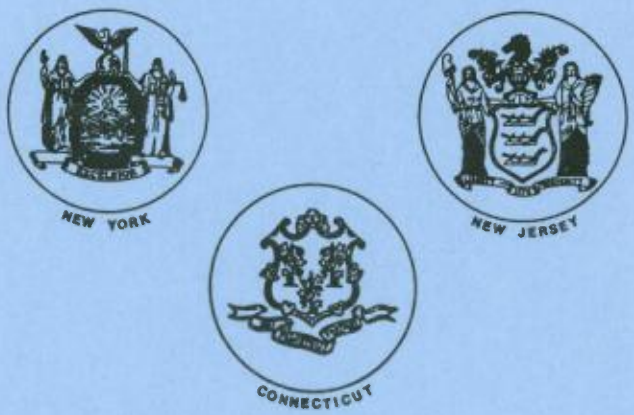
INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY



1998

ANNUAL REPORT

NEW YORK NEW JERSEY CONNECTICUT

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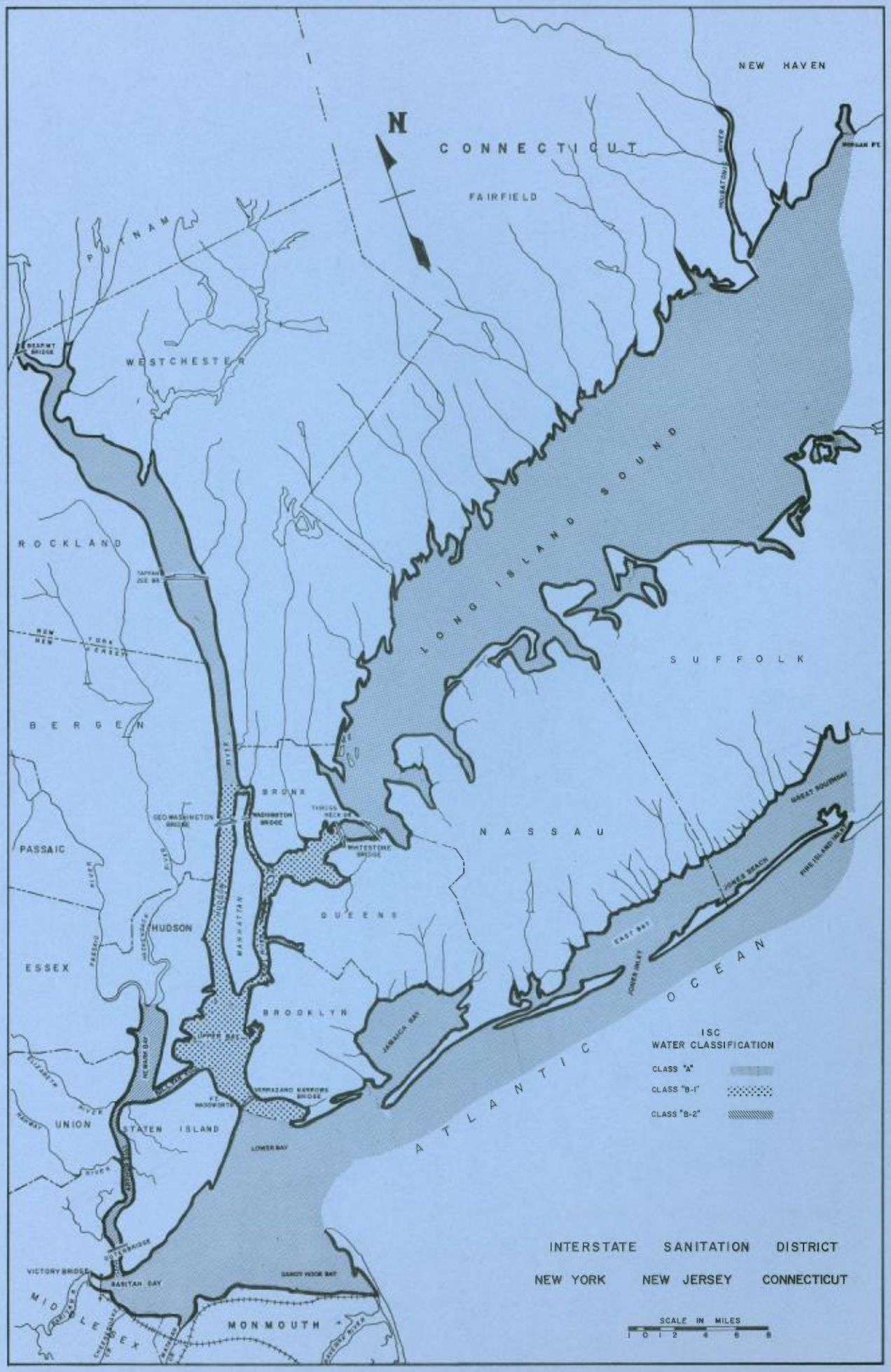
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INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
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INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY

1998

ANNUAL REPORT

OF THE

INTERSTATE SANITATION COMMISSION

ON THE

WATER POLLUTION CONTROL ACTIVITIES

AND THE

INTERSTATE AIR POLLUTION PROGRAM

INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY
311 WEST 43rd STREET • NEW YORK, N.Y. 10036
212-582-0380 FAX: (212) 581-5719

January 24, 1999

To Her Excellency, Christine Todd Whitman
His Excellency, George E. Pataki
His Excellency, John G. Rowland
and the Legislatures of the States of New Jersey, New York, and Connecticut

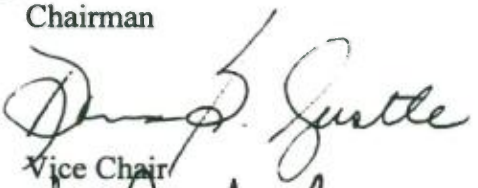
Your Excellencies:

The Interstate Sanitation Commission respectfully submits its report for the year 1998.

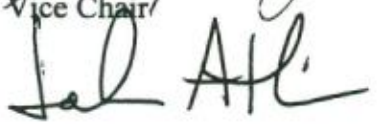
The members of the Commission are confident that with the continued support of the Governors and the members of the Legislatures, the Commission will maintain active and effective water and air pollution abatement programs.

Respectfully submitted,

For the State of New Jersey — Chairman



For the State of New York — Vice Chair



For the State of Connecticut — Vice Chair

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STATEMENT OF THE CHAIRMAN
OF THE
INTERSTATE SANITATION COMMISSION

Throughout the 1990s, the preparation of my Annual Statement always has been a task that I particularly looked forward to — for each year in this decade has been a positive one of marked environmental progress for the ISC. However, this year it is especially so since 1998 emerges as a most memorable year — and a most gratifying year — in that our Commission has been able to put closure on two major issues that posed longstanding threats to the integrity of our waterways throughout this region.

These issues were the discharge permits regarding pollution control requirements for New York City's 14 wastewater treatment plants, and a much needed tri-state agreement on regional notification and tracking procedures for bypasses of sewage into our waterways.

As for the permits, I am pleased to report that the Commission, at long last, reached agreement on the remaining issues wherein the requirements for New York City's sewage treatment plants have been made much more stringent than those set forth in the original permits — permits which caused us to originally initiate litigation years ago.

In the matter of bypasses which threaten our waters with raw and less than fully treated sewage releases, the ISC spearheaded an effort that resulted in a regional bypass group that produced software capable of predicting what beach and shellfish areas would be affected from a sewage release. In addition, specific protocols were established among governmental and health officials in our three member States so when a bypass occurs, everyone is expeditiously informed and nobody is caught unaware of the situation. Happily, this was accomplished before the 1998 bathing season! Since then, the software and the procedures have been tested and they are working.

Our year was also highlighted by the success of two major news-making events. A region-wide combined sewer overflow conference, in co-sponsorship with the College of Staten Island, attracted legislators, technical and engineering specialists and other experts in the field. They were able to put the problem of CSOs into sharp focus and explore tactics and solutions to remedy this major source of pollution. Legislators, environmentalists and the media were also able to take advantage of another opportunity to study the region's environmental problems as participants in our annual boat inspection trip. Conditions were extremely favorable this year for a close-up examination of "environmental hot spots" and areas that included the upper East River and the New York and Connecticut waters of western Long Island Sound, as well as several of the Sound's embayments.

Again, in 1998, we continued our active role as members of the Management Committees for both the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program. For the eighth consecutive year, the Commission conducted an intensive sampling program in Long Island Sound so that our accumulating knowledge of conditions in these waters can direct us toward the most effective strategies for upgrading and safeguarding water quality throughout the environmentally fragile Sound.

At the request of the New York State Department of Environmental Conservation, we were also happy to have completed a sampling program in Little Neck Bay; the sampling is one of the criteria needed before being able to initiate a shellfish transplant program. In addition, our ongoing activities have been extended to include another sampling program in selected Westchester County harbors in preparation for a similar transplant effort.

In New Jersey, we have completed our third year and we're going on to a fourth season of sampling on behalf of the State's shellfish depuration program. Our goal in Raritan and Sandy Hook Bays is to gather the necessary data for New Jersey so they can not only keep present shellfish areas open, but to possibly open additional acreage in the near future.

In closing, I would be remiss if I did not express my pride and gratification in noting that our full budget request from New York and New Jersey was granted in recognition of the importance of our programs and activities.

On a personal note, I wish to thank Brian Comerford who, since recently assuming a new position in the Office of the Attorney General, will no longer serve as the Connecticut Attorney General's Statutory Representative to the ISC. Brian was commended in September when the Commission unanimously adopted a Resolution acknowledging his ten years of distinguished service to the ISC. Furthermore, I wanted to convey appreciation to my fellow Commissioners who have acknowledged the ISC's proud record of achievements in recent years by unanimously voting Howard Golub as ISC's Executive Director and Chief Engineer. It is an appointment well deserved and I am looking forward to continuing to work with Howard for the benefit of the environment and the citizens in this tri-state region as we move into the 21st Century.

Frank A. Pecci
Chairman

CONTENTS

ILLUSTRATIONS

I. EXECUTIVE SUMMARY

In the mid-1930s, when interstate conflicts began to arise regarding pollution in the waters surrounding and shared by the States of New York, New Jersey and Connecticut, the Tri-State Treaty Commission recommended the establishment of a body to control and abate water pollution. Following their recommendation, the Tri-State Compact establishing the Interstate Sanitation District and the Interstate Sanitation Commission were enacted in 1936, with the Consent of Congress. The ISC initially consisted of the States of New York and New Jersey; the State of Connecticut joined the Commission in 1941. Originally dealing only with matters concerning water pollution, air pollution was added to the scope of the Commission's activities in 1962. In 1970, the Commission was designated as the official planning and coordinating agency for the New Jersey-New York-Connecticut Air Quality Control Region.

While some treatment of sanitary wastes in this region began as early as the 1880s, environmental protection was still severely lacking at the time that the Commission began operations in the 1930s — two-thirds of the sanitary and industrial sewage received no treatment and the remaining one-third of the total daily flow of 1.61 billion gallons per day (BGD) received only primary treatment. Construction and upgrading of wastewater treatment facilities became one of the Commission's most important priorities. Over the years, significant improvements have been made, but much remains to be done. Since secondary treatment is in place, controlling untreated discharges from combined sewer overflows (CSOs) and storm sewers is absolutely necessary in order to make further significant reductions in the amount of pollutants plaguing the region's waters. In this regard, many aspects of the issue were discussed this year at a major regional CSO conference sponsored by the Commission, with the College of Staten Island as a co-sponsor.

The Commission's record speaks for itself. ISC's programs and actions have contributed to the great improvements in the region's waterways in the recent past. The Commission's adoption of a requirement for year-round disinfection was instrumental in opening thousands of acres of shellfish beds on a year-round basis. Also, in recent years, tri-state residents have suffered far fewer beach closings due to elevated levels of coliform bacteria or wash-ups of harmful medical debris. The Commission — in conjunction with its three states' environmental and health departments, US EPA and NYC DEP — spearheaded the effort to have software developed to predict the impacts of unplanned sewage bypasses on area beaches and shellfish beds. As part of this effort, regional notification protocols were developed and in place for the 1998 bathing season. The Commission adopted an amendment to its Water Quality Regulations on October 15, 1997, to address the issue of planned sewage bypasses; during 1998, one permittee was affected by this regulation.

The staff continues to fulfill ISC's technical and administrative responsibilities within the limitations imposed by the current resources. While somewhat increased, the ambient and effluent water quality sampling programs remain at reduced levels and, except for the Staten Island odor complaint answering service and limited investigations, the air pollution programs are at a minimum level.

The objectives of the the Commission's programs are to address specific environmental deficiencies and/or to assure compliance with the Tri-State Compact and the Commission's Water Quality Regulations. The programs are designed for gathering the information necessary for enforcement actions, opening waters for shellfishing, opening waters for swimming, developing water quality and/or effluent criteria, and other needs that may arise.

Public involvement, education and outreach remains a high Commission priority. Besides its normal day-to-day activities, the Commission regularly testifies at public hearings and meetings on various issues of concern. ISC also lectures at local schools and colleges on subjects dealing with coastal pollution, oceanography, habitat, sampling and data collection, and related Commission activities. During the past nine years, the Commission has been a sponsor for Our World Underwater which gives young scholars the opportunity to get nationwide exposure to diverse organizations involved with the marine environment. Over the past six years, law student internships have been awarded in conjunction with Pro Bono Students America/New York and New Jersey.

This report provides a record of the water and air pollution activities of the Interstate Sanitation Commission for the period December 1997 through November 1998. To address the environmental problems within its area of jurisdiction, the Commission has focused on technical assistance, enforcement, planning, laboratory analysis, monitoring, coordination, and public outreach.

WATER POLLUTION

The Commission's water pollution abatement programs continue to focus on the effective coordination of approaches to regional problems. Improving water quality so more areas can be used for swimming and shellfishing remains a high priority. The ISC's programs include enforcement, minimization of the effects of combined sewers, participation in the National Estuary Program, control of floatables, compliance monitoring, pretreatment of industrial wastes, toxics contamination, sludge disposal, dredged material disposal, and monitoring the ambient waters — especially with regard to opening new areas for swimming and shellfishing.

Throughout the District, planning and construction is under way to provide water pollution control and abatement from municipal and industrial wastewaters discharging into the ISC's District waters. It is estimated that over $5.23 billion has been allocated by municipalities in the District for projects recently completed, in progress, and planned for the future.

In order to address the problem of unplanned sewage bypasses, the Commission took the lead and coordinated the efforts of a multi-state, multi-agency regional team that worked with a contractor to develop modeling software that is used to predict the effects of those bypasses. The work group also developed a regional notification protocol to promptly inform officials throughout the tri-state area of the occurrence of any bypasses. Both the notification protocol and the modeling were in place and operational prior to the start of the 1998 bathing season.

As a means of addressing combined sewer overflows which are a major source of pollution in the Interstate Sanitation District, the Commission sponsored a highly successful regional CSO conference in April 1998, with the College of Staten Island as a co-sponsor. The conference brought together legislators, regulators, the regulated community, technical experts, environmental groups, and citizens to discuss this important and timely subject. They were able to put the problem of CSOs into sharp focus and explore tactics and solutions to remedy this major source of pollution.

The Commission's involvement in several legal actions continued this past year. Those actions are detailed in the Legal Activities section of this report and are highlighted as follows:

- reached resolution on the three remaining issues in the New York State Department of Environmental Conservation adjudicatory hearing on the State Pollutant Discharge Elimination System (SPDES) permits which that department issued for the 14 New York City water pollution control plants.

- continued involvement and oversight of the Consent Orders designed to prevent debris from escaping from the Fresh Kills Landfill located on Staten Island.

- involvement in an enforcement proceeding against New York City's North River treatment plant on various issues of environmental concern.

- awaiting the start of an adjudicatory hearing granted to the Commission regarding the deletion of ISC's Regulations from a NJPDES permit.

- proceeding with one permittee whose planned bypass falls under ISC's 1997 Water Quality Regulation requiring advance notification to ISC of planned sewage bypasses.

The Commission remains deeply committed and deeply involved with the Long Island Sound Study (LISS) and the New York-New Jersey Harbor Estuary Program (HEP). ISC continued to actively participate on the Management Committees for both of these National Estuary Programs and on various work groups for these studies. The final Comprehensive Conservation and Management Plans (CCMPs) for the LISS and the HEP were signed in 1994 and 1997, respectively. Environmental bond acts were passed in 1996 in both New York and New Jersey. In the $1.75 billion New York State Clean Water/Clean Air Bond Act, $200 million was designated for the LISS implementation. Both the New York and New Jersey environmental bond acts earmark significant resources to the HEP for harbor pollution control — the New York act designated $25 million to implement the CCMP for the HEP and $185 million of the $300 million New Jersey act is specified for projects related to dredging in the New Jersey/New York port area.

ISC has an ongoing project to continually update its region-wide inventory of development projects within the District; this effort is presently in its eleventh year. Among other things, this inventory contains estimates of the amount of sewage that will be generated by proposed projects. This information has been invaluable in determining whether the infrastructure — the sewage

treatment plants and the sewer systems — has the capacity to accept additional wastewater from the construction of residential and mixed-use buildings, as well as hotels, marinas and recreational facilities.

As a means of monitoring compliance with discharge permit limitations for treatment plants and industries, ISC continued to regularly sample waste discharges from permittees throughout the District. Using the ISC research vessel, the R/V Natale Colosi, the Commission again participated in a multi-agency intensive survey in Long Island Sound to continue to document dissolved oxygen conditions. This was ISC's eighth consecutive year as a participant in this important project. For the third year in a row, at the request of NJ DEP, during the winter and spring of 1997-1998 the Commission collected water quality samples needed by NJ DEP to check the bacterial conditions of the shellfish waters of Raritan and Sandy Hook Bays. At the request of NYS DEC, the Commission completed a sampling program in Little Neck Bay in an area that NYS DEC wants to designate for a shellfish transplant program. Additionally, as requested by the NYS DEC for their shellfish transplant program, ISC initiated a sampling program in selected Westchester County harbors in Long Island Sound. These and other sampling programs are detailed in this report.

The Commission has been involved with the US Army Corps of Engineers' Dredged Material Disposal Management Plan for the Port of New York and New Jersey since 1981. The effort must include all interests throughout the region in order to be able to develop solutions that balance dredging requirements of the Port of New York and New Jersey with sound environmental and economic disposal alternatives. By consensus of its organizers, the Dredged Materials Forum has been incorporated into the HEP. The chairpersons of the Forum's work groups were designated as the Dredged Material Management Integration Work Group. The Commission took an active role by participating on the Mud Dump Site Work Group.

In addition to the day-to-day operations performed by the ISC laboratory which has been located on the campus of the College of Staten Island (CSI) since late 1993, the laboratory personnel continue to collaborate with CSI on environmental projects of mutual concern. The ISC laboratory is certified by New York State and New Jersey, and has continued to participate in the US EPA's Water Pollution Laboratory Evaluation Program and Water Supply Microbiology Performance Evaluation Study. The ISC laboratory also conforms with the recommended procedures of the US Food and Drug Administration.

ISC's library holdings continue to be updated and provide an accessible regional depository of water and air quality related subjects. The Commission's current and historical holdings have been sought and made available to the academic community, consulting engineering firms, attorneys, environmental and public awareness groups, government agencies across the nation, and international entities.

AIR POLLUTION

Budgetary restrictions continue to keep the Commission's air pollution monitoring and response programs at a reduced level, including ISC's Staten Island field office remaining closed as has been the case since mid-1989. The Commission's 24-hour-a-day, 7-day-a-week answering service (718-761-5677) remains in service and ISC personnel investigate as many complaints as its resources will allow. ISC also forwards complaints to the appropriate enforcement and health agencies.

During the 12-month period from October 1997 through September 1998, the Commission received 48 air pollution complaints — a decrease of 25% over the previous 12 months. As has been the pattern, most of the calls originate from Staten Island; this year, 96% of the complaints emanated from that Borough. The Livingston section, located in northeastern Staten Island on the shore of the Kill Van Kull, was the neighborhood that registered the most complaints. Citizen complaints are the most frequent source of firsthand information about poor air quality and accurate odor descriptions could lead to the discovery of the emissions sources.

ISC continued its role as coordinator of the High Air Pollution Alert and Warning System for the New Jersey-New York-Connecticut Air Quality Control Region; conditions during the past year did not warrant activation of the system.

The Commission again participated in the Ozone Health Message System to alert the public of unhealthy ambient air conditions. Based on information received from its member states, the Commission disseminated 20 health messages between May 18th and September 15th to the appropriate government environmental and health agencies throughout the region.

II. WATER POLLUTION

GENERAL

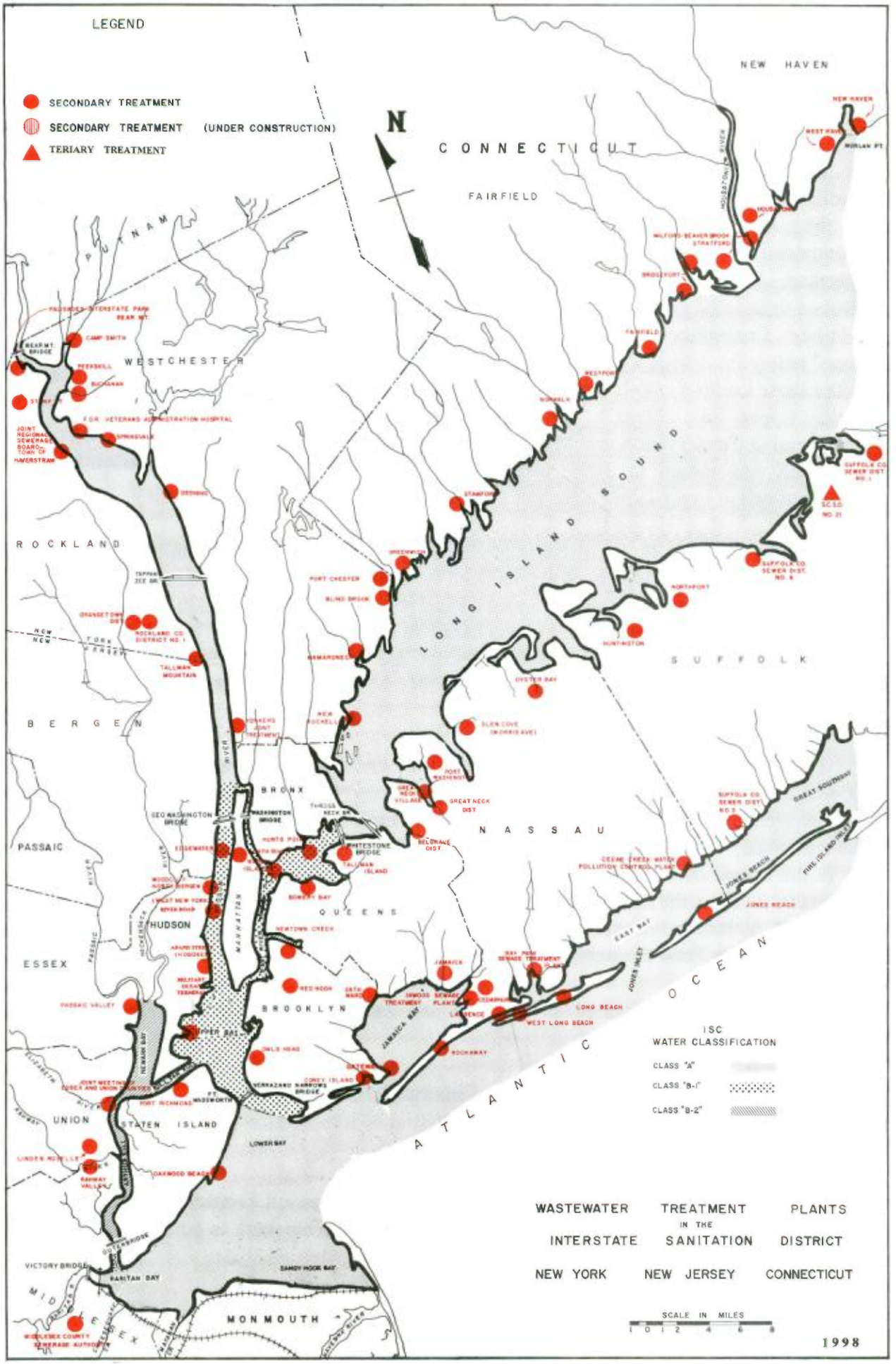
During 1998, approximately $5.23 billion was allocated for 453 water pollution control projects in the Interstate Sanitation District which were either completed, in progress, or planned for the future. These monies were allocated in the following manner: over $25.4 million for 98 completed projects, more than $2.653 billion for 205 projects in progress, and more than $2.55 billion for 150 future projects. These expenditures are being used for engineering studies and experiments, CSO abatement projects, land-based alternatives for sewage sludge disposal, construction of new facilities, and upgrading and/or expanding existing facilities in order to provide adequately treated wastewater for discharge into District waterways. These figures do not include the monies spent by industries for pollution control.

The Commission has long advocated adequate infrastructure as a necessity for maintaining and improving receiving water quality, as well as for minimizing use impairments. These tremendous expenditures on the infrastructure have resulted in significant water quality improvements throughout the District these past years; however, much remains to be done.

With secondary treatment now in place throughout the Interstate Sanitation District, control of the region's combined sewer overflows is necessary in order to achieve further significant water quality improvements. Communities throughout the District have ongoing CSO programs and projects for CSO control range from sewer separation to swirl concentrators to booming and skimming to in-line and off-line storage. The National Estuary Programs in the District have identified major problems affecting water quality which are exacerbated by anthropogenic sources; namely hypoxia, sediment contamination, pathogens, habitat loss and floatables. These issues must be addressed in order to maintain and improve commercial and recreational maritime activities, living marine resources, land use, and wetland creation/remediation.

The Commission obtained the information on water pollution control projects presented in this section from officials in the representative state and local governmental agencies, sewerage authorities, consulting engineering firms, and national depositories of water quality data and industrial/municipal effluent data. The format used in this report is designed to provide background, as well as the current status of construction, engineering studies and experiments, pilot projects and experiments and related environmental conditions. The information in this section is that which was available and accurate through November 1998.

A map of the Interstate Sanitation District on the following page shows the locations of wastewater treatment plants which discharge into District waterways, the type of treatment and status of each plant, and the Commission's water classifications. Additional information on each plant is listed in Appendix A.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WASTEWATER TREATMENT PLANTS
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SCALE IN MILES
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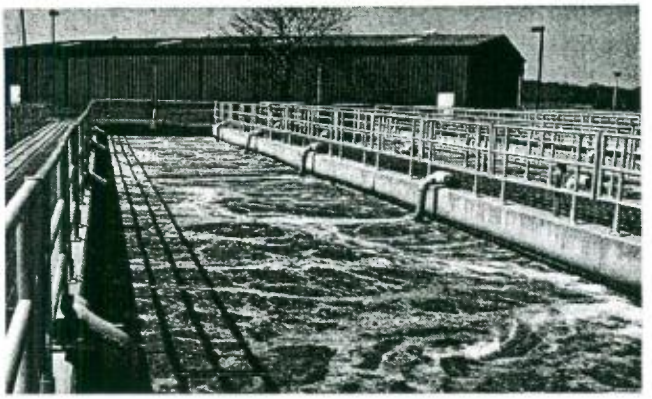
1998

CONNECTICUT WATER POLLUTION CONTROL PLANTS

The Policy Committee for the Long Island Sound Study consists of the Regional Administrators of US EPA - Regions I and II, and the Commissioners of the State environmental departments in New York and Connecticut. As a means of controlling hypoxia conditions in the study area, in December 1990 the Policy Committee adopted a "no net increase" policy for nitrogen discharges in order to reduce those loadings into Long Island Sound and the Upper East River. The Study's Comprehensive Conservation and Management Plan, which was issued in 1994, adopted a phased approach to hypoxia management starting with the "no net increase" policy.



As part of Phase II, Connecticut is allocating approximately $18.1 million to reduce its aggregate, annual nitrogen load by 900 tons from the 1990 baseline. The Connecticut Department of Environmental Protection issued Consent Orders requiring nitrogen reduction assessments and implementation of retrofits at selected plants based on cost and feasibility. Ten of the 12 facilities discharging to the Interstate Sanitation District are incorporating interim and permanent denitrification processes. Subsequently, CT DEP will modify individual NPDES discharge permits to ensure compliance.

