INTERSTATE ENVIRONMENTAL COMMISSION

A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY

2009
ANNUAL REPORT

NEW YORK **NEW JERSEY** **CONNECTICUT**

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2009

ANNUAL REPORT

OF THE

INTERSTATE ENVIRONMENTAL COMMISSION

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A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY

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January 24, 2010

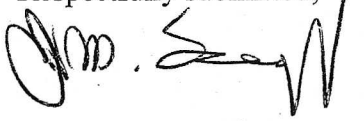
The Honorable Christopher J. Christie
The Honorable David A. Paterson
The Honorable M. Jodi Rell
and the Legislatures of the States of
New Jersey, New York and Connecticut

Dear Governors:

The Interstate Environmental Commission (IEC) respectfully submits our 2009 annual report. In the interest of the environment, this report is in limited print. It is available on our website www.iec-nynjct.org and can be sent via email.

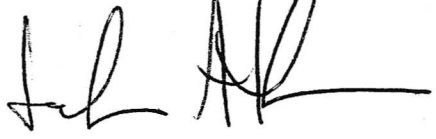
The Commission and staff will maintain active and effective water and air pollution abatement programs, conduct intensive monitoring as well as innovative research and analyses, and continue to provide our member States with exceptional service. IEC looks forward to the full support of the Governors and legislators in the coming years.

Respectfully submitted,



For the State of New Jersey — John M. Scagnelli, Chairman

For the State of New York — Judith L. Baron, Vice Chair



For the State of Connecticut — John Atkin, Vice Chair

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STATEMENT OF THE CHAIRMAN
OF THE
INTERSTATE ENVIRONMENTAL COMMISSION

The year 2009 has been a difficult one for the Interstate Environmental Commission (IEC). The recession and fiscal crisis which has affected the country and the New York, New Jersey and Connecticut Tri-State Area which the Commission serves has affected the Commission as well, requiring the re-examination of Commission programs, staffing, goals and objectives. I am pleased to report that the IEC has emerged from this process better focused and equipped to fulfill its mission under the Tri-State Compact to address environmental issues within its Interstate Environmental District with renewed energy and commitment.

The Commission this year reinvigorated and re-emphasized the role of IEC's Environmental Laboratory which has been located on the campus of the College of Staten Island (CSI) since December 1993. The Laboratory is recognized by the Commission's member states of New York, New Jersey and Connecticut as a nationally accredited environmental facility and is certified by the National Environmental Laboratory Accreditation Program (NELAP) through the New York State Department of Health (NYS DOH), the New Jersey Department of Environmental Protection (NJ DEP) and the Connecticut Department of Public Health (CT DPH). NELAP is sponsored by U.S. Environmental Protection Agency. IEC's Laboratory has been, and continues to be, involved in a wide range of sampling and research projects. Many of those projects are described in detail in the Annual Report. A number of them are conducted in collaboration with CSI's Center for Environmental Science and other organizations. On behalf of the Commission, I would like to emphasize that IEC's Laboratory is available to conduct sampling for, and participate in project work with, the environmental agencies of our member states and with other organizations. New descriptive material describing IEC's Laboratory and its activities has been prepared and is available for review.

I also want to point out that the Commission wishes to strengthen and enhance its collaborative working relationship with the environmental agencies of our member states – New York, New Jersey and Connecticut. In these difficult fiscal and budgetary times, IEC believes that the highest environmental value can be achieved where the environmental agencies of our Tri-State Area coordinate their activities and support and assist each other wherever possible. As can be seen from the examples cited in the Annual Report, the IEC has undertaken projects when requested by its member state environmental agencies. Examples of this include IEC's ambient water quality monitoring conducted in the State of New Jersey's Raritan Bay shellfish harvesting beds and IEC's Pathogen Trackdown Program conducted on the Byram River, an interstate waterway running between New York and Connecticut. IEC is actively looking to conduct other and similar programs and activities in conjunction with the environmental agencies of its member states.

The Commission is also re-emphasizing the important role it has played in the Tri-State Area as the focal point for scientific sampling, monitoring and the study of contaminant conditions which affect the quality of waters in the Tri-State District. The Commission's Laboratory, its research vessel, the R/V Natale Colosi, and its extensive scientific sampling

database are resources for those activities. The Commission is currently working to place its extensive scientific sampling database in a computerized format accessible by scientists, researchers and members of the public.

The Commission has also actively sought grants to supplement its traditional state and federal funding and I am pleased to report that in addition to being awarded several research grants this year described in the Annual Report, the Commission is involved in a number of cutting edge studies, including the areas of pharmaceuticals, green technology, and wastewater effluent. The Commission is interested in continuing with these and other research projects with important implications for human and aquatic health and safety within its Tri-State District. The Commission this past year continued its commitment and involvement with the Long Island Sound Study and the New York – New Jersey Harbor Estuary Program, and conducted special intensive surveys in support of those programs. We just completed our nineteenth year of monitoring Long Island Sound to document dissolved oxygen conditions, our ninth year of monitoring for pathogens in the New York – New Jersey Harbor Complex, our fourteenth year of sampling shell fish harvesting waters in the New Jersey portion of western Raritan Bay, and our seventh year of ambient and point source sampling to determine the causes of bacterial contamination in the Byram River. In addition to participating in these valuable programs, IEC works on a daily basis with the scientists and professionals of the United States Environmental Protection Agency and of the environmental agencies of our member states.

IEC also continues to be a bona fide presence in the environmental community and conducts education and outreach. I am pleased that IEC participated in National Marina Day and World Water Monitoring Day. This year saw the seventh annual World Water Monitoring Day, an event that IEC has participated in since it was begun in 2002 as National Water Monitoring Day. The Commission's outreach and education programs including meetings with key legislators, testimony before government committees and appearances before citizens groups, student internships programs, and public education campaigns. The Annual Report offers a full review of the wide ranging scope of the IEC's programs and activities, and includes an update of the Commission's legal activities in the areas of regulation and litigation as well as in the areas of scientific advancement. It is in limited print, but is available on the IEC's website. I invite you to visit IEC's website, www.iec-nynjct.org for continuing reports, back issues of the Annual Report, and news and information relating to IEC and its activities.

Finally, I want to express my gratitude to my fellow Commissioners and IEC staff for their hard work, dedication and commitment during this difficult year. We look forward to your continued support and to the Commission's continuing fulfillment of its mission under the Tri-State Compact in the coming year.

John M. Scagnelli *-s-*
Chairman

C O N T E N T S

I L L U S T R A T I O N S

I. EXECUTIVE SUMMARY

In uncertain times marked by economic stress on state and national levels, the nation has focused on environmental concerns as a vital area where commitments must be met and we as guardians must not falter. Environmental protection has direct social, economic and health consequences. The Interstate Environmental Commission (IEC) remains the guardian of the waters of the tri-state District and we continue to do more with less. IEC Commissioners and professional staff are dedicated to upholding the highest quality research, monitoring and analyses, providing valuable resources for our member States, our region and the nation. Water and air quality monitoring and abatement are our priorities. Hypoxia in our waters, combined sewer overflows and emerging contaminants continue to need attention and solutions. IEC has been and, continues to be a focal point for research, analysis and solutions that ensure water and air quality.

History

Following the recommendation of the Tri-State Treaty Commission, the Tri-State Compact establishing the District and the Commission was enacted in 1936, with the Consent of Congress. The Commission has an overall responsibility of protecting the environment by viewing the District from a regional, impartial and unbiased perspective. Whereas each state deals with issues within its own borders, the Commission can and does cross state lines. The Commission strives for interstate cooperation and coordination and to harmonize water quality standards, regulations and requirements throughout its District. The Commission's mandate is as important today as it was in the 1930s.

The mandates of the Commission are governed by the Tri-State Compact, Statutes, and the IEC's Water Quality Regulations. In addition to its mandates in water pollution, the capabilities and benefits of the Commission as a regional agency were also recognized when the IEC's interstate air pollution program began in 1962, and were further reinforced in 1970 when the Commission was designated as the coordinating and planning agency for the New Jersey-New York-Connecticut Air Quality Control Region. As the Commission plans to meet its mandates and goals for the future, IEC must adapt to a variety of conditions, but must also rely on good science and sound engineering as an integral part of the decision-making process. The Metropolitan Area contains a world class harbor that is able to support a wide spectrum of commercial and recreational industries and activities.

In October 2000, the name of this agency was officially changed from the Interstate Sanitation Commission to the ***Interstate Environmental Commission (IEC)***. The name change more accurately reflects the nature of the Commission's mandates, mission and responsibilities that embrace a broad range of programs and activities that include air pollution, public involvement and education, and regulatory compliance. The Commission's website — **www.iec-nynjct.org** — contains information on the IEC, including recent annual reports and other reports, and useful links to other appropriate websites. This Annual Report will be

available on the Commission's website.

Water quality and public health are in the national interest. The Clean Water Act, established in 1972, set a national goal to restore and maintain the physical, chemical, and biological integrity of the waters of the United States. Congress and State legislators continue to assess water quality legislation. IEC continues to be in the forefront working with the US EPA and State environmental and health agencies and providing crucial services and information. IEC utilizes its professional staff in the office, in the field and in the laboratory as well as on the seas with our dedicated and independent research vessel. 2009 marks the 73rd anniversary of the Interstate Environmental Commission (IEC) — an agency with a mandate to protect this Tri-State Region's waters long before the creation of state and national environmental entities, and before national standards were established. Our regulations have been in place and ensure standards are met. The IEC is needed now, more than ever.

Mission and Mandate

The IEC's mission is to protect and enhance environmental quality through cooperation, regulation, coordination, and mutual dialogue between government and citizens in the Tri-State Region. As an interstate agency, the Commission views the Region as an environmental entity and is in a unique position to take the lead on regional issues. By interacting with other agencies and interstate commissions, challenges and successes are being shared to better address specific mandates. The staff continues to fulfill IEC's technical and administrative responsibilities within the limitations of the current resources.

The Commission's programs are geared 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 commercial and recreational shellfishing, opening waters for swimming, developing water quality and/or effluent criteria, determine immediate environmental conditions, responding to environmental emergencies, and other needs that may arise.

The Commission has contributed to the many significant improvements in the Region's waters. IEC's adoption of its year-round disinfection requirements was instrumental in opening thousands of acres of shellfish beds year-round since 1989. There have been fewer beach closings during the summer bathing seasons due to elevated levels of coliform bacteria, and no closures due to floatables for the past nine years. In 1997, the Commission amended its regulations to require mandatory notification to the IEC of planned sewage bypasses. This was done as an effort to eliminate or, at a minimum, lessen the impacts from planned sewage bypasses. Additionally, in conjunction with its three member States' environmental and health departments, US EPA, NYC DEP and the NJHDG, and other federal agencies, the Commission coordinated and spearheaded the effort to have a computer model developed to predict the impacts of unplanned sewage bypasses on the area's beaches and shellfish beds. Since its inception, the IEC has chaired the Regional Bypass Work Group. As part of this effort, regional notification protocols were developed and have been in place since the 1998 bathing season.

This program has proved to be extremely effective and is an excellent example of regional cooperation and coordination among many agencies. During early 2008, the Commission completed assembling the funding mechanism, as well as disseminated the software for an updated model to address limitations of spatial assessment and recently promulgated federal regulations. To address the need for comprehensive monitoring throughout the New York-New Jersey Harbor Complex and its tributaries, IEC has taken a leadership role in the development of harbor-wide monitoring programs in an effort to address data gaps and share water quality data. The second report is planned for 2010 and will be distributed by the New York-New Jersey Harbor Estuary Program.

The Commission continues to put great emphasis and a high priority on public involvement, education and outreach activities. This includes testifying at public hearings and meetings on various issues of concern; lecturing at local schools, colleges and community groups on subjects of environmental concern and Commission activities; participating in seminars and forums involving environmental professionals and the general public; and contributing to various outreach documents for congressional and public awareness. For many years, Commission staff has had hands-on interactions with volunteer citizen water quality monitoring groups.

This report provides a record of the water and air pollution activities of the Interstate Environmental Commission for the period December 2008 through November 2009. To address the environmental problems within its area of jurisdiction, the Commission has focused on technical assistance, enforcement, engineering, planning, laboratory analysis, ambient and effluent water quality monitoring, statistical analysis, coordination, oversight, and legislative/public outreach and education.

The Commission is both delighted and gratified to report the improvements in water quality throughout the Region where the majority of the waters are fishable and swimmable. However, the region still faces problems — some of which are local, and some more far-reaching. Hypoxia, sediment contamination, pathogens, habitat loss, combined sewer overflows (CSOs), municipal separate storm sewer systems (MS4s), atmospheric deposition, invasive species, global warming, impacts on living marine resources, land use issues and public education have all been identified as priority areas of concern. All of these issues have socio-economic impacts throughout the Region. The IEC is also advancing studies and applications on green technology and emerging pollutants as well as remediating the effects of wastewater treatment byproducts that may harm delicate ecosystems. Through State and federal grants and in combination with environmental stakeholders and academia, IEC completed and is reporting on blending, a comprehensive research project dealing with how stormwater impacts treatment facilities and is presently awaiting publication by the US EPA. IEC proposals are also supported by pass through grants afforded by Federal Stimulus funds for 2010.

Water Pollution

The Commission's water pollution abatement programs continue to focus on the effective coordination of approaches to regional problems. Opening additional areas for swimming and

shellfishing remains a high Commission priority. The IEC's programs include enforcement; minimization of the effects of combined sewers, stormsewers, and municipal separate stormsewer systems; participation in the National Estuary Program; public involvement, education and outreach; 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.

Planning and construction is under way to provide water pollution control and abatement from municipal and industrial wastewaters discharging into the IEC's District waters. It is estimated that almost $15 billion has been allocated by municipalities and bond act dispersements in the District for over 271 projects recently completed, in progress, and planned for the future. IEC must monitor all activity and take part in water quality projects prioritized by stimulus funding provided to the States by Section 604b of the Clean Water Act.

The Commission remains actively involved with the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program — both part of the National Estuary Program. IEC participates on the Management Committees, implementation and planning teams, and on various workgroups for these studies. With the Comprehensive Conservation and Management Plans for the LISS and the HEP in place, IEC remains involved with the workgroups that are dealing with total maximum daily loads for pathogens, nutrients and toxics. The Commission remains an active participant in the process for public involvement events and products, such as volunteer monitoring workshops, newsletters, tracking reports and fact sheets. The Commission has been involved with research proposal committees, science and technical advisory committees and interactions with citizen advisory committees throughout the District.

IEC's research vessel, the R/V Natale Colosi, is ready to sail year-round. The year 2009 proved to be yet another very active year of water quality monitoring. This was IEC's 19th consecutive year as a participant in the multi-agency intensive survey in Long Island Sound to continue to document dissolved oxygen conditions. For the 14th year in a row, at the request of NJ DEP, the Commission collected water quality samples needed by NJ DEP to check the sanitary conditions of the shellfish waters of western Raritan Bay. In support of NY-NJ HEP and NYS DEC's Hudson River Estuary Management Program, IEC has scheduled its fourth year of a pathogens monitoring program on the Hudson River. Since 2003, IEC has conducted pathogens trackdown investigations on the Byram River, a NY-CT interstate waterway. IEC coordinates its compliance monitoring program with its three member states' environmental departments, as well as with US EPA. This program consists of the Commission regularly sampling waste discharges from municipal and industrial permittees throughout the District. These and other sampling programs are detailed in this report.

For the 12th consecutive year, the Commission took the lead and coordinated the efforts of the Regional Bypass Workgroup which is comprised of 16 federal, interstate, state, county and local agencies. The Workgroup maintained notification protocols to inform each other of unplanned bypasses and, based upon modeling software especially developed to predict the effects of those bypasses, determined if area beaches and shellfish beds should be closed to

protect the health of the public.

The IEC's day-to-day legal activities, as well as 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:

- enforcement of IEC's Water Quality Regulations and ensured inclusion of its regulations in discharge permits.

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

- continued participation as a party in an administrative hearing requested by New York City regarding nitrogen and combined sewer overflows in the reissued SPDES permits for New York City's water pollution control plants.

The Commission again took an active role in the first World Water Monitoring Day and National Marina Day. Water quality monitoring took place in a coordinated effort around the globe between September and October. The Commission joined thousands of volunteers, agencies and countries around the world to sample area waterways and report their findings. Aboard the IEC's research vessel, nine sampling stations were monitored for a variety of parameters in the East River and Long Island Sound and the results were input to an international data base. Another cooperative event was conducted with the LISO and a nonprofit on the Bronx River.

The IEC laboratory has been located on the campus of the College of Staten Island (CSI) since late 1993. In addition to its day-to-day operations, IEC's laboratory personnel continue to collaborate with CSI on environmental projects of mutual concern. The IEC laboratory is nationally accredited, certified by NJ DEP, NYS DOH and CT DPH and also follows US FDA procedures for sampling in shellfish waters. The Commission's laboratory is also certified under the National Environmental Laboratory Accreditation Program. The laboratory director and staff are published scientists engaged in quality reliable research and analyses. Laboratory and engineering and planning personnel will continue to perform mapping, modeling and analysis to advance human and aquatic health, green infrastructure and to protect ecosystems. IEC is a guardian of the waters of the environmental District.

IEC's library holdings and archives continue to be updated and digitized in order to 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. The IEC archives will increasingly be available though our website, which has greatly improved and will continue to advance, www.iec-nynjct.org.

Air Pollution

The Commission's air pollution monitoring and response programs remain in place. IEC's 24-hour-a-day, 7-day-a-week answering service (718-761-5677) remains active and IEC personnel investigate as many complaints as its resources will allow. IEC also forwards complaints to the appropriate enforcement and health agencies.

During the 12-month period from October 2008 through September 2009, the Commission received a minimal number of air pollution complaints. Citizen complaints have proven to be an invaluable source of firsthand information about poor air quality; accurate odor descriptions could lead to the discovery of the emissions sources.

IEC 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 the majority of 16 health messages — 10 for ozone alerts, 5 alerts for fine particles and one for a combined ozone/fire particle alert — between April 24 and August 18, 2009, to the appropriate government environmental and health agencies throughout the region.

* Howard Golub had a serious illness in March 2009 and we wish him well.

II. WATER POLLUTION

GENERAL

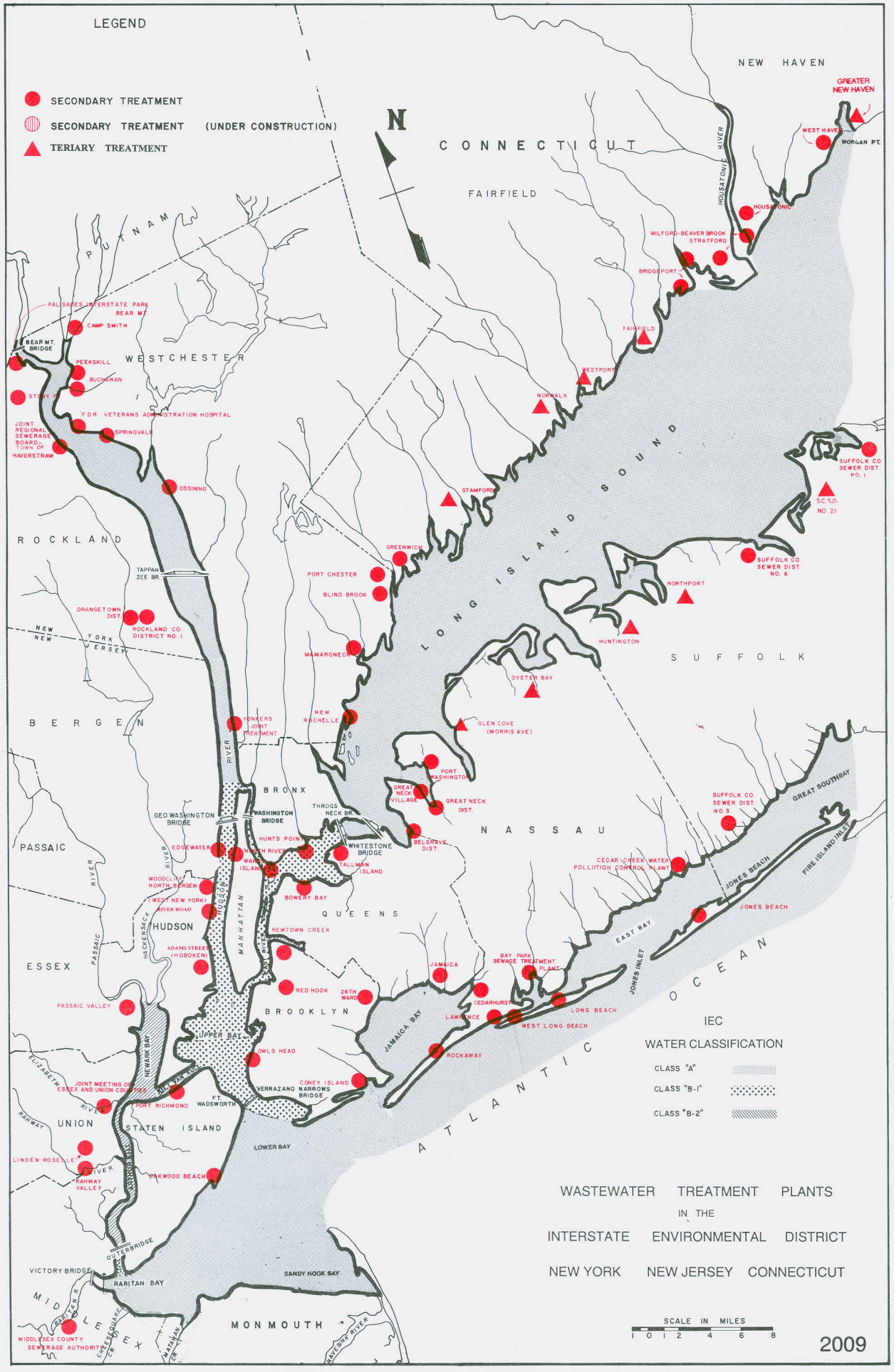
Within the Interstate Environmental District in 2009, over $14.98 billion was allocated for over 271 water pollution control projects which were either completed, in progress, or planned for the future. These monies were allocated in the following manner: over $262.5 million for 37 completed projects, more than $10.2 billion for 146 projects in progress, and more than $4.5 billion for 88 future projects. These expenditures are being used for engineering studies, pilot projects and experiments; CSO abatement projects; stormwater remediation; 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 and committed to pollution control by industries.

Adequate infrastructure is 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 over these past years. This is truly a success story for the Region.

With secondary treatment virtually in place throughout the Interstate Environmental District since 1994, control of the Region's combined sewer overflows, stormwater runoff, and municipal separate storm sewer systems is necessary in order to achieve further significant water quality improvements. Communities throughout the District have ongoing CSO control programs and projects that include sewer separation, swirl concentrators, booming and skimming, in-line storage and off-line storage.

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 related environmental conditions within the associated drainage basins. The information in this section is that which was available and accurate through November 2009.

A map of the Interstate Environmental District on the following page shows the locations of wastewater treatment plants which discharge into Interstate Environmental District waterways, the type of treatment and upgrade status of each plant, and the Commission's water quality classifications. Additional information on each plant is listed in Appendix A.


