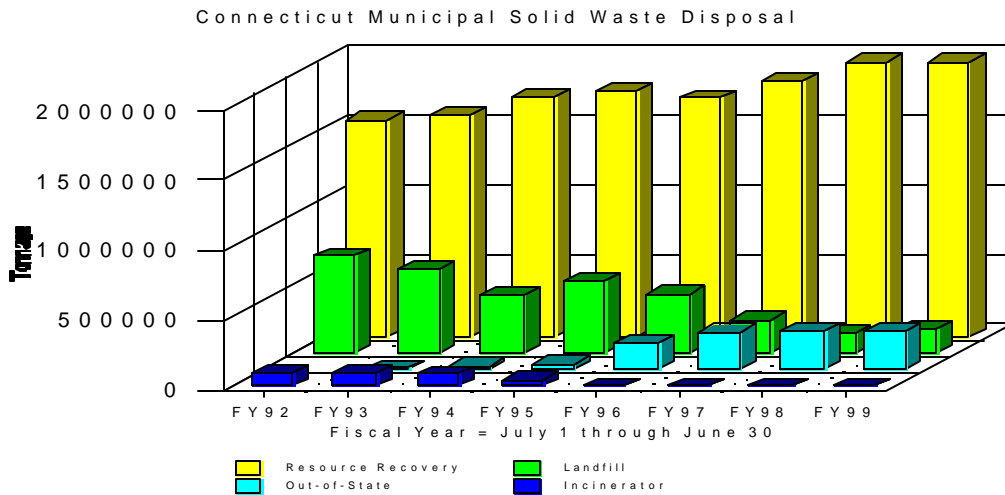


Figure 16

Resource recovery facilities with state-of-the-art pollution controls were developed in Connecticut to accommodate the MSW that could no longer be disposed in landfills. The State's six existing resource recovery facilities are permitted to process about 2 million tons per year of MSW. This capacity is sufficient to meet Connecticut's disposal needs through the year 2015, assuming that the State's 40% source reduction/recycling goal is met. More than 80% (115 of 169) of the State's 169 municipalities have Department approved long-term contracts with one of these resource recovery facilities. The remaining municipalities have short term resource recovery facility contracts which have not been approved by the Department, use Connecticut's resource recovery facilities on a spot market basis, or ship their MSW out of state. As mentioned previously, only Windsor continues to use its landfill for MSW.

Recycling is another part of the fundamental change which has taken place in Connecticut's MSW management system. In 1986, recycling was a voluntary program with limited infrastructure, consisting of one small regional intermediate processing center which processed at most twenty tons of recyclables per day from a handful of towns with voluntary curbside recycling programs. Although the recycling rate was not

measured at that time, the Department estimates that the recycling rate was well under ten percent of the MSW generated in the State.

Once recycling became mandatory throughout the State in 1991, compliance rose quickly to about 19% in 1992. Every town has a mandatory recycling system in place and most residents have access to curbside recycling programs. One hundred twenty eight municipalities are members of ten recycling regions. The remaining 41 towns are operating single-town programs. There are publicly sponsored regional intermediate processing centers for recyclables in Berlin, Groton, Hartford, Danbury and Stratford as well as a variety of other private volume reduction facilities which handle recyclables along with other wastes. These regional centers process and market glass and metal food containers, newspapers and corrugated containers from their member towns. The municipalities ordinarily process other materials such as leaves, scrap metal, lead acid storage batteries, discarded mail, anti-freeze and waste oil on their own. The MSW recycling/source reduction rate in fiscal year 1999 was at least 25%, amounting to 749,780 tons of material recycled. This amount does not count bottle bill material or much of the material recycled by the commercial sector.

In 1993 the legislative goal was increased from 25% to 40% to be achieved through a combination of source reduction and recycling by the year 2000. Although some municipalities are already achieving or approaching this goal, others, particularly Connecticut's largest cities, are having more difficulty.

Achievement of the 40% goal will require increased enforcement of recycling requirements, the expansion of institutional and commercial organics composting and the institution by municipalities of volume-based fees for solid waste collection and disposal. In addition, the Department will continue to educate the public about the importance of source reduction and recycling, promote markets for recycled materials, provide technical assistance to businesses and municipalities, and assess the feasibility of recycling additional materials.

In keeping with the State's solid waste hierarchy, the Department is implementing programs to allow beneficial uses for some special wastes that have traditionally been landfilled but which may be able to be used without adversely affecting human health or the environment. These types of wastes include mixed glass aggregate, sewage sludge incinerator ash, coal ash, water treatment residuals, and municipal waste combustor ash, among others. In 1996 the legislature provided a mechanism for authorizing the beneficial use of such wastes through CGS Section 22a-209f which allows the Department to issue general permits for a category of processing or beneficial use of solid waste when used in a manufacturing process to make a product or as an effective substitute for a commercial product. General permits for the blending and use of mixed glass aggregate have been issued and work is continuing on general permits for the other special wastes mentioned above.

Underground Storage Tank ("UST") Program

UST owner/operators faced a December 22, 1998 Federal deadline (established ten years prior) for closures of systems failing to meet increased maintenance and design criteria for pollution prevention. The Department developed a list of suspected sites in violation of the December 22, 1998 deadline and has been focusing its UST inspection resources on those locations.

Since passage of the deadline, nearly 700 inspections have been conducted at sites gleaned from the list of suspected non-compliers. Approximately 70% of the USTs inspected were found to be properly closed, but the owners failed to provide closure notice to the Department as required by law. Non-compliance at one hundred and thirty two other sites have or are being addressed by an expedited administrative consent order specifically developed to rapidly correct UST violations. A similar approach is being considered to address the high rate of leak detection violations by UST owners and operators in the State.

Pesticide Management Program

Certification of pesticide applicators is required of persons performing commercial application of any pesticide, and private application of any restricted use pesticide. The Department's Pesticide Management Program requires commercial and private applicators to demonstrate competence with respect to the use of pesticides in order to achieve certification.

- **Integrated Pest Management Program**

For over twenty years, Integrated Pest Management ("IPM") has been used in agriculture as a method to reduce pesticide use while maintaining high crop yield and quality. Since then, this philosophy has evolved and expanded to include other areas of pesticide use. Today, there are recognized IPM practices for almost all pests encountered in structural pest control, lawn care, tree care and ornamental plant care. The Department promotes IPM as an effective pollution prevention tool and as a means of reducing the use of pesticides by commercial pest control companies, agriculturists, and households. IPM has been incorporated into written and oral examinations for all categories of pesticide applicator certification and into seminars conducted for the pest control industry. The Department also encourages the practice of IPM by targeting institutions and public facilities. Encouraging the practice of IPM by targeting institutions and public facilities is an effective method of educating homeowners, residents and the business community to the benefits of integrated pest management. Recently the Department has also directly targeted households with IPM messages in an effort to increase demand for this type of service.