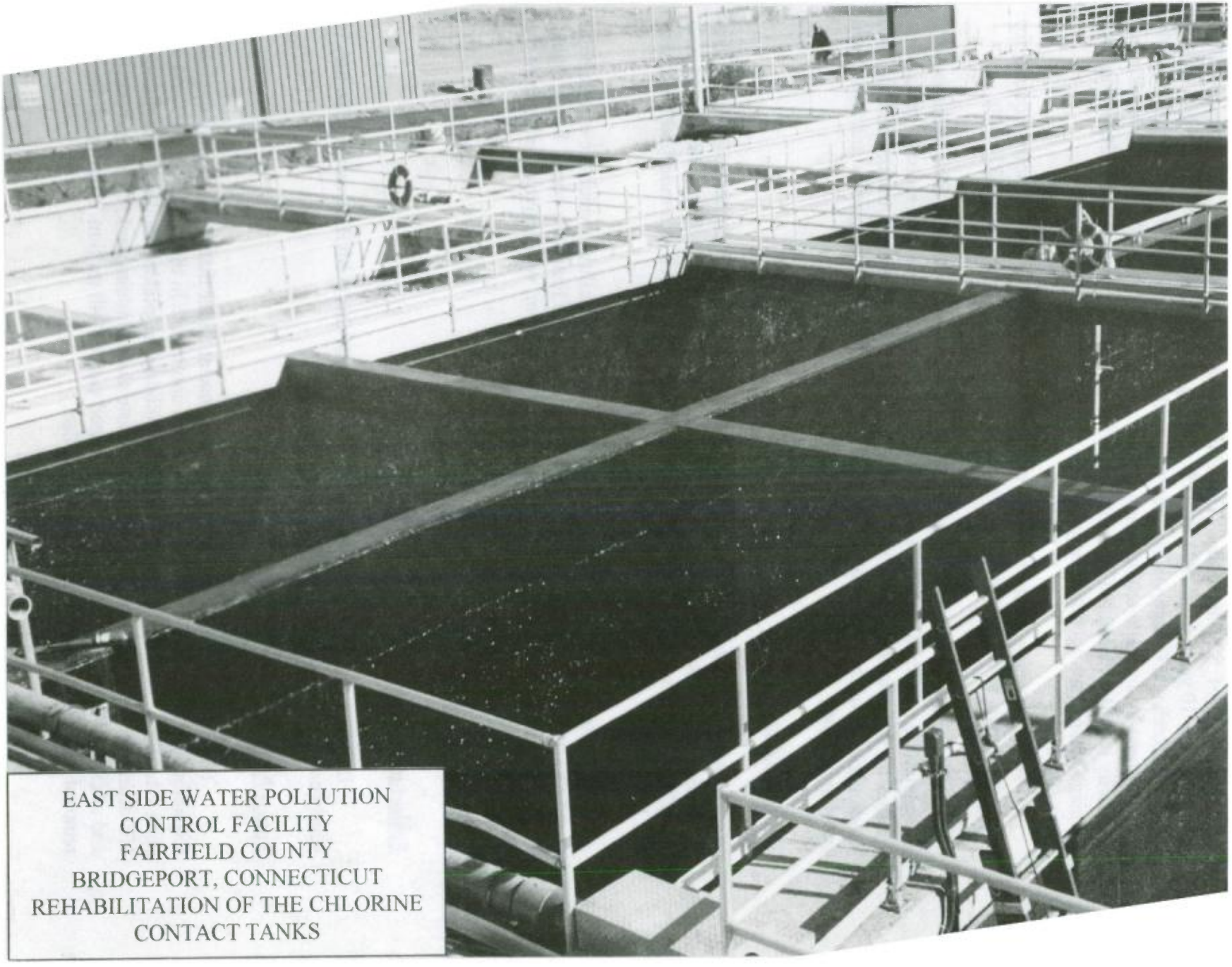
During February 1997, the States of New York and Connecticut and the US EPA released a proposal entitled Phase III Actions for Hypoxia Management, including nitrogen reduction targets for 11 management zones that comprise the Connecticut and New York portions of the Long Island Sound watershed. This phase establishes a 58.5% reduction in nitrogen loadings for all management zones in the Sound over the next 15 years. On February 5, 1998, after a year of public review, comment and revision, the Policy Committee for the LISS adopted the Phase III Actions for Hypoxia Management, including nitrogen reduction targets. Connecticut has pledged $60 million of the State's Clean Water Fund financing to implement the Phase III program.

Refer to the individual plant write-ups and the National Estuary Program section for additional information.

Bridgeport - East Side and West Side Plants, Connecticut (Fairfield County)

Projects in Progress

There is an ongoing multi-year CSO improvement program in the Bridgeport drainage basins which are comprised of 3,880 acres. This work is 60% complete at a re-



EAST SIDE WATER POLLUTION
CONTROL FACILITY
FAIRFIELD COUNTY
BRIDGEPORT, CONNECTICUT
REHABILITATION OF THE CHLORINE
CONTACT TANKS

estimated cost of $27 million. There is a phased construction program spanning approximately 10 years from 1991 to 2002. During this program, 40 CSOs which discharge into Black Rock and Bridgeport Harbors will be eliminated and the 19 remaining CSOs will be monitored by a remote telemetering system. Additionally, the Water Pollution Control Authority has allocated about $1.5 million per year for sewer system rehabilitation in both drainage basins; this agenda is ongoing.

An engineering study is under way to assess process modifications required for nutrient removal at both facilities. This assessment is estimated to cost $350,000.

The complete rehabilitation of all unit processes at the East Side plant is 62% complete; the re-estimated cost is over $37.2 million. Agenda items include, but are not limited to, the overhaul of the preliminary, primary, and secondary treatment units, and modernization of the electrical/mechanical equipment, as well as pumps and associated instrumentation.

Future Projects

Both treatment facilities are operating under State Consent Orders to improve plant performance and attain secondary treatment capabilities. The Authority negotiated new compliance dates with the City of Bridgeport during 1994 which was modified December 12, 1996.

It is proposed that both plants share sludge disposal facilities which are estimated to cost $27.3 million. A sludge incinerator will be sited at the East Side plant. Force mains, which are to be installed on land and under Bridgeport Harbor, will convey sludge from the West Side plant to the East Side plant.

Fairfield, Connecticut (Fairfield County)

Project in Progress

Design work for rehabilitation and expansion of this 9 MGD secondary facility is nearly complete ($2.85 million).

Future Project

This facility is operating under a State Consent Order that requires plant upgrades. Rehabilitation and expansion of this facility will commence in the winter of 1999 and will span a three-year period. The work includes rebuilding the existing facilities, installation of UV disinfection, converting one digester to a waste sludge holding tank, three new clarifiers, and additional aeration tankage at a re-estimated cost of $40 million. Additional nitrogen removal retrofits will be implemented as needed.

Greenwich (Grass Island), Connecticut (Fairfield County)

Completed Projects

A phase II engineering study which details a new biosolids handling facility was completed during late 1997 at a cost of $90,000. Designs are anticipated to be complete during March 1999 with an operational date during early 2002. Another study recently completed focuses on denitrification ($335,000).

Projects in Progress

This facility is operating under a 1995 State Order to eliminate overflowing manholes in the Byram and Old Greenwich neighborhoods. Manhole rehabilitation and sewer lining is anticipated to be complete during March 1999 at a cost of $800,000.

Future Project

A solids handling facility will be installed at a re-estimated cost of $13.5 million. The construction schedule is still to be determined.

New Canaan, Connecticut (Fairfield County)

Projects in Progress

Although this 1.5 MGD secondary facility is located outside the Interstate Sanitation District, the discharge waterway, Five Mile River, has a confluence with Long Island Sound. A plant expansion and upgrade with associated force main and gravity sewer lines is 80% complete. Anticipated to be operational during December 1998, the project includes a new pretreatment building; two new secondary clarifiers; a new control building; administrative offices; and new facilities for dewatering, UV disinfection and odor control. All these construction phases are estimated to cost $14.3 million.

Future Projects

Collection system work has been proposed to build three new pump stations and correct I/I at an estimated cost of $1.8 million. A construction agenda has not been determined.

New Haven - East Shore, Connecticut (New Haven County)

Completed Projects

At a final cost of $800,000, the secondary meters and drives were upgraded. This equipment was operational during March and entirely on line during May 1998. A supervisory control and data acquisition system master plan was completed at an estimated cost of $76,000.

Projects in Progress

An engineering study is under way that will assess the modification needs for the Barnes Avenue/Quinnipiac Pump Station.

Plant upgrades are 50% complete with an operational start-up expected during March 1999. Estimated to cost over $6.68 million, the upgrades are addressing the primary treatment phase including the conversion of a monorake system to a 3-separate chain and flight sludge collection process, the replacement of all of the existing antiquated motor control centers, and the installation of covers on the primary tankage for odor control.

An ongoing long term CSO control plan is 60% complete with project costs estimated at $2 million. Sewer separation construction will continue until combined sewers discharging to New Haven Harbor are eliminated. This work will not be completed until approximately 2015 at a cost of $130 million. The work is approximately 35% complete.

Future Projects

Two additional engineering studies are proposed which will address alternative standby power for the main sewage pumps (FY'99) and a regional septage study.

Norwalk, Connecticut (Fairfield County)

Projects in Progress

A three-year construction schedule, under way since 1996, is over 50% complete and the re-estimated cost is $30 million. An operational start-up is planned for late 1999 and the project will increase the capacity of this 15 MGD secondary facility to 20 MGD. Other plant unit upgrades include odor controls, a new chlorination system, and new tankage for all treatment phases.

At a re-estimated cost of $1 million, collection system improvements and rehabilitation, as well as sewer separation work, have temporarily been postponed. However, the project is approximately 75% complete.

Stamford, Connecticut (Fairfield County)

Completed Project

An engineering study for a revised facility plan was completed at a final cost estimated at $400,000. Design work for the facility upgrade is presently under way ($2.5 million) and is anticipated to be complete during June 1999.

Future Project

Upgrading and expansion of this 20 MGD secondary facility is planned to begin during September 1999. The three-year construction schedule is re-estimated to cost $36 million.

West Haven, Connecticut (New Haven County)

Completed Projects

A plant-wide electrical upgrade was operational during August ($450,000) which replaced all of the existing antiquated motor controls. The Baybrook pump station upgrade ($130,000) was completed and operational during May 1998.

Projects in Progress

Presently under design, $1.2 million will be incurred to prepare for this facility's main pump station wet well upgrade. The modernization includes new automatic bar screens and odor controls and it is anticipated that the work will be complete in December 1999. Additional design plans are being drawn for I/I lining and repairs ($4 million). Presently, I/I lining and point repairs are under way (2% complete - $2 million).

Future Projects

An odor control system will be installed plant-wide and at all pump stations at an estimated cost of between $2 and $3 million. The odor source buildings will be ventilated, treated and released through a bio-filter with scrubbers. This should eliminate or lessen impacts on the surrounding neighborhoods.

A phased approach to upgrade four existing pumping stations city-wide is planned to begin during January 1999. Anticipated to be operational during the summer of 2000, this work is estimated to cost $4.8 million. The remaining stations will be renovated on an as needed basis at a cost of approximately $2 million.

Westport, Connecticut (Fairfield County)

Completed Project

Completed during August, the headworks and covers on the primary tanks were rehabilitated at a final cost of $100,000.

A four-month engineering study which details odor abatement alternatives was completed in November at a cost of $33,000.

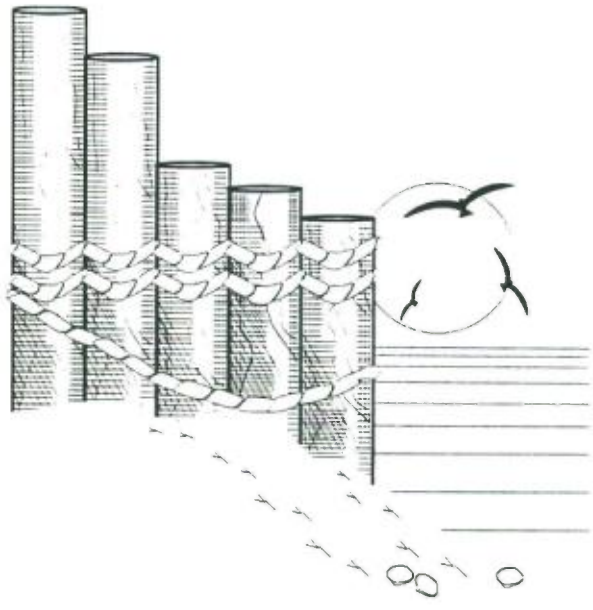
Projects in Progress

This facility is presently operating under a State Infiltration/Inflow Abatement Order. An I/I evaluation is nearly complete. Repairs and corrective work are scheduled to carry on through 1998 at an estimated cost of $250,000 per year. In addition, a State Consent Order was issued on April 3, 1998, to address and implement odor abatement corrective measures.

Future Projects

Planned to begin during the summer of 1999, it is estimated that $250,000 will be spent to replace the Church Street sewers.

It is estimated that $500,000 will be incurred to implement the odor abatement alternatives identified in the recently completed study. An approximate construction start-up is anticipated during the summer of 1999.



NEW JERSEY WATER POLLUTION CONTROL PLANTS

Edgewater, New Jersey (Bergen County)

Completed Project

Reconstruction of Pumping Station #3 is complete. The associated new force main, trunk line and lateral sewer installations were operational during the 1998 spring season. Final costs were not available; the expenses were incurred by the developer of a mixed use residential complex.

Projects in Progress

The Edgewater drainage basin has recently begun to implement a combined sewer overflow abatement and sewer separation project. The first contract, which is 20% complete, will eliminate three regulators and associated outfalls discharging to the Hudson River. This contract is estimated to cost $565,000. The second phase, scheduled to begin during November, will incorporate floatables controls at six regulator outfalls.

Hoboken, New Jersey (Hudson County)

This plant is now under the auspices of the North Hudson Sewerage Authority (NHSA) and is called the Adams Street facility. Refer to the write-up under the NHSA - Adams Street.

Joint Meeting of Essex and Union Counties (Edward P. Decher Wastewater Treatment Facility), New Jersey (Union County)

Projects in Progress

Several modernization projects are under way. These include upgrades of two main sewage pumps and controls (50% complete - $1.7 million) and the rehabilitation of the anaerobic sludge digester and sludge storage tank (35% complete - $2.5 million). These projects are anticipated to be complete during December 1998 and May 1999, respectively. The chlorination controls and dispersion equipment replacements are 50% complete ($500,000).

Trunk sewer rehabilitation began during May 1997 and is ongoing with a phased agenda. A major line was completed at a cost of $300,000. Started during this winter season, another section is being cleaned and lined ($80,000).

Future Projects

Additional rehabilitation, installations and upgrades are planned for the influent screen house facility, sludge thickening and the hypochlorination/dechlorination facilities. These proposed projects are scheduled to begin late in 1998. Final cost estimates for all work is approximately $2.6 million.

Kearny Municipal Utilities Authority, New Jersey (Hudson County)

Completed Projects

During November 1990, this primary facility was converted to a pump station and diverted all flows to the PVSC regional facility for treatment. In late 1996, the Authority applied for a Department of the Army authorization to install a submarine sanitary force main in Cedar Marsh. In addition, gravity sewers were installed. Recently completed, the 3 MGD Harrison Avenue Pump Station will convey flows to the existing South Kearny Pump Station and then to the PVSC facility. The new sewers (5,000 linear feet of force main and 5,000 linear feet of sanitary sewer) will service a portion of Harrison, NJ, as well as the leachate from the Hackensack Meadowlands Development Commission landfill. Estimated final costs for the collection system improvements were $4.5 million. Refer to the PVSC write-up for additional information.

KEARNY MUNICIPAL UTILITIES AUTHORITY, HUDSON COUNTY, NEW JERSEY
KEARNY MEADOWLANDS FORCE MAIN INSTALLATION

Linden Roselle Sewerage Authority, New Jersey (Union County)

Projects in Progress

The Authority is presently operating under a State Administrative Consent Order (July 1992/modified May 1996) to investigate effluent toxicity. Ongoing engineering studies are addressing this issue by exploring industrial pretreatment impacts; pretreatment controls will most probably be implemented. The facility is in compliance with all Order dates and anticipates operational levels by May 2000.

Future Project

The installation of four ultraviolet disinfection units is planned at an estimated cost of $2.5 million. The 12-month project is anticipated to begin during mid-1999.

Middlesex County Utilities Authority (Edward J. Patton Water Reclamation Facility), New Jersey (Middlesex County)

Projects in Progress

This facility is operating under a State Consent Order (May 1996/modified May 1998) to identify I/I and develop alternatives to correct the extraneous flows.

An engineering study is under way to assess the Sayreville pumping station rehabilitation needs.

Monmouth County Bayshore Outfall Authority, New Jersey (Monmouth County)

Projects in Progress

This authority receives secondary treated wastewater from two customer sewerage authorities, Bayshore Regional and Township of Middletown, for discharge outside the Interstate Sanitation District into the Atlantic Ocean. These flows are generated from municipalities that originally discharged to the Interstate Sanitation District. During necessary repairs to the ocean outfall and manholes that will take place over a 30-day period starting January 1999, flows will be discharged to Raritan Bay which is within the Interstate Sanitation District. Planned to begin this winter are pump station modifications (over $2.4 million) and force main manhole repairs ($492,925). Refer to the Legal Activities section of this report for additional information.

An engineering study which began during July will include a dynamic mixing zone analysis and a biological survey to determine the effects of chlorinated municipal wastewater on the marine environment. The three-year study will cost $26,250.

North Bergen Municipal Utilities Authority - Woodcliff Plant, New Jersey (Hudson County)

Project in Progress

There are ongoing negotiations between this facility and the NJ DEP to upgrade the plant design flow from 2.9 MGD to 3.4 MGD.

Future Projects

A construction upgrade is planned for the disinfection facilities in order to meet NJPDES permit limitations for chlorine residual. The estimated operational date is August 1, 1999. The construction is to begin during this winter season with the cost estimated at $200,000.

The elimination of CSO outfalls and/or the installation of floatables capture devices is planned to start this winter at an estimated cost of $1 million.

North Hudson Sewerage Authority - Adams Street (formerly Hoboken), New Jersey (Hudson County)

Completed Project

During the early 1990s, this facility was operated and maintained under the auspices of the Hoboken-Union City-Weehawken Sewerage Authority (HUCWSA). During 1995, this entity was renamed the Tri-City Sewerage Authority. As of November 1, 1996, this entity was again renamed the North Hudson Sewerage Authority and now maintains a second WPCP under its jurisdiction. Both facilities have been renamed — Adams Street, formerly Hoboken, and River Road, formerly West New York. Refer to the NHSA - River Road write-up for additional information.

Projects in Progress

An engineering study with a three-year agenda began during 1995. It will address modeling of the interceptor system and will select alternatives, both structural and nonstructural, for the ultimate control of solids and floatables discharged to the Hudson River.

In light of the new management of this facility, all proposed plant modifications and collection system rehabilitative work that had been previously reported are being reconsidered. This facility is operating under a State Administrative Consent Order (May 22, 1995) to eliminate the effects of CSOs. Presently, the facility is meeting all Order dates and is conducting an engineering study dealing with CSO abatement.

During October 1998, the Authority began to install a new UV disinfection system. Costs are estimated at $900,000 and it is planned to be operational by March 1999.

North Hudson Sewerage Authority - River Road (formerly West New York), New Jersey (Hudson County)

Completed Project

As of November 1, 1996, the North Hudson Sewerage Authority became the official entity to operate and maintain this facility which was formerly known as West New York. The Adams Street facility (formerly named Hoboken) is also under the auspices of the Authority.

Refer to the North Hudson Sewerage Authority - Adams Street write-up for additional information.

Projects in Progress

In light of the new management of this facility, all proposed plant modifications and collection system rehabilitative work that had been previously reported are being reconsidered. This facility is operating under two State Administrative Consent Orders to eliminate the effects of CSOs (September 30, 1993) and toxicity and plant performance (May 19, 1995). Presently, this facility is meeting all Order dates.

Passaic Valley Sewerage Commissioners, New Jersey (Essex County)

Projects in Progress

This facility is operating under federal and State Consent Orders to address alternatives for beneficial reuse of bio-solids (September 1989) and to comply with effluent limitations (August 1995). In addition, this facility is the subject of an Adjudicatory Hearing requested by ISC regarding the omission of the Commission's Water Quality Regulations in the NJPDES permit issued to PVSC . Refer to the Legal Activities section of this report for additional details.

An engineering study is under way to evaluate necessary modifications to the secondary processes.

Under way is the conversion of the disinfection process from gas to hypochlorite. The re-estimated $2.06 million construction (88% complete) is anticipated to be complete during January 1999.

Construction is 50% complete and entails the replacement of existing mixers and gas recirculation compressors with new surface aerators, a new electric distribution system for the oxygenation tanks, and the installation of the oxygenation tankage instrumentation and controls. This work has been re-estimated to cost over $20.8 million and is anticipated to be operational during June 2000.

Rahway Valley Sewerage Authority, New Jersey (Union County)

Completed Projects

Construction of an employee facilities building and a belt thickener building are nearly complete and only punch list items are pending. Within the belt thickener building, installations of the screw conveyors (primary and gravity) and sludge centrifuge are complete. Total costs estimated for all projects are $2.5 million.

Projects in Progress

The replacement of existing motors, drives and controls for the main lift pumps, intermediate pumps, return activated sludge pumps and waste activated sludge pumps is 95% complete ($700,000). The upgrades will be high efficiency motors and variable frequency drive equipment.

Future Project

A laboratory expansion has been proposed. Construction start-up has been set for the spring of 1999.

Township of Middletown Sewerage Authority, New Jersey (Monmouth County)

Completed Projects

Engineering studies completed recently include a pump station capacity assessment ($15,000) and an energy audit ($10,000).

At a final cost of $300,000 a sodium hypochlorite building and odor control covers for the grit removal and primary sludge thickener tanks were installed during the past year.

Projects in Progress

Expansion and upgrade construction to a 10.8 MGD secondary activated plant was completed in 1986. At that time, the Boroughs of Atlantic Highlands and Highlands diverted flows to this facility for treatment and began discharging treated effluent outside the Interstate Sanitation District. However, during necessary repairs to the ocean outfall and

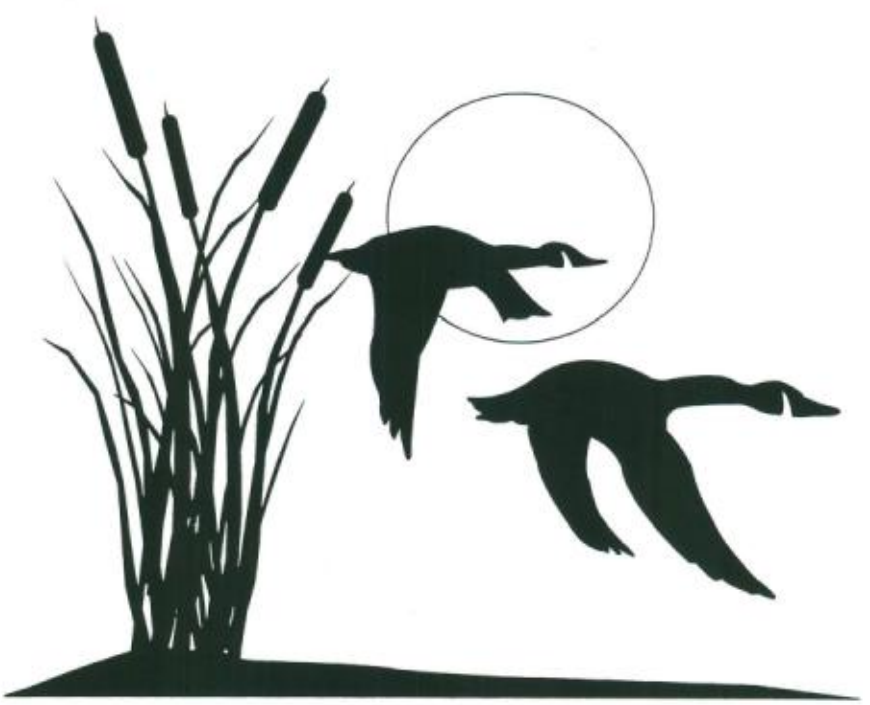
manholes over a 30-day period starting during January 1999, flows will be discharged to Raritan Bay which is within the Interstate Sanitation District. For additional information, refer to the write-up on the Monmouth County Bayshore Outfall Authority.

Planned to be complete (presently 5% complete) during July 1999, a $500,000 renovation will include the installation of new belt filter presses, upgrade of the polymer system, a new conveyor system and new sludge storage system.

The collection system is being upgraded with new motors, variable frequency drives and control panels (100% complete). Presently under way is the cleaning and visual inspection of 40,000 linear feet of gravity sewers. These improvements are to be complete by August 1999 and have a final cost of $650,000.

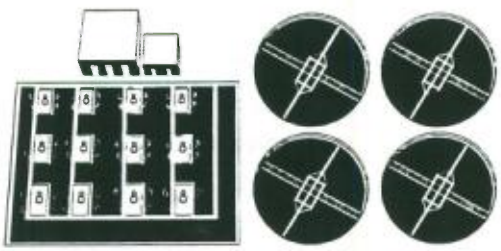
West New York, New Jersey (Hudson County)

This plant is now under the auspices of the North Hudson Sewerage Authority and is called the River Road facility. Refer to the write-up under the NHSA - River Road.



NEW YORK WATER POLLUTION CONTROL PLANTS

As per the recommendations of the Long Island Sound Study, the New York State Department of Environmental Conservation gave local governments the option of imposing nitrogen limits for individual sewage treatment plant discharges, or creating an aggregate of limits for all plants within a given management zone. NYS DEC and NYC DEP reached full agreement on aggregate effluent limits for the four plants on the upper reach of the East River — Bowery Bay, Hunts Point, Tallman Island and Wards Island. NYC DEP also agreed to implement operational and process changes to maximize nitrogen removal, as well as to conduct pilot programs to test new processes and technologies. Six other NYC plants which discharge to the Hudson River, Lower East River and New York Harbor (refer to the map at the beginning of the Water Pollution section of this report) will incorporate nitrogen reduction controls and conduct self-monitoring programs.



NYS DEC has issued final SPDES permits to eight treatment facilities in Nassau and Suffolk Counties for aggregate limits which freeze the nitrogen loads of the dischargers based on 1990 loadings. Presently, all facilities are in compliance with the "no net increase" limits. BNR pilot proposals are being developed for Glen Cove and Kings Park (SCSD #6).

In Westchester County, NYS DEC has issued final permits to the four plants discharging to Long Island Sound — Blind Brook, Mamaroneck, New Rochelle and Port Chester. Their aggregate loading is set at the 1990 nitrogen discharge level. Voluntary reductions are being implemented through a BNR retrofit at the Blind Brook facility. The County has completed a feasibility study for nitrogen removal at all existing plants.

During February 1997, the states of New York and Connecticut and the US EPA released a proposal entitled Phase III Actions for Hypoxia Management, including nitrogen reduction targets for eleven management zones that comprise the Connecticut and New York portion of the Long Island Sound watershed. On February 5, 1998, after a year of public review, comment and revision, the Policy Committee for the LISS adopted the Phase III Actions for Hypoxia Management. Phase III requires a 58.5% reduction in anthropogenic nitrogen loads to Long Island Sound over 15 years with interim targets to achieve 40% of the goal in 5 years and 75% of the goal in the following 10 years. This level of reduction is predicted to reduce the maximum area of the Sound that is unhealthy for fish and shellfish by 75% and the time period that unhealthy conditions exist by 85%. In addition, the Management Conference is investigating a process for nitrogen trading as a potential tool to achieve reductions in the most cost effective manner. Refer to the individual plant write-ups and the National Estuary Program section for additional information.

Bay Park Sewage Treatment Plant - Disposal District No. 2, New York (Nassau County)

Projects in Progress

Engine emissions improvements are scheduled for completion in 1998 at costs of over $4.4 million. This project is 98% complete and includes the addition of emission control devices to the plant's dual-fuel engine generators in order to comply with the requirements of applicable laws and regulations promulgated by the Clean Air Act Amendments.

At an estimated cost of over $17.9 million, additions and modifications to the central heating facilities are to be completed during 1998. The principal features of the project, which is 98% complete, include new boilers and the installation of chiller equipment with associated piping and auxiliary equipment to provide plant-wide heating and cooling.

Final modifications and additions are being made to the sludge digestion facilities which are 95% complete and will cost over $24.03 million. The existing sludge digestion facilities, including both primary and secondary digesters, are being rehabilitated. Equipment that has exceeded its useful life is being replaced. Modifications to existing tankage are being made to enhance the performance of the various process components.

An administration center is being constructed within the existing main building, in addition to new shops for the facility's electrical and HVAC units, along with lavatory and lunchroom areas for plant personnel. Construction is 77% complete with costs over $15.02 million.

Ongoing additions and modifications are 35% complete on a fifth aeration tank which replaces the fluid bed reactor system. Estimated costs are over $10.65 million.

It is anticipated that this facility will accept flows for treatment from the County-owned Inwood plant in January 1999. The 2.5 MGD Inwood trickling filter plant is being phased out due to continuing operational problems. Refer to the Inwood write-up for additional details.