LEGEND
SECONDARY TREATMENT
SECONDARY TREATMENT (UNDER CONSTRUCTION)
TERIARY TREATMENT
N
CONNECTICUT
NEW HAVEN
GREATER NEW HAVEN
WEST HAVEN
MORGAN PT.
HOUSATONIC RIVER
HOUSATONIC
MILFORD-BEAVER BROOK STRATFORD
BRIDGEPORT
FAIRFIELD
WESTPORT
NORWALK
STAMFORD
GREENWICH
PUTNAM
PALISADES INTERSTATE PARK BEAR MT.
CAMP SMITH
BEAR MT. BRIDGE
PEEKSKILL
BUCHANAN
STONY P.
F.D.R. VETERANS ADMINISTRATION HOSPITAL
JOINT REGIONAL SEWERAGE BOARD-TOWN OF HAVERSTRAW
SPRINGVALE
OSSINING
WESTCHESTER
ROCKLAND
TAPPAN ZEE BR.
ORANGETOWN DIST.
ROCKLAND CO. DISTRICT NO. 1
NEW YORK
NEW JERSEY
PORT CHESTER
BLIND BROOK
MAMARONECK
NEW ROCHELLE
YONKERS JOINT TREATMENT
BERGEN
BRONX
HUDSON RIVER
LONG ISLAND SOUND
SUFFOLK CO. SEWER DIST. NO. 1
S.C.S.D. NO. 2
SUFFOLK CO. SEWER DIST. NO. 6
NORTHPORT
HUNTINGTON
OYSTER BAY
GLEN COVE (MORRIS AVE)
SUFFOLK
PORT WASHINGTON
GREAT NECK VILLAGE
GREAT NECK DIST.
THROGS NECK BR.
GEO. WASHINGTON BRIDGE
WASHINGTON BRIDGE
HUNTS POINT
NORTH RIVER
WARDS ISLAND
WHITESTONE BRIDGE
TALLMAN ISLAND
BELGRAVE DIST.
NASSAU
SUFFOLK CO. SEWER DIST. NO. 3
GREAT SOUTHBAY
CEDAR CREEK WATER POLLUTION CONTROL PLANT
JONES BEACH
FIRE ISLAND INLET
PASSAIC
EDGEWATER
WOODCLIFF NORTH BERGEN
(WEST NEW YORK)
RIVER ROAD
HUDSON
MANHATTAN
BOWERY BAY
QUEENS
NEWTOWN CREEK
ADAMS STREET (HOBOKEN)
ESSEX
HACKENSACK RIVER
PASSAIC RIVER
PASSAIC VALLEY
RED HOOK
26TH WARD
BROOKLYN
JAMAICA
BAY PARK SEWAGE TREATMENT PLANT
EAST BAY
JONES INLET
OCEAN
CEDARHURST
LAWRENCE
LONG BEACH
WEST LONG BEACH
ROCKAWAY
JAMAICA BAY
UPPER BAY
OWLS HEAD
NEWARK BAY
ELIZABETH RIVER
RAILWAY
JOINT MEETING OF ESSEX AND UNION COUNTIES
KILL VAN KULL
PORT RICHMOND
FT. WADSWORTH
VERRAZANO NARROWS BRIDGE
UNION
STATEN ISLAND
LOWER BAY
LINDEN ROSELLE
RAHWAY RIVER
RAHWAY VALLEY
OAKWOOD BEACH
ATLANTIC
OUTERBRIDGE
VICTORY BRIDGE
RARITAN BAY
SANDY HOOK BAY
MIDDLESEX
MONMOUTH
RARITAN R.
CHEESEQUAKE CR.
MANALAPAN CR.
MANASQUAN RIVER
MIDDLESEX COUNTY SEWERAGE AUTHORITY
IEC
WATER CLASSIFICATION
CLASS "A"
CLASS "B-1"
CLASS "B-2"
WASTEWATER TREATMENT PLANTS
IN THE
INTERSTATE ENVIRONMENTAL DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 2 4 6 8
2009

CONNECTICUT WATER POLLUTION CONTROL PLANTS

In the State of Connecticut, there are presently 12 water pollution control facilities located in Fairfield and New Haven Counties that discharge to the receiving waters of the Interstate Environmental District. The combined design flow of these facilities is about 183.5 MGD. These facilities are inspected several times a year during unannounced visits by Commission staff to check compliance with the existing State Pollutant Discharge Elimination System permits. These permits contain state and IEC requirements and effluent limitations.

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

Projects in Progress

Two recent projects have started this year associated with the East Side Wastewater Treatment Plant. The East Side Wastewater Dechlorination Project has a cost estimate of $997,000 and an operational start-up date of summer 2010. Currently, the project is 10% complete. The Harborview Pump Station Rehabilitation Project has a cost of $1 million and an operational start-up date of spring 2010. Currently, the project is 30% complete.

A multi-year phased construction CSO improvement program has been ongoing since 1991 in the 3,880 acres that comprise the Bridgeport drainage basins. This is a dual phase improvement program. Phase I has been considered 99% complete since 2003 at an estimated final cost of $32 million. Phase II design and subsequent construction is estimated at $80 million. All work is planned for completion during 2018; Phase II is in the design phase. CSOs, which discharge into Black Rock and Bridgeport Harbors, will be eliminated and the remaining CSOs will be monitored by a remote telemetering system.

Current engineering studies for these drainage basins include: Long-term Control Plan (LTCP) development and nutrient enhancements; and CSO capture, design, and treatment. LTCP has a cost estimate of $1.2 million and an expected completion date of January 2011. Evaluation of Sludge Processing has a cost estimate of $348,000 and a completion date of November 2010. Low Level Nitrogen Removal has a cost of $300,000 and a completion date was set for August 2009. River Street Pump Station and the Island Brook Interconnect Sewer Design have a cost of $651,000 and a completion date of May 2011.

Fairfield Water Pollution Control Facility (Fairfield County)

Projects in Progress

Fairfield is currently working on a 5-phase plan to remove infiltration and inflow. The town has been geographically divided into 5 sections — each section representing a phase of the project. A sewer system evaluation survey of Section I (Phase I), was completed at a final cost of approximately $200,000. The SSES for Section II (Phase II) is scheduled for 2009; estimated costs are $225,000. Based on the findings of the SSES for Section I, rehabilitation of the sewer lines will commence during February 2009. Estimates for Section I are $180,000.

Future Project

Based on a SSES the town of Fairfield will contract for $180,000 a project to rehabilitate the sewer lines in Section 1 in order to remove excess infiltration and inflow. The approximate construction start-up date is October 2009.

Grass Island Waste Water Treatment Plant, Greenwich (Fairfield County)

Completed Projects

Installation of a new UV disinfection system, under way during October 2007, is now 100% complete. The re-estimated $3.5 million project was operational during November 2008. The actual completion date for the project was February 2009.

New UV System
Photo Courtesy of Grass Island WWTP

The headworks upgrade had a construction cost of $1.6 million and was operational in April 2009. The actual completion date was May 2009.

Projects in Progress

This 12.5 MGD secondary activated sludge plant is operating under federal and state orders to evaluate force mains, implement a collection system maintenance program, upgrade the disinfection process with UV, perform an I/I study, evaluate force mains, and implement the findings of the ongoing SSES. The facility is in compliance with all Order dates.

Phase II of the Sewer System Rehabilitation program is a Greenwich-wide continuation of Phase I which was completed during 2005. Under way since September 2006, components of Phase II (98% complete) include pointing repairs/manhole raising ($598,300) and sewer lining/manhole sealing ($929,945) which are trenchless repairs. The South Water pump station relief sewer is in the preliminary design phase. The force mains associated with the South Water and Den Lane pump stations are being installed and are currently 90% complete ($1.2 million).

Future Projects

Proposed plant process improvements include return activated sludge pumps, waste activated pumps, aerations system upgrades, and final effluent pumps and controls. The rehabilitation of the wastewater treatment plant equipment has a cost estimate of $6.5 million. These proposed projects are currently in the design phase.

A pump station rehabilitation project for Ballwood, Huested, Meadow, Chapel, Cos Cob, Old Greenwich, and South Water locations are currently in the design stage.

The Riverside Railroad Force Main Crossing Project is in the design phase and has a cost estimate of $775,000. The project will include replacing a sanitary force main underneath the Metro-North Railroad station in Riverside.

Greater New Haven Water Pollution Control Authority - East Shore Water Pollution Abatement Facility (formerly the New Haven Water Pollution Control Authority) (New Haven County)

Completed Projects

Several components of the GNHWPCA and the City of New Haven Long-Term CSO Control Plan were finalized during 2009. The phased work included the I/I of 50,000LF in Morris Cove, Lower Shepad Brook, and Upper Thorpe for $4 million; pipe rehabilitation in New Haven and Hamden (4,000LF) for $460,000; new forty-two inch diameter (42"Ø) twin force mains under New Haven Harbor for $20 million; and the Old

Chaunces Road pump station repair for $400,000. In addition, the beneficial reuse of waste heat from the sewage sludge incinerator to produce steam to turn a turbine generator which will produce 4.4 million KWH per year ($5.4 million).

Projects in Progress

The Greater New Haven Water Pollution Control Authority was formed during 2005. This regional wastewater authority encompasses the towns of East Haven, Hamden, New Haven, and Woodbridge. Presently, a facility plan is under way ($500,000) to address design, construction schedules, and costs for low level nitrogen removal, as well as upgrades in conjunction with increasing wet weather capacity as per the Long-term Control Plan for CSOs. Expected implementation of these studies is January 2010.

Sewer separation construction will continue until combined sewers discharging to New Haven Harbor are eliminated for up to a 2-year storm through storage and sewer separation. This work will not be completed until approximately 2024 at a re-estimated cost of $600 million; overall, this work is 25% complete. Phased components showing progress include the Prospect Street sewer separation ($20 million), CSO flow monitoring ($1.5 million), and tide gate improvements ($1.2 million).

Future Projects

The Long-Term CSO Control Plan, which was completed and approved in 2003, is an ongoing 15-year program. As mentioned above there were several components completed during 2009. Also part of the CSO Control Plan is to increase plant wet weather capacity at the East Shore for $114 million in 2012, upgrade the East Street pump station during 2014 for $51 million, comprehensive collection system upgrades in 2018 for $115 million, and the addition of storage tanks in 2020 for $128 million.

Also slated for future construction is the Low Level Nitrogen Removal Project. In 2010, Phase I will begin at a cost of $12 million. Phase II is scheduled to start during 2015 at a cost of $18 million.

Milford - Beaverbrook (New Haven County)

Projects in Progress

This facility is being upgraded to meet LISS III nitrogen reduction targets. The additional removal will be accomplished by adding more tankage and implementing waste thickening. Construction began during November 2006 and was planned to be operational during January 2009. Re-estimated to cost $13 million, this project is 99% complete. This facility is operating under federal and State Consent Orders to reduce

nitrogen loadings and attain permitted effluent limitations and requirements.

Milford - Housatonic (New Haven County)

Projects in Progress

This facility is operating under federal and State Consent Orders to reduce nitrogen loadings for new nitrogen limits and attain permitted effluent limitations and requirements by 2014. Facility and design plans are complete for this secondary 8.0 MGD plant, which discharges to the Housatonic River. Construction began during November 2006; is 99% complete; and was operational during May 2009. This upgrading and expansion includes new tankage to enable the facility to increase flow capacity to 12 MGD. Total cost estimates have been re-estimated at $35 million.

Two pump stations — West Avenue and Gulf Pond — will be upgraded with associated gravity sewers and force mains. The collection system designs are complete; construction and installations began during October 2009 and will coincide with the timetables for the main facility upgrades. The cost is estimated at $37 million and has an operational start-up date of October 2011.

Norwalk Waste Water Treatment Plant (Fairfield County)

Projects in Progress

This is a 20 MGD secondary activated sludge plant that is located on the Norwalk River, which has a confluence with Long Island Sound. An engineering study is well under way to address low level nitrogen reductions ($200,000). A multi-focus evaluation is addressing CSO and wet weather treatment, as well as capacity issues. This evaluation is re-estimated at $3.8 million. A third study is addressing SCADA instrumentation needs and remote control logistics for plant-wide operations ($122,500).

A slip line and point repair of the South Side forty-eight inch diameter (48"Ø) interceptor line has a cost estimate of $3.5 million had an approximate operational start-up date of March 2009. The project is currently 95% complete.

Future Projects

Scheduled to begin during November 2009, CSO remediation on the Norwalk River will have positive affects to the river including floatables and pathogen reductions. At the main facility, headworks replacement will be conducted concurrently. Combined, these projects are estimated to cost $36.5 million and are anticipated to be operational during March 2011.

Stamford Water Pollution Control Authority (Fairfield County)

Project in Progress

A sewer project to replace failing septic systems for about 70 homes started during August 2009. This current project has a cost estimate of $5 million and is about 15% complete. This project is scheduled for completion during June 2010.

Future Projects

A future project that would convert wastewater biosolids to energy using a gasification process has been proposed. However, it is not approved at this point. If accepted, the approximate construction start-up date would be late 2010.

Stamford Harbor, September 2009
Photo by P. Sattler, IEC

Stratford Water Pollution Control Facility (Fairfield County)

Projects in Progress

Capacity expansion of this 11.5 MGD secondary treatment plant in conjunction with a facility-wide upgrade was approved by the Town of Stratford and CT DEP during 2005 and under way during October 2006. The total costs to complete all construction phases are estimated at $52 million. As of October 2009, the project is nearing completion.

West Haven (New Haven County)

Projects in Progress

A design to upgrade the West Haven WPCF is 99% complete and has an estimated cost of $3.2 million. Actual construction for the upgrade was started November 2009 and has a cost estimate of $30.8 million. This project includes but is not limited to two new secondary clarifiers, improvements to the existing secondary clarifiers and primary clarifiers, improvements to the existing aeration tanks with new blowers, new return pumps, new chemical feed systems for BNR, new screening equipment, a new lab and technical support building, new SCADA system, improvements to the administration building, and landscaping improvements. The BNR upgrades are in conjunction with a 2002 Administrative Order to upgrade the treatment plant for BNR and to eliminate sporadic SPDES permit violations. The proposed operational start-up date for this project is May 2012.

Future Project

Proposed future construction to install a by-pass line at the Dawson Avenue pump station is expected to start March 2010. This by-pass is necessary to replace existing valves and clean the wet well. The estimated cost for this project is $70,000 and has an operational start-up date of April 2010.

Westport (Fairfield County)

Future Project

Additional residential gravity sewer extensions are planned for the Imperial Avenue/Keyser Road vicinity. The installation is anticipated to be operational during December 2010 and is anticipated to cost $650,000.

Greens Ledge Light at the Norwalk Harbor entrance, September 2009.
Photo by P. Sattler, IEC

NEW JERSEY WATER POLLUTION CONTROL PLANTS

There are nine New Jersey sewerage authorities located in five counties that discharge to the receiving waters of the Interstate Environmental District. Combined, the design flow of these facilities is over 660 MGD. These facilities are inspected several times a year during unannounced visits by Commission staff to check compliance with the existing State Pollutant Discharge Elimination System permits. These permits contain state and IEC requirements and effluent limitations. There are several more authorities that own the collection systems — gravity sewers, force mains, and pump stations — and convey flows to regional facilities for treatment. Since the early 1990s, the authorities in Hudson and Middlesex Counties have implemented sewer separation, CSO elimination, and/or floatables capture controls.

Bergen County Utilities Authority-Edgewater (Bergen County)

Completed Projects

The Borough of Edgewater, located on the Hudson River, has substantially separated its combined sewers into sanitary and stormwater sewers. The Borough of Cliffside Park has partially separated its combined sewers.

Projects in Progress

Updating of the BCUA Wastewater Management Plan is ongoing to incorporate the Edgewater wastewater management planning area which consists of the Borough of Edgewater and parts of the Boroughs of Cliffside Park, Fort Lee, and North Bergen.

Design of the Phase I SCADA and security improvements is 100% complete and is out to bid. The construction cost is estimated to be $8 million with an anticipated completion date of January 2011.

Design of the Phase II Equipment Improvements is ongoing with an estimated completion during February 2010. The improvements are anticipated to be completed by December 2010. The estimated cost for these improvements is $6.5 million.

Future Projects

Studies are ongoing for the outfall extension from the bulkhead to the pierhead in the Hudson River. The final design is anticipated to be completed by January 2012. Bidding will follow thereafter, with an anticipated initiation of construction by April 2013. The estimated construction cost is $10 to $15 million with an anticipated completion by February 2015.

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

Project in Progress

A new 3.2 MW co-generation facility will utilize anaerobic digester gas to produce electricity and has a final cost estimate of $16 million. The co-generation facility has presently been in process during 2009 and is 95% complete.

Completed Co-Generation Facility
Photo Courtesy of Jt. Meeting Essex/Union Counties

Future Project

Designs completed this year included plant-wide pump and valve replacements, service water system upgrades, and plant access and parking improvements An estimate to implement these projects is $10 million. These projects have an approximate construction start dates between January 2010 and March 2010, respectively.

Linden Roselle Sewerage Authority (Union County)

Projects in Progress

Replacement of two transformers and an upgrade of the UV system electric controls have a cost estimate of $550,000 and an operational start date of December 2009.

Phase IV of the New Jersey Harbor Dischargers Group (NJHDG) PCB Trackdown effort was completed in 2006; Linden Roselle is the lead authority. This long-term effort involved the evaluation of methodologies for tracking down possible

sources of PCBs within sewage collection systems and, specifically, within the Linden Roselle collection system. After a presentation of the Phase IV report and discussion with the NY-NJ Harbor Estuary Program's Toxic Workgroup, Phase V was initiated in June 2009. Phase V is comprised of three tiers, of which the first was completed at the end of 2009. All funding was provided by the members of the NJHDG. The NJHDG is comprised of 10 sewerage authorities representing 12 treatment plants (10 plants discharge to the Interstate Environmental District) which discharge to the New Jersey portion of the NY-NJ Harbor Estuary.

Future Projects

A plant upgrade including improvements to aeration tanks, clarifiers, and microgeneration has a cost estimate of $8 million. This project has an approximate start-up date between 2011-2012.

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

Projects in Progress

This facility is operating under an amended Administrative Consent Order (November 15, 2005) requiring the installation of new force mains from the Edison pump station, acoustic monitoring of the 102-inch diameter (102"Ø) Sayreville relief force main, a state-wide survey of the existing pre-stressed concrete cylinder pipe (PCCP) force mains, and exploration of alternate power sources for the co-generation facility. The facility is in compliance with all consent order dates. The substantial construction was completed October 30, 2009 however the operational start-up date is scheduled for November 15, 2010.

The Authority is finalizing the start-up mode for the five new indirect dryers with lime mixers (recently re-evaluated at 99% complete). These units will reduce the volume and operating costs of the sludge end product. This project is estimated to cost $40.4 million.

Under way during December 2006, two new force main installations to convey flows from the Edison pump station are making progress. The work is re-estimated to cost $71 million. The 60-inch diameter (60"Ø) force mains are 4,160 linear feet each and will be encased in a 170-inch (outside diameter) tunnel. An operational start-up date is planned for April 2010.

Middletown Sewerage Authority, Township of (Monmouth County)

Projects in Progress

A main facility upgrade includes the installation of fine bubble aeration diffusers. Additional tankage installations include one new aeration tank and one clarifier. This aeration system has a cost of $15.8 million. At this point, the project is 30% complete, with an operational start-up date scheduled for May 2010.

An infiltration/inflow study for drainage basin 2, which includes repair and rehabilitation of sewers, is 95% complete and has a cost of $427,000.

Current engineering studies include an energy audit with a cost of $47,000 and an expected completion date of February 2010, an electrical coordination study with a cost of $21,000 and a digester gas study with a cost of $13,000. Both of these studies have an expected completion date of October 2009.

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

Project in Progress

Since 1995, negotiations have been ongoing between this Authority and the NJ DEP to re-rate the plant design flow from 2.9 MGD to 3.4 MGD. This facility is currently waiting for NJDEP approval.

North Hudson Sewerage Authority - Adams Street Wastewater Treatment Plant (formerly Hoboken) (Hudson County)

Projects in Progress

This facility is operating under a State Administrative Consent Order to complete the installation of solids and floatables facilities; the Order dates are presently being met.

Collection system upgrades are under way. The contracts include repair of catch basins, manholes, and sewer lines. The 18th Street pump station upgrade is estimated to cost $3.5 million. The Authority is receiving a grant under the Wastewater Treatment Fund in the amount of $181,982 for pump station rehabilitation and replacement of force mains.

Pump controls are being replaced in the effluent and trickling filter pump stations ($579,000). An alternative energy project using solar panels will be incorporated into the main treatment plant. This undertaking includes new roofs and building HVAC. Final costs are estimated at $2.737 million.

Main facility improvements include the replacement of the primary sludge pumps, new sludge transfer pumps and various controls ($600,000). These installations have a 5-month agenda. Old wooden sewers in the Hoboken collection system will be replaced ($2 million). CSO regulator improvements were planned for 2008 ($860,000). The 11th Street pump station will be upgraded at an estimated cost of $450,000. Bids were requested during January 2008 for the construction of a new wet weather pump station; estimates are expected to be approximately $7 million. Another collection system project involves the installation of another floatables module ($9.792 million). At press time, no further updates were available.

North Hudson Sewerage Authority - River Road Wastewater Treatment Plant (formerly West New York) (Hudson County)

Projects in Progress

This facility is operating under a State Administrative Consent Order to have solids and floatables modules installed in the CSOs discharging to the Hudson River. Three solids and floatables screening modules are being constructed. The first was completed (~$7 million) and is in operation. Another module — located at Hillside Avenue in West New York, NJ — was 88% complete and is re-estimated to cost $11.641 million as of November 2007. A planned operational date was December 28, 2007. No status updates were available during 2009.

Under way during 2007, $660,000 was allocated to make improvements on the secondary clarifier (April 2008), install a new influent bar rack (May 2008), and perform a fire system upgrade (December 2008). No status updates were available.

Passaic Valley Sewerage Commissioners (Essex County)

Completed Projects

Completed this year was the Oxygenation Tanks Improvement Project. The work included the removal of 36 submerged turbine aerators from nine oxygenation tanks and the installation of 36 mechanical surface aerators and rehabilitation of the existing purge blowers. Installation of piping, valves, and instrumentation systems required for the rehabilitation of the tanks was also completed. Electrical work associated with installation of new equipment, and modifications to existing motor control centers, distribution system, and substations were also completed in 2009. The final cost for this project was $2.6 million and had an actual completion date of September 2009.

PVSC has also developed an updated criterion for cyanide. The cost of the completed engineering study was $100,000 and currently US EPA is moving toward adopting the proposed criterion on a national basis.

Projects in Progress

PVSC undertook multiple engineering studies in 2009. These studies include removal of fine screenings and the use of CSO nets to capture fine screenings in the primary effluent, computer monitoring of final clarifiers at high flows experienced during wet weather, various coatings to restore concrete in final clarifiers, and to evaluate the condition for the reduction of nitrogen in the sludge recycle stream. The total cost of these studies is estimated at $600,000.

PVSC received funds for Economic Stimulus Projects allotted to Phase 2A of the Oxygenation Tank Improvements, upgrades to the effluent pumps and Phase II of the Heat Treatment Plant Supernantant Return (HTPSR). A project involving the Final Clarifier Polymer system is currently ongoing. However, it is not associated with the Economic Stimulus projects. The cost estimate of the current construction project totals $17 million and is 5% complete.

Future Projects

Six new projects are slated for future construction. These projects include improvements to the electrical and controls of the effluent and wet weather pump stations, filter press locker facility, final clarifiers Phase V, modifications to the sludge system and septage liquid waste receiving facilities, repair to utility tunnels and galleries, and weir wall replacement. Approximate cost for this construction is estimated at $31.5 million. A construction start date is scheduled for late 2009.

Peninsula at Bayonne Harbor (formerly Military Ocean Terminal) (Hudson County)

Future Project

This site was formerly the Military Ocean Terminal (MOT). MOT was decommissioned during the Fall of 1998 and has now reverted to the City of Bayonne. The Bayonne Local Redevelopment Authority (BLRA) has proposed a $32 billion plan to develop 18 million square feet of commercial and residential space. In December 2002, the complete and total transfer to the BLRA was finalized and the property was renamed The Peninsula at Bayonne Harbor. The 437-acre site is located in Upper New York Harbor. The proposed plan includes a port facility, townhouses, office space, movie production facilities, a marina, recreational facilities, and a retail complex. Part of this complex is Cruise Port - Bayonne (Cape Liberty Cruise Port - Bayonne, NJ), which is the first new cruise port in New Jersey since 1960.

During the Spring of 2003, the Bayonne MUA began the sewer integration project to link the Peninsula's sewer mains with those in the rest of the City of Bayonne. As is the case with the rest of Bayonne, the sewage from this site will be treated at the PVSC

treatment plant. No status updates were available.

Rahway Valley Sewerage Authority (Union County)

Completed Projects

Since 2001, this facility has been operating under a state consent order to expand the capacity of the existing plant in order to accommodate additional wet weather flows from CSOs; this plant is in compliance with the Order dates. The milestone for substantial construction completion is between 2006 and 2008. The major plant upgrade is now 100% complete.