The Department's goals regarding IPM in Connecticut are to incorporate IPM practices into pest control services at state owned facilities, encourage IPM in schools through mailings, outreach efforts, and model programs in schools, and to develop a demand for IPM services by the general public. To facilitate the implementation of these goals, the Department has worked closely with the Department of Administrative Services to revise

the contracts for pest control services by state agencies. The contract for structural pest control has been revised, and the contracts for other types of pest control services will be revised as they are re-bid. Public schools have been targeted with several mailings from the Pesticide Management Program regarding the adoption of IPM practices. Legislation adopted in 1999 provided incentives to public schools with IPM plans, and the Department has been assisting schools in this process. Technical assistance and model plans have been developed and have been made available as well. An advertising campaign encouraging homeowners to ask for IPM when contracting for pest control services has been run for the past two years. Advertisements appeared on television, radio, and bus sides. In addition, an advertisement has been placed in the yellow pages pest control section to encourage consumers to request IPM services.

- Arborist Regulation

In October 1998, Public Act 98-229 transferred to the Department jurisdiction over the licensing and practices of arborists (commonly known as "tree surgeons"). The 1998 legislation also raised penalties for practicing arboriculture without a license. The Department discovered a large number of firms and individuals without licenses, and has very successfully used administrative consent orders with cash penalties to increase compliance with the licensing statute.

Compliance Profiles by Industry Sector or Facility Type

In 1997, the Department entered into its first Performance Partnership Agreement ("PPA") with the federal Environmental Protection Agency ("EPA"). The PPA is the product of a process whereby the Department and EPA New England define environmental priorities and agree upon the best strategies to address them. Among the benefits of this process is the institutionalization of an environmental management approach that more effectively links program activities with improved performance and environmental results. This approach comports with the Department's prior reports to the Environment Committee that emphasized enforcement and compliance assistance as tools to achieving better environmental performance and results as opposed to merely goals in and of themselves.

The Department is now tracking inspections and compliance by industry sector or facility type, as defined in the Performance Partnership Agreement with EPA. Data reflecting the underlying rate of compliance by sector and facility type will allow the Department to make better, more effective use of existing resources. Specifically, it will allow the Department to direct compliance assistance and enforcement to sectors where they are most needed and to reduce investments in areas where a high rate of compliance has been achieved and sustained.

The tables to follow depict compliance rates for particular industry sectors and facilities. Enforcement cases are initiated by the issuance of a NOV, UO, CO or AG Referral. Multiple actions issued for the same case (i.e. a consent order issued following issuance of a NOV) are not counted as they will produce a higher rate of non-compliance than actually exists.

For most programs, the rate of compliance for each category was calculated as follows:

$$\% \text{ Compliance} = 100 - \frac{\# \text{ enforcement cases initiated}}{\# \text{ facilities inspected}} \times 100$$

The Bureau of Water Management calculated the rate of compliance based on the review of Discharge Monitoring Reports ("DMRs") submitted by facilities rather than the number of facilities inspected due to the fact that all facilities are required to submit DMRs, but not all facilities are inspected.

Air Management Bureau Compliance Rates FFY 00

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	# of Facilities by Category if Applicable	# of Enforcement Cases Initiated FFY 00	Compliance Rate (%)*
Major Sources	45	75	106	0	65% **
General Permit to Limit Potential to Emit	120	153	368	24	84%
General Permit for Emergency Engines	50	57	523	9	84%
General Permit for Surface Coating	12	30	122	4	87%
General Permit for Automotive Refinishing	50	62	493	24	61%
New Source Review/ PSD	150	189	588	18	90%
Gasoline Distribution	10	9	10	0	100%
Chemical Preparation	10	10	29	0	100%
Metal Finishing	10	10	84	0	100%
Complaints	500	538	NA	31	94%
Other (Enforcement follow-up, compliance inspections)	400	1091	NA	21	98%

* Except for "major sources", inspection category compliance rates depicted in this table were calculated by dividing the number of on-site inspections conducted within an inspection category minus the number of notices of violation issued pursuant to those. Violations detected through report reviews, source emissions monitoring, emission trading, and compliance plans addressed in permits are not included. Therefore, these compliance rates cannot be interpreted as an indication that the facilities in the inspection category are in full compliance with each and every regulatory standard, only that no new notices of violation were issued as a result of the inspection conducted.

** In the major source category (sources that are subject to the federal Title V operating permit program and are in the process of obtaining a Title V permit), the Department is able to draw on a wider range of compliance assessment methods including orders, source monitoring records, emission trading activity, report reviews, compliance certifications, and Title V compliance plans. Using these additional methods indicates the calculated compliance rate for the major source/Title V universe is 65%. This relatively low compliance rate is due in large measure to the difficulties major sources have in complying with very extensive documentation and reporting requirements.

**Air Management Bureau
Division of Radiation
Compliance Rates FFY 00**

Inspection Category	# Inspections Conducted FFY 00	Total # Facilities Inspected	Total # Facilities By Category	# of NOV's Issued	Estimated % Compliance	
					By Total # of Inspected Facilities	By Total # of Inspections
Medical Facilities	404	280	3222	22	92%	95%
Industrial & Radioactive Materials Facilities	94	19	475	4	79%	96%

**Water Management Bureau
Compliance Rates FFY 00**

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	# of Facilities By Category if Applicable	# of Enforcement Cases Initiated in FFY 00	Estimated % Compliance*
National Pollution Discharge Elimination System ("NPDES") Industrial –Majors	47	47	47	12	74%
NPDES Sewage Treatment Plant ("STP") –Majors	68	68	68	11	84%
State Pollution Discharge Elimination System ("SPDES") – Significant Industrial User ("SIU") Pretreatment (Sanitary Sewer)	206	203	257	26	90%
NPDES Industrial - Minors	8	18	84	8	90%
NPDES STP- Minors	38	38	38	15	61%

*Estimated % compliance is based on Department review of Discharge Monitoring Reports submitted by permitted facilities.

**Waste Management Bureau
Waste Engineering and Enforcement Division
Compliance Rates FY 00**

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	Total # of Facilities By Category	# of NOVs FFY 2000	% Inspected Facilities in Compliance	# of Inspections with SNC	% of SNC* Non-compliance
TSF	15	16	85	8	50%	3	19%
LDFs	11	12	96	1	92%	1	8%
Generator:							
LQG	36	48	575	24	50%	21	44%
SQG	20	41	2007	13	68%	2	5%
Transporter	5	8	235	15+	37%++	0	0%
Volume Reduction	N/A	33	22	2	94%	13	39%
Resource Recovery	N/A	18	7	0	100%	0	0
Transfer Stations	N/A	35	116	7	80%	2	6%
Land Disposal Facilities /Solid	N/A	30	53	5	9%	23	77%

* SNC (Significant Non-compliance) - The violator/violation is significant enough to require a formal enforcement response. In addition to assessing compliance rates based upon Notices of Violation ("NOVs"), the Waste Management Bureau also chose to provide a noncompliance rate based upon Significant Non-compliance as defined by the Environmental Protection Agency. This rate is indicative of violations that the Waste Bureau has determined require formal enforcement action in accordance with the Department's Enforcement Response Policy.