Future Project

Aeration tank covers will be installed in conjunction with the installation of an odor/exhaust treatment system. The project is currently in the initial design phase.

Belgrave, New York (Nassau County)

Future Project

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are estimated to cost $2.34 million. A construction schedule was not available.

Blind Brook, New York (Westchester County)

Project in Progress

Alternatives for preliminary treatment equipment upgrades, including the headworks and the automatic bar screens, are the subject of an ongoing engineering study.

Future Projects

Plant refurbishment is scheduled to begin during the winter of 1998-1999. The two-year agenda will include replacement of primary tank sludge collection mechanisms, updating influent headworks, and automation of appropriate portions of the facility. Cost estimates were not available.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to cost about $2.73 million. A construction schedule was not available.

Bowery Bay, New York (Queens County)

Projects in Progress

There are 90 pump stations throughout the 14 drainage basins comprising the NYC collection system. Completed during 1998 at 38 pump stations City-wide were four major upgrades, 14 design plans for major upgrades, six minor upgrades, and 14 design plans for minor upgrades. Major upgrades are under way at nine stations, as well as three minor upgrades. Additionally, the bid process is under way for five major and seven minor upgrades. Cost estimates of $44.997 million for FY'99 were available for five pump stations. Slated for FY'99, costs estimated at $118.715 million will be incurred for work at seven pump stations City-wide.

Completed in 1985, the New York City Regulator Improvement Program was a study to inventory, assess and determine required improvements to the regulators, interceptors and

tide gates. These elements control the amount of combined sewer flow captured for treatment, convey it to the treatment plants and prevent tidal inflow from entering the system. Presently, seven regulators in three drainage basins are fully operational utilizing a hydraulic modulating system. Nine regulators in two drainage basins are utilizing the hydraulic modulating system, but are manually operated. Vortex valves have been installed at two regulators in different drainage basins. City-wide, construction upgrades were completed at 19 regulators, 46 regulators are under construction and 35 additional designs are planned to commence. The status of City-wide tide gate reconstruction includes 11 completed rehabilitations, 27 gates under construction, one is being designed, and 10 additional designs are planned to commence.

The sludge management program consists of dewatering facilities sited at eight of the existing 14 treatment plants. The sludge is transferred from the other six WPCPs by sea. Ongoing improvements and modifications include new docking facilities to be built on the East River (Red Hook and Wards Island) and in Jamaica Bay (26th Ward), cake storage facilities and emergency generators. Costs are estimated at over $211.27 million at the eight dewatering facilities. A residuals building is also slated for Wards Island ($8.631 million). These projects will incur additional fees including, but not limited to, construction management ($86.168 million), additional structures and bionutrient management services ($8.401 million). Future work slated for FY'99 includes completion of the docking facilities ($15.942 million) and during the year 2000, all outstanding aspects ($50 million) are to be completed.

Due to the vast number of on going treatment plant and collection system projects, construction management fees are estimated at over $95.7 million. City-wide, additional consultant fees are slated for FY'98 which address various program management services, technical inspections, concrete quality assurance, environmental conservation, and health and safety management. These fees are estimated at $25.3 million. These services are also slated for FY'99 and will cost $29.086 million. Beyond the year 2000, additional consultant fees are anticipated to cost $199.276 million.

The SPDES permits for this facility and the 13 other New York City municipal wastewater treatment plants have been the subject of a hearing before a NYS DEC Administrative Law Judge. During 1998, the outstanding issues were resolved. The present permits contain many of the ISC's concerns and are much more stringent and protective of the environment than the original permits. The Legal Activities section of this report contains the background and detailed information regarding this hearing.

A City-wide CSO abatement program is under way. The objective is to eliminate or ameliorate the effects of untreated sewage which is bypassed during storm events. The first phase identified the extent to which CSOs result in the contravention of water quality standards. The second phase consists of facility plans involving the entire area of New York City, which has been divided into four major geographical areas of concern. The ultimate

goals of the program are the removal of floatable and settleable materials, and the achievement of New York State standards for dissolved oxygen and coliform bacteria. These programs are being conducted in accordance with SPDES permit and/or Consent Order requirements.

A total of $1.5 billion has been committed by New York City for a 10-year CSO program which is currently in its eleventh year. Structural and nonstructural solutions are being evaluated and prioritized. Final implementation is scheduled between 2001 and 2006. The East River proposals include floatables capture, holding tanks, disinfection, in-line storage and swirl concentrators. Tributaries of the East River will also have holding tanks and in-line storage. Final design work is being prepared and construction is slated for the swirl concentrators that will service Flushing Bay. A retention tank, planned for Flushing Bay, will go to bid during 1999 and is estimated to cost $86.834 million. An in-line storage plan with a retention tank located in the Hunts Point drainage basin is at the facility design stage ($230 million). To address floatables control at its source, $6.048 million is slated City-wide for catch basin hood replacements.

The second geographical area addresses the needs of Jamaica Bay. Holding tanks and in-line storage are the agenda items. About $153 million is being spent for design work and construction costs are now estimated at $260 million. Final design ($197 million) for the Paerdegat Basin retention tank is under way. The pile foundation for the Paerdegat influent facilities, as well as various modifications, are about to begin at a re-estimated cost of $16.645 million.

The other areas that are being addressed are the Inner New York Harbor and Outer New York Harbor. The plan for the Inner Harbor includes maximizing flow to the WPCPs and activation of the flushing tunnel in the Gowanus Canal (dredging costs of $2.563 million - FY'98) with associated force mains (over $17.08 million - 35% complete). Planned for FY'00 are expenditures of $135 million. Outer Harbor proposals include maximizing flow to the WPCPs and reducing CSOs and dry weather flows in Coney Island Creek (Step II design during FY'98 - $6.133 million). These projects are anticipated to accrue $96.205 million in construction management fees. Additional fees of $10 million are estimated to determine designated use and State standard attainment of the receiving marine waters.

Ongoing engineering studies and experiments at the Bowery Bay facility are assessing biological nutrient removal technologies, biological centrate treatment and sludge thickening with polymer treatment.

Refer to the Legal Activities section of this report for additional information.

Future Projects

A BNR retrofit was recommended by the Long Island Sound Study. Planned modifications as delineated in NYC's Nitrogen Control Action Plan are expected to incur capital costs of about $4.8 million. Additional expenditures of $28.59 million would be needed to meet the goals of the Long Island Sound Study CCMP.

Stabilization construction is slated for FY'99 at a cost of $115 million plus $13.7 million in construction management costs.

Buchanan, New York (Westchester County)

Project in Progress

The second phase of planned modifications for the main treatment plant began in November 1997. The construction upgrade schedule consists of replacing electrical control and instrumentation equipment, architectural improvements and laboratory equipment replacements. The work is 80% complete and the total costs are estimated at $600,000.

Cedar Creek Water Pollution Control Plant - Disposal District No. 3, New York (Nassau County)

Projects in Progress

Design work for continued phased construction is anticipated to be complete by 1998. This facility, utilizing a secondary activated sludge process, was re-rated to a flow of 72 MGD during 1995. The construction phases include expansion of the special projects laboratory, improvements to engine emissions (clean burn and catalytic converters) which are 99.7% complete, central hot and chilled water systems (four new boilers and four new chillers) which are 99.5% complete, and the rehabilitation and cleaning of two primary digesters which are 99.5% complete. Additionally, eight final tanks will be demolished and be replaced by six new units and there will be an upgrade of the air distribution to the aeration tanks (98% complete). These phases will cost nearly $44.2 million.

Proposed work for the collection system includes the rehabilitation of seven pump stations. The stations will be updated with new pumps, controls and superstructure repairs. As of August 1998, four pump station upgrades have begun. The estimated costs are over $8.7 million.

Future Projects

Final phases for this facility will address several rehabilitation and improvement contracts and are planned for the period 1999-2000. These projects will affect the following treatment stages: secondary gas compressors, dissolved air floatation, sludge dewatering,

aeration tank covers, plant-wide instrumentation, landscaping and punch list items. Operational start-up dates are anticipated during the 2000-2002 period with costs estimated at $46.84 million.

Cedarhurst, New York (Nassau County)

Future Project

The New York State 1997 Intended Use Plan (IUP) for the Clean Water State Revolving Fund for water pollution control projects was issued in October 1996. Municipal water quality protection projects must be included in the IUP to receive these low interest rate loans. Based upon the second quarter (May 1997) update of the IUP, the Village of Cedarhurst intends to implement facility improvements with an estimated loan of $3.725 million. This project will be ready for financing during November 1998.

Coney Island, New York (Kings County)

Projects in Progress

At an estimated cost of $66.37 million, a plant support facility consisting of a conglomeration of workshops has been divided into four contracts which are ongoing. Estimated to cost over $42.26 million are plant-wide modifications for re-rating of the design flow. Construction management fees are estimated at over $54.16 million.

See the Bowery Bay write-up for information on the City-wide projects.

Future Projects

Structural modifications to handle additional dry and wet weather flows ($55 million) are planned for 1999.

Additional projects at this facility include the reconstruction of the ocean outfall (FY'00 - $2 million), and the building of a new laboratory and a visitors center (FY'99 - $33.33 million).

Glen Cove, New York (Nassau County)

Projects in Progress

As noted in a recent edition of NYS DEC's publication, New York State Environment, this facility was in violation of State discharge limitations for oxygen absorbing substances and heavy metals since 1992. These pollutants originated mostly from industrial facilities discharging to the municipal sewer system. Under the State Consent

Order, this facility will continue to address this problem by modifying administrative and operational procedures.

Future Projects

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility will be accomplished during a phased construction schedule. Phase I engineering plans were completed during August 1998; construction is expected to incur capital costs of about $1.4925 million and be operational by March 1999. It is hoped that the Phase I work achieves nearly 50% nitrogen removal and improves operations at the existing plant. Phase II is estimated to cost $2.4825 million; engineering designs are expected to be complete by February 2000.

The New York State 1997 Intended Use Plan (IUP) for the Clean Water State Revolving Fund for water pollution control projects was issued in October 1996. Municipal water quality protection projects must be included in the IUP to receive these low interest rate loans. Based upon the second quarter (May 1997) update of the IUP, the City of Glen Cove intends to implement a facility upgrade with an estimated loan of $5.528 million. This project will be ready for financing during November 1998.

Great Neck, Village of, New York (Nassau County)

Completed Projects

Improvements to the sanitary sewers in this drainage basin are complete. The project cost was re-estimated at $47,000 and includes the relining of 532 linear feet of 10-inch gravity sewer, cleaning and visual inspections of 2,935 linear feet of force main and the replacement of 55 linear feet of 8-inch gravity sewer.

Projects in Progress

During October 1997, the Strathmore Pump Station upgrade began. The work is 80% complete and includes the replacement of pumps, pump controls, ventilation, new access to the wet well, and the addition of a new generator in a noise attenuating enclosure. The project cost is approximately $246,500. At a cost of $18,000, a new sludge pump and associated piping is being installed by in-house staff and is planned to be operational by December 1998.

Future Projects

Engineering studies are being proposed for a five-year plan for upgrading the treatment plant by adding four new pump stations as well as BNR retrofits at a cost of about

$100,000 per year. Additional lift station upgrades are planned for the spring of 1999 with backup generators and soundproofing. Approximately $400,000 will be needed for two lift station projects.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $1.52 million. A construction schedule was not available.

Great Neck Water Pollution Control District, New York (Nassau County)

Completed Project

Pump station upgrades include new wastewater grinders and a sodium hypochlorite tank and pump. These improvements were complete during October 1998 at a final cost of $150,000.

Future Project

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $15.7 million. A construction schedule was not available.

Huntington Sewer District, New York (Suffolk County)

Completed Projects

Completed during July 1998, the replacement of variable frequency drives on the influent and effluent pumps cost $168,300. Improvements to the wastewater collection system were completed at a final cost $359,400. Replacement of 1,000 linear feet of liner, 350 linear feet of existing sewer and installation of 480 linear feet of new sewer was also completed.

Project in Progress

The Huntington Sewer District is in the process of updating the sewer use ordinance for both commercial and residential areas.

Future Projects

Improvements to the Huntington Farms Pump Station are estimated to cost $250,000.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are estimated to incur capital costs of $4.585 million. Just under way, the District is preparing facility plans for phased nitrogen reductions retrofits. An operational start-up is anticipated for November 2001.

Hunts Point, New York (Bronx County)

Projects in Progress

Collection system improvements, rehabilitation and renovations include work on several pump stations throughout the drainage basin. Design and ongoing construction vary from 0% to 99% degrees of completeness. Pump stations currently under modification are Riverdale (three stations - $12.25 million); and Co-Op City, North and South ($8 million). The City Island and Marble Hill Pump Stations ($15 million) are slated for construction during FY'99 and the Hunts Point Market Pump Station is in final design ($986,000). During the 1997 summer season, emergency force main repairs were necessary and performed subaqueously beneath Eastchester Bay. The permanent force main (8,600 linear feet) that services City Island, the Bronx, is currently being replaced at an estimated cost of $14.952 million.

Ongoing engineering studies that began during October 1996 address biological centrate treatment and biological nutrient removal.

See the Bowery Bay write-up for information on the City-wide projects.

Future Projects

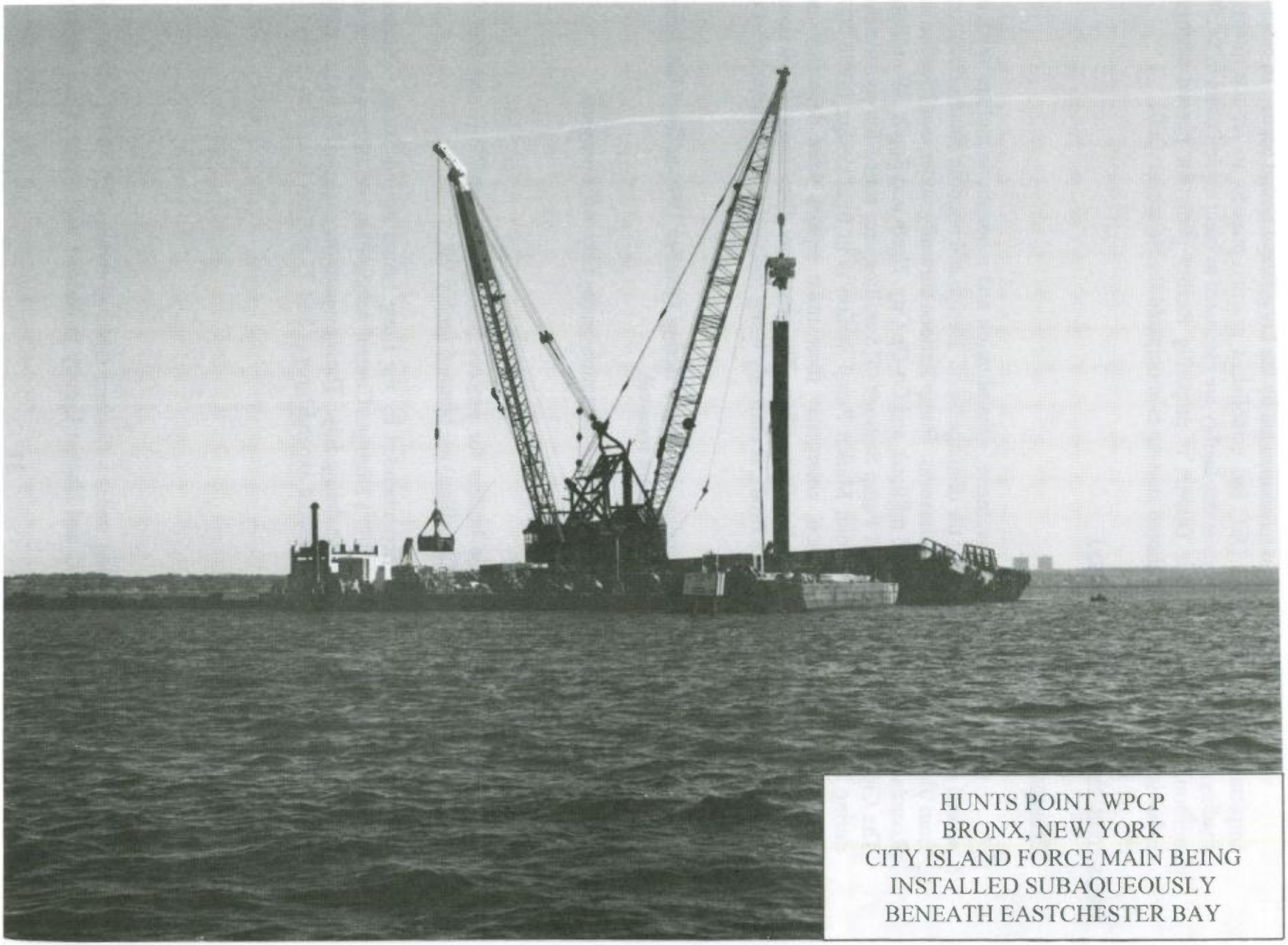
The replacement of the boilers for process heating ($4.5 million) and Step II stabilization modifications ($22 million) are planned for FY'99.

A BNR retrofit was recommended by the Long Island Sound Study. Planned modifications as delineated in NYC's Nitrogen Control Action Plan including a system for biological centrate treatment began during July. These projects are expected to incur capital costs of about $3.4 million. Additional expenditures of $44.73 million would be needed to meet the goals of the CCMP.

Inwood, New York (Nassau County)

Projects in Progress

This facility is operating under a Consent Order (February 22, 1995) which was negotiated between NYS DEC and Nassau County to address violations of the Inwood



HUNTS POINT WPCP
BRONX, NEW YORK
CITY ISLAND FORCE MAIN BEING
INSTALLED SUBAQUEOUSLY
BENEATH EASTCHESTER BAY

SPDES permit limitations for BOD and TSS. The Order established milestones to determine the feasibility of upgrading and expanding, or converting to a pump station with subsequent treatment at another wastewater facility.

Estimated to cost over $7.1 million, a pump station conversion and the installation of force mains to divert flows to the Bay Park facility is 35% complete. As per the Consent Order, the operational start-up date is January 18, 1999. Refer to the Bay Park write-up for additional information.

Jamaica, New York (Queens County)

Projects in Progress

Four ongoing experiments are being conducted by in-house staff and consulting engineers. These studies involve the secondary screening facilities, a rotary drum thickener, aerobic scum digesters and scum dewatering.

Plant-wide interim expansions are under way in order to comply with SPDES limitations and requirements. This work is estimated to cost over $99.52 million plus over $5.04 million in construction management fees. Construction will be performed in two phases with milestones as contained in the Consent Order. The first phase will entail new installations of the following treatment units: a primary tank splitter box, a primary tank, a primary force main, a return activated sludge and waste activated sludge pump station, a chlorine contact tank, odor controls, and an electrical substation. The second phase will include the new installations of various units such as a sludge thickener tank, odor controls, a maintenance building, a sludge degritting and screening wing, emergency lighting and an influent screenings building extension.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Planned for late 1999, stabilization modifications which are alternatives to correct plant performance deficiencies will be implemented. These modifications are estimated to cost $72 million with $7.2 million additional costs in construction management fees.

Joint Regional Sewerage Board-Town of Haverstraw (Rockland County)

Completed Project

A $200,000 construction upgrade which involved the primary settling tanks was completed and on line during April 1998.

Future Project

Planned to begin during February 1999, a sewer trunk line will be relocated at an estimated cost of $500,000.

Jones Beach State Park Water Pollution Control Plant (Nassau County)

Projects in Progress

Estimated to cost approximately $100,000, repairs are being made on the grit channel that includes gears, motors, railings and masonry. Under the same contract, the chlorine contact chamber is being modified and refurbished with new baffles and masonry. The work is anticipated to be operational during February 1999.

Future Project

Planned for early 1999 with a completion date of no later than April 1, 1999, the trickling filter will be repaired, overhauled and refurbished with new plastic media, walkways, under drains and masonry. Final cost estimates are $100,000. Refer to the Legal Activities section of this report for additional information.

Lawrence, New York (Nassau County)

Future Project

The New York State 1997 Intended Use Plan (IUP) for the Clean Water State Revolving Fund for water pollution control projects was issued in October 1996. Municipal water quality protection projects must be included in the IUP to receive these low interest rate loans. Based upon the May 1997 update of the IUP, the Village of Lawrence intends to implement facility improvements with an estimated loan of $2.1 million. This project will be ready for financing during November 1998.

Mamaroneck, New York (Westchester County)

Completed Project

A major storm event which caused a power failure in May 1998 wreaked havoc at this facility and resulted in serious damage to the disinfection facilities. Portable disinfection apparatus was on-site for about six weeks to disinfect the treated effluent, thus avoiding the closure of area beaches. Approximately $800,000 was spent for the repairs.

Future Project

A computer upgrade was completed and operational during September 1997. This system fully automates various plant processes including, but not limited to, sampling at several treatment stages, chlorine residual monitoring and screenings conveyance. Additional automation of plant processes is planned to begin in 1999; the costs are estimated at $400,000.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $10.3 million. A construction schedule was not available.

Metro-North Railroad (Harmon Shop), New York (Westchester County)

Project in Progress

This 0.144 MGD secondary facility is operating under a State Consent Order to cease discharge to the Hudson River and divert all flows to the Westchester County Ossining WPCP by July 1998; the Order was extended to November 1998. This facility will continue to perform preliminary and primary treatment on the waste flow and then pump via force main to the existing Ossining collection system. Refer to the write-up for the Ossining treatment plant.

New Rochelle, New York (Westchester County)

Projects in Progress

On December 12, 1986, NYS DEC imposed a sewer extension moratorium on the New Rochelle Sewer District; this ban is still in effect. This plant is operating at or above its permitted flow capacity. With anticipated development, such as Davids Island which is located in Long Island Sound, there is concern of insufficient plant capacity, as well as the ability to meet effluent requirements. An SSES and an I/I reduction study are ongoing. This work is expected to cost $500,000.

This facility is operating under a State Consent Order to accomplish collection system rehabilitation and eliminate two sewer overflows. The New Rochelle Sewer District — which is comprised of Larchmont, a small section of Mamaroneck, New Rochelle, and Pelham Manor — anticipates a cost of $1 million for all construction phases.

Phase II of the interim upgrade began during November 1997 and is 90% complete. The plant upgrade includes new oxygen storage and vaporizers facilities, structural repairs

to the control building and main pump drive replacements. An operational start-up is anticipated for November 1998.

Future Projects

Phase II of an automation upgrade ($400,000) is planned for late 1999. The upgrading of the multiple hearth furnaces with new air pollution controls is estimated to cost $8 million. BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $16.7 million. Construction schedules were not available for the aforementioned projects.

Awarded during October 1998 under the Clean Water-Clean Air Bond Act, Westchester County will receive $3.3 million to build facilities in the New Rochelle drainage basin to capture and treat stormwater runoff in order to reduce negative impacts on Long Island Sound.

Newtown Creek, New York (Kings County)

Projects in Progress

Upgrading and expansion construction to incorporate a secondary treatment system utilizing step aeration with a reduced contact time is under way. These interim measures are necessary so that the facility can operate until a new facility plan is implemented. With a 12-year construction schedule, estimates of over $264 million were made for all design and construction phases; this includes disinfection, demolition and remediation, and a biofilter demonstration plant. The interim upgrade work began during July 1993. The major items include modifications to the engine generator stack heights, miscellaneous building and equipment system upgrades (i.e., odor control, tankage covers, digester cleaning and piping, various tank reconstructions, etc.), water main and drainage improvements, and landscaping.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Several new additions are planned for 1999 and 2000, including a south wing to the main building ($130 million), a support building ($160 million), sludge handling facilities ($402 million), a sludge force main/docking facility ($33 million) and aeration upgrades ($3.7 million). Construction management costs associated with these phases are $120 million.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen

loadings. Planned modifications at this facility are expected to incur capital costs of about $63.9 million. A construction schedule was not available.

Northport, New York (Suffolk County)

Completed Project

The clarifiers were retrofitted with baffling to increase contact and settling times and went on line during July 1998 at an estimated final cost of $6,000.

Project in Progress

The State-imposed sewer hookup moratorium was allowed to expire on August 31, 1994. A study was completed and recommends capacity expansion. Extraneous flows are being eliminated before plant modifications can be implemented. Sewer lines identified with I/I problems (i.e., antiquated, misaligned, and/or root infiltration) are being cleaned, televised and relined. This rehabilitation is ongoing.

North River, New York (New York County)

Projects in Progress

This facility is operating under a State Consent Order (July 1, 1992) to address issues of capacity, odor, and air emissions. Plant modifications and engineering studies are still under way to address odor control problems. Reconstruction of the primary and final settling tanks, rehabilitation of the digesters, aeration tank covers, odor control equipment and construction management are the main agenda items. Modifications that affect all support treatment equipment are presently ongoing at a cost of over $32.24 million, which includes construction management fees. These installations, inspections and repairs will address electrical, instrumentation and control systems; HVAC; and dock storage facilities. Additional installations of various instrumentation and controls, odor controls, and a natural gas system are under way. Refer to the Legal Activities section of this report for additional information.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

An alternate odor abatement system, re-estimated to cost $22 million, is planned for FY'99.

Oakwood Beach, New York (Richmond County)

Completed Projects

Recently completed, two engineering studies addressed the feasibility of nitrogen removal from centrate wastewater and polymer additions to the sludge thickeners.

Projects in Progress

Reconstruction work is planned for the main facility, including the plant plumbing system. This work is scheduled to start in late 1998 at a cost of $70,000.

Refer to the Bowery Bay write-up for information on City-wide projects.

Future Project

At an estimated cost of $9 million, Step I stabilization modifications are scheduled for fiscal year 1999.

Ossining, New York (Westchester County)

Projects in Progress

Engineering studies are under way which address a furnace upgrade (packed tower odor scrubber) and the conversion of the disinfection facilities from gaseous chlorine to liquid sodium hypochlorite.

Re-estimated to cost $600,000, a computer upgrade which will automate various plant processes is 98% complete. An approximate operational start-up date was March 1998.

In order to meet new federal and state air regulations, furnace upgrades to the multiple hearth system began during September 1997, however, this project has been postponed.

Work is ongoing by Metro-North Railroad, Harmon Shops, to divert its flows to the Ossining collection system by November 1998 as required by a State Consent Order. Refer to the Metro-North Railroad, Harmon Shops, write-up for further details.

Future Projects

A five-month construction agenda is anticipated for converting the disinfection storage facilities from gaseous chlorine to sodium hypochlorite. The estimated $500,000

project is planned to begin during January 1999. Odor abatement modifications will also be completed during this period.

Owls Head, New York (Kings County)

Projects in Progress

Engineering studies are under way to assess automatic thickened sludge control pumps and the oxidation reduction potential instrumentation testing for chlorination control.

Various plant-wide upgrades are under way with costs estimated at over $3.1 million.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Future contracts, both construction and consultation/construction management, are being evaluated for punch list items and landscaping. Estimated costs for these projects are $15.88 million. Plans have slipped from FY'98 to 1999 and 2000 for plant-wide improvements ($14 million), reconstruction of a forebay ($770,000) and screening building modifications ($10 million).

Oyster Bay Sewer District, New York (Nassau County)

Future Projects

Estimated to cost $132,000, the replacement of trickling filter recirculation and sludge pumps is expected to begin during December 1998.

The installation of standby generators at two pump stations is proposed at an estimated cost of $60,000.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of approximately $1.88 million. A construction schedule was not available.

The New York State 1997 Intended Use Plan (IUP) for the Clean Water State Revolving Fund for water pollution control projects was issued in October 1996. Municipal water quality protection projects must be included in the IUP to receive these low interest rate loans. Based upon the May 1997 update of the IUP, the Town of Oyster Bay intends to implement a nonpoint source elimination strategy with an estimated loan of $7.7758 million.

Peekskill, New York (Westchester County)

Project in Progress

Automation of several plant processes, including remote pump station sensors, is currently under construction and is 98% complete. The re-estimated costs are $600,000 and an operational start-up was during March 1998.

Future Projects

In order to address wastewater flows that impact potable water supplies in the Croton watershed, proposals have been made to expand this facility to 20 MGD.

A five-month construction agenda is anticipated for converting the disinfection storage facilities from gaseous chlorine to sodium hypochlorite. The estimated $150,000 project is planned to begin during January 1999.

Port Chester, New York (Westchester County)

Future Project

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $5.7 million. A construction schedule was not available.

Port Richmond, New York (Richmond County)

Projects in Progress

Ongoing I/I work is being done with allocated funds of $1.28 million. Various pump station improvements are being implemented.

At a cost of approximately $1.984 million, reconstruction and installations are ongoing and involve the final treatment phases including digester storage transfer pumps, the digester pump mixing system, various sludge pumps, hypochlorination monitoring, and rooftop heating systems.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Modifications and improvements to the existing plant remain postponed. Planned expenditures of approximately $1.171 million would address the replacement of degritter pumps and reconstruction of primary tanks. Also proposed is the installation of climber screens at a cost of $675,000.