The final cost for this project was $137 million and included new headworks, new aerated grit chambers, a new primary settling tank, two new final clarifiers, filtration, UV disinfection, and effluent pumping. Influent and effluent piping modifications, as well as site facility construction were also completed under this project. This major plant upgrade was completed in February 2009.

Effluent wastewater leaving the sand filtering process
Photo Courtesy of M. Brinker, Jr. RVSA

NEW YORK STATE WATER POLLUTION CONTROL PLANTS

In the New York portion of the Interstate Environmental District, there are 50 water pollution control facilities located in 9 counties discharging to interstate waterways. Combined the design flow of these facilities is over 1.6 BGD. Effluent compliance inspections are conducted several times a year during unannounced visits by Commission staff. Since 2003, in support of NYS DEC – Region 2, Commission staff conduct reconnaissance and comprehensive inspections at the 14 NYC DEP plants.

Nassau County

Bay Park Sewage Treatment Plant - Disposal District No. 2

Completed Projects

An engineering study dealing with improvements and replacements to various process equipment and facility modifications was completed this year. A second study, concerning modifications to preliminary treatment facilities for sewage treatment within Nassau County is nearing completion. A portion of this study is addressing the possibility of consolidation of various sewage collection and treatment entities within the geographical borders of Nassau County.

Projects in Progress

Over $6.42 million will be incurred to modify the chilled and hot water piping in the main facility. The construction is 95% complete and is re-scheduled to be in operation by late 2009.

Plant-wide permanent lighting upgrades to enhance safety and security is currently 32% complete and has an estimated cost of $2.9 million. The project is scheduled to be operational in 2010.

Future Projects

Currently, the plant has three projects out-to-bid. These include improvements to the raw sewage pump system, installation of a pumping station for the plant’s dissolved air flotation facility, and total residual chlorine controls.

Belgrave Sewer District

Projects in Progress

Reassessed to be about 40% complete, denitrification and UV disinfection facilities are being installed at this 2 MGD trickling filter plant. The outfall is located in Little Neck Bay, an embayment in western Long Island Sound. Construction and installations are planned to be operational during 2011. The BNR upgrade will use a denitrification filter. Concurrently, additional upgrades include a new screenings building and a new secondary clarifier. This upgrade is re-estimated to cost $6 million. During 2003, the District was selected to receive a $2.9 million grant for the BNR upgrade from the 1996 Clean Water/Clean Air Bond Act. In addition to that grant, in January 2006, the District was selected to receive an additional $1,237,295 from the 1996 CW/CA Bond Act to help with the costs of the BNR and UV upgrade.

Cedar Creek Water Pollution Control Plant - Disposal District No. 3

Completed Project

A County-wide master plan was completed during 2007 for sewage treatment in Nassau County. A portion of the study is addressing the feasibility of the consolidation of various sewage collection and treatment entities under the auspices of Nassau County. See the Bay Park Sewage Treatment Plant write-up for additional information.

Projects in Progress

Improvements to the sludge thickening and dewatering facilities are 90% complete and are estimated to incur costs of $32.344 million. The project includes the installation of new belt filter dewatering equipment and ancillary systems. The installation of the new gravity belt thickeners (35% complete) which replace the dissolved air floatation thickening tanks began during August 2007. The old tanks have been demolished and construction of a new building is under way. The project is slated for a 30-month construction schedule.

Cedarhurst

Completed Project

The replacement of two trickling filter pumps was completed at a cost estimate of $99,000; both pumps are currently online.

Projects in Progress

An engineering report was completed during 2007 for a dechlorination upgrade. However, this facility may join the Nassau County sewer/stormwater system. The antiquated facility, originally built in 1934, will probably need extensive upgrades to meet any new effluent requirements, such as ammonia reductions. The Village of Cedarhurst has concurred in principle and is negotiating with the County to develop agreements whereby the County would assume control and operation of the collection system and treatment plant. See the Bay Park write-up for additional information.

Presently, this facility's SPDES permit is under review. A permit modification for a reduction in the final effluent limit of total residual chlorine is being negotiated.

Future Project

Facilities are planned to be constructed in order to address total chlorine residual reduction. Estimated costs for this endeavor are $300,000. Presently, no construction start-up dates have been determined due to the aforementioned potential Nassau County master plan. This master plan targets 2012 for the consolidation of the Village into the County system.

Glen Cove

Completed Projects

The installation of an UV disinfection system, demolition of the chemical tank, and a stand-alone back-up diesel generator are completed and online. The total cost estimate for these projects was $1.2 million and is 100% complete.

Project in Progress

A master plan was completed by Nassau County which included the feasibility of the consolidation of various sewage collection and treatment entities under the auspices of Nassau County. The City of Glen Cove has concurred in principle and is negotiating with the County to develop agreements whereby the County would assume control and operation of the collection system and treatment plant. See the Bay Park write-up for more information.

Future Projects

Re-estimated at $4.5 million, the facility's bulk chemical and bulk petroleum storage tanks will be modified or replaced in order to meet state and federal regulations. This cost estimate also includes upgrades to the final tanks and sludge drying facilities. A construction and compliance schedule has yet to be determined.

Completed UV System
Photo Courtesy of Nassau County, Dept. of Public Works

Greater Atlantic Beach Water Reclamation District (formerly West Long Beach Sewer District)

Future Project

As per a modification of the district SPDES permit by NYS DEC the plant is required to reduce effluent ammonia concentrations to 5.7 mg/l and reduce total chlorine to 0.5 mg/l. The estimated cost for this project is $2.4 million and construction is slated to start late 2010 or early 2011.

Great Neck, Village of

Projects in Progress

This facility is operating under a 2005 State Consent Order to update the facility or divert flows. Completion of substantial construction is required by August 9, 2011. An engineering study is ongoing which addresses upgrading the treatment plant by adding four new pump stations and BNR retrofits. Other feasible alternatives involve

combining flows with the Great Neck Water Pollution Control District and/or converting both plants to pump stations and diverting all flows for treatment at a regional facility located on the south shore of Nassau County. Another ongoing study will determine the ability of the District's 2.8 MGD plant to process the Village flow while the Village constructs the treatment plant improvements to meet the LISS III nitrogen reduction targets. Refer to the Bay Park and Great Neck Water Pollution Control District write-ups for additional information.

Under way during June 2008 (75% complete) collection system rehabilitation involves lining of 1,200 LF of 12-inch diameter (12"Ø) and 300 LF of 8-inch diameter (8"Ø) gravity sewers. This work has a cost estimate of over $196,000.

Future Projects

Planned by in-house staff, the grit chamber will be rehabilitated with new chains, sprockets, rails, shafts, and wear shoes. Actual costs and final time schedules are pending. The installation of nitrogen removal facilities and UV disinfection is also pending.

A report was prepared to evaluate construction of the treatment plant using an MBR or an oxidation ditch in order to meet nitrogen limits on a parcel of land that adjoins the existing treatment plant site. The cost estimate for this project is $14,700.

Great Neck Water Pollution Control District

Projects in Progress

The Feasibility Diversion Study, funded with $36,000 of CW/CA Bond Act grants, was completed approximately seven years ago and concluded that it is technically feasible to divert the entire effluent from this plant and the Village of Great Neck to a regional plant on the south shore. However, the study indicated that the diversion would be more costly and not as environmentally responsible as compared to other on site upgrades. An engineering design is currently under way for a facility upgrade to achieve nitrogen removal. The plant design will utilize oxidation ditch technology.

This facility is operating under a 2006 State Consent Order to further the goals of the Environmental Conservation Law and the Federal Clean Water Act. The plant is in compliance with all Order dates and is required to have substantial construction completed by December 31, 2011.

The District is pursuing several Green projects. As part of the upgrade, installation of micro turbines is currently being studied. If feasible, digester gas will be used to generate electricity and heat for anaerobic digester systems with the micro turbines. The District is currently producing biofuel utilizing waste vegetable oil from local restaurants. This biofuel, generated on site, is used to power five diesel vehicles, heat two buildings, and will be used by a generator to co-generate electricity for the new treatment plant. The District is planning a receiving station for grease from local restaurants. This waste product will be used to increase the methane production of its anaerobic digesters, as well as electrical generation capacity of the micro turbines. Finally, the new facility will support a rain garden to address stormwater runoff. This rain garden will act as a bio-filter that will pre-treat the site's stormwater runoff before being recharged into the ground.

The planned upgrade and expansion of this existing facility will enable the District to comply with the NYS DEC effluent limitations mandated by the LISS Phase III nitrogen reduction plan, and provide increased hydraulic capacity sufficient to accommodate the wastewater flow from the District, as well as from the Village of Great Neck. This expansion and diversion plan is re-estimated at over $60 million. An approximate construction start date was set for September 1, 2009, with an anticipated operational start date of August 15, 2013. Liquid side treatment system improvements include the replacement of the existing influent mechanical bar screens and associated screenings handling system and the grit removal system. Upgrades to specific treatment units include the primary tanks, primary sludge pumping system, new oxidation ditch system, four new final settling tanks, a new effluent flow meter, new UV disinfection system and upgrades at the existing effluent pumping station. The solids handling system improvements will include a new gravity belt thickener, conversion of an existing final settling tank and chlorine contact tank into a primary sludge/waste activated sludge/filtrate storage system, upgrade of the anaerobic sludge digesters and sludge dewatering system. Miscellaneous upgrades will include the installation of a new plant generator for back-up power.

Jones Beach State Park

Future Projects

Recently approved by the State, a new project to reduce concentrations of total nitrogen in the effluent from this plant using a Sequencing Batch Reactor (SBR) process

has been initiated as a result of the Long Island Sound Study. The SBR design for this project is currently complete.

Replacement of the existing in-line grinder unit at the head of the higher flow unit, installation of stainless steel brackets, hardware, and rail system to both grinder units is also slated for future construction. The approximate start-up date for these projects is scheduled for October 2010. The grinder portion of this project is currently under construction.

Lawrence

Project in Progress

This facility is operating under a State Consent Order to correct collection system Infiltration and Inflow. The Lawrence drainage basin discharges to Bannister Creek in eastern Jamaica Bay.

A master plan was completed by Nassau County, which includes the feasibility of the consolidation of various sewage collection and treatment entities under the auspices of Nassau County. The Village of Lawrence has concurred in principle and is negotiating with the County to develop agreements whereby the County would assume control and operation of the collection system and treatment plant. See the Bay Park and Great Neck Water Pollution Control District write-ups for more information.

Future Projects

Planning stages for Phase II facility improvements are complete. Various plant-wide equipment upgrades and replacements will be done as needed. The major focus will be BNR capabilities and UV disinfection. During November 2005, the Village of Lawrence was awarded $1.16 million by NYS under the 1996 CW/CA Bond Act. The grant is to help the Village upgrade the main plant to have the capability to remove ammonia and total residual chlorine, and provide denitrification from the final effluent. Estimates for these upgrades are $6 million. Final Village approval is pending, as well as construction start-up dates due to the aforementioned potential Nassau County master plan.

Long Beach

Projects in Progress

An engineering report was finalized and submitted to the City, which addresses modifications to three existing lift stations. Bid specifications and construction agendas are dependent upon the City of Long Beach's review process and acceptance.

A master plan was completed by Nassau County, which includes the feasibility of the consolidation of various sewage collection and treatment entities under the auspices of Nassau County. The City of Long Beach has concurred in principle and is negotiating with the County to develop agreements whereby the County would assume control and operation of the collection system and treatment plant. See the Bay Park and Great Water Pollution Control Districts' plant write-ups for more information.

This facility is operating under a State Consent Order (September 2008) to address dechlorination and ammonia removal effluent limitations. Compliance schedules are being negotiated. The existing SPDES permit was recently modified for effluent flow reading usage.

Currently, work is in progress to modify one lift station on New York Avenue at a cost estimate of $2.5 million. The construction, which was scheduled for spring 2009, is 35% complete and is estimated to be operational during spring 2010.

Oyster Bay Sewer District

Completed Project

Cleaning and rehabilitation of the primary and secondary digesters was completed in August 2009. This rehabilitation included the painting of the exterior covers and cleaning of the interiors and has a re-estimated cost of $500,000.

Project in Progress

An engineering study evaluating the effluent pump capacity is under way, with a present cost of $4,000.

Future Projects

Plans to replace the influent pump station control panels, installation of an auto alarm system at the Highwood pump station, and to replace building doors and hardware

are currently in the design phase. These improvements currently have estimated costs of $90,000 and $70,000 respectively. Construction is slated to begin spring 2010 and December 2009, respectively. Replacement of the control building roof has an estimated cost of $72,000 and construction is expected to begin October 2009.

Port Washington

Completed Project

Installation of the oxidation ditch and new final clarifier were completed and placed in service during September 2009. Currently, the new equipment is handling 1/3 of the plant flow (~ 1.33 MGD).

Projects in Progress

Under way (75% complete) during 2008, plant modifications are being constructed for nitrogen removal capabilities. Costs are re-estimated at $22.2 million. The District completed a Facility Plan was subsequently approved by the NYS DEC in January 2006. Additional installations include UV disinfection, an enlarged plant emergency generator, as well as all associated pumps, piping, and electrical needs. An operational start-up date for all work is anticipated for July 2010.

Future Project

Planned to begin during spring 2010, rehabilitation of the refractory (heat resistant ceramic component) in the sludge fluidized bed reactor will be completed during the summer. The work is estimated to cost $550,000.

New York City (Bronx, Kings, New York, Queens and Richmond Counties)

The New York City Department of Environmental Protection (NYC DEP) maintains a vast infrastructure comprised of 14 drainage basins. The 14 treatment facilities are sited throughout the City's five boroughs and range in capacity from 40 MGD to 310 MGD. 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 plants by sea.

The 14 New York City drainage basins are serviced by a combined sewer system, which has approximately 4,800 miles of sewers, 500 outfalls, and 382 regulators with tide gates. 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.

City-wide CSO Abatement Program

A City-wide CSO abatement program has been under way since the 1980s. The objective is to lessen the effects of untreated sewage, which is bypassed during wet weather 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.

Budgetary constraints necessitate the prioritizing of wastewater pollution control projects and watershed supply and enhancement projects. Many projects previously reported here throughout the 14 drainage basins are being eliminated, postponed, or scaled down. Prioritizing wastewater treatment projects must coincide with the protection and delivery logistics of the NYC reservoir and aqueduct network, which provides 1.2 billion gallons of potable water daily. Structural and nonstructural solutions are being evaluated and prioritized. Projects under way in the upper East River drainage basins are moving ahead. 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.

The NYC DEP began its CSO abatement program in the 1980s, and expanded the program in response to permits issued by the State. The NYS DEC issued an Order on Consent (June 24, 1996) and a Modification (August 6, 1996) that required the NYC DEP to implement a CSO abatement plan to achieve, to a practicable level, compliance with water quality standards. On January 14, 2005, the parties entered into a new Order of Consent which supersedes all previous orders.

During 2004, the CSO Long-Term Control Plan (LTCP) Project was negotiated with NYS DEC. The hearing record closed during November 2004. This Consent Order incorporates the Use and Standards Attainment (USA) Project which began in March 2000. Key components of the revised order include the construction of six retention tanks located in Alley Creek, Flushing Creek, Hutchinson River, Newtown Creek, Paerdegat Basin, and Westchester Creek; installation of floatables controls in the Bronx River and Gowanus Canal; wet weather capacity upgrades to capture 2.5 times design capacity; and sewer system improvements. The

Waterbody/Watershed Facility Plans were due June 30, 2007, and the Long Term Control Plan is due by 2017.

Jamaica Bay

For the Jamaica Bay geographical area, holding tanks and in-line storage are the selected CSO abatement alternatives. The Spring Creek Auxiliary Water Pollution Control Plant (located on Spring Creek, a tributary of Jamaica Bay) is an existing CSO detention facility with a storage volume of approximately 20.2 MG — 14.6 MG basin storage and 5.6 MG influent barrel storage. Floatables controls, dredging, in-stream aeration, and sewer system improvements are being considered.

Inner/Outer New York Harbor

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, which was completed during May 1999. Mechanical and dredging issues were realized soon after activation. Under way since 2008, the tunnel will be modernized, the pump station will be upgraded, dredging will be done in the canal, and area sewers will be improved. Costs are re-estimated at $203 million with phased completion through 2013.

Outer Harbor proposals include maximizing flow to the WPCPs and reducing CSOs and dry weather flows in Coney Island Creek. It is estimated that $45.5 million will be expended through 2010. Consent Order elements include regulator improvements and in-line storage, the Hannah Street pump station bypass, improvements at Wards Island, and additional regulator improvements ($286 million).

East River

The objectives of the East River CSO Facilities Planning Project are CSO abatement and improving the water quality of several rivers and creeks tributary to, and including the East River. The primary goal is to increase, to an extent reasonably feasible and practical, compliance with NYS DEC water quality criteria for the East River and its tributaries. This will be attained through the identification, evaluation, and selection of CSO abatement alternatives that would achieve cost-effective improvement in water quality. The tributaries of concern are the Hutchinson River, the Bronx River, and Westchester Creek, which are all located in the Borough of the Bronx. Alley Creek, which has a confluence with Little Neck Bay, is located in the Tallman Island drainage basin in Queens County.

Eastbound on the East River aboard the R/V Natale Colosi, July 2009
Photo by G. Spencer, IEC

Hutchinson River

The Hutchinson River CSO Storage Tanks Project has been developed by the NYC DEP to reduce CSO discharge from two outfalls into the Hutchinson River. The goals of the project are to improve the water quality and achieve compliance with New York State Class SB water quality criteria. These outfalls currently contribute annually about 95% of the CSO discharges to the Hutchinson River, contribute significantly to water quality degradation, and are the primary sources of violations of water quality standards in the river. The river has a confluence with Eastchester Bay in western Long Island Sound.

The project has gone through a number of design concepts, and the latest proposed plan, as submitted to the NYS DEC on June 30, 2003, provides for the design and construction of one underground storage conduit (4 MG) and an underground storage tank (3 MG) for a total capacity of 7 MG. Additional facility planning completed during 2007 has identified a better alternative and subsequently changed the design to a second storage tank. The proposed facilities would be constructed in two phases: June 2011 through June 2015 for the 4 MG southern storage tank, and December 2016 through 2023 for the 3 MG tank. The CSO storage units would be comprised of mechanical bar screens, an air treatment system, an overflow discharge conduit to the river, a pumping station to pump stored combined sewage back to the existing combined sewer system after rainstorms, and a force main to discharge pumped

combined sewage into the existing combined sewer system. Provisions would be made for the future installation of disinfection facilities, if such facilities are later found to be necessary for compliance with NYS DEC regulations.

Bronx River

A September 2003 submittal to the NYS DEC provided for the Bronx River CSO Storage Facility Project that will include construction of a 4 MG off-line CSO storage conduit. In March 2004, a modified facilities plan identified minimal improvements to the river with the proposed plan. Consequently, additional floatables control facilities will be installed at three outfalls. The in-line netting and screens alternative will be designed with hydraulic capacity to ensure no surcharging conditions in the upstream sewer system. As presently planned, the proposed facilities will be constructed under a single contract from June 2009 through June 2012.

Westchester Creek

As indicated in a June 2003 submittal to the NYS DEC, the Westchester Creek CSO Storage Tank Project will include the construction of an underground CSO storage tank with a capacity of 12 MG; which includes the storage capacity within the supply/storage conduit. Other principal facilities to be constructed as part of the project include an operations building to house operational units including air treatment facilities, a single-barrel supply/storage conduit, and a pumping station with a rated capacity of approximately 10,000 gpm. In addition to the facilities required for CSO abatement, amenities for use by neighborhood baseball Little Leagues will be provided adjacent to the site of the underground storage tank. Provisions would be made for the future installation of disinfection facilities, if such facilities are later found to be necessary for compliance with NYS DEC regulations.

The preliminary phase of the Westchester Creek CSO storage tank will be for site preparation and construction of the Little League restroom facilities, which took place from June 2008 through February 2009. Phase I, scheduled for June 2011 through June 2015, includes the construction of the diversion chamber, supply/storage conduit, and the tide gate chamber. Phase II includes the construction of the storage tank, Little League clubhouse facility, fencing, and parking lot. This phase will be conducted from December 2015 through 2022.

Nitrogen Removal

Required by the LISS TMDL for nitrogen reduction, the NYC Long-Term Nitrogen Program includes upgrading of the upper East River plants: Bowery Bay, Hunts Point, Tallman Island, Wards Island, and 26th Ward (located in Jamaica Bay) for step feed BNR. The Program

will implement separate centrate nititrification at 4 of the 5 plants; construct and operate a 1.85 MGD SHARON process facility (nitrogen removal technology originating in Holland) at Wards Island to treat centrate, as well as conduct supplemental carbon optimization studies at Wards Island. Additionally, implement a sludge transshipment from Tallman Island to Bowery Bay to help mitigate total nitrogen loadings during construction, and implement supplemental carbon addition and other optimizations.

Past milestones to commence operation of the supplemental carbon facilities included a one year extension granted in 2007. The SHARON process had a completion date of 2008, but was extended until July 2009. As of March 4, 2009, this contract was about 50% complete.

Bowery Bay

Projects in Progress

The Bowery Bay WPCP upgrade is a multi-phase modernization intended to improve process efficiency, reduce manpower requirements, and improve reliability. Subsequent to the project's initiation, the City entered into the NYS SPDES Administrative Consent Order - Nitrogen Reduction Agreement. Required under this agreement, the Bowery Bay WPCP will be retrofitted to reduce nitrogen loadings into the East River and Long Island Sound. This facility is located on the upper East River south of Rikers Island.

Phase I includes replacement of most of the process equipment, as well as a complete replacement of the electrical distribution and HVAC systems throughout the plant. Process upgrades include new raw sewage pumps and drives, new preliminary scum collection and pumping equipment, replacement of return sludge and mixed sludge pumping systems, and replacement of the disinfection system. A centralized residuals handling building will be constructed to provide for collection and concentration of screenings and grit. A new plant instrumentation and control system is also being installed. The electrical distribution system improvements involve replacement of all distribution switchgear and construction of new unit substations and motor control centers. The substations and motor control centers will be sized for the eventual conversion of all plant equipment from 208V to 480V power supply. All new equipment will be 480V; all existing equipment to remain will be powered from the existing 208V motor control centers. A complete new boiler plant will be installed in a new addition to the main building. Heating hot water distribution piping and air handling equipment throughout the plant will be replaced. Upgraded personnel, laboratory, and storage

facilities are also being constructed.

The scope of work for this phase has been greatly reduced in order to expedite the contractors vacating the site. Items that were deleted include the residuals handling building, main sewage pumps #3 through #8, and associated headworks, return activated sludge distribution boxes, and main building modifications. The main sewage pump replacement will be completed under another contract. Work on main sewage pump #1 is almost complete, and work on main sewage pump #2 is expected to start shortly. The bid price for Phase I was $214 million. Phase I construction has been under way since December 2000 and is 85% complete.

Phase II of the Bowery Bay WPCP upgrade addresses immediate necessary improvements to the Solids Handling Facilities. The work includes the replacement of the existing gravity thickener mechanisms. The existing plunger type sludge pumps are obsolete and will be replaced with progressive cavity type units. Grinders will be provided to minimize the possibility of clogging the new sludge heaters that will be installed downstream. Deteriorated concrete walls and walkways will be repaired and existing hand railings replaced with railings conforming to current codes. The cost of Phase II is estimated at $37.9 million and is currently 82% complete.

Phase III of the Bowery Bay WPCP upgrade details the BNR improvements required to bring the plant into compliance with the Nitrogen Loading Reduction Consent Order. The scope of work included in this phase will relate to additional stabilization needs. The cost for this work is estimated at $258.6 million; the work commenced in November 2006 and is 44% complete.

Future Project

Phase IV of the Bowery Bay WPCP upgrades includes an upgrade to the emergency generator facilities. Construction is scheduled to start 2013 with an estimated cost of $55 million. This project has an operational start-up date of 2016.

Coney Island

Projects in Progress

The current fire alarm system at the plant is mostly non-functioning and the equipment is obsolete. A new code compliant fire alarm system is scheduled to be installed and will be centrally monitored from the plant’s control room. The system has

an anticipated completion date of October 2010 and is currently 15% complete.