+ Includes 10 NOVs issued to out-of-state companies for operating in Connecticut without the required permit (pursuant to CGS 22a-454)

++ % Does not include 10 NOVs issued to out-of-state companies that were not issued in response to an inspection

**Waste Management Bureau
Pesticides
Compliance Rates FFY 00**

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	# of Facilities By Category if Applicable	# of Enforcement Cases Initiated in FFY 00	% Inspected Facilities in Compliance
Agricultural Use	7	28	N/A	0	100%
Agricultural Complaint/Concern Follow-Up	8	17	N/A	6	65%
Non-Agricultural Use	26	15	N/A	2	87%
Non-Agricultural Complaint/Concern Follow-Up	49	80	N/A	60	25%
Producer Establishment	15	15	N/A	2	87%
Market Place	100	110	N/A	84	24%
Certified Applicator Records	142	233	N/A	81	65%
Restricted Use Dealers	25	40	N/A	5	88%

**Waste Management Bureau
PCB Management Program
Compliance Rates FFY 00**

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	# of Facilities By Category if Applicable	# of Enforcement Cases Initiated in FFY 00	% Inspected Facilities in Compliance
Neutral Scheme	20-35	24	N/A	4	83%
Complaints and Referrals	10-20	24	N/A	3	87%
Clean-Up Sites	10-25	14	N/A	3	79%

**Waste Management Bureau
UST Management Program
Compliance Rates FFY 00**

Inspection Category	Inspections Projected FFY 00	Inspections Conducted FFY 00	# of Facilities By Category if Applicable	# of Enforcement Cases Initiated in FFY 00	% Inspected Facilities in Compliance
“98” Deadline Target List/Complaints	375	289	N/A	79	73%

Assessing Compliance with General Permits

The Department regulates over 84,000 activities through permits, registrations and other authorizations. These licenses dictate levels of emissions, set conditions for facility operation, and impose management practices that are designed to prevent pollution of the air, water and other natural resources of Connecticut. One major category included in this total is the number of activities authorized under general permits. Since obtaining the statutory authority to issue general permits in 1991, the Department has developed at least 35 general permits and over 6,300 activities have been authorized to date under those general permits.

During the past nine years, the Department has focused a great deal of time, energy and effort on issuing general permits and authorizing activities under them. The Department has made a much smaller investment, on a piecemeal basis, in assuring compliance with general permits. Furthermore, while targeted compliance reviews of specific registrants has raised concerns over general permit compliance rates, the Department has yet to systematically evaluate the rate of compliance with general permits.

Recognizing our increased reliance on general permits, the Department sought and received a \$100,000 grant from EPA's Office of Enforcement and Compliance Assurance to comprehensively assess and elevate general permit compliance rates. The Department has, with the assistance of EPA Region I and its contractor, begun to:

- Objectively determine current baseline compliance rates with three general permits (the general permit for the Discharge of Minor Tumbling or Cleaning of Parts Wastewater, for the Discharge of Minor Printing and Publishing Wastewater, and to Limit Potential To Emit);
- Identify root causes of non-compliance with the terms and conditions of the selected general permits;
- Develop and employ compliance assistance and outreach strategies directed at raising the compliance rate within the regulated communities covered under the general permit;
- Reassess compliance rates following compliance assistance and outreach efforts;
- Develop and employ an enforcement strategy to compel compliance by those known violators remaining non-compliant following outreach and assistance efforts;
- Reassess compliance rates following enforcement using the same methodology employed to determine initial baseline compliance.

Beyond the obvious benefits of this initiative, the Department will develop greater capacity to identify root causes of permit non-compliance and to design solutions that eliminate or substantially mitigate non-compliance. By tailoring the method described

above to other environmental compliance issues, the Department will be able to craft interventions to clearly defined problems, thereby maximizing the effectiveness of its compliance assurance resources.

Enforcement

The goal of the Department's enforcement programs is to improve and protect the environment by accomplishing the following: (1) prevention and prompt cleanup of pollution and its sources; (2) protection and restoration of natural resources at the site where a violation occurs and at other sites; (3) protection of public health and safety; (4) prompt compliance with legal requirements that have been violated; (5) deterrence specific to the individual violator and to the regulated community as a whole; (6) removal of any economic advantage or savings realized by noncompliance; and (7) punishment of violators.

The Department is committed to using its enforcement authority intelligently, at all times seeking to produce the maximum benefit to the environment with each action we take. Through its Enforcement Response Policy, the Department prioritizes its enforcement resources by focusing on the most significant environmental, human health and noncompliance problems. Two categories of violators deserve and get the most attention from our enforcement staff. The first category of violators are those whose violations pose the greatest risk to public health and the environment within the State. The second category of violators subject to heightened enforcement is the chronic or recalcitrant violator. Chronic or recalcitrant violators are those demonstrating a pattern or practice of noncompliance with environmental laws; review of a chronic or recalcitrant violator's compliance history indicates a general unwillingness or inability to comply with applicable requirements. Repeated violations or failure of a violator to quickly correct violations in the past or present may also characterize a particular violator as a high priority for enforcement action.

Statistical Trends In Enforcement

Reviewing traditional enforcement outputs has some value as a measure of agency performance. However, enforcement statistics reviewed in isolation fail to inform the reader if the Department's enforcement activities had any real positive impact on the environment. Therefore, while the Department needs to track enforcement outputs, it also needs to develop measures that characterize the impact of its enforcement activities.

To that end, in 2001 the Department is piloting a problem solving approach to environmental protection. Environmental Problem Solving is a method for identifying the causes of environmental problems, the options for solving them, the measurements which would indicate whether the effort succeeds, and the resources which can be brought to bear to solve the problem. A problem solving approach will provide the Department with the capacity to identify significant risks, problems, or patterns of non-compliance, to prioritize them, and to design solutions or remedies that eliminate or substantially mitigate those problems.

The enforcement statistics provided in this report are for the period from October 1, 1999 to September 30, 2000 or Federal Fiscal Year 2000 ("FFY 2000") rather than a calendar year basis. The need for the change from previous reports is twofold: (1) to minimize the amount of staff time necessary to compile statistical data, and (2) to ensure consistency between this report and reporting requirements under the State's Performance Partnership Agreement with the United States Environmental Protection Agency. Therefore, for this year alone there will be a partial statistical "overlap". Data presented for the period of October 1, 1999 to December 31, 1999 were included in last year's report and are also included here.