Port Washington, New York (Nassau County)

Completed Project

Three manholes were replaced or rehabilitated and 2,600 linear feet of gravity sewers were lined in order to reduce infiltration and root intrusion. This work was completed during the spring of 1998 at a cost of $188,000.

Projects in Progress

Estimated to cost $125,000, automatic controls for the hypochlorite system, lining of the tankage and upgrade of the containment dike are anticipated to be complete during the 1998-1999 winter season.

Various upgrades and rehabilitation projects are under way at several pump stations. The work includes new comminutors, wet/dry well separation and ventilation, fuel oil system improvements, a new remote alarm system and central station monitoring equipment. The estimated final cost for all items is $498,000.

Future Project

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $12 million. The two-year construction agenda is expected to begin in the fall of 2001.

Red Hook, New York (Kings County)

Projects in Progress

An engineering study dealing with a thickener blanket analyzer is continuing. Biological nutrient removal is the subject of another in-house experiment.

Various plant modifications and additions are estimated to cost over $5.02 million. An interceptor sewer accruing costs of over $1.28 million is 99% complete. Dredging of the

flushing tunnel located at the head of Gowanus Canal and placement of associated force main is 35% complete with costs nearing $17.08 million.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $10.33 million. A construction schedule was not available.

Rockaway, New York (Queens County)

Projects in Progress

Modifications to various treatment units are still ongoing at estimated costs of $2.321 million.

See the Bowery Bay write-up for information on City-wide projects.

Rockland County Sewer District No. 1, New York (Rockland County)

Projects in Progress

Several capital improvement projects that started in August 1996 are 90% complete. New structures that are being built include a main pump station, a machine shop, and screening facilities. The $5.7 million estimated cost includes the replacement of the anaerobic digester cover and centrifuges.

Future Projects

Planned to begin during the 1998-1999 winter season, $2.7 million will be spent to expand the collection system in the western section of Rockland County, New York. Phased construction of gravity sewer lines, force mains and pump stations will provide service to sections of the Village of Pomona and the Town of Ramapo. Additional designs and subsequent construction estimated to cost as much as $50 million will include the installation of principal trunk sewers, pump stations, force mains and laterals in the Villages of Hillburn and Sloatsburg.

Staten Island University Hospital, South, New York (Richmond County)

Future Project

It is planned that this facility divert flows to the New York City DEP's Oakwood Beach WPCP for treatment via the Hylan Boulevard Interceptor; dates and costs have not yet been finalized. Refer to the Oakwood Beach write-up for additional information.

Suffolk County Sewer District #1, Port Jefferson, New York (Suffolk County)

Projects in Progress

As of February 1996, this facility satisfied the stipulations of the June 1990 State Consent Order to ensure secondary effluent limitations, complete collection system renovations, and conduct a wasteload allocation study in Port Jefferson Harbor. An in-house water quality assessment of the harbor is ongoing. Preliminary engineering work is under way in anticipation of a plant upgrade and expansion in order to address the LISS Phase III nitrogen reduction targets. Refer to the National Estuary section of this report for additional information.

The replacement of various gravity sewer lines throughout the collection system is ongoing and is 95% complete. The estimated cost of $300,000 will address installations to eliminate I/I problems and to expand and rehabilitate the existing infrastructure. The grit removal system is being replaced by rotating screens and is 90% complete; this $100,000 project is expected to be operational during January 1999.

A plant evaluation was conducted to determine the possibility of increasing the present 0.85 MGD flow capacity while maintaining all permit limitations and requirements. This work is being reviewed by NYS DEC.

Future Projects

If approved by NYS DEC, additional treatment units will be added to accommodate any additional flow requests from commercial and residential developments. The re-estimated $9.9 million phased construction costs will be borne by those applying for hookups. Preliminary treatment designs propose the use of a tertiary process with a total flow capacity of 1.0 MGD.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. The aforementioned modifications at this facility will add capacity and comply with the LISS Phase III nitrogen reductions. A construction schedule was not available.

Suffolk County Sewer District #3, Bergen Point, New York (Suffolk County)

Completed Projects

A $20,000 RFP for sludge disposal options is still being finalized. At a cost of $25,000, a consulting engineer completed an inventory of all air pollution sources to assure compliance with applicable regulations. Additional analyses required by the Clean Air Act are being completed. Consulting engineers finalized an energy audit and some of the recommendations are being implemented. The City College of New York, in association with the New York State Energy Research and Development Authority, completed an independent study involving the utilization of sludge incinerator ash for a variety of applications ($600,000). A report indicating the future needs for scavenger waste disposal in Suffolk County was prepared by an independent consultant at a cost of $100,000.

Projects in Progress

A building is being constructed to house three units for scavenger waste pre-treatment. This project is 50% complete and the estimated costs are $500,000. Concurrently, the aeration tankage diffusers are being replaced at a cost of $3.3 million (80% complete).

In-house interceptor flow studies are continuing in order to determine if additional I/I reduction is necessary. In addition, a sludge process evaluation is under way at a cost of $40,000.

Future Project

Equipment replacement and infrastructure repairs are in the design phase with costs re-estimated at $5.7 million. Construction start-up dates were not available.

Suffolk County Sewer District #6, Kings Park, New York (Suffolk County)

Project in Progress

In-house engineering staff continue to investigate equipment and operational changes in order to improve reliability. Independent engineering consultants will be hired in order to fulfill the terms of a New York State Clean Water-Clean Air Bond Act grant being used to meet nitrogen reduction requirements.

Future Projects

Pending negotiations with NYS DEC, construction remains postponed on a planned $4.9 million equipment renovation. Safety equipment upgrades will be addressed on a priority basis.

BNR retrofits have been recommended by the Long Island Sound Study. In order to implement the CCMP, NYS DEC has established priority projects to reduce nitrogen loadings. Planned modifications at this facility are expected to incur capital costs of about $700,000. A construction schedule was not available.

Suffolk County Sewer District #21, SUNY, New York (Suffolk County)

Projects in Progress

As of February 1996, this facility satisfied the stipulations of the June 1990 State Consent Order to assure continued compliance and conduct a wasteload allocation study in Port Jefferson Harbor. Preliminary engineering work has begun in order to address the LISS Phase III nitrogen reduction requirements. A flow study is under way in order to determine future capacity needs.

Future Project

Construction of sequencing batch reactors will increase the plant capacity by 0.5 MGD so that this facility will comply with the LISS nitrogen loading requirements; cost estimates are $7.7 million.

Tallman Island, New York (Queens County)

Projects in Progress

A BNR retrofit was recommended by the Long Island Sound Study. Planned modifications, as delineated in NYC's Nitrogen Control Action Plan, are expected to incur capital costs of about $4.5 million and began during January 1996. Additional expenditures of $13.61 million would be needed to meet the goals of the CCMP. An ongoing engineering study addresses biological nutrient removal and is expected to be complete by December 1998.

At an estimated cost of $14.047 million, current construction at this facility is for plant Step II stabilization improvements.

See the Bowery Bay write-up for information on City-wide projects.

26th Ward, New York (Kings County)

Projects in Progress

Two engineering studies are under way which address biological nutrient removal and centrate nitrogen removal.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Step II stabilization construction improvements are slated for FY'99 at re-estimated costs of $14 million.

Wards Island, New York (New York County)

Projects in Progress

Engineering studies costing $2.35 million are still ongoing to determine plant expansion logistics and to conduct an SSES. Additional pilot studies to reduce nitrogen loadings will focus on sludge age and biological centrate treatment and are estimated to cost $3.66 million. These studies are scheduled to be complete by September 1999.

An interim plant upgrade and capacity expansion to 275 MGD began during FY'95. These interim measures are necessary so that the facility can maintain permit compliance and improve operating conditions for a variety of processes. All of the activities will take place on the existing plant site and at the Manhattan and Bronx grit chambers.

The major aspects of the interim upgrade comprising three phases include modifications to the chlorine contact tank, replacement of the disinfection system, upgrading of the plant electrical system, headworks replacement, elimination of two stormwater discharges, a skimmings handling facility, a primary sludge pumping facility, main sewage pump headworks, renovation of the process air system, solids handling, and new metering systems. The grit chambers will be renovated with automated equipment, flow metering and odor controls. Phase 3 will address the plant heating system, new influent gates, final sedimentation tank upgrades, and personnel and administration building upgrades. The cost for the two-year construction schedule is approximately $105 million plus $10 million for construction management. An ultimate capacity expansion to a flow of 330 to 350 MGD will follow the interim phase sometime in the next century.

Planned modifications, as delineated in NYC's Nitrogen Control Action Plan, include increased sludge age and biological centrate treatment. These projects are expected to incur

capital costs of about $3.6 million and began during July 1996. Additional expenditures of $77.21 million would be needed to meet the goals of the CCMP.

See the Bowery Bay write-up for information on City-wide projects.

Future Projects

Bids will be accepted during FY'00 for additional upgrades. Re-estimated bids of $70 million are expected for various reconstruction and modification projects throughout the plant.

West Long Beach Sewer District, New York (Nassau County)

Projects in Progress

An engineering study was completed during 1996 which determined the cost and feasibility of adding a second trickling filter to this 1.5 MGD secondary plant. Construction is 25% complete and is scheduled to be on line late in 1999. The work includes the installation of three new primary clarifiers, a new trickling filter, a distribution box, a new distributor arm for the existing trickling filter, conversion of the existing primary clarifier to a secondary clarifier, modification to the final lift pump station, a new recirculation station for the converted primary clarifier, and sludge return systems for both secondary clarifiers. The additional tankage will enable the facility to have a totally redundant system. Total estimated costs are $2.5 million.

The New York State 1999 Draft Intended Use Plan (IUP) for the Clean Water State Revolving Fund for water pollution control projects was issued in June 1998. Municipal water quality protection projects must be included in the IUP to receive these low interest rate loans. Based upon the May 1997 update of the IUP, the Town of Hempstead intends to implement the aforementioned facility improvements with an estimated loan of $2.056 million. In addition, the District received a New York State Clean Water/Clean Air Bond Act grant of $516,000 for the upgrades.

Yonkers Joint Wastewater Treatment Plant, New York (Westchester County)

Completed Projects

Two upgrading projects were completed and operational during early 1998. First, the aeration tankage was replaced with fine pore diffusers at a cost of $3.5 million. The second dealt with the primary treatment odor controls. A final cost of $9.5 million was incurred and included the installation of flat aluminum covers with mist scrubbers.

WEST LONG BEACH SEWER DISTRICT
NASSAU COUNTY, NEW YORK
PRIMARY CLARIFIER BEING CONVERTED TO A SECONDARY CLARIFIER

Projects in Progress

This facility is operating under a State Consent Order to implement the findings of the SSES and the final settling tank dye study. The Order required a study of the plant's effluent mixing zone in the Hudson River; this study was completed in August 1997.

Phase I of a plant automation project will fully automate the chorine residual controls and the primary scum collections in addition to plant-wide data gathering. This project is 75% complete and is anticipated to be operational during January 1999.

Future Projects

Awarded during October 1998 under the New York State Clean Water-Clean Air Bond Act, Westchester County will receive $3.4 million to improve water quality in the Hudson River, redevelop the Yonkers waterfront, improve public access to the Hudson River, and expand municipal recycling programs.

The dewatering facility will be expanded at a cost re-estimated at $7 million. Construction is scheduled to begin during September 1999 and will provide for additional truck loading bays, sludge cake hoppers, additional odor control and various equipment enhancements. Another project is for the rehabilitation of the dual-fuel engine and digester mixing equipment ($9.8 million). Additionally, plant processes will be automated (Phase II) as well as plant-wide data gathering capabilities ($3 million). These last projects are anticipated to begin during August 1999 and September 1999, respectively.

EFFLUENT AND AMBIENT WATER QUALITY MONITORING

The Commission's monitoring programs of the District's effluent wastewater discharges and ambient waters continued throughout the year. These programs remained at reduced levels due to resource limitations. ISC's laboratory performs analyses on samples collected at municipal, private and industrial wastewater treatment facilities, as well as on samples from ambient water quality surveys.

Utilizing ISC's research vessel, the R/V Natale Colosi, 1998 marked the eighth consecutive year that the Commission conducted weekly sampling to document hypoxic (low dissolved oxygen) conditions in Western Long Island Sound and the Upper East River. This monitoring project, performed in support of the Long Island Sound Study, was conducted from June through mid-September in cooperation with several other agencies. During the weekly cruises, additional samples were collected and analyses were performed to support two cooperative studies. The first study involved collection and delivery of surface water quality samples to Nassau County Health Department for phytoplankton identification. Concurrently, in conjunction with Hunter College, City University of New York, Center for Applied Studies of the Environment (CAPSE) the analytical results obtained from ambient water quality samples analyzed for chlorophyll and total suspended solids will be used to verify remote sensing values for those parameters obtained by satellite imagery from the Coastwatch/Northeast Regional Node, NOAA/NMFS Narragansett Laboratory.

While the ISC research vessel was berthed in Eastchester Bay for the aforementioned Long Island Sound hypoxia sampling, two reactive surveys (after rain events) were conducted in Western Long Island Sound. Both surveys involved the collection and analyses of surface water quality samples to assess the sanitary condition of the shellfish beds under worst case conditions following rainstorms. The sampling was conducted in response to requests by NYS DEC Shellfisheries Bureau so they could have the necessary sampling data in order to initiate shellfish harvesting relay programs. The areas of interest were Little Neck Bay and selected Westchester County harbors.

After completion of ISC's 1997 Long Island Sound sampling, the R/V Natale Colosi was moved to the New Jersey State Marina at Leonardo so ISC could again participate in a cooperative effort with the New Jersey Department of Environmental Protection and US EPA. In this survey, surface water quality samples were collected to assess the sanitary condition of shellfish beds in Raritan and Sandy Hook Bays. All samples were collected subsequent to storm events between January and April 1998. The Commission plans to conduct sampling in western Raritan Bay throughout the 1998-1999 winter and spring seasons.

For the second consecutive summer, ISC and NYS DEC - Region 2 collaborated on a water quality assessment project within New York City. This NYS DEC project is being used to assess the overall health of nine lakes and ponds that are located in all five boroughs of New York City. Water column samples were collected by NYS DEC staff and then delivered to the ISC laboratory for a variety of analyses. This survey is expected to be conducted three times per year for two more years.

ISC's laboratory is certified by New York State and New Jersey and continues to participate in the US EPA Water Pollution Laboratory Evaluation Program and Water Supply Microbiology Performance Evaluation Study, as well as the New York State Department of Health Non-Potable Water Bacteriology Proficiency Test. The ISC laboratory also conforms with all recommended procedures of the US Food and Drug Administration's National Shellfish Sanitation Program.

Investigations of private and municipal facilities involve a six-hour period of sampling and an inspection of processes, equipment, and plant records. Investigations of industrial facilities generally involve a 24-hour period or a full day's production. Analyses are performed for the parameters specified in the facilities' discharge permits. The data generated from these investigations are used to determine compliance with ISC's Water Quality Regulations and with each facility's N/SPDES discharge permit.

The Commission's laboratory has been located on the campus of the College of Staten Island since late 1993. In addition to the necessary day-to-day analyses performed at the laboratory, the Commission and Center for Environmental Science at CSI have jointly been submitting proposals for research projects whose results would benefit the environment and the citizens throughout the tri-state region. Laboratory staff have submitted research papers for publication in several environmental forums and have been involved with students enrolled in the CES Masters Degree program.

SPECIAL INTENSIVE SURVEYS

1998 Ambient Water Quality Monitoring in Long Island Sound to Document Dissolved Oxygen Conditions

There is a continuing need to document the hypoxic conditions in Long Island Sound. To address that need, the US EPA - Region II again requested that the Commission conduct an intensive ambient water quality survey in support of the Long Island Sound Study. The ISC — for the eighth consecutive year — participated in a cooperative sampling effort with other government agencies during the critical summer season. The weekly data collected by ISC for Western Long Island Sound and the Upper East River has greatly enhanced the existing data sets. The information will also be used to measure the effectiveness of management activities and programs implemented under the Comprehensive Conservation and Management Plan.

All aspects of the monitoring program — station locations, parameters, methodologies, QA/QC, data sharing, etc. — were determined and agreed to by the Long Island Sound Study Monitoring Work Group. As the result of an ISC proposal, a modification was made at a few of the sampling station locations in order to perform monitoring in selected near-shore embayments that were previously not part of this sampling program. Two far eastern sampling stations were dropped in 1997 and five stations added in Little Neck and Manhasset Bays; the station coordinates were supplied by the Nassau County Department of Health. A map and a listing of the station locations are on the following pages.

During this year's Long Island Sound sampling, ISC worked cooperatively with the Nassau County Department of Health. Because of a lack of resources, Nassau County had to discontinue one of their programs several years ago. This year, ISC collected samples for the Nassau County Department of Health at three of the water quality stations. Nassau County Department of Health personnel met the ISC research vessel in Hempstead Harbor to collect the samples and they performed phytoplankton identification on the samples; this is data that they haven't been able to get for quite a while.

As part of the cooperative effort, CT DEP volunteered to have all chlorophyll a analyses performed and to bear the cost for these analyses. The samples collected by the ISC, as well as those collected by NYC DEP and CT DEP, were filtered, archived and frozen until shipped to an independent contract laboratory.

The 1998 survey consisted of 12 weekly sampling runs conducted from June through mid-September. Twenty-one stations were sampled weekly for temperature, salinity and dissolved oxygen. Temperature, salinity and dissolved oxygen (DO) were determined in situ. Measurements were taken one meter below the surface, at mid-depth, and one meter above the bottom. For stations deeper than 15 meters, measurements were taken at five depths — the two additional depths being one equidistant between the surface and mid-depth samples and one equidistant between the mid-depth and bottom samples.

INTERSTATE SANITATION COMMISSION

1998 LONG ISLAND SOUND STUDY SAMPLING STATIONS

STATION	WATER COLUMN DEPTH (meters)	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
A1	26	40-48-12	73-49-36	East of Whitestone Bridge
A2M	35	40-48-06	73-47-00	East of Throgs Neck Bridge
8-403	3	40-46-38	73-45-38	Little Neck Bay - ~0.2 nm W of yellow nun "B"
8-405	3	40-47-33	73-45-49	Little Neck Bay - ~0.15 nm North of LNB mid- channel buoy
A3	25	40-50-30	73-45-18	Hewlett Point South of Fl G 4 Sec "29"
9-409	4	40-49-44	73-43-05	Manhasset Bay
9-412	4	40-49-20	73-42-45	Manhasset Bay
9-413	3	40-48-26	73-42-49	Manhasset Bay
A4	35	40-52-35	73-44-06	East of Sands Point, mid-channel
A5	13	40-53-54	73-41-12	~2.6 nm East of Execution Lighthouse
B1S	15	40-56-42	73-40-00	Porgy Shoal South of Fl G 4 Sec R "40"
B2	20	40-56-06	73-39-12	Matinecock Point 1.6 nm North of Gong "21"
B3M	19	40-55-12	73-38-42	Matinecock Point 0.7 nm North of Gong "21"
B4	15	40-54-24	73-38-06	Matinecock Point South of Gong "21"
DI1	10	40-53-33	73-46-24	Davids Island North of Nun "10A"
DI2	6	40-53-40	73-46-00	Davids Island East of Nun "4"
H-A3	3	40-55-24	73-43-12	Delancy Point South of Can "1"
H-B	12	40-54-48	73-42-54	0.7 nm Southeast of Daymarker Fl R 4 Sec
H-C	8	40-51-54	73-40-30	Hempstead Harbor East of R Bell "6"
H-C1	11	40-53-12	73-41-42	Hempstead Harbor~ 2.0 nm East of Sands Point
H-D	7	40-50-42	73-39-36	Hempstead Harbor East of Can "9"

Samples for chlorophyll a, an indicator of algal production, were collected one meter below the surface on alternate runs. These were properly filtered, archived, and frozen at the ISC laboratory. Subsequently, the filters were shipped overnight to a contract lab that also analyzed the samples collected by NYC DEP and CT DEP; this was done to ensure consistency amongst the agencies. All sampling, sample preservation and analyses were done according to procedures accepted by the US EPA. All field measurements were summarized and forwarded weekly to US EPA - Region II's Long Island Sound Office; the Connecticut DEP Bureau of Water Management; the NYS DEC Division of Marine Resources; the NYC DEP Marine Science Section; and the Coalition To Save Hempstead Harbor, a volunteer monitoring group. The data are available from the Commission office as well as the US EPA's national data base, STORET.

Dissolved oxygen levels are a measure of the ecological health of a waterbody. A dissolved oxygen concentration of 5 mg/l is considered to be protective of most aquatic life. According to ISC regulations, a waterbody classified as "Class A", as are all the stations included in this ISC survey, must have a minimum dissolved oxygen content of 5 mg/l.

A statistical representation of the dissolved oxygen data acquired during the 1998 ambient water quality monitoring in Long Island Sound is depicted on the pie chart entitled "1998 Dissolved Oxygen Monitoring". Measurements of dissolved oxygen concentration, in surface and bottom waters, are separated and grouped in three categories. The first category contains dissolved oxygen concentration values that are less than three mg/l (<3.0 mg/l); it reflects hypoxic conditions. Under such conditions, very few types of fish can survive and the ecosystem can support only a few types of hardy species. The second category includes dissolved oxygen concentration values, which are greater or equal to three mg/l (≥3.0 mg/l)and less than five mg/l (<5.0 mg/l). The third category consists of dissolved oxygen concentrations of at least five mg/l (≥5.0 mg/l). All waters monitored during the 1998 Long Island Sound Study are designated as ISC "Class A". Waters of this type are suitable for primary contact recreation, fish propagation and, in designated areas, shellfish harvesting.

As shown on the pie charts depicting 1997 and 1998 monitoring data, in general, the condition of the surface water of the Sound and the Upper East River was similar in both years. The 1998 surface water results for the categories of *Greater Than 5 mg/l, Between 3 and 5 mg/l*, and *Less Than 3 mg/l* are 76.7%, 23.3% and 0.0%, respectively. In the same category order, the results of the 1997 survey were 74.1%, 24.3% and 1.6%, respectively. According to the measurements of the 1998 survey, 76.7% of the values measured in the surface waters met the ISC requirement for a "Class A" waterbody and 23.3% of the values measured in the surface waters did not comply with their designated standard; there were no hypoxic conditions observed in surface waters.

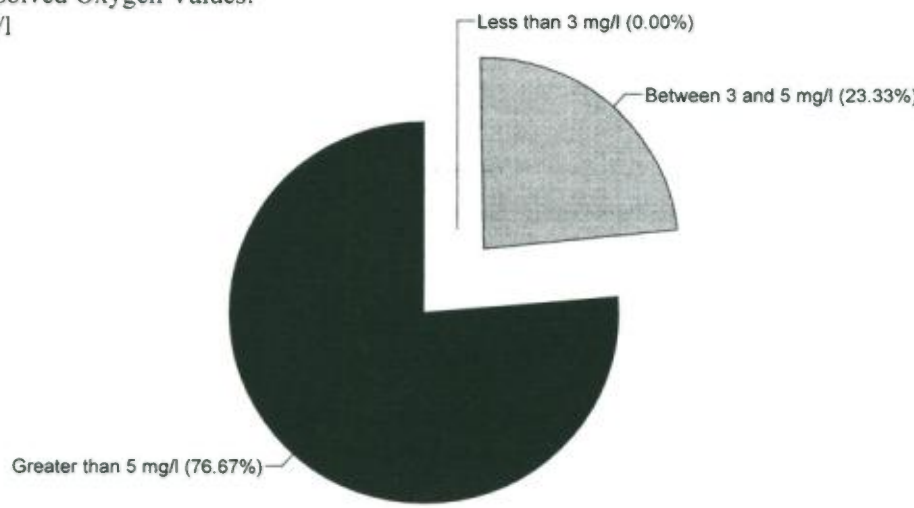
There was a significantly different picture for the bottom waters of the Sound and the Upper East River. In Long Island Sound, the variations in surface and bottom waters during the summer are predominantly caused by insufficient vertical mixing within the water column. This is primarily a result of water temperature and salinity to a lesser extent. In winter, surface waters are cooled by the atmosphere and strong winds. Cold waters are denser and heavier than warm waters. Thus,

INTERSTATE SANITATION COMMISSION
LONG ISLAND SOUND STUDY

1998 DISSOLVED OXYGEN MONITORING
SURFACE AND BOTTOM WATERS

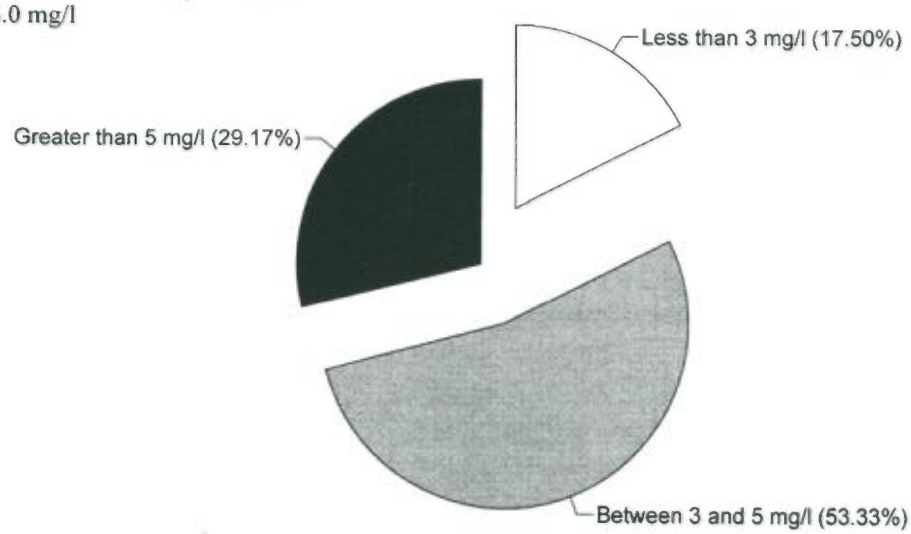
SURFACE WATERS

Range of Dissolved Oxygen Values:
3.0 to 6.9 mg/l



BOTTOM WATERS

Range of Dissolved Oxygen Values:
1.2 to 6.0 mg/l

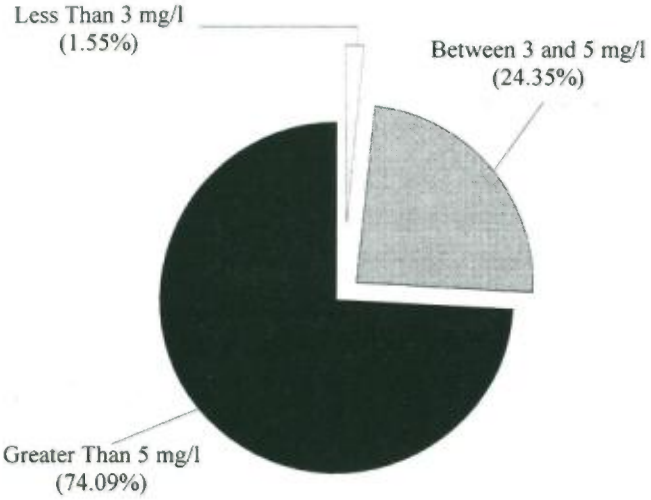


INTERSTATE SANITATION COMMISSION
LONG ISLAND SOUND STUDY

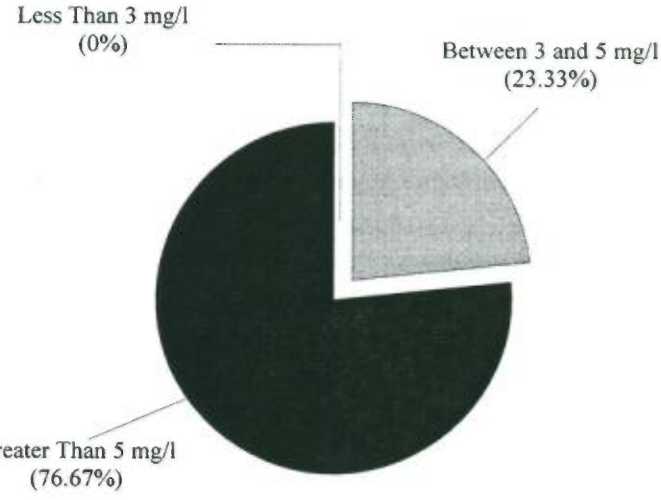
1997-1998 DISSOLVED OXYGEN MONITORING
SURFACE AND BOTTOM WATERS

SURFACE WATERS

1997

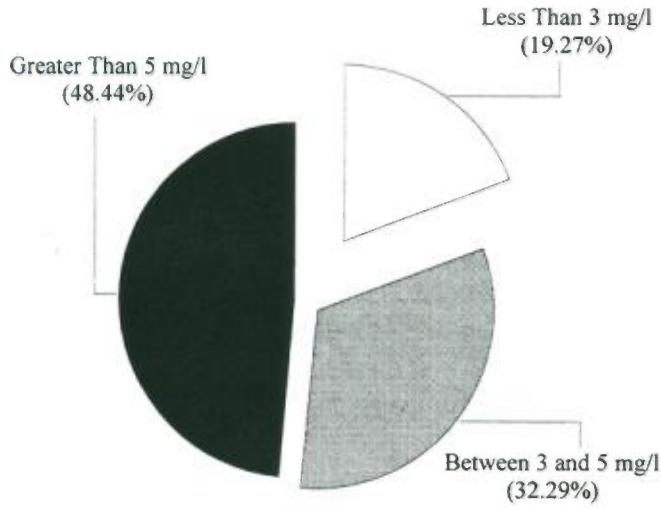


1998

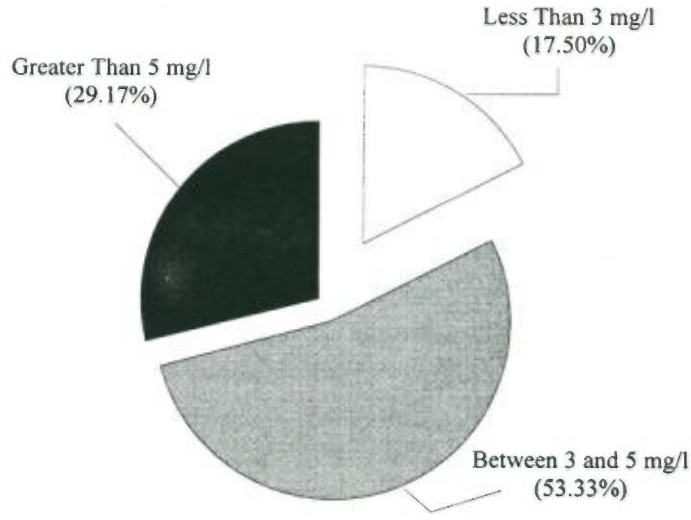


BOTTOM WATERS

1997



1998



surface waters tend to sink when they become colder than bottom waters. This circulation pattern continues throughout the winter, promoting vertical mixing within the water column. In contrast, during the summer, surface waters remain warmer than bottom waters because of the sun's radiation. Therefore, circulation does not take place and mixing is only induced by winds or tidal currents. It should be noted that the 1996-97 and 1997-98 winter seasons were very mild.