Planning modifications and improvements to the chemical bulk storage and petroleum bulk storage facilities are under way. This includes chemical storage tanks, feed/transfer pumps, secondary containment dikes, double wall containment piping, sodium hypochlorite system, and an emergency disinfection system. Under the same contract additional installations include new truck unloading containment pads, drainage piping, and associated equipment. The new chemical system will be linked to the existing SCADA system over a fiber optic link. Completion for this project is scheduled for April 2010 and is currently 5% complete.

Future Project

The Coney Island plant is equipped with two outfalls that discharge effluent in Rockaway Inlet in Jamaica Bay. Installed in 1934, the 72-inch (72"Ø) steel cylinder concrete outfall pipe extends 8,500ft to a 28-foot diameter (28'Ø) outlet chamber. Hydraulic molding of the existing diffuser system indicated that a new diffuser system is required. A new diffuser system will be constructed to replace the existing system and the failed pipe and outfall structure will be demolished.

Paerdegat Basin Project

The objective of the Paerdegat Basin CSO facility, located in Brooklyn at the intersection of Ralph and Bergen Avenues, is to improve the water quality of Paerdegat Basin by substantially reducing combined sewer overflows during rainstorms. The facility plan includes the reduction of CSO impacts through the maximized use of existing facilities (sewers, interceptors, and treatment plant) amounting to 20 MG of in-line storage, and a 30 MG retention tank, all of which capture and store a large portion of combined sewage during a rain event that normally would have been discharged to the basin. The diverted flow is screened prior to entering the tank. After storms, stored combined sewage empties into the Paerdegat Basin Interceptor connected to the Coney Island Water Pollution Control Plant, partly by gravity and mostly by pumps, for complete treatment. Re-estimated costs were $377.5 million for all phases. Phases I and IA were completed during 2002 and 2005, respectively. Phase II of the CSO facility foundations has an anticipated completion date of February 2010.

Phase III of the Paerdegat Basin CSO facility is the construction of above-grade structures consisting of a screenings building, odor control and HVAC building, CSO pump back building, and a collections facilities south building with adjacent Community

Board No. 18 meeting room. Dredging of the canal is also part of the Long-term Control Plan. The anticipated completion date for the CSO facility structures and equipment is January 2011.

Phase IV of the Paerdegat Basin Facility Project includes the creation of a natural area park. Currently the construction for this park is slated for January 2010.

Hunts Point

Projects in Progress

The Hunts Point WPCP upgrade is a multi-phase project intended to improve process efficiency, reduce manpower requirements, improve reliability, and maintain compliance with all applicable permit requirements and Consent Orders. Subsequent to the project's initiation, the City entered into the NYS DEC SPDES Administrative Consent Order-Nitrogen Reduction Agreement. Required under this Order, retrofitting of existing treatment units will reduce nitrogen loadings into the East River and Long Island Sound. This facility is located on the north shore of the upper reach of the East River.

Phase I, estimated to cost $250 million, is a 3½-year construction phase which includes Consent Order mandates for hydraulic improvements to allow treatment of twice dry weather design flow (200 MGD) by October 13, 2004, as well as upgrades to most of the wet stream processes. The major items to address include forebay gate chamber improvements, screen chamber modifications, main pump station upgrade, raw sewage conduit modifications, personnel facility additions, aeration tank froth and foam control, an RAS system upgrade, and chlorine building and contact tank modifications. A new central residuals handling facility will be built on site to handle grit, screenings, and scum under one roof. Phase I is currently 98% complete.

Phase II construction, under way since June 2003, has been estimated to cost $212 million. This 3½-year construction phase involves BNR enhancement. To comply with nitrogen reduction requirements, this phase will also include new process and channel air blowers, polymer and alkalinity addition facilities, new centrate distribution facilities, and a new main electrical substation. Upgrades will be made on the air headers, diffusers, and aeration tanks. Phase II is 86% complete.

Phase III, the upgrade of the plant's solids handling facilities, is currently under design and has been divided into four construction stages. The first stage will be the environmental remediation of the Barretto Point site, which will be the location of future

sludge digestion facilities. Barretto Point is located on the East River south of the Bronx River confluence. The remediation work commenced July 2008, with a construction cost of $10 million and is currently 95% complete.

The second stage will be a contract to renovate the existing digesters and to install facilities to add polymer to the main wastewater flow in order to enhance nitrogen removal. This project went to bid August 2009 and has an expected construction cost of $36 million. The third stage will be the upgrade of the existing sludge thickening facilities and the installation of new waste gas burners and a gas holding tank, which will replace existing facilities. The final stage will be the construction of two new egg-shaped digesters on the Barretto Point site. The scheduled completion date for the upgrade of the solids handling facilities is 2014.

Phase IV is the installation of carbon addition facilities required to achieve future total maximum daily nitrogen limits. The carbon addition facilities are required under the Nitrogen Consent Order, and must be constructed and operational by July 2014. Preliminary design of these facilities has started.

Jamaica

Completed Projects

Under way in 2005 and 2007, engineering experiments dealing with a sludge thickener blanket probe and an experimental hypochlorite feed system were in the testing phase but both studies have recently been closed.

Projects in Progress

Plant-wide interim expansions are ongoing in order to comply with SPDES permit limitations and requirements. The estimated cost for this work is over $260 million plus over $48 million in engineering and design construction management fees. There will be two construction phases. Phase I will entail new installations of treatment units such as a primary tank splitter box, a primary tank, a primary force main, the main sewage pumps driven by VFDs, return activated sludge pump stations, waste activated sludge pump stations, a chlorine contact tank, odor controls, and an electrical substation. Phase II includes a new secondary screenings building, main building alterations, a residuals handling building, an administrative and maintenance building, new covers for existing sludge storage tanks, rehabilitation of the existing air blowers, new process air piping and new fine bubble diffusers in the aeration tanks, odor controls, emergency lighting and a

boiler plant. Final design for Phase II is complete. Phase II construction started in April 2005 and is anticipated to be complete by April 2010.

CSO abatement projects in this drainage basin include the placement of a retention tank in Fresh Creek, which is a tributary of Jamaica Bay. The preliminary design is under way. Other elements to be implemented include upgraded floatables control, sewer system improvements, dredging, and in-stream aeration.

Newtown Creek

Projects in Progress

The Newtown Creek WPCP upgrade project is a multi-phase project designed to improve process efficiency and treatment facility reliability. The project is mandated by the NYS DEC Second Modified Judgment on Consent. The Order requires an effluent enhancement program to achieve City-wide effluent limits; secondary treatment, and step denitrification treatment levels by December 31, 2007; and complete construction by May 1, 2013.

Phase 1A is a nine-year construction phase with a re-estimated cost of $988 million. Under this phase, the existing main building will be remodeled with the inclusion of new boilers, new emergency turbine generators, and preparations for the installation of the process air blowers. Other items include a new electrical substation, locker facilities, and a visitor's center. The construction of the new solids handling facility consists of the new centrifuge thickening building, 24 thickening centrifuges, eight 3-MG egg-shaped sludge digestion tanks, a sludge transfer station, sludge storage tanks and gas holding tanks. The construction of a new support building to house personnel facilities and laboratories, the disinfection facility, and chlorine contact tanks are progressing. The construction of a new contact tank influent channel, new East River/Whale Creek Canal effluent conduits, the Whale Creek Canal outfall and bulkhead are complete. Construction of these aforementioned items is substantially complete.

Phase 1B, estimated to cost $1.43 billion, is a 10-year construction phase consisting of the construction of the north and central batteries of aeration and final tanks, aeration tank influent splitter box, and north control building. The installation of the process air system blowers in the main building and process air mains across all three batteries is nearly complete. Collectively, this phase is substantially complete, is estimated to cost $901 million, and was re-scheduled to be operational during February 2009. Modifications to the north side of the existing main building include the additions

of maintenance shops, training facilities and offices, as well as the replacement of the influent screening equipment and raw sewage pumps. This work is 22% complete and is estimated to cost $305 million. The Manhattan pump station upgrade includes the replacement of raw sewage pumps, structural and architectural modifications to the building, addition of a new electrical substation, and emergency turbine generators. This work is 67% complete, is estimated to cost $225 million, and has a planned completion date of May 2011.

Phase 2, re-estimated at $534 million, is a six-year construction phase consisting of the construction of a new central residuals building with new secondary screens for screening the combined flow from the service areas in Brooklyn, Queens, and Manhattan prior to the treatment batteries. This phase also includes the installation of skimmings concentrators, grit cyclones, and grit classifiers. Screenings containers, truck loading facilities, and an odor control system will also be part of this phase; the design is complete. This phase was repackaged into two distinct contracts. One is to perform the demolition of the digesters and building foundation, and a second is to construct the central residuals building. Construction began during September 2009 and is anticipated to be complete during November 2013. Kingsland Avenue will be reconstructed to reflect the final queuing and travel lane configuration. The Nature Walk Extension will be constructed along Kingsland Avenue.

Phase 3, re-estimated to cost $1.231 billion, is an eleven-year construction phase, which involves rebuilding of the existing south battery of grit, aeration, and sedimentation tanks. The existing control building will be demolished and a new building will be constructed. The construction schedule is based on the central and south battery reconstruction. The construction notice to proceed was given during September 2008 and the work is currently 23% complete. The final site work would occur at the end of the upgrade and would include landscaping, construction of new on-site roads, parking areas, and site lighting. This work is slated to start January 2015 and end July 2017. With the suspension of the rehabilitation of the existing East River sludge dock and sludge force mains, final design has started on the construction of a new sludge loading facility on Newtown Creek, which is a tributary of the East River. The preliminary design was complete during 2006 and is currently on schedule to start August 2010.

Future Projects

Phase III also includes three new sludge vessels which are currently being procured and are scheduled to begin December 2009 ($97 million). This contract is also to include the northwest addition to the main building, as well as Phases 2 and 3 of the

Nature Walk and the extension of the fountain on Greenpoint Avenue. Preliminary design for this project is currently under way and has an estimated cost of $160 million.

The facility is planning various process enhancements, which will update and/or upgrade equipment and facilities provided by previous construction contracts. The process enhancements include work to the digesters, aeration tanks, disinfection building, north control building and the effluent sample line. The project design is currently 60% complete, has an estimated cost of $30 million and is scheduled to start June 2010.

Consent Order elements to be addressed include an 8 MG CSO storage tank, installation of the Morgan Avenue sewer and the Kent Avenue throttling facility. Other elements that will directly affect the open waters of Newtown Creek include enhanced aeration, dredging, floatables control, installation of a 40 MG storage retention tunnel, and a relief sewer in Dutch Kills. Construction dates and costs will be contingent upon NYS DEC approval of Consent Order modifications.

North River

Projects in Progress

This facility, located on the east shore of the Hudson River south of the George Washington Bridge, is operating under a 1992 State Consent Order to address issues of capacity, odor, and air emissions. Odor emissions are a particularly sensitive issue for the North River WPCP, since it is located in a heavily populated section of Manhattan with Riverbank State Park constructed on its rooftop. The Post Construction Odor Survey, which was mandated by Consent Order, was to identify and recommend solutions to odor control. The findings of this study were published in the Post Construction Odor Study, which also includes the results of an independent study as part of a settlement with the Natural Resources Defense Council (NRDC), West Harlem Environmental Action (WHEACT), and the City. Both studies focus on identifying odors and recommend remedial measures to further control odor emissions, as necessary.

The Consent Order required work has been under way since February 10, 2002. The major components included in this contract are (1) odor control system rehabilitation of the scrubbers, absorbers, fans and associated appurtenances, a chemical system and controls; (2) replacement of the aeration tanks' diffusers; (3) a process air upgrade; (4) dissolved oxygen probe installations with automatic controls; and (5) increasing the waste sludge capacity. Expenditures are estimated at $45.5 million and was estimated to be complete during mid-2008, but is ongoing.

Inspections and cleaning of the eight digester tanks revealed that one tank had damage to the mechanical piping and support systems. The work needed to repair the

digester tank includes the internal inspection of six digester tanks, developing the required repairs to the digester piping, pipe support systems, steel liner, and concrete surfaces subsequent to the inspection. Final testing of each digester tank for leaks after the repairs has been completed. The repairs included furnishing and installing new piping, couplings and pipe sleeves, reinforced pipe support systems, and pipe gaskets; welding of the liner and attachments, grouting behind the liner and at the edges, and concrete spall repairs. Costs for all repairs and inspections are re-estimated at over $13 million. These repairs have been under way since December 27, 2004, and are re-scheduled to be complete during 2010.

Engineering studies are continuing dealing with diffusers, air headers and other odor control improvements, centrifuge thickening, primary sludge pumping, degritter replacement, and chlorine disinfection. These studies have been ongoing as early as August 2002, with others initiated as recently as February 2006. These studies are being conducted by in-house staff and contractors. A study involving boiler and heat exchange improvements was completed October 8, 2009.

Under way since June 29, 2005, another contract includes the (1) installation of additional odor control equipment (scrubbers, absorbers and fans); (2) replacement of headworks' ventilation ductwork; (3) installation of additional electric motor driven process air blowers; (4) modification of the digester overflow box control; (5) odor control of the final settling tanks' effluent launderers and chlorine tankage; (6) modification of the secondary bypass control system; (7) upgrading the plant-wide chemical storage and conveyance system; (8) replacement of the City water pumps and pre-packaged booster pumps; and (9) modification of the electrical substation. Expenditures are re-estimated at $83.6 million. Completion is anticipated for the end of 2010.

Owls Head

Projects in Progress

Since the closing of the Fresh Kills Landfill, it has been mandated that the grit and scum building at this facility be expanded to accommodate the storage of grit and scum collected over a three-day to four-day period. The project includes extending the central residual building, designing an odor control system that can accommodate the expansion of the building and the added odorous load of stored grit and scum, improving the bays to accommodate large containers (20-30 cubic yards), and upgrading the electrical service. The bid documents are currently in law review. A Notice to Proceed schedule will depend on the law review outcome. Design costs are about $5.1 million. All construction phases were to be completed by December 15, 2008, at a re-estimated cost of $41 million. No updates on this completion date have been provided.

Stabilization of the forebay includes reconstruction of the forebay conduit,

sampling of sediments, sediment removal, crack repair, rehabilitation or replacement of the steel liner (north forebay conduit only), and installation of a cathodic protection system for the new liner. After completing the crack repair, several items will be undertaken: installation of a microfine cement grout around the soil envelope of both conduits, designing of a pump-around system to facilitate wet weather flow during storms, stabilizing the soil around the forebay, and providing power to support the construction. A contract was awarded during March 2006. All phases were to be completed by February 2008 at a re-estimated cost of $12.1 million. No updates on this completion date have been provided.

The objectives in reconstructing the 30 MGD Avenue V pumping station and force mains are to: reduce the potential for sanitary sewer surcharge conditions upstream of the station, improve the Coney Island Creek water quality by increasing the wet weather (CSO) pumping capacity, and upgrade and automate the station for unmanned operation. The station's wet weather flow capacity will be increased to a nominal 80 MGD to pump the sum of peak sewage flow of 34.6 MGD and necessary CSO flow of 42 MGD. Anticipated work will continue through 2012; construction is roughly 28% complete. Costs are estimated at $169 million.

The pumping station upgrade includes construction of a wet well extension for temporary pumping, sequential demolition and construction of the wet well lowered by 3.5 feet, demolition of unneeded structures, replacement of tide gates, force mains, removal of old equipment, installation of six wet pit submersible pumps with VFDs, and new electrical and HVAC equipment. Having historic and architectural significance, the main building's restoration will be done with the approval of the New York City Landmarks Preservation Commission and the New York State Office of Parks, Recreation, and Historic Preservation.

The pumping station upgrade will be bid as two contracts. The total cost has been re-estimated at $117.1 million — $42 million for the station and $75.1 million for the force mains. First, is the reconstruction and upgrading of the station for automated operation and expanding the pumping capacity for wet weather flow. Construction actually began during December 2005. Second, is construction of two new force mains: a 42-inch diameter (42"Ø) pipe (18,500 LF) dedicated to dry weather flow and a 48-inch diameter (48"Ø) pipe (13,100 LF) dedicated to wet weather flow. Construction was scheduled to begin April 2007. These projects are anticipated to be complete during April 2011 and April 2012, respectively.

Red Hook

Project in Progress

A continuing experiment, under way since July 2003, involves fuel cell

efficiency.

Rockaway

Projects in Progress

The preliminary design for the stabilization project began during April 2006 and was anticipated to be complete during March 2008. Subsequently, a three-year construction agenda is planned to begin during March 2009.

Ongoing engineering studies are addressing total residual chlorine management, chlorine disinfection system improvements, and the first planning phase of plant-wide improvements.

Tallman Island

Completed Project

The objective of the Flushing Bay CSO facility is to improve the water quality of Flushing Creek and Bay by substantially reducing combined sewer overflows during rainstorms; these waters have a confluence with the upper East River. This phase was substantially completed on May 17, 2007, and was planned to be operational during August 2008. Additional elements to be addressed through 2027 include the construction of a 25 MG retention tunnel, sewer upgrades, and dredging. Estimated costs for this agenda are $2.146 billion.

Projects in Progress

The Tallman Island upgrading is a multi-phase project intended to improve process efficiency, reduce manpower requirements, improve reliability, and maintain compliance with all applicable permit requirements and consent orders. Subsequent to the start of this project, the City entered into the NYS DEC SPDES Administrative Consent Order-Nitrogen Reduction Agreement. This Order requires this facility to be retrofitted to reduce nitrogen loadings into the East River and Long Island Sound. This 80 MGD secondary treatment plant is located on the south side of the upper reach of the East River.

Phase I is the only phase with a defined scope of work and consists of high priority repairs and implementation of low-level BNR. The major stabilization improvements in this phase include the replacement of the main sewage pumps and process air blowers. BNR improvements — such as increased blower capacity, mixers, baffles, and increased RAS capacity — will also be implemented. The estimated cost of this phase is $280 million and was registered for FY 2007. Construction is anticipated to be complete during December 2013. Phase II of the Tallman Island upgrade includes

BNR enhancement work including methanol, alkalinity and polymer addition, and centrate treatment. Other major items include new main sewage pumps and engines, digester improvements, and plant-wide instrumentation. In order to avoid a bypass event while replacing the main sewage pumps and suction piping, a $6 million pump-around-system will be constructed. This three-year construction phase started in 2005 and, as mandated by Consent Order, must be constructed and operational by December 31, 2009. This phase is estimated to cost $233 million.

Phase III of the Tallman Island upgrade includes BNR enhancement work including methanol addition and centrate treatment. This three-year construction phase is estimated to cost $23 million. Overall, contract work is less than 14% complete.

Several engineering experiments are under way to investigate automated chlorine control using total chlorine residual analyzers, automatic sampling based on plant effluent and flow pace and the evaluation of new hypochlorite pumping system for disinfection.

The Alley Creek Drainage Area Improvements/CSO Abatement Facilities Project, which has been designated as Phase I of the comprehensive Alley Creek Project, will be constructed in three stages: the Alley Creek Drainage Area Improvements (Stage 1), the Alley Creek CSO Abatement Facilities (Stage 2), and the Alley Park Environmental Restoration (Stage 3). The Oakland Ravine Stormwater Treatment System (ORSTS), a stormwater treatment system in the form of settling basins and natural emergent wetlands, which is not a part of the CSO abatement project, has been designated as Phase II of the comprehensive Alley Creek Project. Alley Creek is located at the head of Little Neck Bay, an embayment of western Long Island Sound.

The principal elements of the project include additional stormwater and combined sewers, a new outfall sewer, and a new combined sewer outfall to substantially eliminate street flooding and sewer surcharging, and construction of a new 5 MG CSO storage facility to abate CSO discharges into Alley Creek (Stage 1). Stage 2 is the activation of the 5 MG CSO storage facility, upgrading the Old Douglaston pumping station to enhance the station's reliability to pump the captured combined sewage to the Tallman Island WPCP for treatment, a fixed weir constructed within the new outfall sewer at its downstream end near the outfall to induce storage of the combined sewage, and a baffle constructed within the outfall sewer immediately upstream of the fixed weir for floatables control. This stage began during December 2006 and was anticipated to be operational in June 2009. Finally, a permanent ecological restoration of approximately 23.5 acres within Alley Park including the restoration and/or creation of 8.2 acres of wetlands and 15.3 acres of upland/parkland community comprised of trees, shrubs, herbaceous plants, and grasses. This final stage began during August 2007 and was planned to be complete during August 2009. Total costs are estimated at $130 million and is 80% complete.

Ongoing since October 2003, engineering studies are addressing automated chlorine controls, installation and evaluation of new hypo-chlorite pumping systems, and

automated samplers for plant effluent and flow pace.

New Settling Tanks
Photo Courtesy of NYC DEP

26th Ward

Projects in Progress

The 26th Ward WPCP upgrade is a multi-phase project to improve process efficiency, reduce manpower requirements, and improve reliability. This modernization will ensure compliance with all applicable SPDES permit requirements and consent orders.

Phase II of the facility-wide upgrade involves the replacement of the main sewage pumping station force main. Other collection system installations include a new force main and flow meter on the plant site, installation of a new header within the existing pump station, connection of each pump to the new force main, and temporary pumping while the connections are made. Construction of the new force main will require relocation of the existing fuel oil storage tanks. The existing tanks are aging and will be replaced with temporary, above-ground tanks. The project bid price was $16,926,750. Construction for this project began during May 2005 and is slated for completion December 2009.

Phase III will concentrate on BNR installations and other improvements at the plant. The scope of work for this phase includes replacement of the preliminary settling tank mechanical equipment (sludge pumps and piping), blower motors and control systems, aeration tank diffusers, return sludge pumps, thickener mechanisms, and various electrical and HVAC elements. Refurbishment of the existing process air blowers, miscellaneous improvements to the final settling tanks, and construction of a new chlorine storage building are the final agenda items for this phase. Work began during October 2005 with associated costs re-estimated at over $91.05 million.

Collectively, the Consent Order construction completion milestone of the facility-wide upgrade was June 30, 2008. The milestone modification date requested is December 31, 2009. The current projected completion date is January 6, 2010. Presently, the contract work is 67% complete. Overall completion is scheduled for the end of 2012.

Engineering designs, completed in July 2009, for the replacement of the existing two 4.0 MW gas turbine generators with three 2.5 MW diesel engine generators have a bid price totaling $32.46 million. The generator system project will implement the improvements required to provide the necessary, reliable, and efficient emergency power for plant operations in the event of a total utility outage. This project was identified for stimulus (ARRA) funding. Construction is due to start 2010 with an anticipated completion date of mid-2012.

Several engineering studies have been ongoing since 1991, which address biological nutrient removal, centrate nitrogen removal (postponed due to plant-wide construction), polymer addition for sludge thickening enhancement, and the use of fuel cells for co-generation and the sludge thickener blankets. Several of these studies are on hold due to construction including centrate treatment and a thickener enhancement project and are expected to be back online by mid-2010.

Future Project

A comprehensive upgrading at 26th Ward, including expansion of the plant to accept 50 MGD of additional flow during storm events, is being planned. Engineering services for this work are being procured. Design for the comprehensive upgrading began during June 2006. It is anticipated that substantial construction will be complete during December 2015 however construction is scheduled to be complete by 2024. The multi-phase construction will include two additional preliminary settling tanks, a new raw sewage pumping station with additional chlorine contact tanks, an odor control, and scum removal system. The estimated construction cost for these combined projects is $814 million.

Wards Island

Completed Project

Phase I construction began in 1996 and has been completed recently. Under these construction contracts, the existing disinfection system was demolished and replaced with a new system. This system improves the control of the sodium hypochlorite feed with an automated chlorine residual monitoring and control system at a cost of $35 million.

Projects in Progress

Engineering studies and experiments under way since 2004 focus on polymer additions and enhancements, and several froth control alternatives.

The Wards Island WPCP upgrading is a multi-phase project to improve process efficiency, reduce manpower requirements, and improve reliability. These necessary steps will ensure compliance with all applicable permit SPDES requirements and consent orders. The upgrades will address the digester gas system, secondary treatment equipment, and implement BNR in the existing secondary treatment facilities. The plant's remote facilities are currently under construction to upgrade the mechanical treatment equipment and architectural attributes of the Bronx grit chamber, which is considered a New York City landmark.