Activity	1996	1997	1998*	1999*	FFY 2000*	Five Year Average
Referrals(AG/EPA/CSA)	62	73	67	66	63	66
Orders	119	115	124	146	230	147
Notices of Violation	714	1247	1293	1439	1258	1190
Total Enforcement Actions**	895	1435	1484	1651	1551	1403

*Including the Office of Long Island Sound Programs

**Does not include Warning Notices

In FFY 2000 the Department collected over \$2.6 million in combined administrative fines and supplemental environmental projects ("SEPs"), and, through the Attorney General's Office, caused nearly \$1.8 million in civil penalties and SEPs to be assessed in civil judgements following referral (the amount actually collected may be less). The following pages present in graphic form: (1) a detailed summary of enforcement statistics for FFY 2000; (2) enforcement actions timeframes for FFY 2000; and (3) enforcement statistics by Bureau, 1996-FFY 2000.

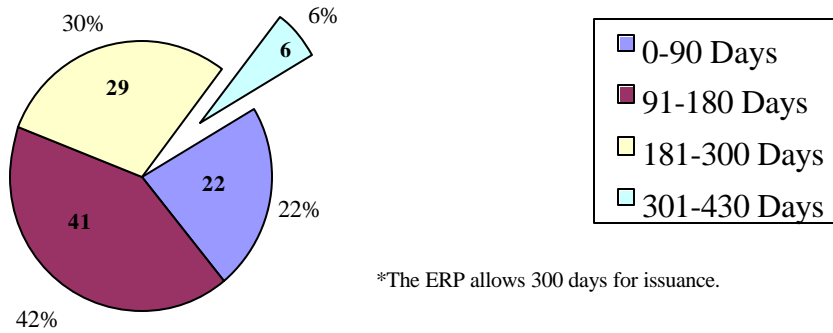
Summary of Enforcement Statistics - FFY 2000

Revised (01/09/01)

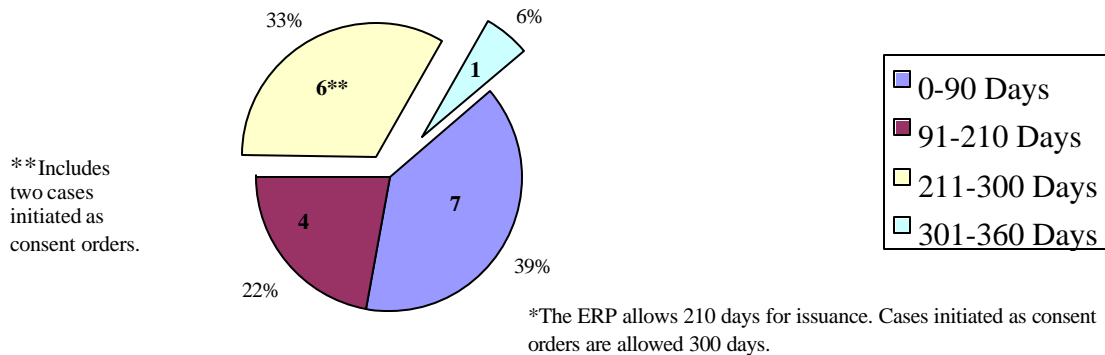
Actions	Air Management Bureau	Water Management Bureau	Waste Management Bureau	Office of Long Island Sound Programs	Total for Year (10/01/99-9/30/00)
Warning Notices Issued under CGS ' 22a-6s	N/A	N/A	24	N/A	24
Notices of Violation Issued	314	384	524	36	1258
Consent Orders Issued	43	29	113	13	198
Administrative Penalties Assessed (# of cases)	\$157,374(9)	\$327,670(12)	\$579,432.70(103)	\$80,500(12)	\$1,144,976.70(136)
Supplemental Environmental Projects (# of cases)	\$216,200(5)	\$592,639.50(12)	\$692,755.50(18)	\$33,500(3)	\$1,535,095(38)
Unilateral Orders Issued	5	17	10	0	32
Attorney General Referrals	5	13	20	0	38
Judicial Assessments					
Penalties	\$111,000	\$535,000	\$340,000	0.00	\$986,000
Supplemental Environmental Projects		\$800,000	\$12,500	0.00	\$812,500
Chief State's Attorney Referrals	0	3	3	0	6
Referrals to EPA	1	0	18	0	19
Inspections Conducted (including complaint investigations)	6743	1396	2275	226	10,640

The following pie charts depict enforcement action timeframes only for those cases in which the underlying violations were discovered after June 1, 1999 (effective date of the Department's revised Enforcement Response Policy).

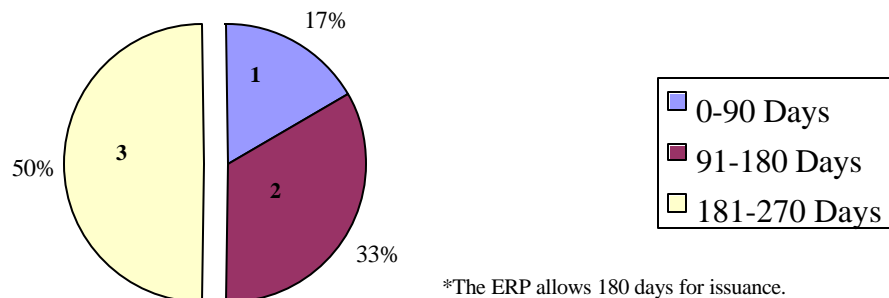
Consent Order Timeframes for Issuance* FFY 2000



Attorney General Referral Timeframes for Issuance* FFY 2000



Unilateral Order Timeframes for Issuance* FFY 2000



Enforcement Statistics 1996-2000
Air Management Bureau

Program Activity	1996 CY	1997 CY	1998 CY	1999 CY	2000 FFY	Five Year Average
Warning Notices						
Notices of Violations	139	290	338	429*	314*	302
Orders	57	32	27	35	48**	40
Referrals(AG/EPA/CSA)	6	5	10	7	6	7

*Includes the Radiation Division (NOVs).

**Of the 48 orders reported for 2000, 30 are "traditional" enforcement actions addressing past violations and 18 are NOx RACT Compliance Orders issued pursuant to RCSA ' 22a-174-22(J). The NOx Ract orders create an enforceable mechanism by which the source is brought into compliance with the NOx Ract Regulations.

Enforcement Statistics 1996-2000
Waste Management Bureau

Program Activity	1996 CY	1997 CY	1998 CY	1999 CY	2000 FFY	Five Year Average
Warning Notices	31	19	21	27	24	24
Notices of Violations	443	514	461	501	524	489
Orders	25	32	36	61	123*	55
Referrals(AG/EPA/CSA)	39	46	40	42	41	42

* Includes 51 expedited consent orders for Underground Storage Tank violations and 34 expedited consent orders in the Pesticides Program for practicing arboriculture without a license (see pages 26 and 27 above for details).