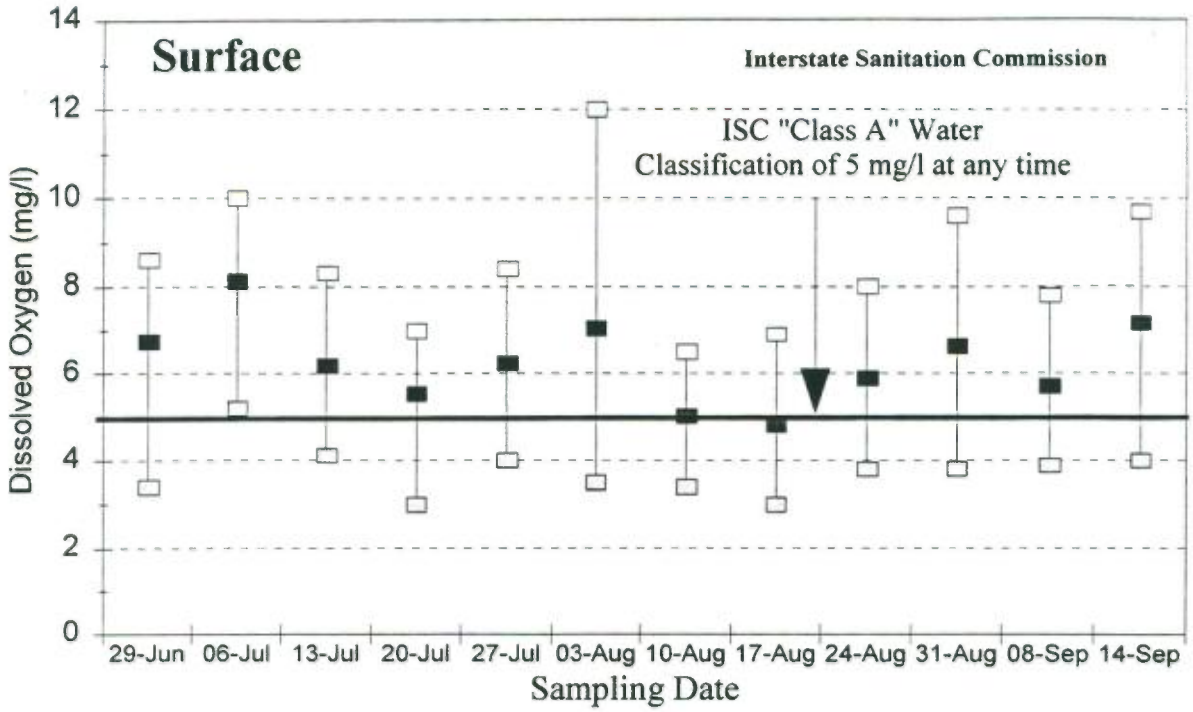
As displayed in the bottom half of the pie chart entitled "1997 and 1998 Dissolved Oxygen Monitoring", the 1998 bottom water results for the categories of *Greater Than 5 mg/l, Between 3 and 5 mg/l* and *Less Than 3 mg/l* are 29.2%, 53.3% and 17.5%, respectively. In the same category order, the bottom water results of the 1997 survey were 48.4%, 32.3% and 19.3%. It is interesting to note that hypoxic levels in bottom waters remained similar from 1995 to 1998, after a considerable improvement from 1994 (33.3% of the values <3 mg/l) to 1995 (21.1% of the values <3 mg/l). Variations from 1997 to 1998 in the categories of *Greater Than 5 mg/l* and *Between 3 and 5 mg/l* are noteworthy. The percentage of readings taken in bottom waters with dissolved oxygen concentrations greater than five mg/l decreased from 48.4% in 1997 to 29.2% in 1998. In contrast, there was an increase in the number of readings between three and five mg/l (32.3% in 1997 and 53.3% in 1998). Although there is a similarity in the *Less Than 3 mg/l* category from 1995 to 1998, there is no similarity or trend towards improving or deteriorating conditions in the *Greater Than 5 mg/l* and the *Between 3 and 5 mg/l* categories. Many different natural and anthropogenic factors (water pollution, municipal water pollution control programs, weather, circulation pattern changes, proliferation or lack of algal blooms, etc.) contribute to this variability. In any case, in 1998, only 29.2% of the values measured in the bottom waters met the ISC requirement (5 mg/l) for a "Class A" waterbody.

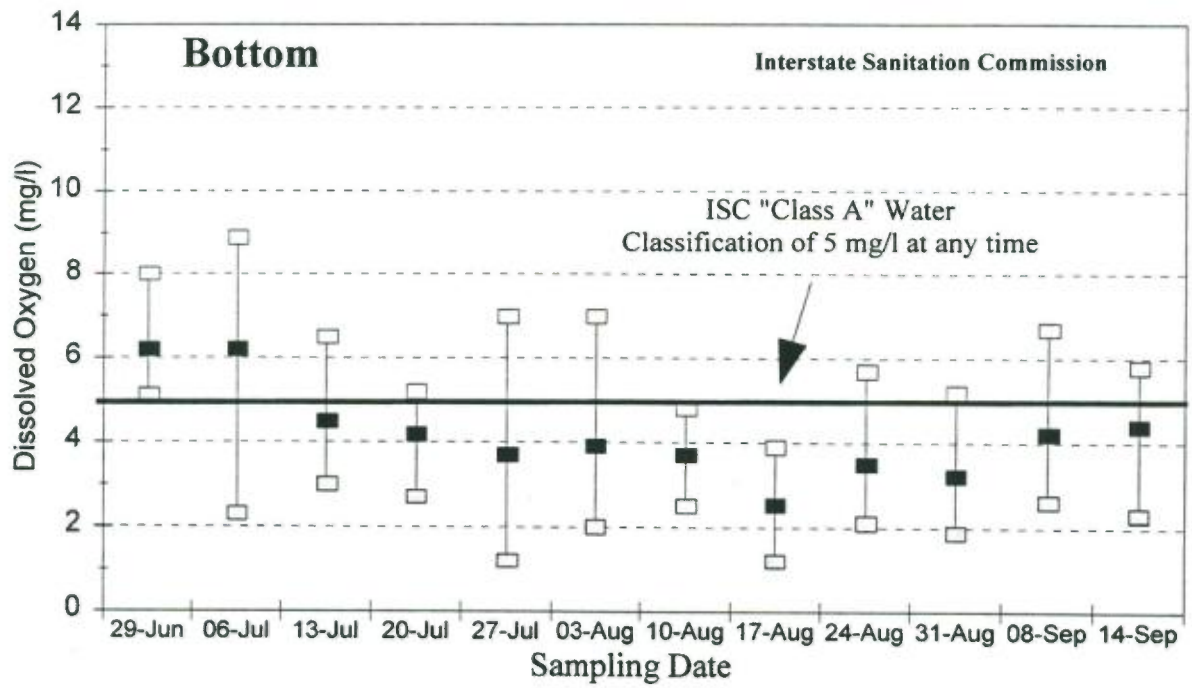
Along with surface and bottom water readings, dissolved oxygen measurements at intermediate depths were obtained for ISC sampling stations with a depth greater than 15 meters. Combining all readings to represent the waterbody in its entirety, the 1998 results for the categories of *Greater Than 5 mg/l, Between 3 and 5 mg/l*, and *Less Than 3 mg/l* were 47.8%, 44.7% and 7.5%, respectively. In the same category order, the results of the 1997 survey were 56.2%, 32.4% and 11.4%. Thus, for the waterbody as a whole, only 47.8% of the observations during the 1998 sampling survey met the ISC requirement of 5 mg/l for DO.

One of the intents of the Long Island Sound Study is to approximate the time period in which hypoxic conditions occur in surface and bottom waters. The graph entitled "Surface and Bottom Waters: Average and Range of All Stations Sampled", displays the variation of the average dissolved oxygen concentration at all stations between sampling dates. Surface and bottom waters are represented separately. Along with the averages, maximum and minimum values of each run are also displayed. The graph indicates that hypoxic conditions were not observed in surface waters. Average concentrations did not drop below 3.0 mg/l; furthermore, there were no individual minimum measurements below 3.0 mg/l. However, it can be seen that the minimum surface water dissolved oxygen concentration reached its lowest on August 17th and the maximum surface water dissolved oxygen concentration reached its lowest on August 10th. July 6th was the only date when

LONG ISLAND SOUND STUDY
1998 DISSOLVED OXYGEN MONITORING

SURFACE AND BOTTOM WATERS:
AVERAGE AND RANGE OF ALL STATIONS SAMPLED





Maximum Minimum Average

the minimum dissolved oxygen concentration of the surface waters at all stations met the ISC requirement for a "Class A" waterbody.

As in surface waters, the bottom water dissolved oxygen concentration reached its lowest value on August 17th. This value definitely reflects hypoxic conditions. A trend in the average dissolved oxygen concentration of bottom waters can also be observed: average DO values decrease from the initial sampling date to August 17th and then the average DO values slowly increase. In 1998, the bottom waters of the Sound were oxygen depleted from the end of July to the beginning of September; June 29th was the only sampling date that all the stations had DO values meeting the standard of 5.0 mg/l. Moreover, in accordance with the results of ambient water quality monitoring in Long Island Sound from 1995 to 1997, critical conditions transpired during the same time period. In 1995, minimum average dissolved oxygen concentrations in bottom waters developed on July 24th (4 mg/l). The corresponding dates for the years of 1996 and 1997 were August 26th (2 mg/l) and July 28th (1.2 mg/l), respectively. Therefore, for the majority of the Western Long Island Sound and its embayments, normal development of aquatic life is especially unfavorable from the end of July to the beginning of September, and especially in August.

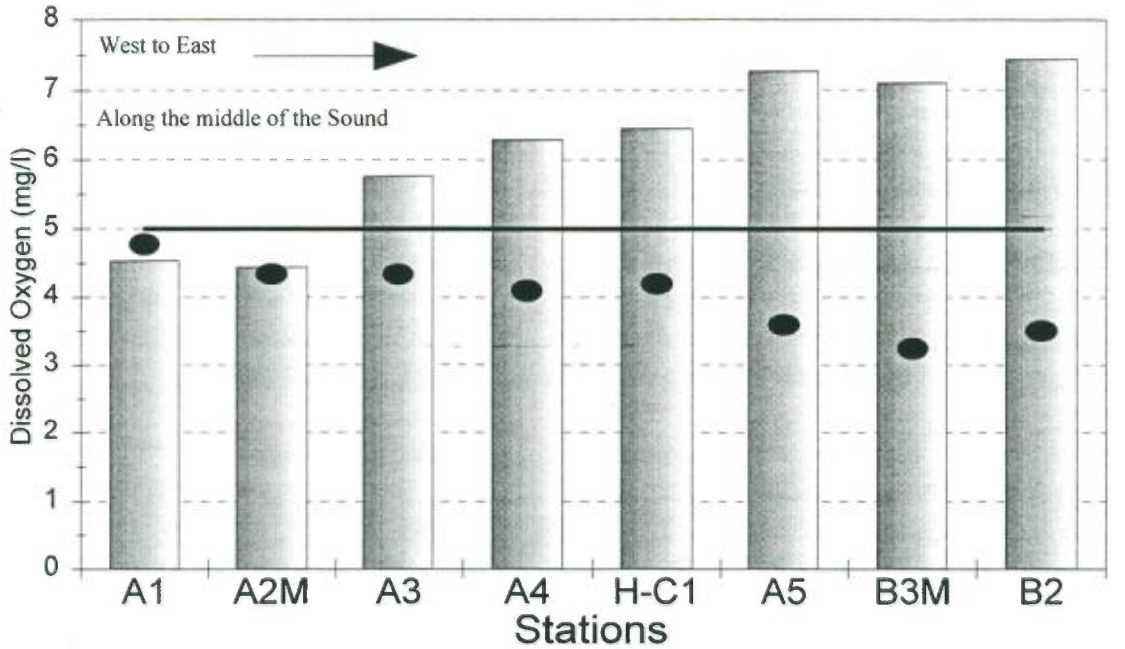
For the 1998 survey, as was true for the 1997 and 1996 surveys, surface water dissolved oxygen levels were lowest in the western portions of the Sound and consistently increased as one moved to the east. This is illustrated on the graph entitled "Average Surface and Bottom Dissolved Oxygen Concentration for Selected Stations Along the Mid-Sound and the Westchester County Shorelines". In 1998, the average surface dissolved oxygen concentration values at stations A1 (east of the Whitestone Bridge) and A2M (east of the Throgs Neck Bridge) were 4.5 and 4.4 mg/l, respectively. The difference between western and eastern portions of the mid-Sound becomes obvious when the surface water concentration values of A1 and A2M are compared with that of station B2, which is located about 10 nautical miles east of the Throgs Neck Bridge. The average values are increasing as one moves to the east, reaching a maximum of 7.4 mg/l at station B2. In 1997, the surface water concentration values for stations A1, A2M and B2 were 4.6, 5.2 and 7.2 mg/l, respectively. The same phenomenon is observed in surface waters at stations along the Westchester County Shoreline, going from west to east. This is depicted in the bottom half of the same graph. At stations DI1 (west) and B1S (east), the average surface dissolved oxygen concentrations in 1998 were 5.3 and 7.0 mg/l, respectively.

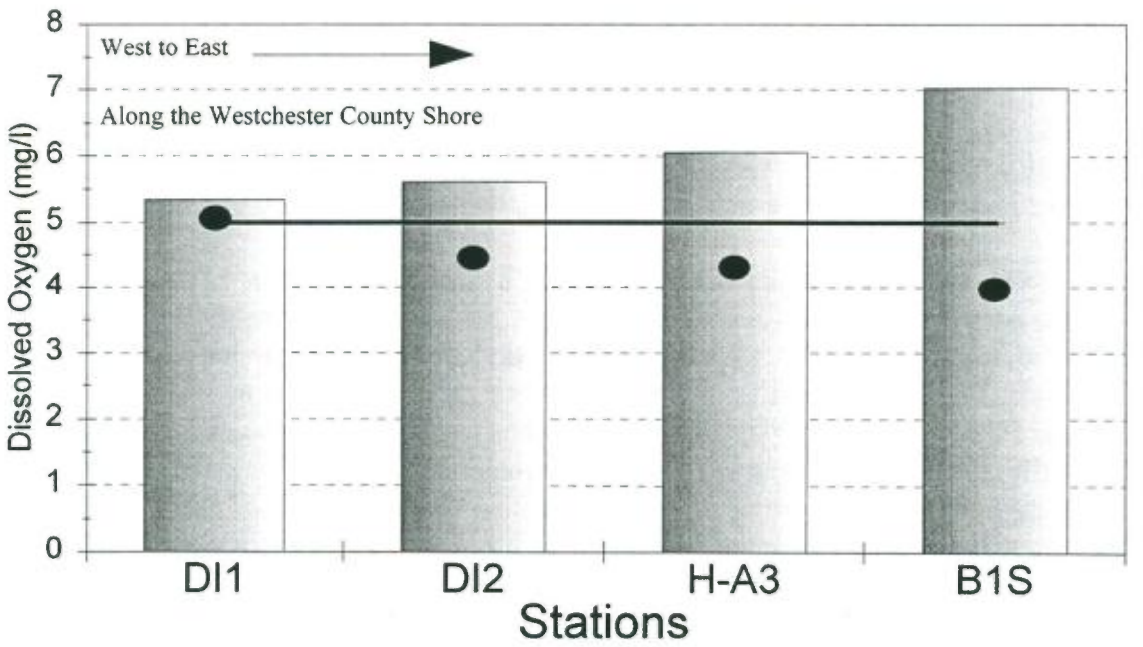
The average bottom dissolved oxygen concentration at selected stations is also illustrated on this graph. The opposite dissolved oxygen concentration trend from that of surface waters is observed in bottom waters. Moving from west to east, the concentration of oxygen decreased for both mid-Sound stations (top half of the graph), and stations along the Westchester County shoreline (bottom half of the graph).

Several possible explanations exist for this easterly increase of dissolved oxygen in surface waters and decrease in bottom waters. Vertical mixing together with atmospheric reaeration (oxygen transfer from the air to the water) are the most important factors contributing to this trend. The degree of vertical mixing is elevated in the western Sound. During tidal excursions, the same

LONG ISLAND SOUND STUDY
1998 DISSOLVED OXYGEN MONITORING

AVERAGE SURFACE AND BOTTOM DISSOLVED OXYGEN CONCENTRATION FOR SELECTED STATIONS ALONG THE MID-SOUND AND THE WESTCHESTER COUNTY SHORELINES





SURFACE WATERS (1 m below surface)

BOTTOM WATERS (1 m above the bottom)

ISC "Class A" Waterbody Standard of 5 mg/l at any time

amount of water passes through the narrow openings of the western Sound and the wide regions of the eastern Sound. Therefore, greater velocities and turbulence, which promote mixing, are observed in the western portion of the Sound. ISC dissolved oxygen data from 1991 to 1998 suggest that vertical mixing is enhanced in the western portions of the Sound, since average surface and bottom dissolved oxygen concentrations are nearly identical.

This can be observed on the graph entitled "Average Surface and Bottom Dissolved Oxygen Concentration for Selected Stations Along the Mid-Sound and the Westchester County Shorelines". Differences between average surface and average bottom dissolved oxygen concentrations, referred to as concentration gradients, are greater in the waters of the eastern Sound. Further analysis of the 1998 data shows that at station A1 (representing western Sound), 67% of the surface and 67% of the bottom readings were under five mg/l. The identical percentages reveal the similarity of surface and bottom waters. However, at station B2 (representing eastern Sound), 0% of the surface and 89% of the bottom readings in 1998 were under five mg/l. Minimal mixing in the eastern Sound appears to cause reaeration of only surface waters for the extent of the summer season.

Thus, as data conforms, high oxygen levels are manifested in surface waters of the eastern Sound and low in bottom waters. In contrast, mixing is improved in the western portion of the Sound. As a result, the bottom waters of the western Sound are slightly "healthier" than those of the eastern Sound. Nevertheless, oxygen concentrations remain low. This could be attributed to higher population densities in the Western Sound, which decline to the east. Higher loads of oxygen demanding wastewater accompany high population densities. In addition, the narrow embayments of the far Western Sound can prevent higher wind velocities and allow less oxygen to diffuse into surface waters.

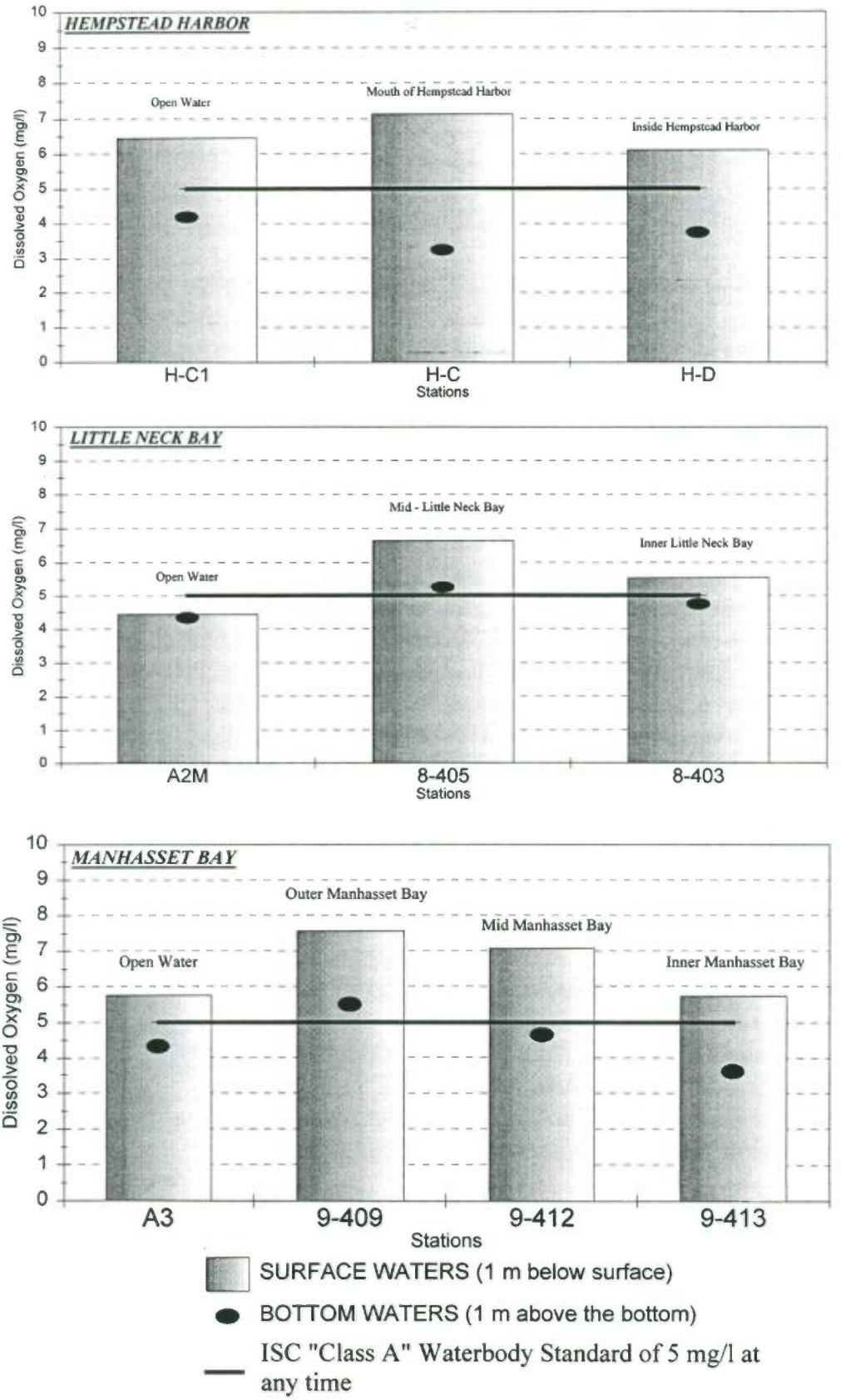
The average surface and bottom dissolved oxygen concentrations for Hempstead Harbor, Little Neck Bay and Manhasset Bay are displayed in the graph entitled "Average Dissolved Oxygen Concentration of Open Waters Versus Embayments". The graphs illustrate the values at different points within each embayment as well as in the open waters adjacent to the embayments.

In 1998, the ISC sampled for chlorophyll a during six of the 12 survey runs. High chlorophyll a concentration is associated with greater proliferation of floating aquatic plants, such as algae and phytoplankton. Floating plants produce oxygen on the surface waters by photosynthesis. The Long Island Sound Study, which released its Comprehensive Conservation Management Plan in 1994, has identified human activities which may contribute to low levels of DO. Primarily, the Sound is impacted by nitrogen loadings from point and non-point discharges. This excess nitrogen acts like a fertilizer, spurring the temporary growth of algae. When the algae dies, it settles to the bottom of the waterbody where it is degraded by oxygen-consuming bacteria. To this end, the Management Conference is implementing Phase III nitrogen reduction limits of 58.5% from 11 management zones in the New York and Connecticut waters of the Long Island Sound watershed.

The CCMP, signed by the Governors of both Connecticut and New York, as well as the Administrator of US EPA, seeks to remedy this situation by reducing nitrogen discharges from

LONG ISLAND SOUND STUDY
1998 DISSOLVED OXYGEN MONITORING

AVERAGE DISSOLVED OXYGEN CONCENTRATION OF OPEN WATER VERSUS EMBAYMENTS



sewage treatment plants and other point and non-point sources. On October 31, 1996, the two governors held a "Re-Commitment Ceremony" to reiterate their commitment to the Long Island Sound Agreement.

Ambient Water Quality Cooperative Studies

Due to nutrient enrichment in Long Island Sound, phytoplankton can contribute to the Sound's hypoxic conditions. The Commission entered into a cooperative agreement with Nassau County Health Department in order for the NCHD to be able to characterize normal and excessive phytoplankton conditions in three embayments of Western Long Island Sound.

During each of ISC's 12 weekly Long Island Sound sampling surveys, additional water quality samples were collected, preserved and kept on ice until delivery by sea to NCHD. The NCHD subsequently carried out phytoplankton species identification — dominant, most prevalent and nuisance species. The water quality samples for phytoplankton identification were collected at one established station in each of the three Western Long Island Sound embayments: Little Neck Bay, Manhasset Bay and Hempstead Harbor. It was planned that additional samples would be collected if an algal bloom was encountered during the weekly cruises; that situation did not occur and no additional water quality samples were collected.

Additionally, the Commission has entered into a cooperative agreement with the Center for Applied Studies of the Environment (CASPE), Department of Geology and Geography, Hunter College of the City of New York. The collaboration will share real time chlorophyll data supplied by satellite imagery from the Coastwatch/Northeast Regional Node, NOAA/NMFS Narragansett Laboratory, in order to help understand the complex processes of water quality pollution control and impacts in Western Long Island Sound. This study is another example of the ISC's cooperation with the academic community and the pooling of resources to the benefit of the environment.

1997-1998 Microbiological Surveys in the Shellfish Harvesting Waters of Raritan and Sandy Hook Bays

The New Jersey Department of Environmental Protection, Bureau of Marine Water Classification and Analysis (BMWCA) regularly conducts ambient water quality monitoring of the State's 750,000 acres of shellfish harvesting beds. In order to meet the increasing demands for sampling that the shellfish industry has requested, accompanied by a shortfall in staffing, the BMWCA requested the ISC for the third consecutive year to assist in sample collection in Raritan and Sandy Hook Bays during the 1997-1998 winter and spring seasons.

Following the criteria established by the US Food and Drug Administration's National Shellfish Sanitation Program, sampling runs were planned for the purpose of collecting the data needed to assess the microbiological quality of the shellfish waters. The surveys were triggered by

storm events with an intensity of at least 0.2 inch of rain. A window of 72 hours subsequent to the rain gave ample time to document the effects of the runoff. All samples were collected from surface waters at 36 sampling stations. A map and a listing of the sampling stations are on the following pages. In conjunction with the New Jersey Department of Environmental Protection/US EPA Performance Partnership Agreement, all samples were transported by ISC field personnel to the US EPA's Edison, NJ, laboratory for analysis of fecal and total coliform bacteria.

During mid-December 1997, the R/V Natale Colosi was moved to and berthed at the Leonardo State Marina which is operated by the NJ DEP. From February 1998 until early April 1998, five survey runs were completed.