The physical facilities of the Bronx and Manhattan grit chambers are currently under construction. The rehabilitation includes automation of grit handling, electrical upgrades, odor control, new emergency generators and other equipment as needed. The bid price was $91 million and the current cost is $123.4 million. The structures will be in compliance with current building codes. The Manhattan grit chamber will be renovated based on concepts approved by the Art Commission of NYC. The Bronx grit chamber will be renovated based on concepts approved by the NYC Landmarks Preservation Commission.

Phase III previously included all work necessary to provide 20 years of reliable service for the solids handling facility. Due to budget constraints, this phase has been deferred until 2010. As an interim measure, Phase III was designed to stabilize the solids handling facility and has been designated Plant Stabilization 1. Improvements to the thickeners, gas handling system, and gas holder are included. The construction began during June 2005 and will require about 6 years to complete. The bid price was $42.4 million and the current cost is $52.9 million.

BNR related improvements, as well as other stabilization improvements will be implemented under Plant Stabilization 2. BNR will include process air blowers, separate centrate treatment, chemical addition systems, aeration tank upgrades, and new RAS

pumps. In addition, process improvements such as gate replacement, final settling tank drives, control panels and concrete repair will be performed. Construction began during April 2006 and will require about seven years to complete. The bid price was $173.4 million and the current forecast budget is $204.4 million. Existing consent order requirements mandate BNR completion and operational by December 31, 2010.

Plant Stabilization 3 includes improvements to the main electrical substation. An additional feed will support additional loads as a result of construction of various demonstration projects and Plant Stabilization 2. This work began during June 2008 and has a construction agenda of 24 months. The bid price for this work was $8.1 million and the current forecast budget is $8.3 million. Upgrades to the chemical and petroleum bulk storage systems to meet federal, State, and local regulations are under way since August 2008 and will require about 18 months to complete. The bid price for these upgrades was $11.4 million, with a forecast budget of $12.3 million. These upgrades have an anticipated completion date of February 2, 2010.

Future Projects

Planned improvements to the main plant will address the primary sludge pumping and degritting system and other miscellaneous components of the primary settling tanks. These facilities were originally constructed in the mid-1970's and due to deteriorated conditions of the equipment, piping, etc., the units require replacement. Improvements also include replacement of primary sludge pumps, motors and piping modifications. New cyclone degritters will replace existing degritter/classifier unit. Also included is the installation of new primary settling tanks sluice gates and collector drive mechanisms. The construction of these improvements is scheduled to start December 2009 and is anticipated to span 3 years ($15.7 million).

Rockland County

Joint Regional Sewerage Board-Town of Haverstraw

Completed Projects

The upgrades of pump station #1, pump station #2, and Marina pump station had a construction start-up date of October 2008 collectively. All construction was 100% complete in August 2009. This project had a final cost of $1 million.

Future Project

A four-month agenda has been scheduled for the replacement of the existing bar

screen, as well as the existing grit removal system in the main facility. The re-estimated $650,000 project is planned to be complete during August 2010.

Orangetown

Completed Projects

Phase I/Tier I of a capital improvement plan was operational November 2009. Work included extensive upgrades and expansions for the main facility and collection system. Five pump stations — Better Brands, Hunt Road, Nyack, Pearl Street, and Upper Nyack — were upgraded/rehabilitated as needed. The Better Brands, Hunt Road and Pearl Street force mains have been replaced. The force main installations included 3,400LF of 8-inch diameter (8"Ø); 2,300LF of 10-inch diameter (10"Ø); and 7,300LF of 24-inch diameter (24"Ø), respectively. The sanitary sewer installations included 1,100LF of 12-inch diameter (12"Ø); 4,500LF of 15-inch diameter (15"Ø); and 600LF of 8-inch diameter (8"Ø). Associated siphon installations included 3,100LF of 16-inch diameter (16"Ø) and 3,100LF of 18-inch diameter (18"Ø). Additionally, the Pearl Street influent sewer was replaced. Operational levels will be reached on a phased basis between late 2009 and 2010. The collection system improvements have a final cost of $49.9 million and an actual completion date set for April 2010.

Projects in Progress

Phase I/Tier II of the Pumping Station Improvement Plan at the treatment plant includes the replacement of sludge pump lighting and the installation of an internal heating system. These improvements have a cost of $3.3 million, are 70% complete and are scheduled to be in operation June 2010.

During the period from August 2003 until September 2004, there were 18 sanitary sewer overflow events reported to NYS DEC - Region 3 at several pump stations and sanitary sewer manholes. On March 28, 2005, the Town Board voted to enter into a State Order on Consent, which included a $15,000 penalty (½ of which was suspended), as well as a schedule to upgrade pump stations, repair leaking sewers, and eliminate illegal sewer connections. The Order also requires upgraded disinfection capabilities and odor controls at the main facility. The District is in compliance with Order dates for disinfection and odor controls. Start-up operations for odor controls met the scheduled date of April 2009.

Future Project

Phase II of the Pumping Station Improvement Plan will include rehabilitation of sludge holding tanks Nos. 1 and 2. These improvements have an approximate construction start-up date of spring 2010 and an estimated cost of $3 million.

Rockland County Sewer District No. 1

Projects in Progress

The District is operating under a State Consent Order to eliminate overflows during wet weather events. All Order dates are being met.

Planned for completion in 2009, engineering studies are addressing flow monitoring, I/I and hydraulic modeling of the collection system. These studies, collectively will incur costs of $200,000.

Under way since 2006, construction of a new 1.5 MGD advanced treatment facility to serve western Ramapo will incur costs of $44 million and is now 95% complete. The plant process will incorporate sand filters, microfilters, and post-aeration. An approximate operational start-up was during December 2008. The new plant, which is sited in Hillburn, New York, will discharge to the Ramapo River; this waterway is outside of the Interstate Environmental District. The modernization of the existing Rockland County 28.9 MGD secondary facility includes replacement of debilitated treatment units and pump station improvements. Presently 75% complete, this work will incur costs of $5.1 million and is anticipated to have an operational start-up during December 2009.

The first construction contract began in 2004 for the installation of principal trunk sewers, pump stations, force mains, and laterals in the Villages of Hillburn and Sloatsburg and the unincorporated portion of western Ramapo. Total construction is estimated to cost $50 million. The sanitary sewers and force mains along Route 17 were completed ($20 million); this infrastructure was operational during December 2008. Another collection system phase (95% complete/$2.5 million), will include the Ridge Road sanitary sewer extension and the Congers Road pump station. The 5th Avenue pipe bridge rehabilitation has recently begun (1% complete) and will incur costs of $1.1 million. Collection system work in Western Ramapo ($10 million) has a 12-month agenda and started in November 2008.

Additional existing treatment plant and pump station improvements will incur costs of $10 million. Planned to begin in conjunction with the collection system work, this phase was rescheduled to begin during January 2009. Additional collection system construction for Western Ramapo, commenced during the 2008 winter season. This $10 million phase has an anticipated operational start-up date of December 2008. Rescheduled to begin during January 2009, the Cooper Morris Drive-Buena Vista Road-Dogwood Lane sewer extension and pump station will incur costs of $6 million.

Suffolk County

Huntington Sewer District

Completed Projects

An antiquated underground gasoline tank and fuel pump were removed in 2009.

Two projects dealing with nonpoint source pollution are the Fleets Cove/Knollwood Beach Stormwater Mitigation ($300,000) and the Centerport Harbor Stormwater Runoff Mitigation ($250,000). The Fleets Cove project has been completed with the exception of stormwater retention and drainage structures on Bayview Drive. A new engineering design was necessary to include additional drainage structures and relief for stormwater runoff. This construction is slated for completion during June 2009. The work includes new drainage pipes, leaching basins, and catch basins. The Centerport Harbor project is being finalized. Improvements are being implemented to the existing stormwater drainage system.

Future Projects

Collection system maintenance, i.e., cleaning and televising sanitary sewers, has a 2009 estimated capital budget of $50,000. Preliminary plans have been prepared for the installation of the Hill Place siphon. A siphon is a section of sewer constructed below the hydraulic gradient due to an obstruction and operates under pressure. The plans are currently under review by NYS DEC and NYS DOT. The Hill Place siphon construction budget is $800,000 and is scheduled to be awarded in the spring of 2010. There is a planned installation of a low pressure sewer in NYS Route 110 to serve five parcels.

Northport

Completed Project

An engineering design is 100% complete ($195,000) for automatic DO controls.

Future Projects

Phase II of facility upgrades to meet 2014 SPDES permit limits is currently under review by NYS DEC - Region 1. The Phase II WWTP upgrades include denitrification filters, a pH control system, a dissolved oxygen control system, and an influent screening system. The estimated cost for these upgrades is $3.6 million and has an approximate

construction start date of July 2010. The upgrades are expected to be operational by September 2011.

Phase II also includes collection system improvements which include sewer and manhole lining and repairs (I/I remediation) and shoreline sewer and pump station replacement. These upgrades have an estimated cost of $4.5 million and have an expected construction start-up date of January 2010.

Suffolk County Sewer District #1, Port Jefferson

Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. Substantial construction compliance dates were re-negotiated during September 2005. Presently, substantial construction has been completed.

An in-house water quality assessment of Port Jefferson Harbor and an engineering study for collection system upgrades are ongoing. Since 2006, the in-house staff has been rehabilitating manholes and sewers to minimize I/I impacts. Expenditures are estimated at $300,000. Additional pump station improvements, if needed, will be initiated. A pump station evaluation ($50,000) to assess hydraulics was completed and recommendations are being considered.

Future Projects

Sewer rehabilitation and pump station upgrades are planned for lower Port Jefferson. An approximate construction start-up date is January 2011. Slated costs are estimated at $1.5 million and an operational start-up date is anticipated during January 2012.

Suffolk County Sewer District #3, Southwest

Completed Projects

Sludge dewatering facility upgrades were completed in September 2009 with a final cost of $2.5 million. The addition of a second influent force main was also completed in September 2009 with a final cost of $1.7 million.

Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by June 2007. This facility is also under a federal Consent Order to address the pretreatment program. The facility is in compliance with all Order dates.

Several engineering studies, design projects and RFP preparations are under way to address a variety of treatment unit and collection system improvements. Consulting engineers are currently designing grit handling improvements, UV disinfection facilities, a sludge dewatering and disposal system and the design of a 10 MGD treatment plant expansion. The outfall pipe has been evaluated, the report has been completed, and it is now in the environmental stage. A design for an odor control system for the influent is also under way (95% complete). Facility-wide improvements including grit handling, plant security, UV disinfection, and odor control have been re-estimated at a cost of $100 million.

A project has been awarded to evaluate I/I and develop the Capacity Management/Operations and Maintenance Program ($200,000). Funding has been obtained ($2 million) for Phase III study of the collection system improvements including evaluations for I/I. An RFP is being sent out to evaluate areas lacking a sewer system in Islip and Babylon Townships.

A project involving the reduction of extraneous flows has been awarded. Phase I improvements estimated at $1.9 million are under construction and are approximately 50% complete. Phase II scope is currently under development. Final cost of all phases is estimated at $20 million.

Suffolk County Sewer District #6, Kings Park

Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by September 2005. Due to construction delays, a revised date is being negotiated. The facility is in compliance with all Order dates.

The installation of sewer systems in both downtown Smithtown and Kings Park along with pump stations, groundwater discharge, and a plant expansion of 1.2 MGD has

a cost estimate of $40 million. A construction start date is anticipated for 2013. Installation of gravity sewers in portions of Smithtown and Kings Park is now in the design phase. The budget for this project is $1.8 million. These towns are located on the north shore of Long Island, west of the Nissequogue River.

A re-estimated $15 million SBR and equipment renovation is recently under way. The installation includes a second SBR, an UV disinfection system, and related construction. This construction is 50% complete with an estimated start-up date of March 2010. Future construction of the outfall will include a clean-out chamber on the barrier beach and a terminal fitting.

Suffolk County Sewer District #21, SUNY

Completed Projects

An interim groundwater recharge project with a cost of $200,000 has been completed. The rehabilitation of manholes and sewers to minimize I/I impacts is 100% complete with a final cost estimate of $450,000.

Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. A revision of compliance dates was negotiated; construction delays affected milestones. The Order now requires the completion of substantial construction by July 2009. The facility is in compliance with all Order dates and must obtain operational levels by July 2014.

Future Projects

Construction of sequencing batch reactors is planned in order to increase the plant capacity by 0.15 MGD to a total design flow of 2.65 MGD. Anticipated construction for early 2009 will address additional treatment processes. To enable compliance with LISS Phase III nitrogen reduction targets, a portion of the treated effluent will be diverted to groundwater. An approximate operational date is mid-2014 and will incur re-estimated costs of $18 million. A final report, contingent on the completion of effluent recharge design will be submitted as soon as discussion with NYS DEC in regards to effluent recharge has been completed.

Westchester County

Blind Brook

Completed Projects

Collection system upgrades include installations at one pump station with alarm systems and remote monitoring of various main facility functions. These installations are 100% complete and had a final cost of $30,000.

Project in Progress

This facility is operating under a 2008 State Order to meet SPDES permit limitations for total nitrogen and total residual chlorine reductions. The plant is in compliance with Order dates and is required to obtain operational levels by December 31, 2014.

Future Projects

Performance maintenance in order to upgrade the plant process equipment will incur costs of about $9 million and will be underway soon. All work is planned for completion during 2011. Bids for this project were received in September 2009 and an award is expected by December 2009.

Upgrades to the aeration tanks to increase nitrogen removal before discharge to Long Island Sound is set to begin in 2010. The upgrade includes internal recycle pumps, instrumentation and controls. The estimated total cost is $1.92 million with NYS DEC contributing up to $1.47 million.

Camp Smith, Division of Military and Naval Affairs

Completed Project

At a final cost of $1.5 million, several new treatment units were installed and on-line during July 2009. The improvement project included new trickling filter media, a new clarifier, an ultrasound flowmeter, and duplex recirculation pumps with VFDs.

Mamaroneck

Completed Projects

Installations at eight pump stations of new alarm systems and remote monitoring of various facility functions are 100% complete and had a final cost of $350,000. A phased operational start-up began during June 2008.

A project to install final clarifier influent channel sluice gates was completed in December 2009. The installed gates had an operational start-up date of August 15, 2009, and had a final cost of $69,700.

Projects in Progress

This facility is operating under a 2008 State Order to meet SPDES permit limitations for total nitrogen reductions. The plant is in compliance with Order dates and is required to obtain operational levels by December 31, 2014.

Currently under construction, variable frequency drives are being replaced on the sludge force main pumps. The construction was given an approximate operational start-up date of November 30, 2009. At this point the project is 65% complete and has a cost estimate of $229,000.

Future Projects

Planned for late 2009 with a 12-month agenda, the screening and grit facilities will be repaired and rehabilitated. Costs are estimated at $3.75 million. During the same year, steel sheet piles that encase one of the Long Island Sound outfalls will be replaced at an estimated cost of $5 million. Both projects have an estimated operational start-up by 2011.

During 2010, designs for the replacement of the administration building roof and tower will start. This project has an estimated budget of $2.13 million.

As required by the 2008 Consent Order to reduce nitrogen levels, construction of a BNR upgrade is slated to begin in 2010 with an estimated cost of $55 million.

New Rochelle

Completed Projects

Architectural, electrical, and mechanical upgrades were installed at two pump stations with costs estimated at $5.9 million. These installations are 100% complete and were operational during April 2008. Installations at nine additional pump stations include alarm systems and remote monitoring of various facility functions. An operational start-up commenced during June 2008. These installations are 100% complete and had a final cost of $300,000. These remote systems are currently under review.

Projects in Progress

A December 12, 1986, NYS DEC sewer extension moratorium on the New Rochelle Sewer District remains in effect. This plant is operating at or above its permitted flow capacity. With anticipated and ongoing development, there is concern of insufficient plant capacity, as well as the ability to meet effluent requirements. This facility is operating under a 2004 State Order to meet SPDES permit limitations for total nitrogen, flow, carbonaceous biochemical oxygen demand (CBOD) and total suspended solids (TSS) percent removal, and total residual chlorine (TRC). The plant is in compliance with Order dates and is required to obtain operational levels by December 31, 2014.

In preparation for the composite performance implementation project, demolition of obsolete equipment is 85% complete. Complete demolition is estimated for December 2009, with a cost of $1.55 million.

Future Projects

Required by a 2008 Consent Order to address the percent removal for CBOD and TSS, increased flow capacity and TRC, construction will be implemented for a Composite Performance Implementation Project. This work is scheduled for spring 2010 and will cost approximately $145 million.

The plant is scheduling a BNR upgrade project with an estimated cost of $176 million. Completion of this construction is scheduled for June 2014.

Ossining

Completed Projects

Architectural, electrical, and mechanical upgrades were made to one pump station. Operational since April 2008, this work is now 100% complete and had a final cost of $2.29 million.

Projects in Progress

Under way since March 2007, installations at five pump stations include alarm systems and remote monitoring of various facility functions. These installations are 75% complete and will incur costs of $145,000. These upgrades were operational during June 2008.

Sludge handling improvements include two new sludge holding tanks and a new sludge loading building with odor control capabilities. Construction is under way (March 2008); the estimated costs are approximately $9.5 million and an operational start-up is anticipated for March 2010. As of November 2009, this project was 90% complete. In

addition, a design for structural rehabilitation of the chlorine contact tank began in 2009 and has an estimated cost of $1.25 million.

Future Projects

A project involving the replacement of twin feeder aerial cables is set for design in 2010 and construction in 2011. This project has an estimated cost of $2.7 million.

As required by the new total residual chlorine limits in the SPDES permit by May 2012, design for total chlorine residual reduction is set to begin in 2010 and has an estimated budget of $2.2 million. This project will include new sodium bisulfate tanks, piping, induction mixers, instrumentation, and controls.

Peekskill

Projects in Progress

Under way since March 2007, two pump stations are being upgraded with alarm systems and remote monitoring capabilities for various operating functions. This work is 50% complete and is estimated to cost $70,000. An operational start-up is planned for 2010.

Rehabilitation of the Mill Street pump station began in June 2009 with a cost estimate of $5.1 million. At this point the project is 30% complete and is scheduled to be completed by July 2010.

Upgrades to the aeration system at the main facility are currently in progress and are 15% complete. The upgrades include new aeration diffusers, controls, blowers, and instrumentation. The cost estimate for this project is $3.81 million and currently has an operational start-up date of May 2011.

Future Projects

Electrical upgrades at one pump station and at the main facility ($6.1 million) are re-scheduled to begin during summer 2010. An upgrade to the influent pumping stations is planned for February 2011. These upgrades include new screens, motors, structural upgrades, and HVAC. As of November 2009, 30% of the design phase is complete with a cost estimate of $1.6 million.

Due to the new total residual chlorine limits in the current SPDES permit, modified October 2008, design for total residual chlorine reduction is slated for 2010. To meet the compliance date of May 1, 2012, a new UV disinfection system will replace the current hypochlorite disinfection system. An approximate construction start-up date is scheduled for 2011 and has a total cost estimate of $5.75 million.

Port Chester

Completed Project

Construction of the facility-wide performance maintenance project is 100% complete and is currently under final review. The final cost of this upgrade totaled $7.1 million.

Projects in Progress

The Commission is coordinating and addressing oversight for a multi-agency pathogen track down investigation of the Byram River. Since 2003, IEC field staff have conducted ambient and end-of-pipe inspections and discovered dry weather discharges to the river. Continued surveillance, laboratory analysis, and data sharing have been maintained throughout the past six years. Since 2004, inland tracking for dry weather flow and illegal hook-ups were jointly conducted by IEC and the Westchester County Department of Health. Refer to the Ambient Water Quality Cooperative Studies section for a detailed report.

This facility is operating under a 2008 State Consent Order to achieve SPDES permit effluent limitations for total nitrogen and total residual chlorine. The facility is in compliance with Order dates and is required to complete substantial construction by June 30, 2013, and obtain operational levels by December 31, 2014.

Future Project

An HVAC upgrade is planned. A study will be conducted at an estimated cost of $200,000. As of November 2009, the project is currently in the design phase.

Springvale Apartments

Future Project

The facility is planning to replace gear drive, reducer, and motor with identical replacement parts on a primary settling tank. The cost estimate for this construction is $30,000 to $40,000 and is planned to be operational mid-October of 2010.

Yonkers Joint Wastewater Treatment Plant

Completed Project

Completed in March 2009, the North Yonkers pump station was upgraded incurring a final cost of $3.2 million.

Projects in Progress

Currently, the plant is upgrading the primary digester system, which includes roof replacements. These upgrades are 55% complete with a cost estimate of $4.75 million with a scheduled completion for September 2010. The dewatering building is also being

upgraded and is scheduled for completion in March 2010. The total cost for this project is $3.65 million and includes upgrade to the centrifuge drives, control panels, and ancillary equipment. The installation of automatic skimmers on the final clarifiers is 35% complete and is estimated to cost $3.69 million.

Three capital projects are currently in progress at the North Yonkers pump station: odor control installations, electrical control upgrade, and HVAC replacement. The total cost for these three projects is $8.66 million and are expected to be complete by November 2010.

Future Projects

Construction of Phase II of the Cellular Bulkhead Rehabilitation is scheduled to start in 2011. The chlorine contact tank and piping upgrade construction is scheduled for 2010 and is estimated to cost $3.6 million. Emergency generator replacement will begin in 2010 and includes a new generator, ATS controls, duct banks, and associated electrical work ($9.9 million).

Upgrades to the engine generators are slated for 2011 with cost estimates of $9.8 million. This work includes new cabling, generator, associated electrical work, and a siloxane treatment system.

Buoy 44A near Execution Rocks, July 2009
Photo by P. Sattler, IEC

AMBIENT AND EFFLUENT WATER QUALITY MONITORING

During 2009, the Commission conducted extensive compliance monitoring programs of municipal and industrial wastewater discharges. Ambient water quality surveys were conducted year-round to document hypoxia, to measure pathogens affecting shellfish beds and bathing beaches, perform pathogens track down in IEC's Tri-State District, as well as collect data to support pathogens TMDL development. The Commission's laboratory and field staff perform analyses on samples collected at wastewater treatment plants and industrial facilities, as well as in the ambient waters. IEC conducted scheduled and reactive sample collection programs in response to regulatory compliance, wet weather conditions, and the need for information on dissolved oxygen and pathogens. Field inspections of CSOs, SSOs and MS4s were conducted during dry weather to discover illegal discharges and to take steps to have them remediated.

The IEC acquired its own research vessel to conduct year-round sampling and ambient water quality monitoring in an efficient and cost-effective manner. It was built to US Coast Guard specifications and delivered to NY Harbor in November 1987. In memory of Dr. Natale Colosi, a Commissioner from 1945 to 1985 and Chair from 1963 to 1985, the new research vessel was christened the R/V Natale Colosi. *Photo by P. Sattler, IEC*

The Commission continued its weekly summer sampling to document hypoxic (low dissolved oxygen) conditions in western Long Island Sound and the upper East River. This year, 2009, was the 19th consecutive summer season that the Commission conducted this sampling. This survey was performed utilizing the IEC's research vessel, R/V Natale Colosi. The monitoring is performed in support of the National Estuary Program's Long Island Sound Study and was conducted from late June through mid-September in cooperation with several other agencies. Through agreements with CT DEP, IEC collected and delivered surface water samples to the Center for Environmental Sciences and Engineering at the University of Connecticut (UCONN) for chlorophyll a analysis.

The 2008-2009 winter season was the 14th consecutive winter-spring season that IEC participated in a cooperative effort with the NJ DEP and US EPA. Aboard the R/V Natale Colosi, the Commission's field staff collected surface water samples for the assessment of the sanitary conditions of shellfish beds in western Raritan Bay. This project is conducted under the auspices of the US FDA's sampling protocols. The Commission plans to continue reactive sampling in western Raritan Bay during the 2009-2010 winter and spring seasons.

In support of the New York State Hudson River Estuary Program, IEC staff, aboard the R/V Natale Colosi, will continue to conduct an ambient water quality monitoring program for pathogens under dry and wet conditions from Yonkers to Bear Mountain. The R/V Natale Colosi will return to Tarrytown in Spring 2010 to complete the water quality survey, which was enhanced in 2008 with an additional sampling station and a commitment for two extra survey runs for a total of 8. This will be the 4th such survey since 2006. All water quality samples will be delivered for analysis to the IEC laboratory for fecal and total coliforms, fecal streptococcus, enterococcus and E.coli. This unique data set will be used for state and interstate water quality assessments, bathing beach water quality, model calibrations, and TMDL development.