Enforcement Statistics 1996-2000
Water Management Bureau

Program Activity	1996 CY	1997 CY	1998 CY	1999 CY	2000 FFY	Five Year Average
Warning Notices		3				
Notices of Violations	132	441	477	486	384	384
Orders	37	42	54	39	46	44
Referrals(AG/EPA/CSA)	17	20	17	17	16	17

Another way to maximize the effectiveness of traditional enforcement tools is by coordinating cases that have multi-media issues. The following are examples of multi-media enforcement actions issued by the Department during FFY2000:

Phelps Dodge Copper Products Company is a copper rod manufacturing facility located in Norwich, Connecticut. The company is one of the largest copper miners and manufacturers of copper material in the world. In 1997, Phelps Dodge reported to the Department that emissions of carbon monoxide from its copper cathode-melting furnace exceeded 400 tons per year. In early 1998, Phelps Dodge notified the Department that emissions of arsenic, a known carcinogen and one of Connecticut's regulated toxic air pollutants, from the furnace exceeded the emission limit.

In response to these violations, the Bureau of Air Management began an in-depth investigation into the extent of the company's noncompliance. Air Bureau staff discovered that Phelps Dodge had, without first obtaining the necessary authorization, modified its cathode melting furnace to increase the unit's capacity to melt copper. In July 1998, the Department ordered the company to perform emissions testing at the facility. Test results revealed violations of Connecticut's air toxic regulations for copper and lead. Phelps Dodge increased its stack height numerous times in an effort to comply with State hazardous air pollutant emission standards designed to limit public exposure to such pollutants at the property line.

As a result of a coordinated effort between Air, Waste and Water Bureau enforcement staff, additional violations were identified including toxic runoff of copper laden storm water into the nearby Yantic River and improper storage and management of hazardous waste. A referral to the Office of the Attorney General followed, and, without Phelps Dodge admitting to any of the alleged violations, the case settled on December 20, 2000. The conditions of the settlement will result in significant additional environmental and public health benefit throughout FY 2001 by requiring Phelps Dodge to reduce emissions, including toxic air pollutant emissions. More specifically, the judgment requires Phelps Dodge to:

- Pay all past due emission fees.
- Apply for and obtain air permits for the modified copper-melting furnace, including installation of control equipment to achieve 99% removal of carbon monoxide, particulate and copper.¹

⁵ Concurrent with the enforcement case negotiations, Phelps Dodge applied for a construction permit for the unauthorized modification of its cathode-melting furnace. The permit was issued in February 2000 and required the company to install best available control technology to reduce emissions of carbon monoxide, copper and particulate matter by 99%. The company installed a regenerative thermal oxidizer to control emissions of carbon monoxide and a baghouse to control emissions of copper and particulate matter. Testing in 2001 is expected to demonstrate the 99% removal efficiency required by the air permit.

- Comply with all hazardous waste small quantity generator requirements for the next three years.
- Conduct a study to investigate the environmental impact of air emissions and material storage in the surrounding area of the facility and the Yantic River, and conduct remediation as needed.
- Remediate the copper laden stormwater outfalls from the property to the Yantic River above and beyond regulatory requirements.

In addition to remedial measures, the stipulated judgment also requires Phelps Dodge to pay a civil penalty of one-half million dollars and to fund or perform supplemental environmental projects ("SEPs") totaling another one-half million dollars. One SEP requires the company to establish a \$250,000 fund to support outreach efforts designed to decrease toxic air emissions from sources in the Norwich/New London area. In addition, the company will be performing SEPs at the facility to create a wastewater recycling system that will reduce the release of copper containing water discharge to the Yantic River. The company will also construct additional roofing over a copper material storage area to prevent stormwater from contacting the stored copper material.

Unified Sports, Inc. ("USI") of Waterford entered into an administrative consent order with the Department of Environmental Protection on September 17, 2000. The consent order alleged violations of the State's Hazardous Waste Management Regulations, Air Pollution Control Regulations and Water Pollution Management Regulations. The alleged hazardous waste violations included failure to report a spill, perform hazardous waste determinations, conduct inspections, provide personnel training, develop a contingency plan and properly manage containers of hazardous waste at the site. The alleged water discharge violations included the discharge of wastewaters associated with aqueous cleaning directly to the ground without obtaining a permit for the discharge from the Commissioner. The alleged air pollution violations included failure to use coatings that comply with applicable regulations and failure to apply for and obtain a Title V Operating Permit. The consent order required USI to investigate potential pollution resulting from the discharge of aqueous wastewaters and the storage of hazardous waste containers directly on the ground and to perform remedial action as needed. USI agreed to conduct four environmental compliance audits and pay a civil penalty of \$27,900. In addition, USI agreed to undertake a supplemental environmental project ("SEP") at a cost in excess of \$80,000. The SEP consists of replacing an existing painting process that uses paints containing volatile organic compounds ("VOC") with a powder coating process. The process changes are expected to reduce VOC emissions by 75% and the volume of hazardous waste generated by 65%.

The Town of Stratford entered into an administrative consent order with the Department of Environmental Protection on July 31, 2000 for illegally storing and burning waste oil at the Stratford Water Pollution Control Facility. The Town of Stratford failed to determine whether each solid waste generated at the site was a hazardous waste and failed to register for a general permit for the storage of waste oil. In addition, the Town operated an underground storage tank system at the site that did not comply with applicable regulatory standards. Waste oil stored in tanks at the site and burned in a space heater was found to be contaminated with polychlorinated biphenyls ("PCBs"). Oil

containing PCBs was spilled around and burned in the space heater, causing the spread of PCB contamination.

The consent order required the Town of Stratford to perform a hazardous waste determination on each solid waste generated at the facility, develop a Best Management Practices plan for all facilities under the control of the Town of Stratford and to investigate and remediate contamination at the site that resulted from the violations. The consent order included payment of a \$25,000 civil penalty that the Town may elect to pay or put toward a supplemental environmental project.

Connecticut Valley Hospital ("CVH") and the Department of Mental Health and Addiction Services ("DMHAS"), providers of health services to the public for mental health and addiction illnesses, entered into an administrative consent order with the Department of Environmental Protection on June 22, 2000 relative to a facility they operate in Middletown. The consent order alleged that CVH and DMHAS released petroleum products to waters of the State from underground fuel storage tank facilities on-site, disposed of solid waste and drums containing regulated waste and residual #6 fuel oil in the ground and discharged non-contact cooling water, boiler blowdown, photographic wastewater and filter backwash water to waters of the State without permits issued by the Commissioner for such activities.