All sample collection, storage and delivery to the US EPA Edison laboratory adhered to chain of custody procedures and followed standard operating methods as outlined in the NJ DEP Field Sampling Procedures Manual. The Commission, at the request of BMWCA, will monitor western Raritan Bay over the 1998-1999 winter and spring seasons.

1998 Microbiological Surveys in the Shellfish Harvesting Waters of Little Neck Bay

Shellfish are a valuable natural food resource and they represent an important part of the economy of coastal communities. Sanitary controls and monitoring are necessary to ensure safe use of shellfish and to prevent the transmission of disease. Under the auspices of the National Shellfish Sanitation Program, the US FDA and the states combine efforts to preserve and manage natural shellfish harvesting throughout the country.

Due to resource limitations, the ISC was requested by the New York State Department of Environmental Conservation to conduct ambient water quality monitoring for total and fecal coliform determinations in accordance with sampling criteria for shellfish waters developed by the US FDA. As per the NYS DEC Bureau of Shellfisheries, an up-to-date sanitary survey consisting of a pollution source inventory and shoreline survey were completed for Little Neck Bay which is located in the western portion of Long Island Sound.

A map and list of station descriptions of the 13 station sampling network is shown on the following pages. The station locations were supplied to the Commission by NYS DEC, Division of Marine Sources, Bureau of Shellfisheries. The subsequent bacteriological analysis of the collected water samples was conducted by the ISC laboratory. All final data — including field observations, meteorological and tidal information — were transmitted to NYS DEC, Shellfisheries Section; the Nassau County Department of Health; and PROBE, a local volunteer monitoring group.

Water quality samples for fecal and total coliform bacteria determinations were taken at all stations. Last year, during the period June through November 1997, 10 reactive survey runs were conducted under worst case conditions — during ebb tide (sampling to begin approximately 2 hours after high tide at Willets Point, New York) and after a storm event recording at least 0.25 inches of rainfall as measured at Central Park, New York. Daily local weather forecasts and marine/offshore

INTERSTATE SANITATION COMMISSION
1997 - 1998 SAMPLING STATION LOCATIONS FOR THE MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF RARITAN AND SANDY HOOK BAYS

SAMPLE NUMBER	STATION NUMBER	LATITUDE (DD MM SS)	LONGITUDE (DD MM SS)	DESCRIPTION
1	916A	40 25 49	74 03 21	Leonardo State Marina
2	916C	40 26 37	74 02 48	White/orange "C" Can
3	916D	40 27 04	74 02 29	~ 800 yards East of Earle NWS
4	93A	40 27 55	74 01 33	~ 800 yards SSW of Sandy Hook Point
5	78	40 28 25	74 01 43	~ 800 yards NNW of Sandy Hook Point
6	73	40 28 56	74 01 50	~ 0.9 nm NNW of Sandy Hook Point
7	43	40 29 26	74 02 00	~ 1.3 nm NNW of Sandy Hook Point
8	38	40 29 58	74 02 10	~ 1.85 nm NNW of Sandy Hook Point
9	36	40 29 45	74 03 21	~ 2.2 nm NW of Sandy Hook Point
10	47	40 29 05	74 04 31	~ 2.7 nm NW of Sandy Hook Point
11	49A	40 28 55	74 05 27	~ 2.65 nm N of Port Monmouth
12	50	40 28 40	74 06 44	~ 1.7 nm N of Ideal Beach
13	29A	40 28 58	74 08 11	~ 1.2 nm N of Point Comfort
14	28	40 28 45	74 09 25	NW of Point Comfort
15	26A	40 28 30	74 10 40	~ 1.0 nm N of Conaskonk Point
16	24A	40 28 20	74 11 52	Keyport Harbor
17	56	40 27 56	74 11 43	Keyport Harbor
18	61A	40 27 23	74 11 35	Keyport Harbor
19	62	40 27 35	74 10 25	~ 1.0 nm N of Conaskonk Point
20	63B	40 27 46	74 09 07	West of Point Comfort
21	86A	40 27 28	74 07 44	East of Point Comfort
22	88A	40 27 10	74 06 17	Ideal Beach
23	97B	40 26 53	74 04 51	~ 0.9 nm N of Port Monmouth
24	97A	40 27 00	74 03 53	White/orange "D" Can
25	918	40 27 41	74 02 38	~ 0.6 nm NNE of Earle NWS (east pier head)
26	914D	40 27 35	74 01 14	~ 0.7 nm W of Sandy Hook (flag pole)
27	910E	40 27 28	74 00 27	~ 0.2 nm SW of Sandy Hook (flag pole)
28	908C	40 26 40	74 00 23	Horseshoe Cove
29	906C	40 26 08	73 59 51	Horseshoe Cove
30	906B	40 25 40	74 00 06	Spermacetti Cove
31	906A	40 25 15	74 00 18	~ 0.8 nm E of Atlantic Highlands Day marker
32	907	40 25 06	74 00 44	~ 0.4 nm E of Atlantic Highlands Day marker
33	908	40 25 10	74 01 15	Atlantic Highlands Day marker
34	910A	40 25 32	74 01 48	~ 0.3 nm N of Atlantic Highlands Day marker
35	912	40 25 58	74 02 26	~ 0.9 nm N of Atlantic Highlands Day marker
36	914	40 25 59	74 02 48	~ 0.9 nm N of Leonardo

INTERSTATE SANITATION COMMISSION

1998 SAMPLING STATION LOCATIONS FOR THE MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF LITTLE NECK BAY

SAMPLE No.	STATION	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
1	1	40-48-59	73-46-30	Kings Point
2	2	40-48-37	73-46-37	Little Neck Bay - ~0.5 nm west of Kings Point
3	3	40-48-10	73-46-45	Willets Point - Nun "2"
4	4	40-47-34	73-46-19	Willets Point - ~0.5 nm south of Nun "2"
5	5	40-47-19	73-46-14	~0.5 nm north of Bayside Marina
6	6	40-46-59	73-46-08	Bayside Marina - head of pier assembly
7	7	40-46-31	73-45-49	Between Nun "C" and Nun "D"
8	8	40-46-49	73-45-39	West of Nun "A"
9	9	40-47-11	73-45-34	Nun "A"
10	10	40-47-26	73-45-31	~1.0 nm north of Nun "A"
11	11	40-47-41	73-45-46	South of Udalls Mill Pond
12	12	40-47-59	73-45-41	Udall's Mill Pond
13	13	40-48-19	73-45-58	~0.5 nm southwest of Kings Point pier assembly

forecasts broadcast by the National Weather Service Forecast Office were monitored daily for weather and tidal information as well as rain data for the previous 24-hour period. The Commission library maintains up-to-date meteorlogical records for Central Park, New York, as well as four additional monitoring stations in order to be aware of localized storms affecting the study area and as verification of the daily broadcasts. A window of 96 hours after a rain event with a maximum of two survey runs per event were the response criteria.

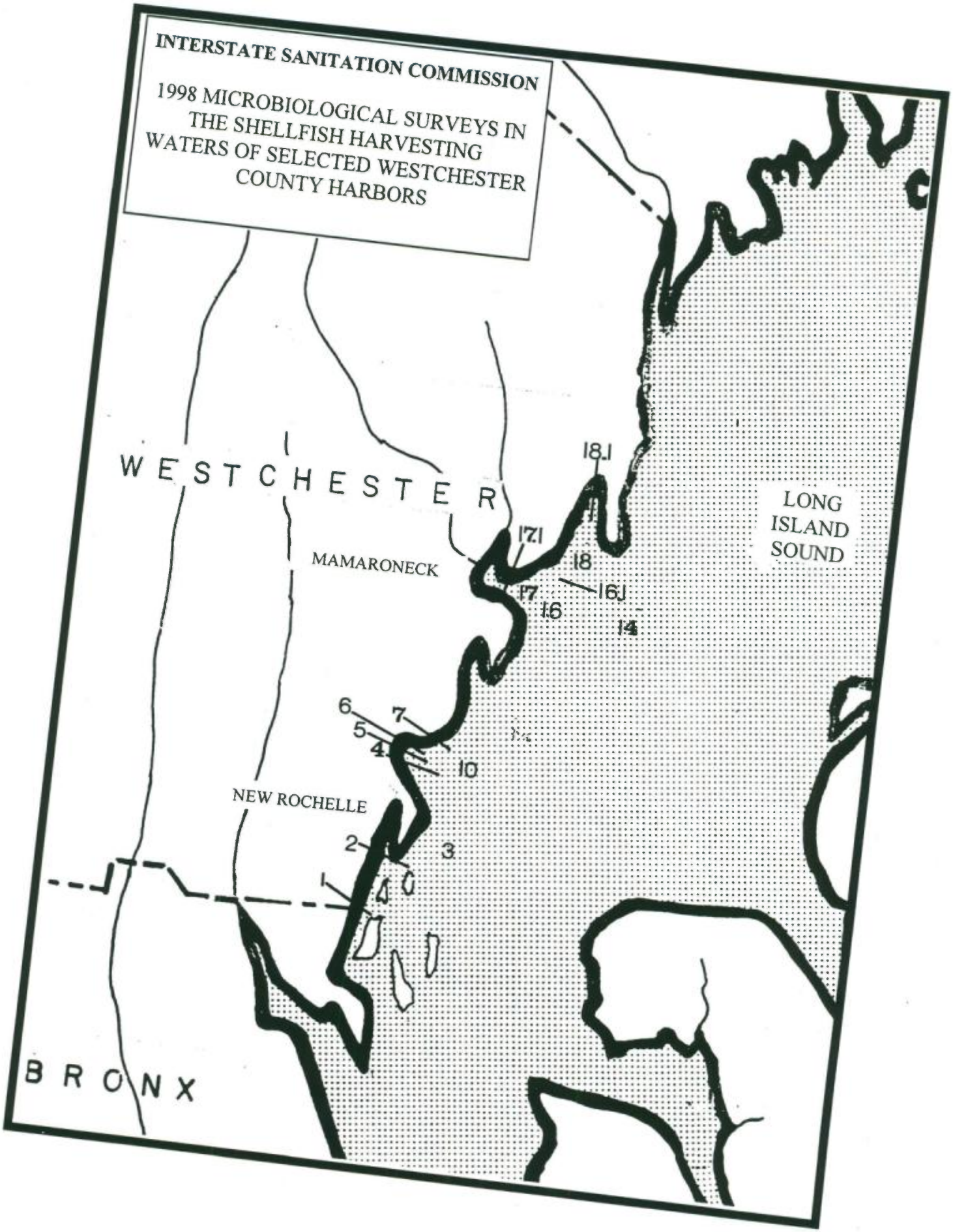
All samples were preserved on ice and delivered to the ISC laboratory on Staten Island, New York. The fecal and total coliform analyses were determined using the multiple tube fermentation methodology. To be consistent with other coliform data used by NYS DEC to determine the sanitary conditions of shellfish beds, analyses were performed using a 3-tube, 3-dilution test. The decimal dilutions used to yield the range of values required (MPN values from <30 to >24,000) were 1.0 ml, 0.1 ml, and 0.01 ml.

After leaving the New Jersey shellfish waters in early April 1998, the ISC conducted five reactive surveys from late April through late May. Combined with the 10 data collection surveys conducted in 1997, the total of 15 data sets as required by the NSSP completes the water quality evaluation of Little Neck Bay. The NYS DEC, Division of Fish, Wildlife and Marine Resources, Bureau of Marine Resources, Shellfisheries Section must still collect clam tissue samples. Once these samples are analyzed, Little Neck Bay could be included in the New York Shellfish Transplant Program.

1998 Microbiological Surveys in the Shellfish Harvesting Waters of Selected Westchester County Harbors

This sampling is being conducted at the request of the New York State Department of Environmental Conservation to collect fecal and total coliform data in accordance with sampling criteria for shellfish waters developed by the US FDA. As per the NYS DEC, Bureau of Shellfisheries, an up-to-date sanitary survey consisting of a pollution source inventory and shoreline survey was completed for the Westchester County shoreline in Long Island Sound. Due to resource limitations, the ISC was asked to conduct the ambient water quality monitoring for total and fecal coliform determinations as required by the NSSP.

A map and list of station descriptions on the following pages show the sampling network which consists of 15 stations. The stations are located in Milton Harbor, Mamaroneck Harbor, Larchmont Harbor, Echo Bay in New Rochelle, and the open waters of Long Island Sound which include stations in the vicinity of two WPCP submerged outfalls. The station locations were supplied to the Commission by NYS DEC, Division of Marine Sources, Bureau of Shellfisheries. The subsequent bacteriological analysis of the collected water samples was conducted by the ISC laboratory. All final data — including field observations, meteorological and tidal information — were transmitted to NYS DEC, Shellfisheries Section, and the County of Westchester, Department of Health, Bureau of Public Health Protection.


INTERSTATE SANITATION COMMISSION
1998 MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF SELECTED WESTCHESTER COUNTY HARBORS
WESTCHESTER
MAMARONECK
NEW ROCHELLE
BRONX
LONG ISLAND SOUND
18.1
17.1
18
17
16.1
16
14
6
7
5
4
10
2
3
1
0

INTERSTATE SANITATION COMMISSION

1998 AMBIENT WATER QUALITY MONITORING IN SELECTED WESTCHESTER COUNTY HARBORS IN WESTERN LONG ISLAND SOUND FOR FECAL AND TOTAL COLIFORMS

SAMPLE No./ ISC WP	STATION	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
1/80	1	40-53-33	73-46-24	Davids Island - Nun "10A"
2/81	2	40-53-32	73-45-17	Huckleberry Island - fl R "2"
3/82	3	40-53-40	73-44-34	New Rochelle WPCP outfall
4/83	14	40-55-14	73-42-05	Mamaroneck WPCP outfall-fl R Bell R"42"
5/84	18	40-56-19	73-42-16	Milton Harbor- South of Can 3
6/85	18.1	40-56-40	73-41-58	Milton Harbor -Mid channel: Can 5/Nun 6
7/86	16	40-56-24	73-42-56	Mamaroneck Harbor- West of Nun 8
8/87	16.1	40-56-28	73-42-55	Mamaroneck Harbor -North of Hen Island
9/88	17	40-56-34	73-43-16	Mamaroneck Harbor -Mid channel Can 7
10/89	17.1	40-56-38	73-43-32	Mamaroneck Harbor - Mid channel Nun 12
11/90	10	40-55-07	73-44-09	Larchmont Harbor - Can 3
12/91	4	40-54-22	73-45-08	Hicks Ledge - Can "HL"
13/92	5	40-54-24	73-45-41	Echo Bay - fl G Buoy "3BR"
14/93	7	40-54-32	73-45-47	Echo Bay - Nun "4"
15/94	6	40-54-39	73-46-01	Echo Bay - Nun "8"

Water quality samples for fecal and total coliform determinations were taken at all stations. During the period June through early November, the relatively dry summer season resulted in only one reactive survey being conducted. The sampling was conducted under worst case conditions — during ebb tide (sampling to begin approximately 2 hours after high tide at Willets Point, New York) and after a storm event recording at least 0.25 inches of rainfall as measured at Central Park, New York. A window of 96 hours after a rain event with a maximum of two survey runs per event were the response criteria.

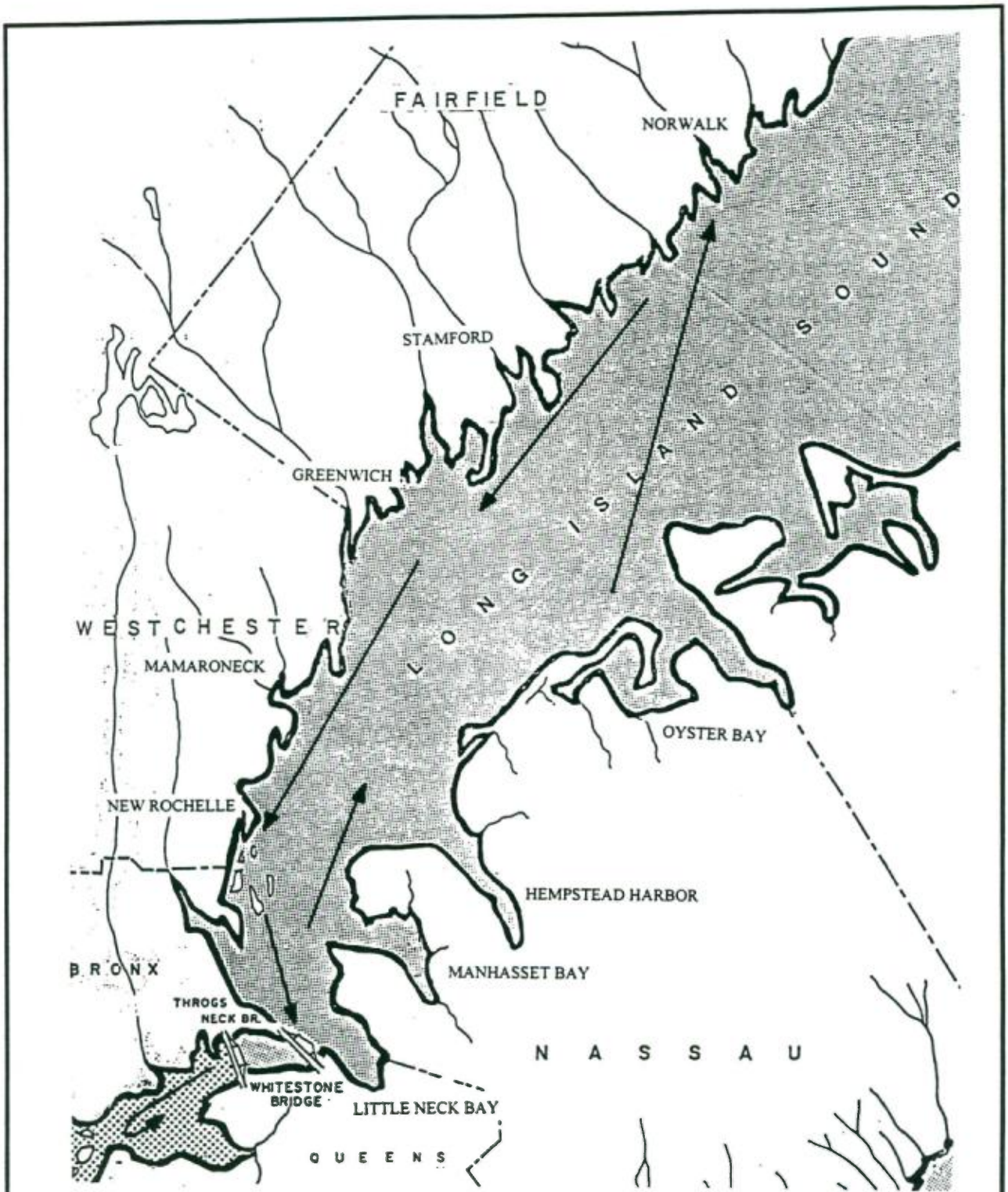
All samples were preserved on ice and delivered to the ISC laboratory on Staten Island, New York. The fecal and total coliform analyses were determined using the multiple tube fermentation methodology. To be consistent with other coliform data used by NYS DEC to determine the sanitary conditions of shellfish beds, analyses were performed using a 3-tube, 3-dilution test. The decimal dilutions used to yield the range of values required (MPN values from <30 to >24,000) were 1.0 ml, 0.1 ml, and 0.01 ml. The Commission intends to return to these waters during the 1999 spring season in order to continue this survey.

1998 BOAT INSPECTION TRIP

This past summer, the Commission's boat inspection trip focused on Long Island Sound. The trip provides an excellent opportunity for public officials and other parties interested in protecting the environment to view and discuss water quality issues affecting the Region. The 1998 Boat Inspection Trip was held on August 5th and covered the Upper East River and Western Long Island Sound. On the southern side of the Sound, the trip included Little Neck Bay, Manhasset Bay, Hempstead Harbor and Huntington Harbor. Crossing the Sound to its northern shoreline, the trip covered Norwalk, Stamford and Greenwich, Connecticut, and New York's shorelines of Westchester and Bronx Counties. The map on the following page shows the six-hour route which was traversed, covering nearly 50 nautical miles. The waters inspected during the trip provide for recreational powerboating and sailing; the use of canoes, kayaks and sculls; and a major sea-lane for the eastern seaboard. Other primary contact activities supported by these waters include commercial and recreational fishing, shellfishing, crabbing and lobstering; scuba diving; swimming; jet skiing; parasailing; water skiing; and wind surfing.

ISC Commissioners, officials from all levels of government, citizen groups, and the press viewed bathing beaches and seaside parks, commercial shellfish and lobster operations, numerous party boats and small recreational vessels, sailing clubs comprised of dozens of vessels, tug and barge transports, urban and maritime industries, historical landmarks, and waterfront development projects. A running dialogue of water quality issues, sights and points of interest, recommended fishing and scuba diving sites as well as local lore dealing with lighthouses, embattlements and shipwrecks were provided throughout the trip.

The attendees viewed ongoing waterfront development, sewage treatment plants, sludge dewatering facilities, prison facilities, electrical/steam generating stations, a subaqueous force main



INTERSTATE SANITATION COMMISSION
1998 BOAT INSPECTION TRIP

installation in Eastchester Bay, closed landfills (one of which is being converted to a public golf course), and CSO outfalls in the Upper East River.

Attendees had the opportunity to see unobstructed views of the New York City and Stamford skylines; the magnificent homes of the Nassau and Suffolk County's Gatsbian era; osprey nesting sites in Manhasset Bay; and fragile bird sanctuaries on North and South Brother Islands in the East River, on Huckleberry Island off the Westchester County shore, and on Tavern Island in Sheffield Island Harbor. The inspection trip gave the attendees a firsthand view of the progress that has been made and some of the problems that must still be addressed in the Region.

REGIONAL BYPASS WORK GROUP

During June 1997, a force main failure under Eastchester Bay in Western Long Island Sound caused the immediate closing of public beaches in the Bronx, adjoining Westchester County and Connecticut (~10 miles to the east). The force main which conveys sewage from City Island, a Bronx nautical community since the 1700's, to the NYC Hunts Point WPCP had emergency repairs completed during the summer and is being replaced with a permanent subaqueous force main for which completion is anticipated for the spring of 1999. The necessity to close beaches in the vicinity of the sewage release for the public welfare was paramount, but it became obvious that there was a need to be able to predict which beaches and shellfish harvest waters may be affected by a sewage spill, and to establish a regional protocol to notify responsible authorities of potential threats to these sensitive areas from unplanned sewage releases. This incident — in conjunction with several other sewage releases from a NYC pump station and a Greenwich, Connecticut, force main break — stimulated environmental and health officials to assess the notification process among the agencies as well as the public. A meeting in July 1997 in Tarrytown, New York, was a first attempt to bring all the stakeholders together to discuss closure protocols, notification and predictive modeling tools.

The July 1997 meeting of New York and Connecticut environmental and health officials, as well as the Interstate Sanitation Commission, was convened to discuss unplanned sewage bypasses that resulted in beach closures in New York and Connecticut. As an outgrowth of that meeting, a modeling work group representing 15 agencies was formed to discuss modeling scenarios/strategies for unplanned sewage bypasses. The work group had been meeting with the New York City Department of Environmental Protection's modeling contractor and the discussions focused on various possible sources (locations from where bypasses may occur) and receptors (areas that may be affected by bypasses, such as beaches and shellfish harvesting waters), as well as other criteria, in order to develop a tool for an initial prediction as to which areas may be affected by a particular bypass. ISC hosted the meetings of the work group which has members from the three states' environmental and health departments, ISC, US EPA, US FDA, NYC DEP, and county officials.

ISC spearheaded the effort to get the necessary funding for the modeling. The Commission coordinated getting a grant from EPA and getting a funding package amongst ISC's three member states, ISC and EPA to pay for the modeling which enables quick predictions of whether a discharge

occurring at certain point will affect another area, and if there should be concern as to whether a beach or a shellfish area should be closed.

The work group met its goals of having a predictive modeling tool and regional notification protocols developed and put in place for the 1998 summer bathing season. Both the model and communications protocol have been working as planned. Whenever an accidental bypass occurred, there were calls among the three states, ISC, EPA and others. Everyone has been kept well informed and appropriate action has been taken.

NATIONAL ESTUARY PROGRAM

The National Estuary Program was established in 1984 and provides assistance to estuaries of national significance that are threatened by pollution, development or overuse. The NEP provides federal assistance to develop a Comprehensive Conservation and Management Plan, known as a CCMP, for designated estuaries. Presently, more than 28 estuaries located along the Atlantic, Pacific and Gulf of Mexico coastlines, as well as in Puerto Rico, are developing or implementing CCMPs. Within the Interstate Sanitation District, Long Island Sound and the New York-New Jersey Harbor Estuary have been receiving funding under this program since 1985 and 1988, respectively. The overall coordination for the Long Island Sound Study is being carried out by the US EPA - Regions I and II. The New York-New Jersey Harbor Estuary Program is being coordinated by the US EPA-Region II.

The Commission continued its active participation as a member of the Management Committees and various work groups for the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program. The New York Bight Restoration Plan, whose preparation was required by Congress in 1987, was incorporated into the HEP because the two systems are linked within the larger ecosystem. The Dredged Material Management Plan has also been incorporated into the HEP. The Commission has been involved with these plans since their inception.

The final CCMP for the LISS was signed by the Governors of the States of New York and Connecticut and the Administrator of the US EPA in September 1994, and in October 1996, the Governors of New York and Connecticut met to re-affirm their commitment to the actions set forth in the CCMP. The Plan details priority areas of concern including education, low dissolved oxygen, toxins, pathogens, floatables, living marine resources, land use/development and public involvement. It is essential to continually evaluate the effectiveness of management actions and programs implemented and, if necessary, refocus management decisions.

The final CCMP for the HEP was signed in August 1997 by the Governors of New York and New Jersey and the US EPA Administrator. The plan addresses habitat and living resources, toxic contamination, dredged material, pathogen contamination, floatable debris, nutrients and organic enrichment, rainfall-induced discharges, and public involvement/education. Simultaneous with 1997 closure of the Mud Dump Site in the Atlantic Ocean, the site and surrounding areas that have been used historically as disposal sites for dredged materials, was designated as the Historic Area

Remediation Site (HARS). The Commission took an active role by serving on the MDS/HARS Workgroup. The final CCMP was amended to reflect the accelerated implementation schedule.

As an active member of the Management Committees and various work groups for the aforementioned studies, ISC will continue to coordinate its programs, including its sampling activities and schedules, with the environmental departments of its member states and US EPA so that the needs of the Region are best met with the limited resources available to all agencies.

Through voter referendums in both New York and New Jersey, environmental bond acts were passed in 1996. In the $1.75 billion New York State Clean Water/Clean Air Bond Act of 1996, $200 million was designated for the LISS implementation. Both the New York and New Jersey environmental bond acts earmark significant resources to the HEP for harbor pollution control — the New York act designated $25 million to implement the CCMP for the HEP and $185 million of the $300 million New Jersey act is specified for dredging related projects in the New Jersey/New York port area.

COMBINED SEWER OVERFLOWS AND 1998 CSO CONFERENCE

The Commission continues to take an active role in CSO control with in-house programs as well as through its participation in the National Estuary Programs in the region. As a follow-up to the Commission's 1988 CSO inventory report and 1989 region-wide CSO Planning Conference, this year the Commission continued its project documenting the status of CSO abatement progress. The Commission is compiling information on dates, milestones, and implementation for those entities with CSOs in the tri-state region. ISC will also be putting information into a geographic information system (GIS) that is compatible with that of ISC's member states. ISC will continuously update the data and supply the information to the HEP and LISS.

The ISC has an ongoing program of inspecting CSOs to determine whether they are discharging during dry weather. When dry weather discharges are discovered, the incident is reported to the appropriate State environmental department for their action. The Commission then works with that department to determine the most expeditious manner to alleviate the violation. During the 12-month period ending September 30, 1998, a total of 27 outfalls were inspected during dry weather; none had any discharge during the ISC's inspections.

ISC has been deeply involved for many years in the issue of CSOs. Because they remain as a major source of water pollution, CSOs are a timely theme as a subject for a conference to discuss the progress and problems associated with CSO control throughout the Metropolitan Area.

Since the 1997 Fresh Kills Landfill Conference at the College of Staten Island, of which ISC was a co-sponsor, was so successful, on April 24, 1998, the Commission sponsored, with the College as a co-sponsor, yet another all day conference to discuss the progress associated with combined sewer overflow control throughout the tri-state metropolitan area. Through this forum, the ISC continues its longstanding concerns to promote CSO abatement. The conference was very successful, well attended, and informative and the excellent, well informed speakers and panelists greatly contributed to the success of the conference. On display was a working model of a CSO system from Edmonton, Canada, which was a big hit throughout the conference.

After welcoming remarks, representatives from federal, state and local agencies outlined the CSO issues in each of their jurisdictions. Legislators, regulators, the regulated community, environmental groups and academia were all on the program and the attendees had the opportunity to ask questions and interact with the program participants. An overview of CSO technologies was presented, recognizing the cross disciplines of all attendees. This presentation identified CSOs as a major source of pollution and addressed the available collection, control and treatment technologies. The conference program included presentations concerning policies, guidelines, regulations, and enforcement as well as perspectives on the progress to date and future solutions.