The Commission participated in the seventh World Water Monitoring Day which grew out of the 2002 National Water Monitoring Day; IEC has participated in this event since its inception. In 2009, IEC participated in two World Water Monitoring Day events. During the first, aboard the R/V Natale Colosi, in situ measurements of dissolved oxygen, salinity, temperature, and water clarity were made at nine established water quality stations in the upper East River and Long Island Sound on September 21st. The second event, on September 22, on the Bronx River, was a cooperative with the Long Island Sound Office and Rocking the Boat, a non-profit organization. This event included high school students enrolled in a Bronx after school program which teaches students how to build classic wooden boats. IEC staff sailed the R/V Natale Colosi to the Bronx River, where students boarded the vessel, were given a presentation on dissolved oxygen issues and were shown how to take dissolved oxygen measurements in the Bronx River. These waterways are within the Interstate Environmental District, as well as the core areas of two National Estuary Programs. All of the data were submitted to an international data bank which can be accessed at www.worldwatermonitoringday.org.

R/V Natale Colosi on the Bronx River.
Photo by P. Sattler, IEC

Laboratory

All analyses performed by the Commission's laboratory are in accordance with IEC's Laboratory Quality Control Manual, Quality Assurance Project Plans, and Quality Management Plan, all of which are approved by US EPA. IEC's laboratory is certified by NJ DEP, NYS DOH and CT DPH. The Commission's laboratory also has certification under the National Environmental Laboratory Accreditation Program (NELAP) from the NJ DEP, the NYS DOH and the CT DPH. NELAP, under the auspices of the National Environmental Laboratory Accreditation Conference (NELAC), is sponsored by the US EPA. The purpose of NELAC is to foster the generation of environmental laboratory data of known and documented quality through the development of national performance standards.

Investigations of private and municipal facilities involve an unannounced six-hour sampling period 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. IEC conducted 94 inspections at municipal facilities and 10 inspections at industrial facilities during 2009. Analyses are performed for the parameters specified in the facilities' National Pollutant Discharge Elimination System (NPDES) permits which contain the Commission's requirements. The data generated from these investigations are used to determine compliance with IEC's Water Quality Regulations and with each facility's NPDES discharge permit effluent limitations. The Commission coordinates the industrial compliance monitoring of major dischargers, as well as its monitoring of municipal facilities, with the environmental departments of its member States and with US EPA.

In 2009, in addition to conducting unannounced effluent surveys, the IEC continued for the sixth consecutive year, a cooperative program with NYS DEC - Region 2, whose jurisdiction encompasses the five boroughs of New York City. This effort consists of the Commission conducting what NYS DEC defines as reconnaissance inspections and comprehensive inspections at NYC DEP's 14 wastewater treatment plants.

The Commission's laboratory has been located on the campus of the College of Staten Island (CSI) since December 1993. In addition to the day-to-day analyses performed at the laboratory, the Commission, both on its own and in conjunction with the Center for Environmental Science (CES) at CSI, submits proposals for research projects whose results would benefit the environment and the citizens throughout the Tri-State Region. An ongoing collaborative research study pertains to chlorine reactions with phenolic residues in treated effluents. The study has successfully established the mechanisms of toxic chlorophenol formation resulting from treatment plant disinfection (chlorination). The laboratory director and staff continually have research papers and articles published, make presentations at prestigious environmental forums and are involved with students enrolled in the CES Masters Degree program.

SPECIAL INTENSIVE SURVEYS

2009 Ambient Water Quality Monitoring in Long Island Sound to Document Dissolved Oxygen Conditions

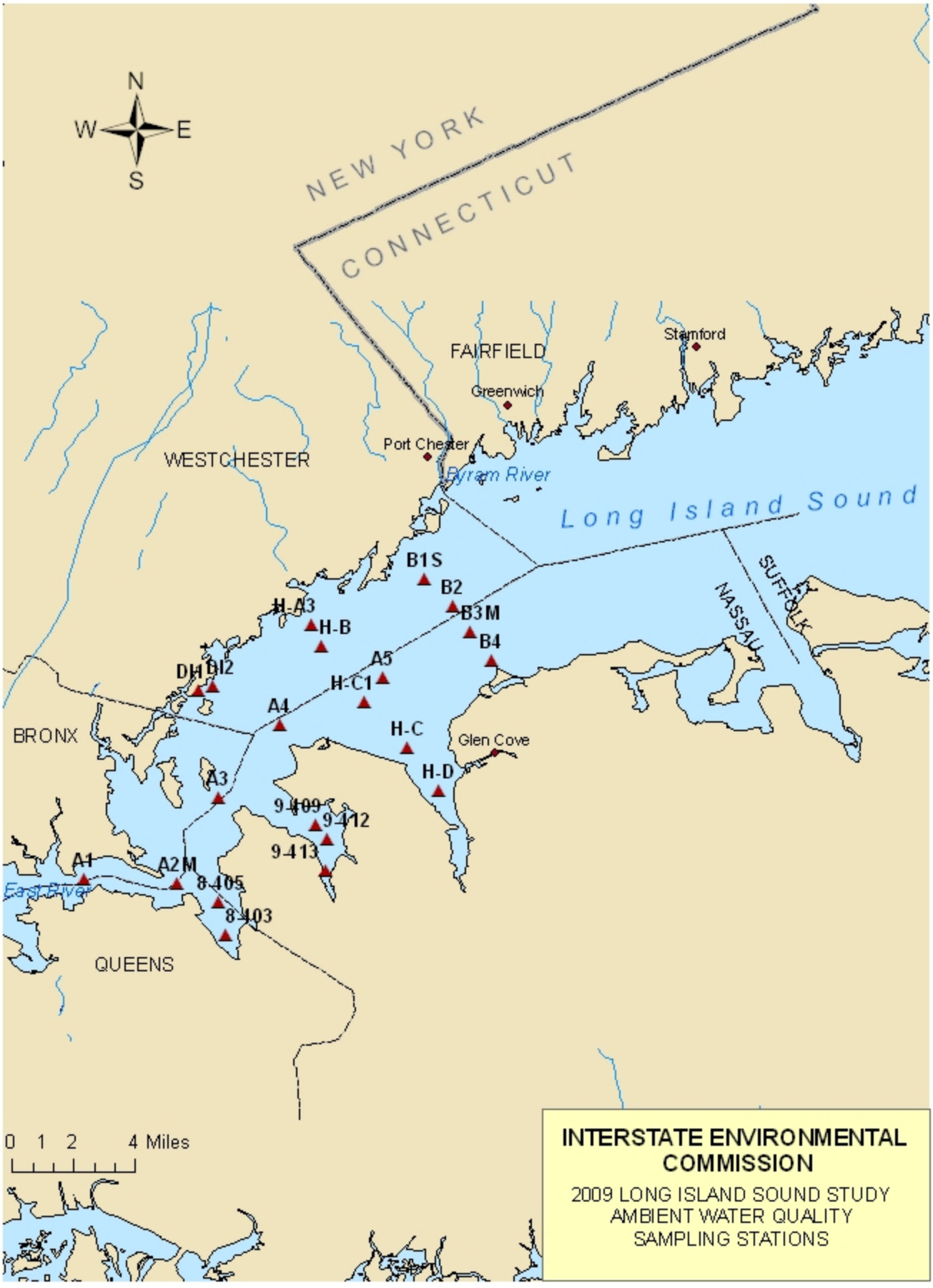
With an ongoing need to document the hypoxic conditions in Long Island Sound and its embayments, where the majority of primary recreational activities take place, US EPA - Region 2 again requested that the Commission continue to conduct an intensive ambient water quality survey in support of the Long Island Sound Study during 2009. For the 19th consecutive year, the IEC participated in a cooperative sampling effort with other government agencies during the critical summer season. The existing data sets have been significantly enhanced by the weekly data collected by IEC for western Long Island Sound and its embayments and the upper East River. The information will also be used to measure the effectiveness of management activities and programs implemented under the Comprehensive Conservation and Management Plan. The Commission disseminates its data on a weekly basis to give cooperating agencies and volunteer monitoring groups an immediate picture of environmental conditions, as well as a basis for comparison with historic and ongoing monitoring programs.

IEC is an active participant on the Long Island Sound Study Monitoring Workgroup. This is the Workgroup that determined and agreed to station locations, parameters, methodologies, QA/QC, data sharing, etc. A map and a listing of the 2009 station locations are on the following pages. A subset of these ambient water quality stations (those marked with an asterisk on the station listing) were monitored on September 21st for the World Water Monitoring Day data set. A second cooperative event was conducted on September 22nd on the Bronx River.

CT DEP again volunteered to have all chlorophyll a analyses performed and to bear the cost for these analyses. The samples collected by the IEC — as well as those collected by NYC DEP and CT DEP — were filtered, archived, and frozen until shipped to the Center for Environmental Sciences and Engineering (formerly named the Environmental Research Institute) at the University of Connecticut. Under agreements between CT DEP and US EPA's Long Island Sound Office (LISO), the analyses for chlorophyll a were conducted by the University of Connecticut (UCONN).

Low levels of oxygen can be fatal to aquatic life if levels remain persistent and drop below the organisms' threshold to survive. Fish kills can also occur due to predation and toxic phytoplankton. During its weekly sampling runs, the Commission has always communicated from the field with local environmental and health agencies to pass on current information about unique events. Additional monitoring in response to fish kills and beach closures has taken place in past years. Because the Commission's research vessel is available and accessible to typical western Long Island Sound trouble spots, the NYS DEC's Division of Marine Resources requested the IEC to assist and respond to fish kills.

In response to the typical summer hypoxic event, 12 weekly sampling runs were conducted from the end of June through September 14th when observations showed an end to hypoxia; with the exception of three, all other dissolved oxygen readings were above 5 mg/l.


N
W
E
S
NEW YORK
CONNECTICUT
FAIRFIELD
Stamford
Greenwich
Port Chester
WESTCHESTER
Byram River
Long Island Sound
SUFFOLK
NASSAU
B1S
B2
B3M
B4
H-A3
H-B
A5
H-C1
DH1
DH2
A4
BRONX
H-C
Glen Cove
H-D
A3
9409
9412
9413
A1
A2M
8405
8403
East River
QUEENS
0 1 2 4 Miles
INTERSTATE ENVIRONMENTAL COMMISSION
2009 LONG ISLAND SOUND STUDY
AMBIENT WATER QUALITY
SAMPLING STATIONS

INTERSTATE ENVIRONMENTAL COMMISSION

2009 LONG ISLAND SOUND STUDY SAMPLING STATIONS

		LOCATION		
STATION	WATER COLUMN DEPTH (meters)	LATITUDE NORTH D M S	LONGITUDE WEST D M S	DESCRIPTION
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 *	12	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 N of Gong "21"
B3M *	19	40-55-12	73-38-42	Matinecock Pt 0.7 nm N 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 E of Sands Pt
H-D	7	40-50-42	73-39-36	Hempstead Harbor East of Can "9"

*In situ measurements of dissolved oxygen, salinity, temperature and water clarity conducted for World Water Monitoring Day, September 21, 2009.

The ambient network of 21 stations was sampled weekly and in situ measurements were made for pH, temperature, salinity and dissolved oxygen (DO). 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. For the eighth consecutive year, the measurement of water clarity or Secchi depth was collected. A Secchi disc is lowered into the water until it disappears and raised until it appears; this equates to the vertical transparency, or distance below the water surface, that light penetrates. Secchi depth measurements ranged from 0.8 to 3.2 meters. This range is nearly the same as in the past six years. In general, measurements in the embayments are less than 1 meter while open water stations had better clarity with values greater than 2.0 meters. During 2009, observations below 1.0 meter were rare, but were always in the north shore Nassau County embayments (Little Neck Bay and Manhasset Bay). This correlates with the few high chlorophyll a concentrations observed in the embayments, as well as with low concentrations in the open waters of the Sound. Clarity on the surface does not necessarily equate to good vertical or horizontal visibility on the bottom.

Samples for chlorophyll a, a pigment found in aquatic plants and used as an indicator of algal production, were collected one meter below the surface on alternate runs at all stations. These were filtered, archived, frozen, and subsequently shipped by overnight mail to the Center for Environmental Sciences and Engineering at UCONN. To ensure consistency amongst the agencies, this lab also analyzed the samples collected by NYC DEP and CT DEP. 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 2's Long Island Sound Office, the CT DEP's Bureau of Water Management, the Nassau County Health Department, the NYS DEC Division of Marine Resources, the NYC DEP Marine Sciences Section, Westchester County Department of Health, US EPA's modeling contractor, and to several volunteer monitoring groups. The data are available from the Commission's office. The Long Island Sound data, as well as all Commission ambient water quality data, can be retrieved from STORET, the US EPA's national data base.

Dissolved oxygen is a measure of the ecological health of a waterbody. A dissolved oxygen concentration of 5 mg/l is considered to be protective of most marine aquatic life. According to IEC's Water Quality Regulations, a waterbody classified as "Class A" — as are all the stations included in this IEC survey — has a minimum dissolved oxygen requirement of 5 mg/l at all times. Waters of this type are suitable for primary contact recreation, fish propagation and, in designated areas, shellfish harvesting. During 2001, CT DEP adopted revised DO criteria in some of the Long Island Sound waters in Connecticut. NYS DEC is also addressing this issue in Long Island Sound and other New York waters. The NYS DEC adopted revised water quality regulations on February 16, 2008. Monitoring methodologies will be addressed by the NYS DEC's Water Technical and Operational Guidance Series (TOGS). To date, NJ DEP has not proposed any revisions to their DO criteria in the New Jersey waters of the NY-NJ Harbor Complex, which also encompasses the IED. Since the interstate waters in Connecticut, New York and New Jersey are also IEC waters, whatever is done by IEC's member states in those waters is going to affect IEC and the course of action the Commission might have to take regarding its DO regulations.

A presentation of the dissolved oxygen data acquired during the 2009 ambient water quality monitoring in Long Island Sound is shown on the pie chart on the following page entitled "2009 Dissolved Oxygen Monitoring". Measurements of dissolved oxygen concentration in both surface and bottom waters are separated and grouped into three categories. Dissolved oxygen concentrations that are less than three mg/l (<3.0 mg/l) reflect hypoxic conditions; under these conditions, very few types of juvenile fish can survive, many adult fishes will avoid or leave the area, and those organisms not free to move (sessile) will die. For dissolved oxygen concentrations which are greater than or equal to three mg/l (≥3.0 mg/l) and less than five mg/l (<5.0 mg/l), marine resources surviving in this range are at threshold levels for reduced growth and abundance. The impact to marine organisms is dependent on the duration and spatial extent of hypoxia, as well as the water temperature, salinity and the distribution and behavioral patterns of resident species. Dissolved oxygen concentrations of at least five mg/l (≥5.0 mg/l) are considered to be protective of most marine aquatic life. The summer of 2009 marks the ninth consecutive year that hypoxic conditions were measured in the surface waters of the Sound; the extent was the least during 2009. For all stations, the surface water range of dissolved oxygen was 2.7 to 17.6 mg/l. The waters of western Long Island Sound, which tend to be stratified, were well mixed, but hypoxic. The lowest value at the surface was recorded on August 10th. Bottom waters ranged from 0.5 to 11.4 mg/l with the low values representing extreme hypoxia and, in some areas, anoxic conditions. These extremely low values were recorded from late July to end of August. The temporal range of poor surface and bottom dissolved oxygen concentrations were an improvement over those of the 2008 survey.

As shown on the pie charts depicting 2008 and 2009 monitoring data, the condition of the surface waters was significantly better during 2009 than in 2008. The 2009 surface water in situ measurements for the categories of Greater Than 5 mg/l, Between 3 and 5 mg/l, and Less Than 3 mg/l are 85.66%, 12.75% and 1.59%, respectively. In the same category order, the results of the 2008 survey were 67.45%, 28.24% and 4.31%, respectively. The weather patterns for 2009 were unremarkable: extremely cool and wet from June through July, very humid summer with little wind.

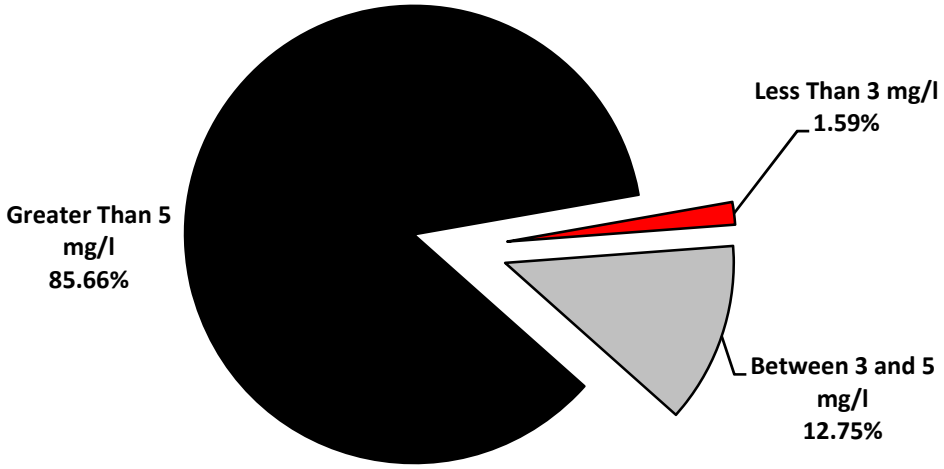
Based on the percentage of hypoxic readings, the bottom waters of the Sound were considerably better in 2009 as compared to 2008. As displayed in the bottom half of the pie chart entitled "2008 - 2009 Dissolved Oxygen Monitoring," the 2009 bottom water in situ measurements for the categories of Greater Than 5 mg/l, Between 3 and 5 mg/l and Less Than 3 mg/l are 36.89%, 35.66% and 27.45%, respectively. In the same category order, the bottom water results of the 2008 survey were 6.27%, 33.34% and 60.39%, respectively. A variety of natural and anthropogenic factors (water pollution, municipal water pollution control programs, weather, circulation pattern changes, proliferation or lack of algal blooms, etc.) contribute to hypoxia and year-to-year variability.

It is important to know the time period in which hypoxic conditions occur in surface and bottom waters. A display of the variation of the average dissolved oxygen concentration at all 21 stations between weekly sampling dates is shown on the graph entitled "Surface and Bottom Waters: Average and Range of All Stations Sampled". The average, maximum and minimum dissolved oxygen values of surface and bottom waters for each run are displayed and represented

INTERSTATE ENVIRONMENTAL COMMISSION
LONG ISLAND SOUND STUDY
2009 DISSOLVED OXYGEN MONITORING
SURFACE AND BOTTOM WATERS

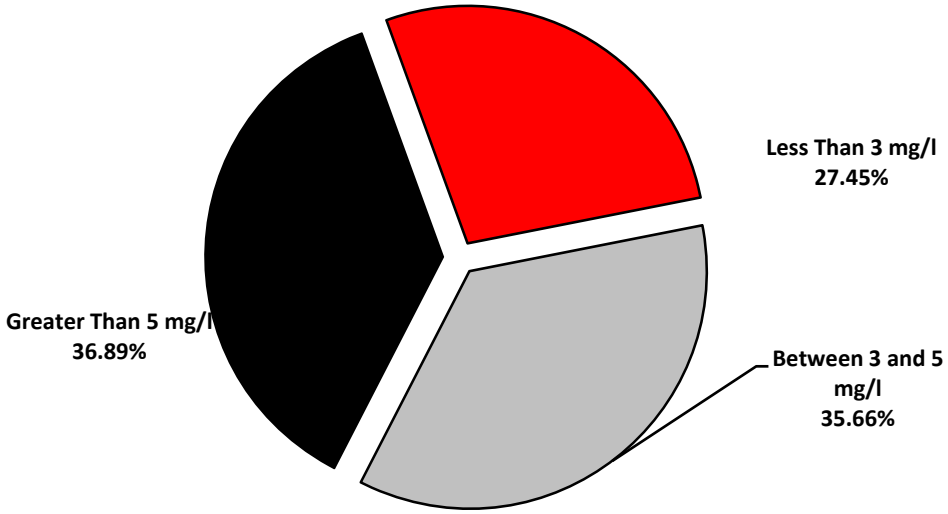
SURFACE WATERS

Range of Dissolved Oxygen Values: 2.7 to 17.6 mg/l



BOTTOM WATERS

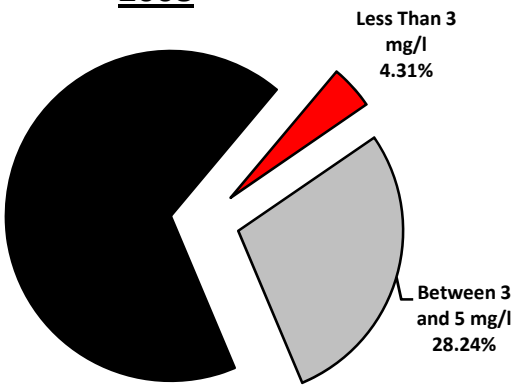
Range of Dissolved Oxygen Values: 0.5 to 11.4 mg/l



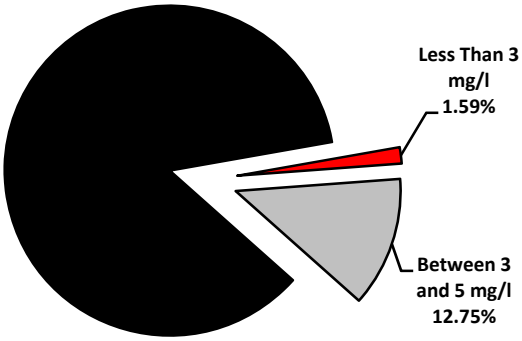
INTERSTATE ENVIRONMENTAL COMMISSION
LONG ISLAND SOUND STUDY
2009 DISSOLVED OXYGEN MONITORING
SURFACE AND BOTTOM WATERS