The consent order required CVH and DMHAS to cease all unlawful discharges to the waters of the State and conduct an investigation of the contaminated soils and solid, petroleum and hazardous wastes at the site to characterize the extent and degree of soil, surface water and groundwater pollution at the site. Once the investigation is complete, CVH and DMHAS must remediate the site. The consent order also required CVH and DMHAS to either obtain a permit or eliminate the discharges for the non-contact cooling water and boiler blowdown. Finally, the consent order required CVH and DMHAS to undertake two Supplemental Environmental Projects ("SEPs") at a total cost of \$181,700.

New Source Review Litigation. Connecticut's air quality is significantly compromised by out-of-state major stationary emission sources. These emission sources generate substantially more air pollution than stationary sources located within the State. So much so that advanced air quality computer modeling indicates that even if all emission sources in Connecticut were "turned off", air quality in Connecticut would still exceed the federal health-based standard for ozone on days when the prevailing winds are out of the south and west. It is against this scientific backdrop that Connecticut has joined other affected states in legal action against major out-of-state emission sources.

In the fall of 1999, the New York Attorney General shared information with the Connecticut Attorney General concerning coal-fired power plants located in upwind jurisdictions. Based on information developed by the State of New York, numerous coal-fired power plants located throughout the midwest may have violated the Clean Air Act by constructing and continuing to operate major modifications to major stationary sources of air pollution without obtaining the necessary pre-construction permits. The resulting air pollution from these large power plants consists primarily of nitrogen oxides

and sulfur dioxide. Nitrogen oxides contribute to unhealthy surface level ozone throughout the northeast, including Connecticut. Surface level ozone plays a part in many respiratory health problems including shortness of breath, coughing, nausea, throat irritation and increased susceptibility to respiratory infections. Sulfur dioxide emissions lead to the creation of fine sulfate particles that, like ozone, are transported to the northeast on prevailing winds. Inhalation of fine particulate matter causes respiratory distress and cardiovascular and pulmonary disease. In addition to public health impacts, sulfur dioxide and nitrogen oxides also cause environmental damage in the form of acid deposition and eutrophication of Connecticut's coastal waters, respectively.

On November 3, 1999, the Office of the Attorney General, on behalf of the Department, filed notices of intent to sue several companies operating coal-fired power plants in the midwest and southeast. The notice alleged that the operators of the plants illegally released massive amounts of air pollutants over a period of several years and contributed to some of the most severe environmental problems facing our State today. The companies involved in the action are American Electric Power Company, Cinergy, and Ohio Edison. Also on November 3, 1999, in separate but related actions, the Department of Justice and the United States Environmental Protection Agency filed lawsuits against these same companies and several others, and also filed an administrative order against the Tennessee Valley Authority, which is a federal entity. These legal actions represent the most comprehensive, coordinated enforcement effort under the Clean Air Act to date.

In addition to filing several lawsuits jointly with the State of New York, the Connecticut Attorney General chose to intervene in a number of the federal lawsuits. Staff from the Office of the Attorney General and Department of Environmental Protection have invested a substantial amount of time in developing information in support of this litigation, pre-trial discovery and document production, responding to lengthy freedom of information requests and pursuing settlement negotiations. The goal of this legal action has been, and continues to be, the pursuit of cleaner air. These efforts are now beginning to produce substantial environmental results.

As of December 27, 2000, three of the defendant power companies, Cinergy, Tampa Electric Co., and Virginia Electric Power Co., have entered into proposed settlement agreements with the EPA and northeastern states. The settlement agreements require the payment of civil penalties, the construction of state-of-the-art air pollution control technology to limit nitrogen oxides, sulfur dioxide, particulate matter and, in some cases, mercury from older, coal-fired power plants. In some cases, the agreements will require some power plants to close and re-power to combust natural gas. The agreements also call for the surrender of a significant number of federal acid rain allowances. Compliance is to be phased in over a period of five to ten years at costs exceeding a billion dollars.

The environmental benefits to be achieved by these legal actions cannot be overstated. For example, the most recent proposed settlement with Cinergy will result in substantial pollution reduction from one of the largest and most coal dependent power producers in the nation. Almost 95 percent of Cinergy's generating assets are coal-fired. Under the proposed settlement, emission reductions will be enormous - sulfur dioxide emissions will be reduced by 400,000 tons per year and nitrogen oxide emissions by 100,000 tons

per year. The benefits to public health and the environment will extend to all within the State and beyond.

Compliance Assistance and Pollution Prevention

Examples of Tools and Initiatives

Compliance assistance and pollution prevention initiatives can take many forms, some of which include: providing information and assistance on regulatory requirements, conducting seminars and workshops, or financial assistance. In almost all cases, compliance assistance represents a resource investment at the "front end" and is designed to encourage the regulated community to act proactively to comply with environmental laws and regulations. The Department sponsors high-quality, low-cost seminars for the regulated community and the public on a wide variety of environmental topics. Forums for these events include the Connecticut Business and Industries Association (CBIA), the Connecticut Forum for Regulated Environmental Professionals (CFREP), Government Institutes sponsored training, and numerous Department co-sponsored conferences. The Department also develops and distributes assistance and pollution prevention materials such as fact sheets, checklists and training packages.

- ***Dedicated Resources*** - The Department dedicates significant resources to media-specific assistance activities. For example, established in 1996, COMPASS (Compliance Assistance Program) is an outreach service provided by the Bureau of Waste Management to assist Connecticut businesses and industries in complying with waste management regulations. Last year Bureau staff answered over 2100 calls and answered 122 written requests for information. On-site compliance audits are also provided by Waste Bureau staff at the request of new or expanding businesses.
- ***Mercury Reduction Initiative*** - The Department initiated an aggressive mercury reduction effort. During FFY 00, the Department collected 650 pounds of mercury, nearly a third of its goal to reduce the amount mercury in Connecticut's environment by 2001 pounds by the end of the calendar year. Forty of the 650 pounds came from 32,000 thermometers collected, 115 pounds from school laboratory clean-outs and the balance from regional household hazardous waste collections (including elemental mercury, thermostats and other mercury-containing devices). To meet our goal of 2001 pounds, additional hazardous waste collections, thermometer exchanges and school clean-outs will be held. Plans are also underway over the next few months to collect elemental mercury from dental offices and dairy farmers.
- ***Dental Office Guidance Document***- Dental offices are a common source of mercury and other potentially harmful wastes. A guidance document titled "The Environmentally Responsible Dental Office: A Guide to Proper Waste Management in Connecticut Dental Offices" was published and distributed by the Department this past fall. The document reviewed waste handling procedures applicable to dental offices and included a resource handbook providing further information for dentists.

- ***Permit Applications*** - This past year, in an effort to improve the quality of water discharge permit application submittals, the Bureau of Water Management developed a reference document entitled, "What You Can Do To Make The Permit Process Easier, Common Errors and Omissions". This two page guidance document is divided into three sections: (1) types of wastewater commonly omitted from applications; (2) specific parts of the application forms that are typically filled out incorrectly; and (3) a list of steps recommended for each applicant to follow prior to filing an application to help shorten the overall review time. Several Water Bureau staff members have made presentations to CBIA, which included a discussion of this guidance document in the past year. The guidance document is now available on the Department's web site.