ISC maintained an information booth and distributed pertinent publications. ISC Commissioners and staff were available to discuss water quality issues. On display was a working sewer model that served as an educational tool for the public to see how a combined sewer system works. The model was brought to the conference and operated by a representative of the "Towards A Cleaner River" campaign of Edmonton, Canada.

This conference brought together lawmakers, regulators, the regulated community, technical experts, environmental groups, and citizens on a timely theme that is of great importance to this region and is a prime example of the Commission's involvement in public outreach and education.

PUBLIC EDUCATION AND OUTREACH

The Commission remains committed to participating in an active public involvement, education and outreach program. ISC continues to lecture at local schools and colleges on a variety of environmental topics and Commission activities. In addition to the Commission's day-to-day activities, the remainder of this section outlines some of the ISC's involvement in this area.

Law Student Internships

ISC remains a part of the Pro Bono Students America/New York and New Jersey (PBSA/NY & NJ) database which is a program that the Commission has been involved with since 1992. The database includes a network of more than 300 organizations including not-for-profits, government, courts and private firms. PBSA is one of the primary groups organizing the development of pro bono programs. The ISC is also listed with area law school career placement offices through which students seek paid part-time employment. The opportunity to work with PBSA has proven mutually

beneficial to both the ISC and the student participants. This year, recent graduates and placements from law firms sought positions with the Commission. Over the years, the Commission has attracted approximately a dozen students from area law schools. The student participants appreciate the opportunity to apply the skills which they were learning in the classroom, and the experience provides them with a perspective which greatly enhances their understanding of the legal concepts being taught.

Our World Underwater

Our World Underwater is a non-profit corporation focusing on educational opportunities for young people going into various fields of marine science, such as marine biology and oceanography. The Commission has a long involvement with this group, including its Scholarship Society program to support a gifted student for a year to study, experience and interact with a wide range of professionals. Since the Commission began its relationship with Our World Underwater in 1989, all scholarship recipients have enjoyed a "hands-on" experience. Since none of the recipients hosted by ISC have been from this region, their experience is compounded by this being their first visit to the Northeast, as well as by them also being afforded the opportunity to view this urban environment from the water.

Board of Cooperative Educational Services (BOCES)

The Environmental Studies Academy is an educational program for high school juniors and seniors who are interested in pursuing careers in natural or environmental studies. Students participate in learning activities to develop an understanding and appreciation of natural systems. A large facility on the BOCES campus in Valhalla, N.Y., provides hands-on opportunities for high school seniors to work in a greenhouse and operate farm machinery for landscaping and agricultural career motivation. A Commission staff member is involved with the BOCES of Southern Westchester and stresses ISC's regional focus on water quality issues affecting the Hudson River and Long Island Sound. The Commission serves on the advisory committee.

The Coalition to Save Hempstead Harbor is a citizens group that has been conducting water quality monitoring in Hempstead Harbor for approximately five years. A workshop on water quality monitoring was organized under the auspices of BOCES of Nassau County. The intent is for the workshop to create a broader picture of water quality conditions and events in Long Island Sound, promote data sharing through better communication and software links, and establish a network to inform each other of conditions in Long Island Sound during the monitoring season. ISC staff has been involved with this forum over the last three years.

Fresh Kills Landfill Photo Exhibit

A photo exhibit was on display during the March 1997 conference, Fresh Kills Landfill: Closure and Beyond, which was sponsored by the College of Staten Island, with the Commission and the Staten Island Advance as a co-sponsors. The Center for Environmental Science of the

College of Staten Island put together a collection of 45 black and white photographs that were selected from the huge holdings of the Staten Island Advance and the Howard Cleaves Collection, which is part of the archives of the Staten Island Institute of Arts and Science. After leaving the CSI campus, this exhibit was viewed by the public at Borough Hall, Staten Island, and is presently on display at the Commission's office in Manhattan, courtesy of the Center for Environmental Science of the College of Staten Island.

The Fresh Kills Landfill was opened in 1948 on 2,900 acres of what was a tidal wetland. When the landfill was started, there were no environmental laws, regulations or enforcement agencies to oversee the operation. Presently, the Fresh Kills Landfill is the only active landfill in New York City. The photos, taken between 1950 and 1997, document the landfill's growth and operations, as well as press conferences and public meetings. The photographs vividly display the impacts on the surrounding neighborhoods, waterways, residents and indigenous wildlife. The photo retrospective shows the disappearance of recreational opportunities (i.e., fishing and bathing) and the loss of natural habitat which have been replaced by a garbage mound that vies to be the highest point on the eastern seaboard.

III. AIR POLLUTION

GENERAL

The Commission's interstate air pollution program began in 1962. The program has focused on field investigations, applied research, and advocacy of regional viewpoints on environmental issues. Part of this program involves the ISC receiving air pollution complaints. As has been the pattern in the past, almost all of the complaints recorded have come from Staten Island. For the 12-month period ending September 30, 1998, a total of 48 air pollution complaints were received; this represents a decrease of 25% from the previous 12-month period.

This year's distribution of odor complaints differed from previous years in that the odor characterized as "antifreeze" — an odor not previously reported to the ISC — represented the majority of the complaints recorded. The "garbage" odor category was replaced as the number one nuisance for only the fifth time since 1982 (this odor was number 2 in 1986 and 1991).

For the eleventh consecutive year, the Commission participated in the regional Ozone Health Message System that is activated during the summer months. Health advisories were issued within the region, primarily by the New Jersey Department of Environmental Protection. The public is informed of the health advisories through communications from wire services and radio and television stations. ISC also sent the advisories it received to the environmental and health agencies of all member States.

Pollutant values and meteorological conditions did not warrant activation of the High Air Pollution Alert and Warning System in the New Jersey-New York-Connecticut Air Quality Control Region, which ISC has coordinated since 1970.

AIR POLLUTION COMPLAINTS

Staten Island remains as the source of more citizens' complaints than any other area in the Interstate Sanitation District. A great many of the complaints come from the western portion of Staten Island in the vicinity of the New York-New Jersey border and from the neighborhoods closest to the Fresh Kills Landfill. Since 1989, budget cuts necessitated the closure of ISC's Staten Island field office from which Commission staff responded to and conducted field investigations of citizens' complaints — including nights, weekends and holidays. The field office received hundreds of odor complaints annually; peaking in 1986 with nearly 3,500 complaints. The closing of the Staten Island field office still generates expressions of frustration to the Commission by concerned citizens.

The Commission still maintains an answering service (718-761-5677) to receive complaints. The answering service operates 24-hours-a-day, 7-days-a-week and complainants are contacted

during regular office hours. When available, ISC personnel are dispatched to investigate ongoing complaints and, when warranted, Commission personnel are contacted during non-office hours. The ISC also contacts the appropriate enforcement agencies and health departments to perform follow-up.

For the 12-month period ending September 30, 1998, the Commission received a total of 48 complaints; this represents a decrease of 25% from the previous 12 month period. Note that there were 64 complaints in the 1996-1997 period, 86 complaints in the 1995-1996 period, 140 complaints in the 1994-1995 period, and 202 complaints in the 1993-1994 period. This pattern shows a significant yearly decrease in complaints. It should also be observed that the total number of complaints for this 5-year period was dwarfed by the thousands of odor complaints registered between 1982 and 1988. Of the 48 complaints received this year, a total of 46 — or 96% of the complaints — originated from Staten Island. The accompanying tables enumerate the complaints categorized by the community from which they originated and by the type of odor.

Four Staten Island communities were the source of at least three complaints to the Commission during the reporting period. These neighborhoods represented approximately 54.0% of the total complaints received. Livingston, located in northeastern Staten Island on the shore of the Kill Van Kull, reported the most complaints with a total of 16 — representing one-third of all complaints registered. Over the years, the majority of the complaints received by the ISC come from the same group of neighborhoods. A total of two complaints were received from other New York City boroughs and New Jersey.

Odors were classified into nine categories. The "antifreeze" category was reported most frequently, representing over 33% of the total. This is the first time this type of nuisance odor was reported by citizens since the ISC began statistical analysis of odor types in 1983. Citizen complaints are the most frequent source of firsthand information about poor air quality. The odors are usually detected by persons who do not have special knowledge or training in identifying problem emissions; it is their accurate odor descriptions that could lead to the sources of odors.

OZONE HEALTH MESSAGE SYSTEM

For the eleventh consecutive year, the Ozone Health Message System was activated to alert the public of unhealthy levels of ozone in the atmosphere of the Metropolitan Region. The system — developed as a cooperative effort by the Commission and environmental and health representatives from the States of New Jersey, New York and Connecticut, New York City and the US EPA — serves as a central source of precautionary advice on ozone to the Region during the warm weather months (from May to September) when higher concentrations of ozone occur.

DISTRIBUTION OF AIR POLLUTION COMPLAINTS BY COMMUNITY ON STATEN ISLAND FROM OCTOBER 1997 TO SEPTEMBER 1998

COMMUNITY	COMPLAINTS	
	NUMBER	% TOTAL
Livingston	16	33.3
South Beach	4	8.3
Annandale	3	6.2
Arden Heights	3	6.2
Great Kills	2	4.2
Grasmere	2	4.2
Tottenville	2	4.2
Huguenot	2	4.2
Other Staten Island*	12	25.0
Other Non-Staten Island**	2	4.2
TOTAL	48	100.0

* Represents communities from which only one complaint was reported.

** Represents complaints received from other New York City boroughs and New Jersey.

DISTRIBUTION OF AIR POLLUTION COMPLAINTS BY TYPE OF ODOR

FROM STATEN ISLAND COMMUNITIES

FROM OCTOBER 1997 TO SEPTEMBER 1998

TYPE OF ODOR	COMPLAINTS	
	NUMBER	% TOTAL
Antifreeze	16	33.3
Chemical	5	10.3
Garbage	3	6.3
Gas	3	6.3
Burning	1	2.1
Burning Rubber/Plastic	1	2.1
Cat Urine	1	2.1
Raw Sewage	1	2.1
Other*	17	35.4
TOTAL	48	100.0

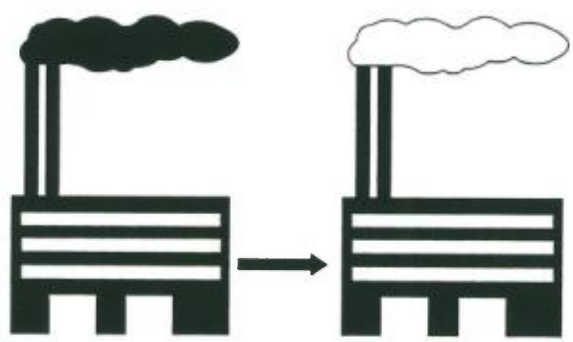
* Represents odors not specifically identified by the complainant.

Ozone irritates the respiratory system and may cause decreased lung function. Adverse effects may include shortness of breath, chest pain, throat and eye irritation, and wheezing. It especially affects the elderly and those with pre-existing lung disease. Healthy adults and children may feel these effects during high ozone days. Whenever ozone reaches unhealthy levels, the public is advised against strenuous outdoor activities and physical exertion such as jogging, ball playing, and running.

During 1998, the Commission continued to participate in this program, although still at a reduced level due to budgetary constraints. ISC took an active role in alerting the public to unhealthful conditions. During the warm weather months, when elevated levels of ozone existed in parts of the Metropolitan Area, the ISC relayed "health advisory" messages to the appropriate government environmental and health agencies. The ISC received 20 ozone advisories from the New Jersey Department of Environmental Protection between May 18th and September 15th. Individual states issue their own health messages which identify specific counties where ozone levels are a special health threat. During 1998, it was not necessary for ISC to issue a region-wide Ozone Health Message.

REGIONAL AIR POLLUTION WARNING SYSTEM

The Interstate Sanitation Commission is the coordinator of the New Jersey-New York-Connecticut Air Quality Control Region's High Air Pollution Alert and Warning System. Based on high pollutant concentrations or stagnation advisory reports, the Commission may activate this system. The pollutant levels and stagnation advisory reports did not warrant activation of the system during this past year.



IV. LEGAL ACTIVITIES

The Counsel to the Commission maintains many functions, one of which is that of ensuring compliance with those responsibilities granted to the Commission. In some but, notably, fewer than might be anticipated, compelling compliance could necessitate the commencement of an administrative proceeding or case or controversy. In significantly more instances, the Commission's regulatory authority is recognized through advice to affected communities and negotiation. It warrants mention that some of Counsel's work falls into a less visible, but not less significant arena — that of enforcing Commission policy in water and air pollution abatement as part of general housekeeping. An example of this type of work is the Commission's activity, albeit behind the scenes, to provide background and history to any groups seeking information, particularly community groups involved with the process of siting for garbage disposal in the anticipated wake of the closure of the Fresh Kills Landfill at the end of the year 2001. The Commission is engaged in developing a position paper on solid waste alternatives in light of the imminent closure of the landfill. The bulk of this report on activities, however, is devoted only to those items of major interest — either as recurring themes or due to some unique issues during the year that deserve special note.

For a significant portion of 1998, the Commission's attention was devoted to substantiating the significant gains fought for and achieved in preceding years. Aided by the New Jersey Attorney General's Office and the Township of Woodbridge, the ISC continued to work toward the implementation of broad directives that will assist in ensuring that the waters in and around the New York-New Jersey Harbor will be protected from floatable debris emanating from the Fresh Kills Landfill.

Discussions and negotiations with the NYS DEC and NYC DEP achieved a much-desired settlement of the administrative matter involving the New York City sewage treatment plants.

Efforts to add secondary treatment to wastewater systems for certain municipalities that lacked them has ultimately proved successful. The Consent Decrees entered into with Hudson County, New Jersey, municipalities — Hoboken, Jersey City, Bayonne, and the Township of North Bergen — have been terminated.

The ISC continues to be diligent in insisting that the Commission's Water Quality Regulations are properly included in discharge permits throughout the Interstate Sanitation District. This has become the subject of some concern for a discharge permit issued in New Jersey to a publicly-owned sewage treatment plant. In this case, the Commission's request for an Adjudicatory Hearing was granted.

The Commission continued its participation in a clearinghouse to attract area law students who are interested in environmental affairs to work as legal interns, gaining course credit and/or

valuable experience in the process. This program has proven successful in that the interns gain valuable experience and the Commission gets assistance for its legal counsel.

LITIGATION AGAINST NEW YORK CITY'S OPERATION OF THE FRESH KILLS LANDFILL

At the end of 1997, the Court had relieved the City of its obligation to build a single-barge enclosed unloader contingent, upon the City's implementing certain measures. The failure to implement those measures could result in an immediate return to Court and a judgement that the City begin construction on the single-barge enclosed unloader immediately. In any event, the long-term solution could be revisited on an annual basis.

Since the entry of the Federal Court Order in September 1997, the parties have not returned to court, however, there has been constant action to tackle the dictates of the Order with mixed success. For example, the Order called for the implementation of certain measures within a 30-day period, and further called for an annual reporting to the Court. Only two of the measures ordered were implemented immediately — an increased presence of the water quality monitors and a procedure for the immediate reporting of deficiencies at the landfill. The other measures took longer to implement. In lieu of placing monies earmarked for alternative measures in an escrow fund, the City set aside the monies in the Capital budget and represented that monies would be available for projects associated with the Order. The Judge ordered that the perimeter fence be extended in the water so as to provide an additional barrier against debris leaving the landfill. The City has projected a May 1999 date for the completion of the perimeter fence. According to the City, this time is required for design, permitting and construction. With regard to the disposition of a fence repair contract, the City relied upon an existing fence repair arrangement and in mid-May submitted a proposal to the Comptroller for registration. The requirements contract for fence repair is to be awarded in March of 1999.

Perhaps the most significant aspect of the September 18, 1997, Order was the directive to hire an independent expert to report to all parties, and to hire a plaintiffs' representative on an interim monitoring team. The plaintiffs immediately made a staff member from the Commission available to act temporarily as the plaintiffs' representative on the interim monitoring team and monitoring commenced in December 1997. Although the plaintiffs identified a consultant as the permanent representative in April 1998, the City, as the entity required to pay for the consultant, sought approval of certain parameters. The City's approval was not final until July. Although the parties met in January 1998 with a consultant who was ultimately hired in July 1998, the City had arranged for the initial meeting with a group within the same firm who had no expertise in solid waste management and had insisted upon an approval of a scope of work prior to the parties entering into a binding contract. By the year's end, it is expected that the independent expert and the plaintiffs'

representative on the interim monitoring team will be well on their way to an established schedule for monitoring and a reporting protocol that will include recommendations. Some recommendations have already been aired although not presented formally.

The plaintiffs transmitted a progress report to the Judge in July 1998. The City countered with their assessment of progress in a report of late August 1998. Following sampling, certain studies, and a further evaluation, the expert is poised to report to the Court during the first quarter of 1999.

The City continues to do timely reports on closure. However, the City's plan as it now stands has run afoul of opposition from concerned citizens in Brooklyn, where a temporary restraining order has prevented the City from utilizing the contractor it had signed with to remove 2,400 tons-a-day of garbage from Brooklyn. Garbage from the Bronx has been diverted from the landfill and transported out of state since July 1997.

The City has decided to use marine transfer stations as its approach for a long-term waste export system. Evaluation of proposals for the use of MTSs is currently underway and selected vendors were to be announced in the fall of 1998. Because this alternative entails a long development timetable (36 months from when the vendors are selected), the City is pursuing a transitional export program. Accordingly, the City has solicited bids for short-term contracts (the transitional export program) for the export of garbage from the Boroughs of Brooklyn and Queens. The City expected to award contracts to transport waste from existing private land-based transfer stations (which are subject to fewer restrictions than public stations) located in Brooklyn and Queens, but not in Manhattan, by October 1998. There is significant community opposition, particularly in Brooklyn, given the deplorable condition of many unregulated private land-based transfer stations. This so-called transitional program will entail the use of truck-to-truck and truck-to-rail transfer facilities located throughout many communities, with the attendant traffic, air pollution and garbage spillage problems. A major land-based facility contemplated for Brooklyn is the subject of a much contested restraining order issued against the City being heard in December in State Supreme Court.

The enclosed barge unloader had been selected by the City and agreed upon among all the parties as the permanent solution for keeping floatable debris from entering the waterways in and around the landfill. When the City sought relief from building the enclosed unloader subsequent to the 1996 passage of laws mandating that no garbage be brought to the landfill for disposal after the end of 2001, the Commission was willing to consider appropriate alternative solutions that offer the same safeguards as those originally stated by the City for the enclosed barge unloader. The Commission is committed to ensuring that floatable debris is prevented from entering the waterways around the landfill. The background that leads up to the most recent events is presented below.

This suit (Township of Woodbridge v. City of New York, Civil No. 79-1060) relates to the waterborne debris that enters the District's waters as a result of the garbage unloading operations at the Fresh Kills Landfill. Located on the Arthur Kill shoreline in the western portion of Staten Island,

New York, the majority of New York City's municipal solid waste is transported to the Fresh Kills Landfill by barge.

In 1986, the ISC intervened in an action in New Jersey Federal District Court which was initiated in 1979 by the Township of Woodbridge, New Jersey. Approximately 13 Court Orders were issued in the intervening years prior to ISC's cross-motion for contempt in September 1987. After investigations were conducted by Commission field inspectors, it was determined that, in spite of the Orders issued and the steps taken by the City, the problem of debris from the landfill operations entering adjacent waterways persisted in contravention of the ISC's Water Quality Regulations. ISC sought and succeeded in obtaining a Contempt Citation.

In order to find a solution to the Region's waterborne garbage problems, the parties to the suit entered into a Consent Order. That Consent Order required the City of New York to implement water cleanliness procedures; the installation of interim remedial equipment, including the superboom; and the hiring of an independent monitor. The Order also provided for an Independent Consultant to evaluate the effectiveness of the interim equipment and procedures, and recommendations for alternative long-term measures by January 1, 1990. Reports issued by the Independent Consultant in 1990 recommended containerization and a single-barge enclosed unloading system as alternatives. The City concluded that of the final alternatives reviewed, the single-barge enclosed unloading facility presented the most effective and practical method to comply with the Consent Decree and proposed to implement it. The ISC submitted a revised Consent Decree to the parties in January 1991.

During 1992, the Commission's request for assurances that there are monies set aside and dedicated solely to the design and construction of the single-barge enclosed unloading system were met. With only a minor adjustment in compliance dates, a draft Consent Decree was accepted by the parties in the spring of 1993. A final Consent Decree was filed in the United States District Court on June 15, 1993, and a fully executed copy was received by the Commission on June 28, 1993. Although the City was seemingly compliant after the 1993 revised Consent Decree was entered, 1995 saw the disbursement of technical assistance funds held by the Court. Litigation resumed during 1996 when Woodbridge initiated an action seeking relief from medical waste washing up on its shores. Ultimately, a monitor determined that while debris, including medical waste, escaped from the landfill, evidence was insufficient to establish the landfill as the sole source. During 1996, the City let it be known that following the passage of laws mandating closure of the landfill by the year 2001, they were considering filing a motion to be relieved of their obligation to build an enclosed barge unloader. The foregoing details the aftermath of the City's filing.

NEW YORK CITY SEWAGE TREATMENT PLANT PERMIT HEARINGS

The three remaining issues —whole effluent toxicity, flow measurement and plant capacity — from eight that were originally certified by administrative decision, all are now resolved.

Background

In late April 1998 the Deputy Commissioner for Water Quality and Environmental Remediation for the NYS DEC issued the Final Decision in a series that was preceded by five Interim Decisions by the NYS DEC Commissioner. This Final Decision was delegated to the Deputy Commissioner for Water Quality and Environmental Remediation instead of the Commissioner of NYS DEC, since the Commissioner served as NYS DEC's General Counsel at times when the hearings in this matter took place.

During the administrative proceeding, the City's SPDES permits were modified as follows. The Second Interim Decision (1991) incorporated new conditions, including ISC's regulations, and modified others as part of a settlement of the issues related to numeric toxic limits and industrial pretreatment requirements. The Fourth Interim Decision (1994) incorporated conditions for controlling nitrogen loading. The Fifth Interim Decision (1996) determined that the proposed March 1996 Modification to the June 1992 Consent Order resolved all issues related to untreated discharges for combined sewer outfalls. The permits were administratively renewed without prejudice to the ongoing proceedings and are now due for review and modification.

The Final Decision dealt with three remaining issues designated in the Issues Rulings of the ALJ — flow measurement, plant capacity and whole effluent toxicity. The ALJ had concluded that a substantive and significant factual disagreement had surfaced with respect to an aspect of flow measurement. Specifically, this issue dealt with the method being used by the City to calculate dry weather flows. The ALJ also directed that permit conditions be added so that the City would be required to install double flow monitoring systems at all plants.

The Deputy Commissioner denied ISC's appeal and granted the Riverkeeper's appeal indicating that a hearing would ensue only if the parties could not reach an agreement. The Commission appealed the flow measurement and plant capacity issue and the Hudson Riverkeeper appealed the whole effluent toxicity issue.

The Deputy Commissioner analyzed the issues as follows:

Total flow vs. Dry Weather Flow: Effluent limits are based upon design flow. Whether to place any flow limits in the permits is left up to the states, as there is no federal regulation requiring flow limits in SPDES permits. The concept of dry weather flow was developed to accomplish wet weather flow maximization without penalizing the City for exceeding the flow limits based on average design flow in the permits, when the sole cause of exceedance is enhanced wet weather capture. The City uses a statistical approach to record flows during wet weather conditions. If hourly flows exceed a boundary of two standard deviations above the average flow for that hour based on long-term measured dry weather flows, the average dry weather flow for that hour is used to calculate the 30-day average flow required by the permit. When the storm event ends, at the hour at which the actual flow dips below the two standard deviations line, the actual flow is again used for reporting purposes. For purposes of determining whether permit-mandated moratoria on new

service connections are to be imposed, a moving annual average dry weather flow criterion is used. The Deputy Commissioner ruled that ISC's position was not consistent with NYS DEC or EPA combined sewer overflow policies, a position that ISC takes exception to.

Design Criteria: ISC argued that the Ten States Standards should apply to the City. NYS DEC advised the City in August 1995 that for all future upgrading, no approvals would be granted unless the primary settling tanks that are designated to be used to handle wet weather CSO flows are designed to meet the Ten States Standards. The ISC views that as a fair compromise.

Flow Verification: The City has agreed to provide two independent means for measuring flow at almost all plants. This requirement will be memorialized in the permit modification process. This is again a fair compromise, however, it does not require the City to have an outside independent expert to do initial calibration and periodic recalibration/verification — an issue raised by ISC, State legislators and community groups.

Capacity Assurance: The Deputy Commissioner judged that the City's I/I program, which imposes certain requirements whenever dry weather flows exceed 95% of capacity, is adequate.

Pump-Back: The City has submitted plans to NYS DEC to recommend the construction of up to nine off-line storm water storage/treatment facilities. The ruling stated that the permits need not address pump-back of stored water, and should not until the facilities are completed.

Flow maximization: The Deputy Commissioner dismissed ISC's concerns about treatment degradation during wet weather stating that some small degree of degradation is acceptable, as long as there is no waiver of effluent concentration limits in the permits. He again noted that ISC's position was contra to NYS DEC's and EPA Guidance, a position that ISC cannot agree with.

Whole Effluent Toxicity: The Deputy Commissioner found that the record was not clear as to the practicality of using ambient river water in lieu of synthetic dilution water. He directed that this matter be clarified.

On May 15th, the ISC participated in a conference with the parties and the ALJ who wished to be updated on the issues. The Riverkeeper and other parties concluded that the only remaining issues were the ability of the City to implement the scheduling for the contracts, as the test procedure would represent a change order. As the cost and scope of the contract for sampling is changing, the issues of speed and method of implementation remain areas of legitimate inquiry. In addition, the parties had to agree on how to incorporate this into the permit. ISC also participated in a follow-up conference.

Careful consideration was given by ISC to appealing the Deputy Commissioner's ruling. In the aftermath of the initial favorable ruling by the New York State Supreme Court, and following the certification of certain issues by the ALJ, the permits are now substantially stronger in all areas. Moreover, the ISC received favorable rulings on issues that were the focus of ISC's concentration.

It is questionable that ISC could have met the arbitrary and capricious standard for a successful appeal. In addition, had the ISC been successful in meeting the legal standard, any additional gains that might be realized would have been minimal as compared to the gains already achieved.

Nitrogen Limits

On March 12, 1998, the Soundkeeper and others filed an action against the City in the Eastern District of Federal Court, which is in Brooklyn, NY. They selected that venue because most of the plants alleged to have been in violation are located in that federal district. Later that same day, the State, represented by the NYS DEC, filed an action against the City in state court. These filings followed the filing of a 60-day Notice of Intent under the federal Clean Water Act against the State and EPA on behalf of the Long Island Soundkeeper, Inc.; the Riverkeeper, Inc.; John Cronin, the Hudson Riverkeeper; the American Littoral Society; Andrew Wilner, the Baykeeper; and other private citizens, alleging that for every month since January 1996, when nitrogen limits were imposed (using aggregates), the City has consistently been in violation of those limits. The 60-day notice and the federal and state complaints allege that these violations of the nitrogen loading limits contribute to the severe hypoxic conditions in Long Island Sound and Jamaica Bay, causing damage to those ecosystems. The proximate location of these plants, which discharge pollutants into the East River and the Jamaica Bay in violation of the permitted effluent limit of the SPDES permits, and the likely impact of the East River plants on Long Island Sound account for the concern on the part of the State of Connecticut.

There are currently two cases pending that have to do with the City's failure to meet certain nitrogen limits, one is in federal court and the other is in state court. The federal court action is a citizens' suit in which the State of Connecticut has joined. On or about March 23rd, the State of Connecticut moved to intervene in the case; their motion was granted. The state court action was filed by NYS DEC against the City. The City's preference is for the state case to go forward first.

On July 21st, a federal court judge heard oral argument on the City's motion to stay the federal court case. The City reasoned that since that state had acted expeditiously, there was no need for citizens to be concerned. The judge questioned the City's approach given the stated statutory right of citizens to question environmental violations under the Clean Water Act. The judge also expressed concern about any rights the State of Connecticut might have to intervene in a state court action. He further raised questions about the differences in penalty schedules in federal and state court and the lack of provision for attorneys' fees in state court. Ultimately, he opined about the possibility of granting a qualified stay, which would enable the parties to go forward in the state case, albeit without Connecticut. Such a decision would allow the federal case to remain on hold without any prejudice to the rights of any of the parties to revisit the federal case and to proceed as though nothing had occurred, assuming the outcome in the state case was not to anyone's liking. In a Ruling in late November, the federal court judge denied the City's motion for dismissal or for a stay of the federal court case; hence the federal court case will go forward.