SURFACE WATERS

2008

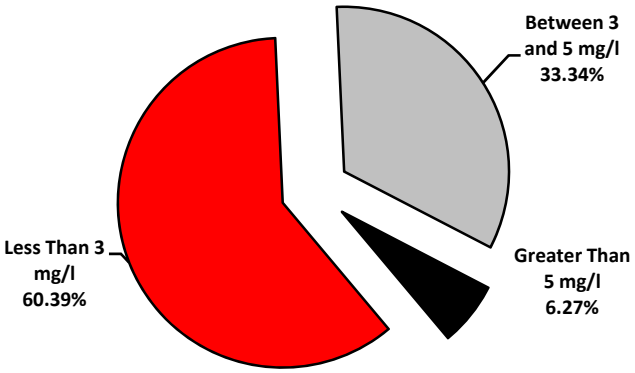


2009

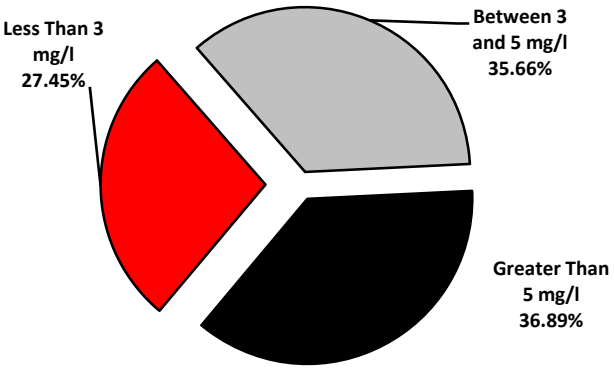


BOTTOM WATERS

2008



2009



INTERSTATE ENVIRONMENTAL COMMISSION

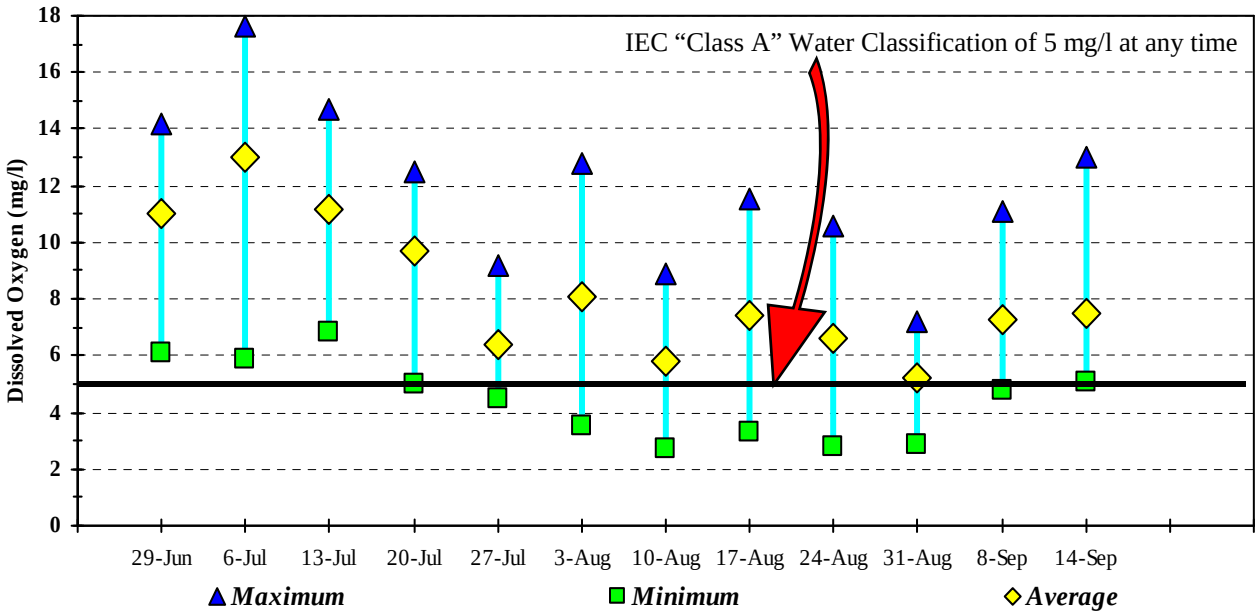
LONG ISLAND SOUND STUDY

2009 DISSOLVED OXYGEN MONITORING

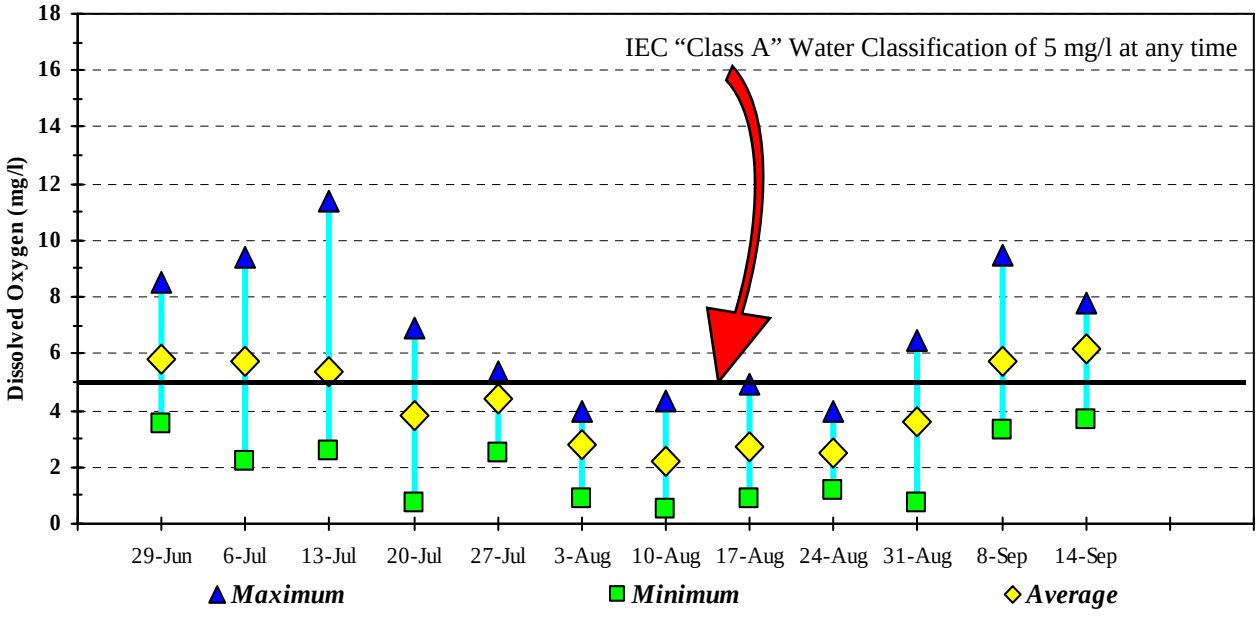
SURFACE AND BOTTOM WATERS:

AVERAGE AND RANGE OF ALL STATIONS SAMPLED

SURFACE WATERS



BOTTOM WATERS



separately. The graph indicates that hypoxic conditions were observed in surface waters during the 2009 sampling; this is the ninth year in a row that these conditions were observed in surface waters. Prior to 2001, the last observation by IEC of hypoxic conditions in the surface waters was in 1997.

During 2009, hypoxic (DO < 3 mg/l), as well as anoxic conditions (DO < 2 mg/l), were observed in bottom waters from July 6th to August 31st. As early as July 20th, two stations recorded values less than 2 mg/l. For the six-week period from July 20th to August 31st, 6 stations recorded values of less than 1 mg/l. Due to the narrow hypoxia event, 12 weeks of summer surveys were conducted. Generally, a dramatic recovery of well oxygenated waters is seen due to localized storms. The lowest bottom water dissolved oxygen concentration of 0.5 mg/l was observed on August 10th.

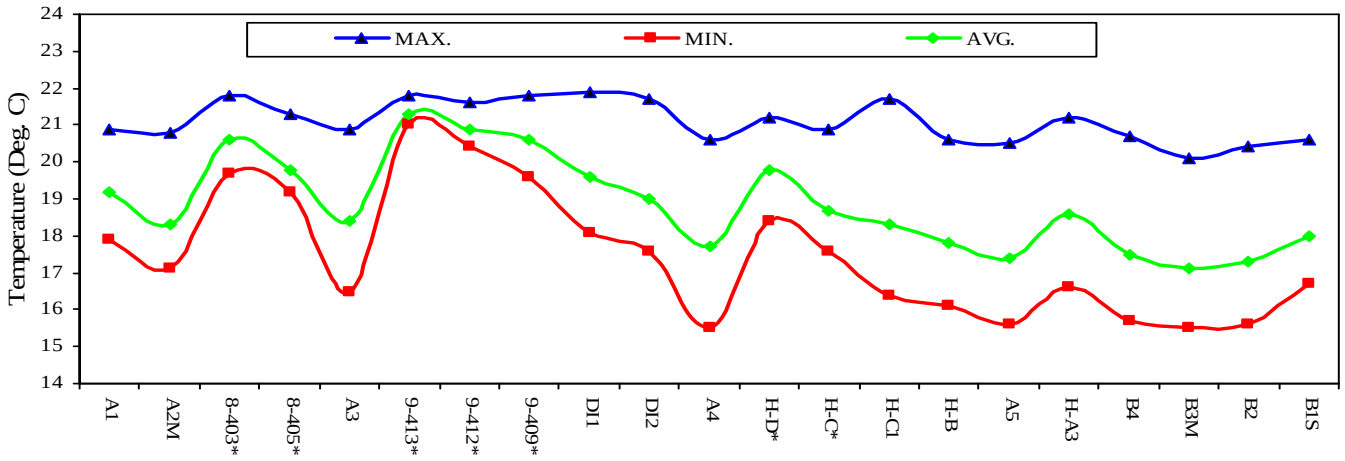
A gradual and positive recovery of lobster catches in western Long Island Sound has been observed in past years. Lobster had been a major cash crop for this area; prior to 1999, it was the third largest producer behind Maine and Massachusetts. Dead lobsters were reported in traps in late November 1998 and by late August 1999, catches in western Long Island Sound were nearly zero. The 2007 commercial and recreational harvest in the western and central portions of the Sound was better than 2003 when the harvest started to recover — especially compared to 2000 when the dockside landings were almost nonexistent. However, the 2008 and 2009 lobster harvests were very poor.

Minimum size regulations for lobster in Long Island Sound were increased from 3 1/4" to 3 9/32" in 2005. Additional protective measures were enacted on July 5, 2006, when the minimum size was increased to 3 5/16". The CT DEP announced on July 21, 2008, that the federal Lobster Conservation Management Area 6 (Long Island Sound) lobster “V-notch” program achieved the level of success needed to delay (for at least one year) an increase in the current minimum legal size for lobsters that are taken from the waters of Long Island Sound. NYS DEC was accepting comments through September 2, 2008, on lobster emergency regulations. The regulations establish a more conservative V-notch definition of 1/8" with or without setal hairs and a maximum carapace size limit of 5 1/4" for all lobsters in the federal Lobster Conservation Management Area 4 (Atlantic Ocean between 3 and approximately 30 miles offshore off the south coast of Long Island, New York, and westward to about the central coast of New Jersey).

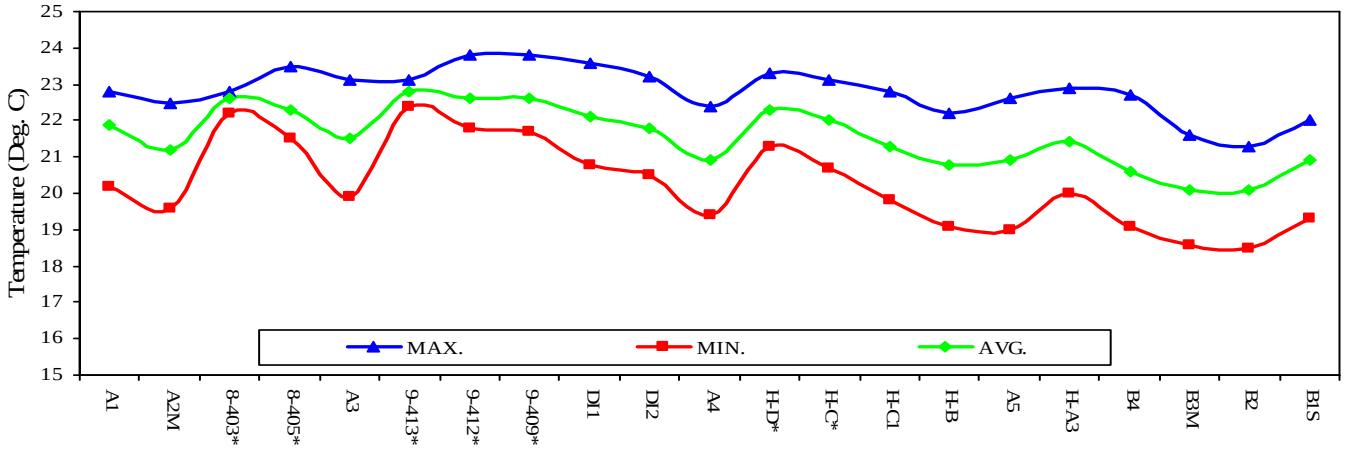
Research dealing with disease and responses to stress in lobsters showed a threshold temperature of 20.5^0C; bacterial infections increase due to higher temperatures and hypoxia. Mortality increases with low DO, high temperatures, high sulfide and ammonia concentrations resulting from organic matter decomposition. The profiles on the following page entitled, “2009 Monthly Bottom Water Temperature Distribution in Long Island Sound” illustrates the temporal extent for temperature at all 21 monitoring stations from west to east. In situ measurements of bottom temperatures recorded during 2009 ranged from 15.5^0C to 21.9^0C in July; 18.5^0 C to 23.8^0C in August, and 20.8^0 C to 22.7^0C in September. Bottom temperature ranges were higher than observations made for the three-year period 2005 to 2007 measurements.

2009 MONTHLY BOTTOM WATER TEMPERATURE PROFILES IN LONG ISLAND SOUND

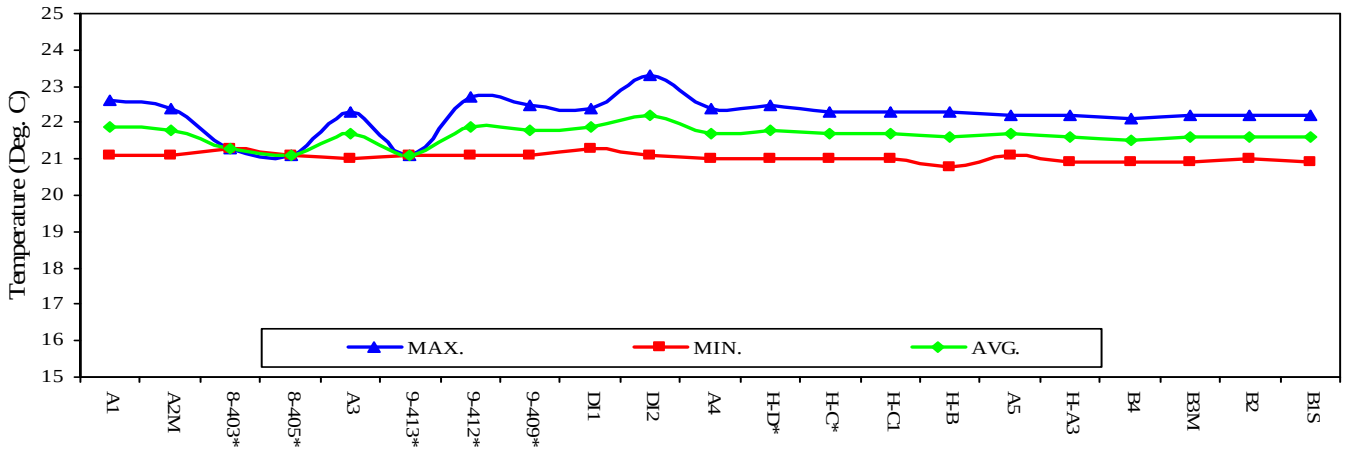
JULY



AUGUST



SEPTEMBER



* Stations inside embayments

IEC STATIONS (WEST TO EAST)

2008-2009 Microbiological Surveys in the Shellfish Harvesting Waters of Western Raritan Bay

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 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 IEC, for the 14th consecutive year, to assist in sample collection in western Raritan Bay during the 2008-2009 winter and spring seasons.

Sampling runs were planned to collect the data needed to assess the microbiological quality of the shellfish waters; protocols used followed the criteria established by the US Food and Drug Administration's National Shellfish Sanitation Program. The surveys were triggered by storm events with an intensity of at least 0.2 inches of rain. A window of 48 hours subsequent to the rain gives ample time to document the effects of the runoff. During 2005, the sampling route was expanded by four stations to include Keyport Harbor. All samples were collected from surface waters at 22 sampling stations. A map and a listing of the sampling stations are on the following pages. In conjunction with the NJ DEP/US EPA Performance Partnership Agreement, all samples were transported by IEC to the US EPA's Edison, New Jersey, laboratory for analysis of fecal and total coliform bacteria.

During March 2009, the R/V Natale Colosi was moved to Raritan Bay and berthed at the Leonardo State Marina, which is operated by the NJ DEP. From March 18 until June 1, 2009, one survey run was 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 again conduct this survey over the 2009-2010 winter and spring seasons.

The 10,400 acres of Raritan Bay waters off the eastern shore of Staten Island, NY, represent nearly 45% of New York State's hard clam industry. During 2002, a shortened shellfish season limited the harvest to 48,102 bushels from these waters. The economic hardship of the shortened season was compounded on March 13, 2003, when the NYS DEC Division of Marine Resources closed the harvest for 2003 due to quahog parasite unknown (QPX). QPX is a protozoan parasite (slime mold) that infects the soft tissue of the clam. This parasite is not harmful to humans and does not represent a public health threat, but is fatal to hard clams. In order to eliminate the spread of the parasite, the transfer program to cleaner, eastern waters of the District was stopped as a precautionary measure. There is no known treatment or cure for QPX. The closure remained in effect throughout 2004. On May 2, 2005, about 2,600 acres were reopened for transplant harvest. The areas approved for harvest are located west of a line extending southerly from the mouth of Lemon Creek (~2,000 acres) and to the east in the area of Great Kills Harbor (~650 acres). The program is restricted to a maximum of 40 diggers. The shellfish harvest waters remained open in 2009.

QPX was also confirmed in low prevalence in parts of the New Jersey waters of Raritan Bay and Sandy Hook Bay. NJ DEP closed these areas to relay harvest, but allowed depuration harvest to continue in Raritan Bay. NJ DEP reopened Sandy Hook Bay to relay in 2004 based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NEW YORK
RICHMOND COUNTY
Great Kills Harbor
Arthur Kill
Staten Island
Raritan Bay
20A
18
20
21
23
58
24 A
56
26 A
28
29 A
10
50
63 B
62
61 A
86 A
88 A
KP 2
KP 4
KP 3
KP 1
MIDDLESEX COUNTY
NEW JERSEY
MONMOUTH COUNTY
0 0.5 1 2 Miles
INTERSTATE ENVIRONMENTAL COMMISSION
2008-2009 SAMPLING STATIONS FOR MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY

INTERSTATE ENVIRONMENTAL COMMISSION

2008-2009 SAMPLING STATION LOCATIONS FOR MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY

		LOCATION		
SAMPLE #	**STATION**	**LATITUDE NORTH D M S**	**LONGITUDE WEST D M S**	**DESCRIPTION**
1	50	40-28-40	74-06-42	~0.7 nm south of Can "9"
2	10	40-29-23	74-06-58	~0.5 nm west of Can "9"
3	29A	40-28-58	74-08-09	~0.5 nm west of Buoy "I"
4	28	40-28-45	74-09-23	~1.8 nm north of Union Beach
5	26A	40-28-30	74-10-38	~1.1 nm north of Conaskonk Point
6	24A	40-28-20	74-11-50	~1.25 nm north of Buoy "7"
7	18	40-28-33	74-13-26	~1.0 nm east of Ward Point Daymarker
8	20A	40-28-53	74-14-53	~0.4 nm south of Ward Point Daymarker
9	20	40-28-20	74-14-45	Cheesequake Creek
10	21	40-27-54	74-14-38	Cheesequake Creek
11	23	40-28-02	74-13-18	Seidler Beach
12	58	40-27-35	74-13-09	Seidler Beach
13	56	40-27-56	74-11-41	Keyport Harbor
14	KP 2	40-26-58	74-12-21	Keyport Harbor
15	KP 1	40-26-31	74-12-10	Keyport Harbor
16	KP 3	40-26-52	74-11-55	Keyport Harbor
17	KP 4	40-26-52	74-11-28	Keyport Harbor
18	61A	40-27-23	74-11-33	Keyport Harbor
19	62	40-27-35	74-10-23	Conaskonk Point
20	63B	40-27-46	74-09-05	Keansburg
21	86A	40-27-28	74-07-42	Point Comfort
22	88A	40-27-10	74-06-15	Ideal Beach

on the 2003 sampling results of null prevalence of QPX. Pathologists from New York and New Jersey have reported an overall decrease in QPX prevalence in Raritan Bay in 2004 in both States.

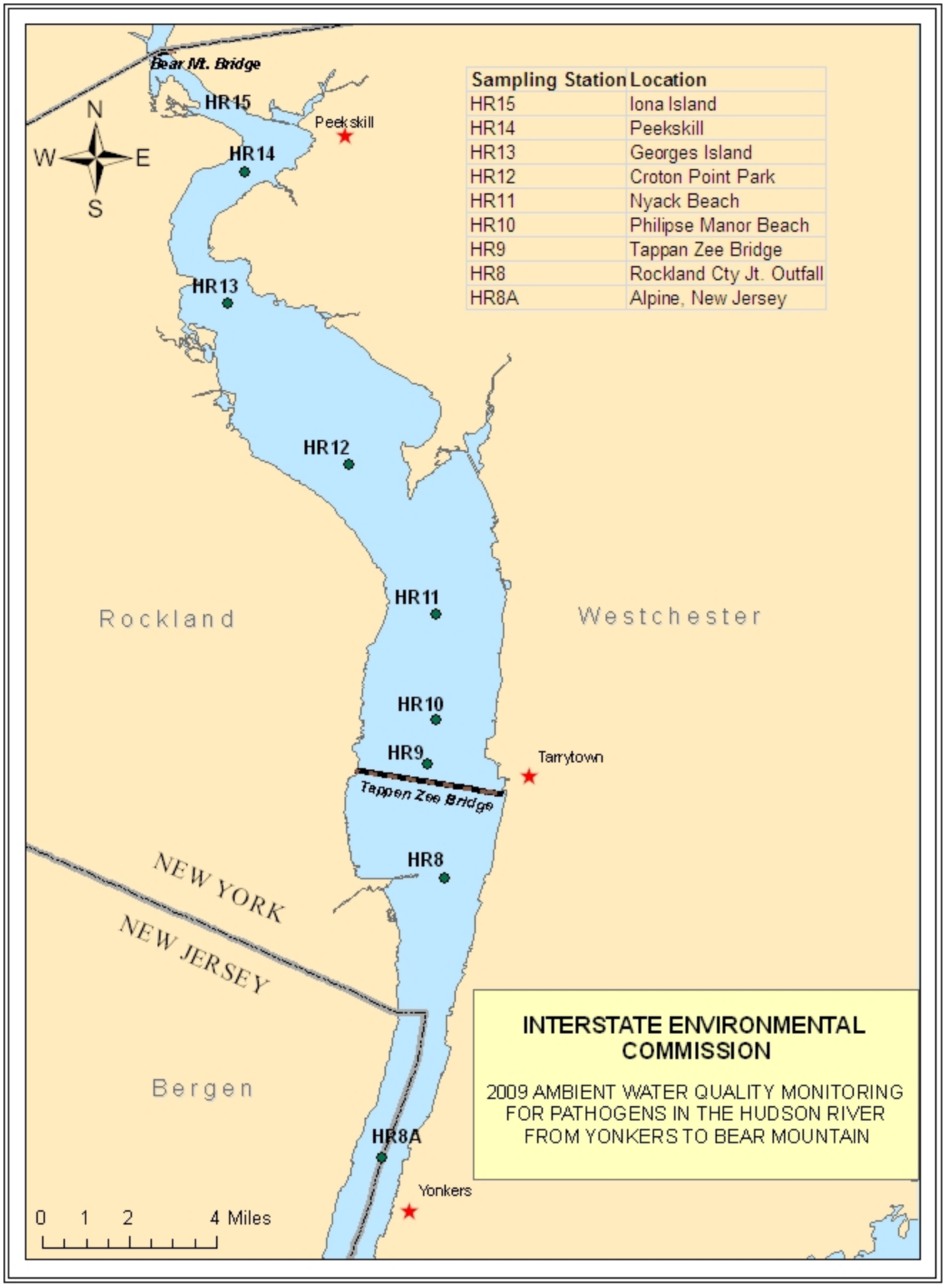
2009 Ambient Water Quality Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain

Within urban areas, pathogens levels are influenced by combined sewer overflows and stormwater runoff, both of which are widely recognized as major contributors to water pollution. Several recreational beaches, as well as many productive shellfish beds within the Interstate Environmental District have been frequently closed (some areas closed since the 1920s), primarily due to pathogens contamination. Priority attention has therefore been placed on site-specific surveys leading to a better understanding of the association between pathogens levels and point and non-point source runoff, especially discharges from storm sewers and combined sewer outfalls, as well as the pathogens distribution in receiving waterbodies. IEC has previously conducted a number of pathogens sampling projects at the request of the US EPA - Region 2, in support of the New York-New Jersey Harbor Estuary Program.

While most of the waters in the Interstate Environmental District have been recently sampled by IEC or other agencies for the bacterial parameters, there is limited monitoring of pathogens for the portion of the Hudson River between Yonkers and Bear Mountain. Recognizing this data gap, IEC, in cooperation with the NYS DEC's Hudson River Estuary Management Program, and local county health departments, developed a pathogens monitoring program for the aforementioned portion of the river. The results of this plan will be used to create a database for fecal coliform, total coliform, enterococcus and E. coli. Similar District-wide surveys were conducted between 2001 and 2005.