- ***Conceptual Site Modeling***- During the year 2000, the Department, in collaboration with the Environmental Professional's Organization of Connecticut (EPOC), held two, two-day seminars on Conceptual Site Modeling. The seminars, attended by over 200 Licensed Environmental Professionals and Departmental staff, are being offered again this year. The overall objective of the seminar is to promote the use of conceptual site modeling as a process to achieve effective site characterization and remediation of contaminated properties and to improve communication between all parties who have a stake in those results-consultants, regulators, responsible parties, attorneys, financial institutions, and the public.

- ***Title V Compliance Reporting*** – The Federal Title V program requires all major air emission sources to have a comprehensive operating permit including, as necessary, a plan to address and resolve all outstanding compliance issues. The Air Bureau's Title V operating permit program implementation effort has focused on permit issuance to the State's largest emission sources first, to be followed by issuance to smaller sources. Along with the permitting focus, a compliance certification and reporting program was developed and supported by new forms and guidance. A workgroup of external stakeholders participated in the form development. Comprehensive instructions and guidelines were mailed to all affected sources and placed on the Department's website and a well-attended workshop was held in cooperation with CBIA. The Air Bureau continues to provide compliance assistance and outreach in support of the Title V operating permit program.

- ***The Hartford Neighborhood Project*** - For the past four years, the Department has partnered with community organizations, institutions and small businesses to enhance the economic opportunities, environment and quality of life in four primarily African-American and Hispanic neighborhoods in Hartford. The project is sponsored by the Department's Office of Pollution Prevention and provides environmental education and funding to community organizations operating in seven of Hartford's poorest areas. The program has been operative since 1995. Activities include training sessions for community leaders, Earth Day celebrations including workshops on asthma and air pollution, preventing pollution from household cleaners and where to go for environmental help. The project has helped to revitalize neighborhoods,

educate neighborhood residents and businesses on environmental issues and has promoted environmental health literacy of school age children.

- ***Urban Initiatives*** - The Department fosters urban revitalization through permitting and remediation assistance provided to major development projects in our cities. The Department has worked with the City of New London and the New London Development Corporation on the redevelopment of New London's waterfront. The present plan includes the redevelopment of the Fort Trumbull peninsula, a new state park, and enhancement of the downtown waterfront. The Department has also worked with private and municipal interests in the City of Bridgeport in planning for the redevelopment of the Steel Point and Carpenter Technology sites. In Hartford, the Department has participated in meetings with local government and community leaders on redevelopment plans for downtown and waterfront proposals.
- ***Green Circle Awards*** - In 1998, the Department initiated the Green Circle Awards program to recognize businesses, institutions, civic organizations and individuals who have undertaken pollution prevention, waste reduction, or other projects promoting natural resource conservation and environmental awareness. In three years, the Department has given 380 Green Circle Awards, including about 80 to companies who have undertaken pollution prevention or engaged in "beyond compliance" activities.
- ***Recycling Assistance*** - The Waste Bureau's Source Reduction and Recycling Program continues to increase recycling rates in the state. The Program held a statewide workshop for municipalities on unit based pricing for solid waste disposal costs, also known as pay-as-you-throw ("PAYT"). Requiring residents to only pay for the trash they generate (as opposed to everyone paying the same unit cost), PAYT has been successfully launched in several Connecticut communities. PAYT provides an immediate financial incentive for residents to reduce the quantity of trash that they generate by recycling. In the next fiscal year, the Waste Bureau will offer financial and technical assistance to all municipalities in Connecticut interested in implementing PAYT programs.
- ***ClimateWise*** – The Department, through the Office of Pollution Prevention, continues to recruit and provide support to Connecticut manufacturers who pledge to improve the energy efficiency of their operations. In the past year, the Department has worked to expand the ClimateWise partnership to include eight new partner companies.
- ***NICE3*** - The Department, through the Office of Pollution Prevention continues to recruit and provide support to Connecticut manufacturers who pledge to improve the energy efficiency of their operations. In calendar year 2000, Connecticut was awarded a total of \$780,000 in grant funds for two projects. Green Technology Group (Sharon) will use \$450,231 of NICE³ grant funds to demonstrate a new technology for regenerating hydrochloric acid that has been used to pickle steel. Advanced Fuel Research (East Hartford) will use \$279,867 of NICE³ grant funds to demonstrate a new, low-cost, energy efficient continuous emissions monitoring system. The

technology will also serve as an on-line combustion tuning tool that will save fuel, reduce emissions, and validate pollution abatement and control technology. It can be used by all industries and utilities that use combustion boiler and turbine systems.

- ***Model Agency Project*** – The Waste Management Bureau continued a 1999 initiative to ensure compliance with the Hazardous Waste Management regulations at the Department's 130 (approximate) field sites. In 2000, several half-day training sessions were conducted at various Department field sites to ensure proper hazardous waste handling, waste reduction, product substitution and recycling options.

Advisory Groups

The Department continues to work with stakeholders through the air, waste, and water advisory committees. Some of the major issues discussed this past year included emission and effluent trading, used oil regulations, implementation of the universal waste rule, reduction of mercury in the environment, and aquifer protection.

Waste Management Bureau

The Waste Management Bureau Advisory Committee Subcommittees provided final recommendations to the Department on regulatory matters such as the proposed used oil regulations, special waste plans, the Universal Waste Rule and the State Solid Waste Management Plan. Other subcommittees have provided recommendations to the Department on matters such as consolidation of the regulated and special waste programs. In 2000, the Universal Waste subcommittee completed the task of assessing specific categories of wastes and determining whether they should be regulated as universal wastes. This subcommittee also submitted a final report with recommendations for implementing universal waste collection systems in Connecticut.

Air Management Bureau

SIPRAC (State Implementation Plan Revision Advisory Committee) focuses on air issues. In the past year, meeting topics have covered the full range of issues affecting clean air including: implementation of the Title V Operating Permit Program, Executive Order No. 19, Utility Deregulation, and revisions to the New Source Review regulations. SIPRAC subcommittees continue to play an integral role in the regulatory development process and in providing recommendations for program development. During 2000, three subcommittees have been particularly active: New Source Review, Emissions Credit Trading, Distributed Generation, and Record Keeping and Reporting.

Water Management Bureau

During 2000, the Bureau of Water Management's Advisory Committee convened on five separate occasions. The committee received updates and held discussions on topics including: the requirements of newly drafted or revised general permits; enforcement efforts, legislation; regulation development; aquifer protection; the Naugatuck river restoration project; stormwater; flood warning and response services; and reorganization

within the Bureau's Permitting, Enforcement and Remediation Division. Additionally, the Bureau kept the advisory committee apprised of its efforts to improve water quality in Long Island Sound. Pursuant to Special Act 99-6, the Bureau is completing a plan for a general permit specifying effluent limits for nitrogen discharges to state waters affecting Long Island Sound and a nitrogen credit trading program to facilitate the purchase and sale of nitrogen reduction credits between sources regulated under such general permit.