The Commission is not participating as a party in these cases. NYS DEC was supportive of an amicus curiae filing in the state case.

The details of ISC's administrative appeal are noted above. Some additional history of the proceeding is also detailed below.

The ISC initiated a suit in State Supreme Court in Queens County, New York, in November 1988 (ISC v. Jorling), over the NYS DEC - Region 2's failure to hold a hearing prior to issuing SPDES permits for wastewater discharges from 14 sewage treatment plants operated by the New York City Department of Environmental Protection. In a Judgment issued in April 1989, the Court held that the NYS DEC had acted arbitrarily and capriciously in not holding a hearing and ordered that an adjudicatory hearing be held. The administrative proceeding on the City's SPDES permits was the hearing resulting from that Judgment. The petitioners in the state court case became interveners in the permit proceeding. The parties involved were the ISC and co-petitioners Natural Resources Defense Council (NRDC), Hudson River Fishermen's Association (HRFA), Sierra Club and the Environmental Defense Fund (EDF), as well as the NYS DEC and the NYC DEP.

A decision by the NYS DEC Commissioner in April 1994 approved the nitrogen permit conditions for incorporation into the SPDES permits and ordered that certain conditions take effect immediately. The permit conditions set aggregate effluent limits for nitrogen discharges for two groups of four plants discharging into the upper reach of the East River and into Jamaica Bay, respectively. Before these limits were to take effect in 1996 and 1997, the City was required to make operational and process changes to maximize nitrogen removal in the existing plant units, and also conduct extensive pilot work to test new processes and technologies. The City and NYS DEC were then to jointly determine the most appropriate new systems to implement in order to meet specified nitrogen reduction goals.

All 14 of the City treatment plants are included in the permits with the exception of North River because this facility is the subject of a federal lawsuit in which capacity, among other things, is at issue.

At those plants outside of the East River and Jamaica Bay, there will be monthly data collection programs initiated. The monthly sampling sites will include influent, primary effluent, final effluent and side streams. In the long-term, the Nitrogen Control Feasibility Plan will comprehensively analyze additional methods to meet much greater levels of nitrogen reduction for future discharges.

ENFORCEMENT PROCEEDING AGAINST NORTH RIVER WATER POLLUTION CONTROL PLANT

The City has indeed made a movement toward addressing the concerns of many about the precipitous 24 MGD drop in flow that occurred at the North River WPCP in April 1994. They have

made progress as well with questions that have been raised about the flow metering system. When the Commission became aware of the drop in 1995, it met with the City and the City agreed to share several reports of independent consultants mandated by Court Orders. Some have been received, and the ISC is awaiting others. The City has also made its Quarterly Conservation Reports available. It has been acknowledged that many of the conservation measures adopted were not in place at the time of the 24 MGD drop. NYS DEC continues to reassess its position on independent calibration. Despite the City's efforts, deep concerns still persist that the only way to ensure some indicia of reliability is through calibration by an independent outside entity.

A Coalition of groups on the west side of Manhattan — concerned about prospective development and who had brought an action against the City in federal Court (the particulars are explored herein) — commissioned a consultant to conduct an examination of the plant flow. The ISC agreed to assist the Coalition in examining any patterns to ascertain whether or not this drop was indeed a phenomenon. The actual drop in flow had occurred in the spring of 1994, but was brought to light in 1995. US EPA and NYS DEC investigated the occurrence and ISC prepared a report of the Commission's findings which was shared with NYS DEC.

The Coalition for a Livable West Side, joined by Soundwatch, Inc.; New York City Environmental Quality, Inc.; Citizens United Against Riverwalk, Inc.; and Union Square Community Coalition, Inc., filed a complaint in federal Court on December 15, 1992, against the City of New York. The Commission provided technical expertise and assistance. This action followed the NYS DEC Commissioner's decision denying ISC and the other plaintiffs party status in NYS DEC's enforcement action regarding permit violations at the City's North River water pollution control plant. The plaintiffs sought an injunction against additional hook-ups to both the North River and Wards Island treatment plant service areas until the quantity of sewage to those plants is reduced to an amount less than that stated in the SPDES permits, or until additional plant capacity is attained through construction. North River's permitted dry weather flow limit of 170 MGD had been exceeded for several months through January 1992. Similarly, the flow at Wards Island exceeded its limit of 250 MGD. The complainants argued that dry weather flow limits are effluent standards within the meaning of the Clean Water Act and must be enforced by the federal Court.

Lending further support to the importance of the operation at the North River WPCP in September 1996, the United States Justice Department filed an amicus brief on behalf of a Coalition of groups. The United States adopted a position that the ISC has held for some time now — *if flow to a plant is increased beyond maximum capacity, the result will be less than optimal pollutant removal and potential violation of permit-mandated removal standards. Continued flow at levels above the flow limit could impair pollutant removal efficiency* . . . The City had argued that the federal Court had no jurisdiction since flow was not a permitted parameter.

In making a motion for summary judgement, the City acknowledged that it exceeded the flow limitations set forth in the SPDES permits. They argued that the flow limits may not be enforced under Section 505 of the Clean Water Act (CWA) because they are not required by the CWA or its

implementing regulations. The plaintiffs cross-moved for summary judgement, requesting that the Court enjoin the City from permitting additional hook-ups of sewage service for North River and Wards Island until the plants have adequate capacity to treat the additional sewage without violating the flow limits. The Court denied both motions.

When the plaintiffs brought a citizen suit in 1992, they were seeking to enjoin the City from having any additional hook-ups that would deliver flow to either Wards Island or to North River, and they sought the appointment of a expert to monitor operations at these plants.

The Court found that the plaintiffs properly brought the action as a citizen suit under the CWA. The Court, having found this, did not consider the question of whether flow limits are effluent limitations under the CWA. The Court, more importantly, denied permanent injunctive relief to the plaintiffs from hook-ups, noting that the plaintiffs could not demonstrate a threat to the integrity of the waters surrounding the Wards Island or North River plants, nor could the plaintiffs demonstrate irreparable harm. The Court cited material that the City provided showing that the dry weather flows had been in compliance with the permit authorizations. Without more explanation than that, the Court found that there was no record to support the appointment of a special master and the Court denied such an appointment.

The only remaining issue is that of whether attorneys' fees should be awarded. It remains undecided.

ADJUDICATORY HEARING CONCERNING THE DELETION OF ISC'S REGULATIONS FROM THE PASSAIC VALLEY SEWERAGE COMMISSIONERS' DISCHARGE PERMIT

During the middle of 1996, the Commission filed a Notice of Intent to Request an Adjudicatory Hearing with the NJ DEP. The ISC is contesting the deletion of ISC's Regulations from the discharge permit issued for the treatment plant of the Passaic Valley Sewerage Commissioners (PVSC). Since the early 1980s, when NJ DEP specifically insisted that the Commission's regulations be included in the permit, they have always been part of the PVSC permits. The draft permit contained references to the ISC Water Quality Regulations and included them under "Special Conditions". The June 27, 1996, final permit issued to PVSC deleted any reference to provisions of the ISC, citing Article XII of the ISC's "Tristate Compact for Pollution Abatement" as authority for the removal of the Commission's Regulations. The final permit contained adjustments made to accommodate comments made by consultants for PVSC during the draft permit process. All ISC parameters were removed as were references to ISC in four other sections.

The language of that Article which deals with controlling future pollution, abating existing pollution, and working in cooperation with the states, is not meant to be read alone. The applicable language reads, as follows:

The provisions of this act shall not affect the discharge from the outfall pipes of the Passaic Valley sewerage system into the water of New York harbor; provided, however, that said discharge shall be in accordance with the terms and provisions of the stipulation entered into on April fourteenth, one thousand nine hundred and ten, between the United States of America and Passaic Valley Sewerage Commissioners.

The ISC Article is meant to be read in conjunction with the Stipulation. The Stipulation does not in any manner whatsoever suggest that PVSC does not come under the jurisdiction of the ISC, nor does it suggest that PVSC is not subject to ISC's Regulations.

In 1903, PVSC recommended to the legislature an intercepting sewer along the west bank of the Passaic River from the Great Falls at Paterson to a pumping station on the Newark meadows, the sewage to be pumped through a steel main under Newark Bay into a main sewer across Bayonne to an outfall in New York Bay near Robbins Reef Light. Following a thorough investigation in 1905 and 1906, the New York Bay Pollution Commission reported upon this adversely. When the report suggesting the discharge of the sewage from this large and rapidly growing district into New York Bay was made public, there was criticism concerning the discharge of the sewage in its raw form into the harbor. PVSC applied to the War Department for permission to construct the outlet sewer into the harbor. New York State sought an injunction to prevent the discharge of the Passaic Valley sewage into the harbor. The United States Government intervened in the suit as co-plaintiff. The War Department granted PVSC permission to discharge sewage into the harbor providing certain terms were met to protect fish life. That agreement did not terminate the suit between the State of New York and PVSC.

In fact, the United States government took the position that they were not essentially interested in the pollution of the waters as affecting health conditions surrounding the City of New York. Its interest in the matter concerned the health of the troops and government employees. The interest of the City of New York in the effects of harbor pollution were and remain vastly greater than those of the United States Government.

ISC made it clear to NJ DEP that there would not be a need to proceed with an adjudicatory hearing if the Commission's Regulations were reinserted into the permit.

On March 31, 1997, the Commission received an administrative decision regarding the hearing request made during the late summer at which time ISC had asked that its regulations be reinserted into the PVSC permit. After analyzing all of the background and information provided to the NJ DEP, the NJ DEP Commissioner decided to grant ISC's hearing request.

During recent communications with NJ DEP, the Commission became aware that NJ DEP mistakenly believed that the case was being negotiated toward settlement and, accordingly, had not assigned an attorney. Having become aware of the misunderstanding, NJ DEP is in the process of

assigning an attorney in advance of the case being sent to the Office of Administrative Law, where it will be assigned to a judge.

NOTICE OF VIOLATION OF INTERSTATE SANITATION COMMISSION REGULATION ON PLANNED SEWAGE BYPASSES

During late October 1998, the Commission learned for the first time that the Jones Beach Water Pollution Control Plant (Jones Beach) had scheduled a treatment reduction for the winter of 1998-1999. The Commission immediately contacted NYS DEC in order to ascertain whether Jones Beach's proposed action would be compliant with their SPDES permit. NYS DEC informed the Commission that NYS DEC was aware of the proposed action and that NYS DEC had advised Jones Beach to inform both the Commission and US EPA of the proposed treatment reduction.

In early November 1998, ISC notified Jones Beach that their failure to advise ISC of a scheduled treatment reduction constituted a violation of ISC regulations. Jones Beach was further advised that ISC records established that Jones Beach had been notified of the recent amendments to the Commission's regulations by Memorandum of October 31, 1997. A copy of the new regulation was included in the package transmitted to all treatment facilities within the Interstate Sanitation District. In fact, the ISC bypass notification regulation had been adopted on October 15, 1997, and all dischargers into Interstate Sanitation District waters are required to comply with ISC's Water Quality Regulations.

Jones Beach contacted ISC and a meeting took place in early December that was attended by the permittee, ISC, NYS DEC, and the permittee's contractors; the process of evaluating alternatives is under way.

ADMINISTRATIVE CONSENT ORDER ENTERED ON BEHALF OF MONMOUTH COUNTY BAYSHORE OUTFALL AUTHORITY

The Monmouth County Bay Shore Outfall Authority (MCBOA) has an ocean outfall that discharges to the Atlantic Ocean south of Sandy Hook, and that discharge is outside of ISC's District. However, MCBOA has been having problems over the past several years and has had to bypass treated effluent into the Raritan and Sandy Hook Bays. While the effluent is of a very high quality, the shellfish areas are automatically closed by the State of New Jersey because shellfish harvesting is not allowed within a certain distance of any discharge.

In late October 1998, the Commission was notified by NJ DEP that an Administrative Order and Civil Penalty Assessment had been settled by the entry of an Administrative Order on Consent (ACO) against the Monmouth County Bayshore Outfall Authority. MCBOA's discharge pipeline and pump station problems had resulted in numerous unpermitted discharges of secondary effluent to Raritan and Sandy Hook Bays. Raritan and Sandy Hook Bays are part of the ISC's District and

ISC was properly notified by NJ DEP. ISC actively took part in discussions among MCBOA, NJ DEP, and US EPA to determine whether the discharges to the bays during construction were necessary and, if so, whether the length of time for those discharges could be shortened.

As part of the ACO, MCBOA is being required to 1) construct and maintain pipeline and pump stations according to a set schedule so as to eliminate unpermitted discharges; 2) submit progress reports; and 3) pay fines and stipulated penalties. The work is being scheduled to take place in January 1999. The work is being done in January because that is the time when the baymen least go out to gather the resource in the bay. MCBOA is getting a contractor on board and the contractor will have everything staged and ready prior to the start of the job. They've been given a one-month window from start to finish, and there will be stipulated penalties if that schedule is not met.

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE SANITATION DISTRICT WATERS

1998

PLANT	ISC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREAT-MENT	SLUDGE (1) GENERATED TONS/YEAR	SLUDGE PERCENT SOLIDS	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
CONNECTICUT									
Fairfield County									
Bridgeport - East Side	B-1	1994+	8.6	10.0	Secondary (AS)	35,000	4 to 6	Incineration (2)	44,000
- West Side	B-1	1996+	24.1	30.0	Secondary (AS)	90,000	4 to 6	Incineration (2)	112,000
Fairfield	A	1982+	9.2	9.0	Secondary (AS)	5,000	20	Compost/Landfill	45,000
Greenwich (Grass Island)	A	1994+	9.6	12.5	Secondary (AS)	6,200	14	Compost/Landfill	35,000
Norwalk	B-1	1980+	16.25	15.0	Secondary (AS)	60,000	5	Incineration (2)	80,000
Stamford	B-1	1991+	19.9	20.0	Secondary (AS)	14 (4)	25	Landfill	100,000
Stratford	A	1992+	7.8	11.5	Secondary (AS)	32,333	6.5	Landfill	50,000
Westport	A	1975+	1.9	2.85	Secondary (AS)	456	3 to 4	Incineration (2)	14,800
New Haven County									
Milford - Beaver Brook	A	1996+	1.9	3.1	Secondary (AS)	505	14.8	Incineration (2)	19,000
- Housatonic	A	1996+	6.8	8.0	Secondary (AS)	2,482	17	Incineration (2)	22,500
New Haven - East Shore	B-1	1997+	36.7	40.0	Secondary (AS)	34,158	21.2	Incineration (2)	215,000
West Haven	B-1	1996+	8.0	12.5	Secondary (AS)	8,700	27	Incineration	55,000
NEW JERSEY									
Bergen County									
Edgewater	B-1	1989+	3.4	6.0	Secondary (PO)	3,526	17.3	Beneficial Reuse (2)	16,000
Essex County									
Passaic Valley Sewerage Commissioners	B-1	1988+	286.3	330.0	Secondary (AS)	79,000	55	Land Applications	1,300,000
Hudson County									
North Bergen M.U.A. - Woodcliff	B-1	1991+	2.9	2.9	Secondary (TF)	6,032	8.54	Incineration (2)	22,300
North Hudson Sewerage Authority									
- Adams Street (Hoboken)	B-1	1994+	11.8	24.0	Secondary (TF)	5,800	23	Beneficial Reuse (2)	67,000
- River Road (West New York)	B-1	1992+	6.8	10.0	Secondary (TF)	500	8	Beneficial Reuse (2)	56,000
Middlesex County									
Middlesex County Utilities Authority	A	1994+	126.8	147.0	Secondary (PO)	200,000	25	Beneficial Reuses	752,000
Union County									
Joint Meeting of Essex & Union Counties	B-2	1991+	67.5	85.0	Secondary (AS)	31,900	31.2	Landfill & Land Applications	500,000
Linden Roselle Sewerage Authority	B-2	1989+	13.9	17.0	Secondary (AS)	42,000	5	Compost	70,000
Rahway Valley Sewerage Authority	B-2	1991+	30.8	40.0	Secondary (AS)	-	-	Landfill	175,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE SANITATION DISTRICT WATERS

1998

PLANT	ISC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREAT-MENT	SLUDGE (1) GENERATED TONS/YEAR	SLUDGE PERCENT SOLIDS	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
NEW YORK									
Nassau County									
Bay Park	A	1992+	54.1	70.0	Secondary (AS)	44,249	19.23	Landfill	498,000
Belgrave Sewer District	A	1995+	1.4	2.0	Secondary (TF)	2,465	3.55	Trucked to Bay Park	12,000
Cedar Creek	A	1997+	50.7	72.0	Secondary (AS)	40,253	18.91	Compost	504,000
Cedarhurst	A	1968+	0.9	1.0	Secondary (TF)	-	-	Compost	6,000
Glen Cove	A	1981+	4.5	8.0	Secondary (AS)	4,242	21	Landfill	29,000
Great Neck Sewer District	A	1990+	2.6	3.8	Secondary (TF)	155 (4)	23	Landfill	13,400
Great Neck Village	A	1995+	0.9	1.5	Secondary (TF)	61 (5)	4	Landfill	9,000
Inwood	A	1989+	0.9	2.5	Secondary (TF)	404	5.88	Landfill	7,600
Jones Beach	A	1990+	0.1	2.5	Secondary (TF)	-	-	Trucked Out	Seasonal
Lawrence	A	1983+	1.4	1.5	Secondary (TF)	22 (4)	-	Compost	6,200
Long Beach	A	1994+	6.7	7.5	Secondary (TF)	454 (4)	26	Landfill	37,500
Oyster Bay Sewer District	A	1992+	1.2	1.8	Secondary (TF)	35 (5)	4	Trucked Out	8,500
Port Washington Sewer District	A	1991+	3.3	4.0	Secondary (TF)	553 (4)	32	Incineration	33,000
West Long Beach Sewer District	A	1986+	0.57	1.5	Secondary (TF)	780	5	Trucked to Bay Park	5,000
New York City									
Bronx County									
Hunts Point	B-1	1977+	131.2	200.0	Secondary (AS)	112,795	27	Land Application/Landfill Cover	629,927
Kings County (Brooklyn)									
Coney Island	A	1994+	104.0	100.0	Secondary (AS)	(3)		Land Application/Landfill Cover	602,097
Newtown Creek	B-1	1967+	237.1	310.0	Secondary (AS)	(3)		Land Application/Landfill Cover	1,039,294
Owls Head	B-1	1996+	116.0	120.0	Secondary (AS)	(3)		Land Application	761,479
Red Hook	B-1	1987	36.7	60.0	Secondary (AS)	6,926	27	Landfill	192,215
26th Ward	A	1975+	67.7	85.0	Secondary (AS)	87,132	27	Land Application/Landfill Cover	271,240
New York County (Manhattan)									
North River	B-1	1986	140.7	170.0	Secondary (AS)	(3)		Land Application/Landfill Cover	584,192
Wards Island	B-1	1979+	222.8	250.0	Secondary (AS)	112,944	27	Land Application	1,004,213
Queens County									
Bowery Bay	B-1	1978+	122.8	150.0	Secondary (AS)	40,750	27	Land Application/Landfill Cover	727,117
Jamaica	A	1978+	85.3	100.0	Secondary (AS)	28,414	27	Land Application/Landfill Cover	632,148
Rockaway	A	1978+	19.9	45.0	Secondary (AS)	(3)		Land Application	94,471
Tallman Island	B-1	1979+	59.1	80.0	Secondary (AS)	21,569	27	Land Application/Landfill Cover	388,214

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE SANITATION DISTRICT WATERS

1998

PLANT	ISC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREAT-MENT	SLUDGE (1) GENERATED TONS/YEAR	SLUDGE PERCENT SOLIDS	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
NEW YORK (con't)									
Richmond County (Staten Island)									
Atlantic Village*	A	1985	-	0.075	Secondary (AS)				-
Elmwood Park Condominiums*	B-1	1974	-	2.0	Primary				20,000
IS-7	A	1964	0.005	0.021	Secondary (AS)				1,000
Mount Loretto Home-Plants #1 & #2*	A	1962	0.041	0.041	Septic Tank				1,000
Oakwood Beach	A	1979+	27.9	40.0	Secondary (AS)	31,732		Landfill	151,585
Point East Condominiums*	A	1986	-	0.16	Extended Aeration w/ Sand Filtration				300
Port Richmond	B-2	1979+	43.0	60.0	Secondary (AS)	(3)		Landfill	172,268
PS-3	A	1969	-	0.004	Extended Aeration				1,000
PS-42	B-2	1967	-	0.002	Secondary (AS)				1,100
Saint Joseph's School*	A	1963	-	0.02	Septic Tank with Sand Filtration				1,200
Staten Island University Hospital, South*	A	1995+	0.05	0.06	Secondary (AS)	-	-	Oakwood Beach	-
Treetop Village*	A	1985	-	0.25	Extended Aeration w/ Sand Filtration				-
Rockland County									
Joint Regional Sewerage Board - Town of Haverstraw	A	1989+	5.2	8.0	Secondary (AS)	1,357 (5)	3.3	Landfill	33,000
Orangetown Sewer District	A	1996+	9.6	12.75	Secondary (TF)	4,000	23	Landfill	46,800
Palisades Interstate Park									
- Bear Mountain Plant	A	1967+	0.3	0.3	Secondary (TF)	-	-	-	20,000
- Tallman Mountain Plant	A	1968	0.003	0.01	Secondary (AS)	-	-	-	Seasonal
Rockland County Sewer District # 1	A	1995+	21.1	26.0	Secondary (RD)	2,446 (4)	20	Landfill	160,000
Stony Point	A	1985+	0.98	1.0	Secondary (AS)	883	17	Landfill	12,000
Suffolk County									
Huntington Sewer District	A	1988+	2.1	2.5	Secondary (TF)	2,114	20.1	Landfill	25,000
Northport	A	1972+	0.33	0.34	Secondary (AS)	31 (5)	2.5 to 3	Incineration (2)	2,500
Suffolk County Sewer District # 1	A	1988+	0.8	0.8	Secondary (RD)	245 (5)	2.8	Incineration (54%), Landfill (46%)	12,000
Suffolk County Sewer District # 3	A	1989+	21.1	30.0	Secondary (AS)	71,815	24	Incineration (54%), Landfill (46%)	215,000
Suffolk County Sewer District # 6	A	1973+	0.41	2.0	Secondary (AS)	81 (5)	1.3	Incineration (54%), Landfill (46%)	6,000
Suffolk County Sewer District # 21	A	1989	2.1	2.5	Tertiary (OD)	320 (5)	1.6	Incineration (54%), Landfill (46%)	20,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE SANITATION DISTRICT WATERS

1998

PLANT	ISC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREAT-MENT	SLUDGE (1) GENERATED TONS/YEAR	SLUDGE PERCENT SOLIDS	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
NEW YORK (con't)									
Westchester County									
Blind Brook (Rye)	A	1985+	3.7	5.0	Secondary (AS)	5,758 (5)	<0.5	Pumped to Port Chester	30,000
Buchanan	A	1990+	0.24	0.5	Secondary (AS)	200 (5)	4	Trucked Out	2,400
Coachlight Sq. Condo. Asso. Inc.*	A	1992+	0.03	0.05	Secondary (AS)	-	-	Trucked Out	210
Mamaroneck	A	1993+	18.2	20.6	Secondary (AS)	2,700 (4)		Pumped to New Rochelle	80,000
Metro North (Harmon Shop)*	A	1998+	0.05	0.144	Primary	250	3	-	500
New Rochelle	A	1997+	17.0	13.6	Secondary (AS)	2,800 (4)	-	Incineration	80,000
Ossining	A	1981	5.4	7.0	Secondary (AS)	9,000	20	Incineration	40,000
Peekskill	A	1980+	6.7	10.0	Secondary (AS)	3,650	3	Trucked to Ossining	35,000
Port Chester	A	1990+	5.0	6.0	Secondary (RD)	1,879	4.8	Incineration/Landfill	25,000
Springvale Sewerage Corporation*	B-1	1996+	0.09	0.13	Secondary (RD)	0.286	-	Trucked Out	1,500
Yonkers Joint Treatment	A	1988+	93.5	92.0	Secondary (AS)	35,575	25	Lime Stabilization (2)	477,000
Federal and Military									
Camp Smith (Westchester County)	A	1997+	0.045	0.24	Secondary (TF)	-	-	-	2,400
FDR Veterans Administration Medical Center (Westchester County)	A	1982+	0.12	0.4	Secondary (TF)	-	-	Trucked Out	Patient Count
Gateway National Recreation Area (Floyd Bennet Field, Kings County)	A	1981+	0.12	1.0	Secondary (TF)	-	-	Landfill	5,000
Military Ocean Terminal (Hudson County)	B-1	1982+	0.09	0.18	Secondary (AS)	6,117	0.74	Landfill	2,500

NOTE: Except for the ISC Receiving Water Classification, all information and data are supplied by the operating entities and are published as supplied.

(+) Year of major additions or reconstruction.
(*) Private or institutional sewage treatment plant.
(-) Denotes no information.
(1) Except where indicated, all volumes represent wet tons per year rounded to the nearest ton.
(2) Disposal method occurs off-site.
(3) Transferred by sea to dewatering facility for processing.
(4) Reported as dry tons per year.
(5) Estimated volume.

(AS) Activated Sludge (BO) Biochemical Oxidation (OD) Oxidation Ditch
(PO) Pure Oxygen (RD) Rotating Disc (TF) Trickling Filter

INTERSTATE SANITATION COMMISSION
FINANCIAL STATEMENT FY 1998

The Commission's accounting records are maintained on a cash basis and are audited annually. The following is a statement of cash receipts and disbursements for fiscal year July 1, 1997 to June 30, 1998:

CASH BOOK BALANCE AS OF JUNE 30, 1997		$1,095,889.46
RECEIPTS		
Connecticut - FY'98	$ 3,333.00	
New York - FY'98	315,000.00	
New York - FY'99	97,000.00	
New Jersey - FY'98	315,000.00	
EPA - FY'97	72,500.00	
EPA - FY'98	192,835.00	
CT - Bypass Model Runs	6,000.00	
NYS DEC - Bypass Model Runs	6,000.00	
Interest	54,215.40	
Miscellaneous Receipts	6,664.27	
TOTAL RECEIPTS		1,068,547.67
	Sub-Total	$2,164,437.13
DISBURSEMENTS		
TOTAL DISBURSEMENTS		926,840.45
CASH BOOK BALANCE ON JUNE 30, 1998		$1,237,596.68

U.S. Treasury Bills	$ 970,367.94
Insured Money Market Accounts	258,128.60
Checking Accounts	9,100.14
	$ 1,237,596.68

GLOSSARY

ACO	Administrative Consent Order
ALJ	administrative law judge
BGD	billion gallons per day
BMP	best management practices
BMWCA	Bureau of Marine Water Classification and Analysis
BNR	biological nutrient removal
BOCES	Board of Cooperative Educational Services
BOD	biochemical oxygen demand
CCMP	Comprehensive Conservation and Management Plan
CASPE	Center for Applied Studies of the Environment
CES	Center for Environmental Science
COAST	Clean Ocean and Shore Trust
CSI	College of Staten Island
CSO	combined sewer overflow
CT	Connecticut
CWA	Clean Water Act
DEC	Department of Environmental Conservation
DEP	Department of Environmental Protection
DO	dissolved oxygen
EDF	Environmental Defense Fund
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FY	fiscal year
GIS	geographic information system
HEP	Harbor Estuary Program
HARS	Historic Area Remediation Site
HRFA	Hudson River Fisherman's Association
HUCWSA	Hoboken-Union City-Weehawken Sewerage Authority
HVAC	heating, ventilating and air conditioning
IMT	interim monitoring team
I/I	infiltration/inflow
ISC	Interstate Sanitation Commission
ISD	Interstate Sanitation District
IUP	intended use plan
LISS	Long Island Sound Study
MCBOA	Monmouth County Bayshore Outfall Authority
MDS	Mud Dump Site
MGD	million gallons per day
MPN	most probable number
MTS	marine transfer station

GLOSSARY
(continued)

NCHD	Nassau County Health Department
NEP	National Estuary Program
NHSA	North Hudson Sewerage Authority
NJPDES	New Jersey Pollutant Discharge Elimination System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
N/SPDES	National/State Pollutant Discharge Elimination System
NSSP	National Shellfish Sanitation Program
NYC	New York City
NYS	New York State
PBSA/NY & NJ	Pro Bono Students America/New York & New Jersey
PVSC	Passaic Valley Sewerage Commissioners
QA/QC	quality control/quality assurance
RFP	request for proposals
R/V	research vessel
SBR	sequencing batch reactor
SCSD	Suffolk County Sewer District
SPDES	State Pollutant Discharge Elimination System
SSES	sewer system evaluation survey
STP	sewage treatment plant
SUNY	State University of New York
TSS	total suspended solids
UV	ultraviolet
WPCP	water pollution control plant