Partnering With Other Providers

The Department participates in the Environmental Network whose members also include: Briarwood College, Capital Community Technical College, CBIA, Connecticut Development Authority, Connecticut Economic Resource Center, Connecticut Innovations, ConnSTEP, Department of Economic and Community Development, and the Manufacturing Alliance of Connecticut. The purpose of the network, which was established in 1998, is to provide easy and direct access to environmental and economic resources in Connecticut. The Department also actively participates in regional initiatives that lead to coordinated approaches to environmental compliance among the northeastern states. An example is the Mercury Action Plan which was adopted by the Eastern Canadian Premiers and New England Governors in June 1998 and which outlines compliance and education strategies to reduce anthropogenic emissions of mercury in the region.

Glossary of Terms

Attainment Area- An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

Advanced Wastewater Treatment- Any treatment of sewage that goes beyond the secondary or biological wastewater treatment step and may include removal of nitrogen, phosphorus, toxic metals or suspended solids, or provide a more complete reduction of organic pollutants.

Best Available Technology ("BAT") The Best Available Technology that is economically achievable.

Combined Sewer Overflow ("CSO")- An overflow from a sewer system, carrying both sewage and stormwater runoff, which occurs during heavy storms and results in the discharge of partially treated or untreated wastewaters into receiving waters.

Enforcement Response Policy- Department policy adopted June 1, 1999 that guides the enforcement process by establishing a violation classification system, enforcement response procedures and recommended timelines for issuance of enforcement actions.

LDF- A hazardous waste land disposal facility.

LQG- Large quantity generator of hazardous waste. An LQG generates greater than 1000 kilograms (2200 pounds) of hazardous waste per month.

Market Place - Designation in the Pesticide Program for businesses that sell pesticides to the general public.

Neutral Scheme- Strategy for inspection targeting in the Department's PCB program.

NOV- Notice of Violation- An informal enforcement tool used by the Department to address non-compliance.

NPDES- National Pollution Discharge Elimination System- A provision of the Clean Water Act which prohibits the discharge of pollutants into waters of the United States unless a permit is issued by the State or EPA.

Point Source- A stationary location or fixed facility from which pollutants are discharged or emitted, or any single identifiable source of pollution.

Primary Waste Treatment- The first treatment step in most publically owned waste treatment systems in which physical processes, such as screening and sedimentation, are used to remove a portion of the materials that float or will settle.

PSD- Prevention of Significant Deterioration- Program that requires permits intended to restrict emissions for new or modified major sources in places where air quality is already better than required to meet ambient air quality standards.

Publicly Owned Treatment Works ("POTW")- A system used for the collection, treatment and/or disposal of sewage from more than one lot, and which discharges to the waters of the state and which is owned by a municipality or the State.

Secondary Waste Treatment- The treatment step in most publically owned waste treatment systems in which bacteria consume the organic portions of the wastestream.

SIU- Significant Industrial User- An industry which is subject to federal pretreatment standards, or that either discharges an average of 25,000 gallons per day or more of process wastewater to a POTW, contributes a process wastestream composing 5 percent or more of the POTW's average dry weather hydraulic or organic capacity, or has a potential to adversely affect the POTW's operation.

SQG- Small Quantity Generator of hazardous waste. A SQG generates between 100 and 1000 kilograms (220 and 2200 pounds) of hazardous waste per month and cannot accumulate greater than 1000 kilograms of hazardous waste on-site at any one time.

Supplemental Environmental Project ("SEP") - An environmentally beneficial project undertaken by a defendant or a respondent in settlement of a judicial or administrative enforcement action.

TSF- A hazardous waste treatment or storage facility.

Attachment I

Naugatuck River Water Quality Monitoring Data

NAUGATUCK RIVER WATER QUALITY MONITORING PROJECT

The DEP Bureau of Water Management is conducting an intensive water quality monitoring project related to the Waterbury WWTP upgrade. The scope of the monitoring project measures both physical and chemical parameters and the condition of the resident biological community of the Naugatuck River upstream and at three locations downstream of the WWTP outfall.

Pre-Construction. Monitoring began in the Fall of 1997 to establish baseline conditions prior to the start of construction in the Fall of 1998. Prior to implementation of AWT at the Waterbury WWTP, the biological community of the Naugatuck River was moderately impaired upstream and downstream from the Waterbury outfall. In the reach immediately downstream from the outfall, for a distance of approximately two miles, the condition was severely impaired. Physical and chemical monitoring during conditions of minimal streamflow showed dissolved oxygen (DO) levels below the acceptable level of 5 ppm for a distance of at least six miles downstream. During the same time period ammonia and dissolved copper exceeded toxic levels within the same section of river.

Post-Construction. Due to severe drought conditions and resulting record low stream flows, water quality in the river was severely degraded downstream of Waterbury for approximately one year during construction. Shortly following implementation of AWT at the Waterbury WWTP, DO and ammonia were well within acceptable levels. Also dissolved copper was reduced by about fifty percent over pre-construction levels (even though copper reduction was not a major goal of AWT). Biological monitoring was conducted less than five months after implementation of AWT which is a relatively short time for recovery to take place. The condition of the biological community, as evidenced by three benthic indices, shows that the section of river directly downstream from Waterbury improved from severely to moderately degraded and the farthest downstream location monitored had returned to the same condition. Further improvements are expected after one or two full growing seasons.

Sensitive Taxa. This index is a count of the number of different types of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera). In general these 3 groups of aquatic insects are considered to be sensitive to changes in water quality. The total number of Ephemeroptera, Plecoptera, and Trichoptera types tends to increase with increasing water quality.

RBP III Assessment Results. Rapid Bioassessment Protocol III (RBP III) is a method developed by the US EPA for water quality assessments using aquatic macroinvertebrate community data. In general a series of indices based on the macroinvertebrates present at a site are compared to the same indices from a site on a stream indicative of the best attainable situation for the region. The final assessment result is based on the following scale; >83% Nonimpaired, 54%-79% Slightly impaired, 21%-50% Moderately impaired, and <21% Severely impaired. Generally sites >54% are considered to meet water quality standards. For the complete protocol visit the EPA web site at <http://www.epa.gov/owow/monitoring/rbp/>

Hilsenhoff Biotic Index (HBI). Is the weighted mean of the tolerance values for an aquatic macroinvertebrate community sample. Each type of organism is assigned a value from 0 to 10. The lower the value the more sensitive the type of organisms is to organic pollution. The index value can be compared to other values in order to determine which community as a whole has greater representation of sensitive organisms.