The 2006 survey consisted of six boat runs: three dry weather and three wet weather. The 2007 survey (amended QAPP, October 2007) was expanded to eight sampling runs: four during dry weather (planned) and four wet weather events (reactive); and one additional sampling station. A run was considered wet weather when there was at least 0.25 inches of rain as recorded at Lake DeForest, West Nyack, NY, during the previous 24-hour period. Mid–river samples were taken at nine pre-determined locations that span from Iona Island (just south of the Bear Mountain Bridge) to a mid-river location by Alpine, NJ, and Yonkers, NY. This Alpine, NJ, sampling location was added in order to expand the 2007 survey and this is the southernmost station. This expanded survey was conducted in 2008. A map and listing of the sampling stations are on the following pages. All samples were transferred to the IEC laboratory and analyzed for pathogens including enterococcus, and fecal and total coliform and E. coli.

Temperature, salinity, conductivity, pH and water clarity (Secchi depth) were measured at each site. Bacterial growth is impacted by temperature. Favorable temperatures create conditions in which bacterial population growth rates are significantly higher than rates associated with adverse temperatures. Salinity, on the other hand, if compared amongst sample locations, could provide an indication of the extent of mixing of fresh water with salt water. It could also potentially describe, taking into account a variety of other parameters, the impact of



Sampling Station	Location
HR15	Iona Island
HR14	Peekskill
HR13	Georges Island
HR12	Croton Point Park
HR11	Nyack Beach
HR10	Philipse Manor Beach
HR9	Tappan Zee Bridge
HR8	Rockland Cty Jt. Outfall
HR8A	Alpine, New Jersey

2009 SAMPLING STATION LOCATIONS FOR AMBIENT WATER QUALITY MONITORING FOR PATHOGENS IN THE HUDSON RIVER FROM YONKERS TO BEAR MOUNTAIN

		LOCATION		
SAMPLE #	STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	DESCRIPTION
1	15	41-18-21	73-58-15	Iona Island- mid-river
2	14	41-16-40	73-57-15	Peekskill - mid-river
3	13	41-14-03	73-57-35	Georges Island - mid-river
4	12	41-10-48	73-55-09	Croton Point Park - mid-river
5	11	41-07-48	73-53-25	Nyack Beach - mid-river
6	10	41-05-42	73-53-35	Philipse Manor Beach - mid-river
7	9	41-04-48	73-53-35	Tappan Zee Bridge - mid-river
8	8	41-02-31	73-53-14	Rockland County Joint Outfall - mid-river
9	8A	40-59-06	73-54-30	Alpine, New Jersey - mid-river

2006-2010 PATHOGEN AND WATER QUALITY MONITORING ON THE HUDSON RIVER

YEAR	DATES	DRY / WET[1] EVENTS	# OF STATIONS[2]	PARAMETERS (SURFACE)
1	2006 Riverkeeper[3] MAY to JUNE 2007	3/3 (2/1) (1/2)	8	Temperature, Salinity, Dissolved Oxygen, Secchi Depth, Conductivity and Pathogens (Total and Fecal Coliforms, Fecal Strep. and Enterococcus)
2	OCT 2007 & MAY 2008	4/4	9	
3	MAY to JUNE 2008 AUG 2008	4/4	9	
4	2010	4/4	9	

(1) Rain event of at least 0.25" as measured at Lake DeForest, NY and 24-hour response window.
(2) All sampling stations are mid-river locations.
(3) All sample collection conducted aboard the R/V Natale Colosi except where indicated.

discharged water in the vicinity of the sample location from sources including, but not limited to CSOs.

The R/V Natale Colosi returned to Tarrytown, NY, on October 1, 2007, to resume sampling in the Hudson River. As of the end of October, IEC completed a total of five sampling runs. Following the completion of the first run, IEC's laboratory obtained certification to analyze for E. coli, and began to perform all analyses outlined in the project. Between May 10th and August 12th, 2008, the remainder of the wet weather samplings was completed. Funding logistics and QAPP approvals were completed during late 2009; this survey will continue during April 2010. A summary of the four year effort on the Hudson River is presented on the previous page.

Pathogen Track Down on the Byram River

The Byram River is an interstate waterway about 13 miles long. It runs between New York and Connecticut, with Port Chester, Westchester County, New York, on the west bank and Greenwich, Fairfield County, Connecticut, on the east. The river mouth empties into Port Chester Harbor and has a confluence with Long Island Sound. While a bacterial contamination problem in the Byram River has existed for some time, there's great interest in eliminating this pollution source because there are negative impacts on the shellfish beds that are used for recreational purposes in adjacent Greenwich Harbor, as well as the New York-Connecticut area beaches. The areas around this portion of the river are highly developed with numerous potential industrial and residential sources of bacteria.

Lower Byram River near the confluence with Long Island Sound *Photo by P. Sattler, IEC*

Since 2002, IEC has been working with CT DEP, NYS DEC - Region 3, Westchester County Department of Health (WC DOH), Greenwich Health Department, and the Village of

Port Chester to eliminate potential discharges into the Byram River. Throughout the years IEC, Westchester County and the municipalities have been locating discharges to the Byram River. The majority of the discharges has been illegal connections to storm sewers or cross connections between sanitary and storm sewers. These discharges were then remediated by the municipalities. As part of this investigation, IEC has been sampling discharges into the Byram River and areas adjacent to those discharges. The IEC's most recent sampling was in February 2009 and it showed continued levels of bacterial contamination (see map on the following page). IEC will continue to meet and work with the other regulatory agencies in 2010. In addition, IEC is also working with a grassroots citizen's organization in addressing Byram River watershed issues. Also, IEC will begin working with Columbia University to perform water quality monitoring and modeling along the Byram River through funding from the American Recovery and Reinvestment Act (ARRA).

AMERICAN RECOVERY AND REINVESTMENT ACT AND CLEAN WATER ACT SECTION 604(b) FUNDING

The IEC is the recipient of three grant awards from the NYS DEC to support three water quality planning projects as part of the Clean Water Act (CWA) Section 604(b) funds made available from President Obama's signing of the American Recovery and Reinvestment Act (ARRA) into law. The ARRA provides $17.025 billion nationwide to protect infrastructure and create new, green jobs. Funds are provided to remediate hazardous waste sites, protect air and water quality and ensure against natural disasters such as floods. The ARRA will provide $1.7 million to New York State for projects that promote regional comprehensive water quality management planning activities as described in Section 604(b) of the federal Clean Water Act associated with green infrastructure, total maximum daily loads (TMDLs), phase II stormwater for municipal separate storm sewer systems (MS4s) and water quality management.

Water Quality Monitoring and Modeling of the Byram River

The Interstate Environmental Commission (IEC) will perform ambient water quality sampling during wet and dry weather along the Byram River to assess water quality of the river and the watershed. A minimum of three dry weather and three wet weather events will be conducted. A GIS-based watershed planning tool will also be implemented to: 1) help design specific flow and water quality monitoring programs; 2) prioritize sub-basins that contribute significant nutrient and pathogen loads; and 3) identify green infrastructure projects for funding recommendations. This study will commence during December 2009, for about 25 months (expected completion date: December 2011) with an award of $87,171.

MS4 Survey of the Croton-Kensico Watershed, Westchester County, New York

IEC will collaborate with the Croton-Kensico Watershed Intermunicipal Coalition to develop a regional map of a municipal storm sewer system within a sub-watershed of the Croton-Kensico Watershed. This study will start December 2009, for the duration of about 25 months (expected completion: Summer 2011) with an award of $28,500.


INTERSTATE ENVIRONMENTAL COMMISSION
PATHOGEN TRACKDOWN ON THE BYRAM RIVER
2009
N
W
E
S
Wilkins Avenue
Rollhaus Place
G
F
King Street
D
Higland Street
E
Willet Avenue
Broad Street
C
N. Main Street
Westchester Avenue
2A
2
4A
4
5
5A
3
3A
Mill Street Bridge
N. Water Street
Connecticut
Greenwich
New York
Port Chester
Byram River
1
Grace Church Street
Slater Street
B
A
Midland Avenue
Purdy Avenue
1
1A
95
Port Chester Harbor
Byram Point
Long Island Sound
0 0.05 0.1 0.2 Miles
SAMPLE LOCATIONS
Outfalls
Byram River
1 Purdy Avenue
1A
2 Westchester Avenue
2A
3 Mill Street Bridge
3A
4 North Water Street
4A
5 North Main Street
5A
Upstream Sites
A Slater Street and Midland Avenue
B Grace Church Street and Midland Avenue
C Broad Street
D King Street and Willet Avenue
E Higland Street
F Wilkens Avenue
G Rollahaus Place and Wilkens Avenue

Long Island MS4 Phase II Planning Program

IEC will act as a pass-through entity to provide Long Island-wide (Nassau and Suffolk) MS4 management planning assistance. The program involves a combination of workshops, presentations, site visits, workgroups and in-depth consultations as provided for by the New York State Sea Grant Long Island - MS4 Planning Program. Work will include assisting over 100 municipalities with planning, implementing, evaluating and documenting the existing stormwater programs. Supporting further inter-municipal stormwater programs will also be a priority. The funding for this study will last two years.

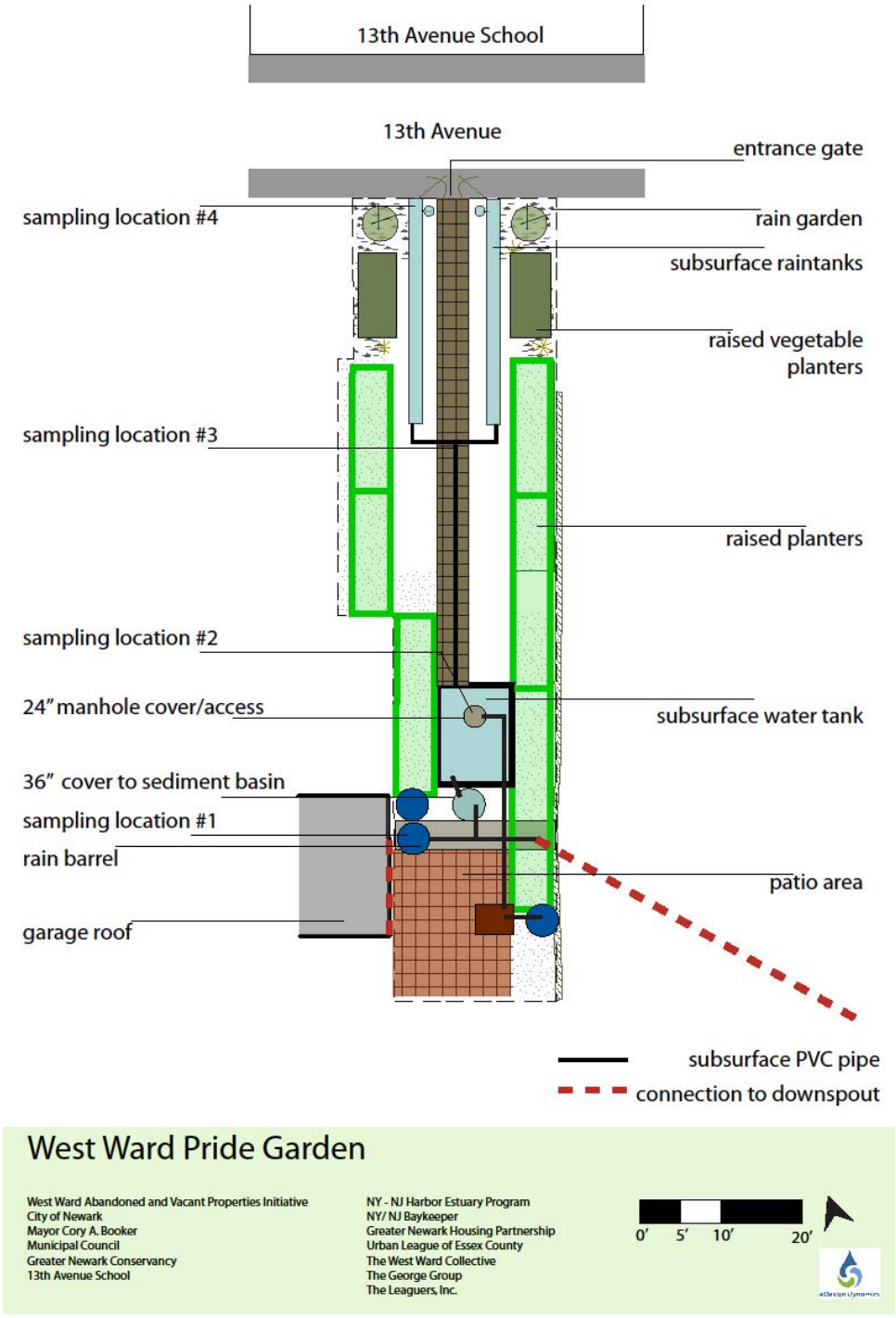
OTHER FUNDED PROJECTS AND GRANTS

IEC continues to pursue funding opportunities that support and further IEC's vital role in water quality monitoring and planning. The Commission collaborates with other interstate agencies, member state and federal entities and other environmental stakeholders in the region. This is done through solicited and unsolicited grants from a variety of funding sources with the primary objective to fund applied water quality research and projects that will bring benefits to waterways throughout the Interstate Environmental District.

Implementation and Assessment of the Effectiveness of the Green Infrastructure Technology for Reducing Combined Sewer Overflows in Newark, NJ

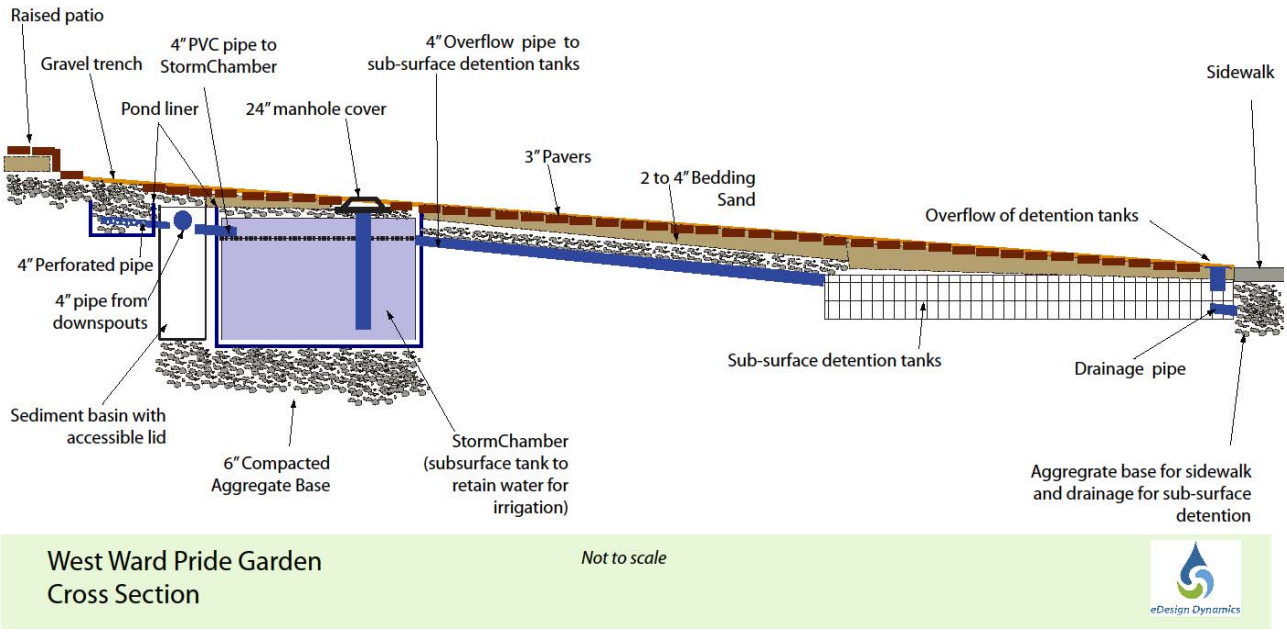
Green infrastructure (GI) technologies have the potential to mitigate a variety of stormwater issues. A pilot study was conducted in Newark, NJ, with the primary objective of constructing and monitoring a suite of GI measures to assess their effectiveness in minimizing combined sewer overflow (CSO) impacts. The NY/NJ Harbor Estuary Program and the NY/NJ Baykeeper supported this study to design, construct, instrument, and monitor the water quality and quantity impact of several GI measures on a city-owned vacant lot in the West Ward neighborhood of Newark, New Jersey. The project site is approximately 2,200 square feet and is located across the street from an elementary school. The site is in a residential/urban area that has stormwater conveyed by CSOs into the Passaic River (see site design figure on the next page).

After the GI measures are installed, water quality and quantity monitoring field data will be collected and utilized to demonstrate the functionality of the different GI technologies. Rain gauges and data loggers will continuously record water quantity parameters. IEC field and lab staff will collect and analyze samples during successive wet-weather sampling events to monitor water quality (pathogens, metals, etc.) at different locations within the network's design. Ultimately, the results of this pilot study will provide recommendations regarding technical feasibility, costs, benefits, and implementation guidance for the use of similar GI structures at additional locations in Newark and in the NY-NJ Harbor Estuary Region.



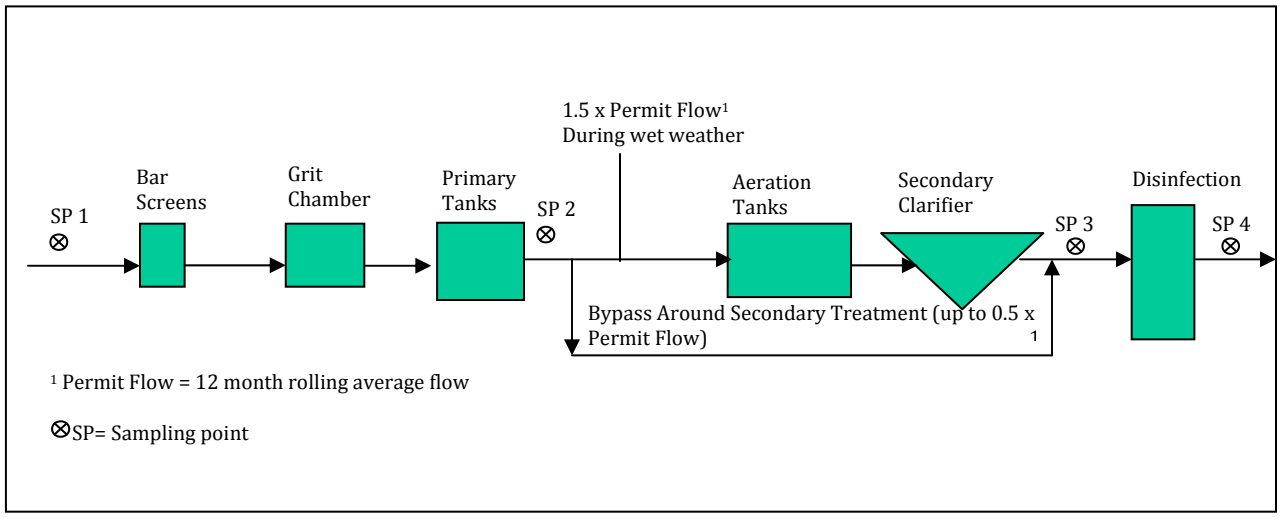
The network of GI measures implemented includes: a subsurface retention water tank, above ground cisterns, rain barrels, subsurface detention tanks, permeable pavement, raised planting beds and rain gardens (see cross section of sub-surface systems figure on the next page). Since there is no City water supply, a water reuse system was designed with the intent of

providing 100% irrigation at the project site. In addition to direct rainfall, stormwater from adjacent rooftops has been re-directed on-site and, also flows through these GI technologies before reaching the street.



Impact of Blending During Stormflow on Disinfection (Using Chlorination) at Wastewater Treatment Plants

Beginning in 2006, IEC began work on a comprehensive research project funded by a contract administered by the US EPA, Office of Water. Its intent was to determine the microbiological impact of blending primary effluent flows that are in excess of secondary treatment capacity with the secondary effluent prior to disinfection at large municipal WPCPs. Blending is the practice of diverting a part of peak wet weather flows at wastewater treatment plants around biological treatment units and combining effluent from all processes prior to disinfection and discharge from a permitted outfall. The US EPA 1994 CSO Policy encourages the delivery of maximum flows to WPCPs, while ensuring that bypasses would not result in SPDES permit exceedences. Consistent with that principle, blending of flows at the treatment plants serving combined sewer systems present one of the most feasible alternatives. This approach is typically used by NYC DEP and a number of other municipalities in the IED during wet weather to maximize the flow to the treatment plant and reduce CSO events. An examination of the relationship between influent flow during rain events vs. dry weather flow events, level of total residual chlorine (TRC) and concentrations of fecal coliform and enterococci in the final effluent was carried out in order to determine the microbiological impact of blended flows on final effluent. The project's outcome will be important for better predicting and understanding the impact of blending on CSO abatement and receiving water quality.



IEC Sampling Locations at Wastewater Treatment Plant Project Sites

The primary objective was to evaluate the effect of blending on the concentration of indicator bacteria in the treatment plant final effluent. To better characterize the impact of blending on the concentration of the indicator bacteria in the treatment plant effluent, a detailed sampling plan was implemented. Wet weather sampling started after the beginning of the bypassing of the secondary treated wastewater. For New York City treatment plants, this typically happens after the influent flow exceeds one and a half times the permitted flow limit for a specific plant. All field work and sampling was performed by IEC staff. During the period July 2006 and April 2007, 5 dry weather and 12 wet weather events were conducted. In situ field measurements were taken for TRC and pH. Analyses performed by the IEC laboratory included BOD, TSS, turbidity (effluent only), enterecoccus and fecal coliform. Enterococci and fecal coliform samples were analyzed using the most probable number (MPN) methodology.

Due to the nature of this project, an incredible amount of inter-agency collaboration and coordination was required. In addition to IEC's field collection and bacterial analysis of samples, five laboratories (IEC, BCS, EPA-Region 2, US EPA-ORD Edison and US EPA-NERL) received samples to perform additional analyses. This included two divisions of US EPA Edison: the Division of Environmental Science and Assessment (DESA), where the analyses for Giardia and Cryptosporidium were performed, and the Office of Research and Development (ORD), where particle size distribution analyses were completed. Virus (such as adenovirus, astrovirus, rotavirus, enterovirus (polio, coxsackie and echo viruses, Hepatitis A, calicivirus and reovirus) and coliphage samples were analyzed by Biological Consulting Services of North Florida (BCS), along with Cryptosporidium infectivity analysis, and protozoa analysis when the US EPA Edison laboratory was not available. US EPA's lab in Cincinnati was also involved in bacterial analysis by utilizing PCR methods. Following validation and interpretation of all collected data, a final report was developed by IEC in accordance with US EPA final report specifications, and is currently under peer review.

Harbor-Wide Water Quality Monitoring Activities in the New York-New Jersey Harbor Complex

As part of and in cooperation with the NY-NJ HEP, the Interstate Environmental Commission has been chairing an Ad Hoc Committee to develop a harbor-wide water quality monitoring survey to be fashioned after the NYC DEP Harbor Survey. The conceptual monitoring survey is in place and addresses the entire New York-New Jersey Harbor Complex, which includes state and interstate waters, as well as tributaries. The Committee includes IEC, US EPA - Region 2, NYS DEC, NJ DEP, NYC DEP, and the New Jersey Harbor Dischargers Group (NJHDG), which is chaired by PVSC. All of the aforementioned agencies have existing water quality monitoring programs within the HEP core study area. The conceptual plan is to be consistent with the existing New York City Harbor Survey so as to allow for a harbor-wide assessment of water quality.

To assess the data gaps necessary to have harbor-wide monitoring, the Committee looked at all aspects of the current and future sampling/data collection programs, including the parameters of concern, waterways, monitoring scenarios, methodologies, laboratory capabilities and capacities, QA/QC and final products. This Committee sought input from all HEP workgroups to identify needs.

Under way in late 2003, the NJHDG, with an initial grant from the HEP, established an ambient water quality monitoring program consisting of 33 stations. Subsequently, all funds were allocated from internal resources. During 2004, 16 parameters of concern including DO, nutrients and pathogens (except enterococcus) were collected weekly between May and September, and bimonthly between October and April. The analyses are conducted at three laboratories located at the Bergen County Utilities Authority, MCUA and PVSC. This program was maintained in 2009.

During the 2008 fall season, the report entitled, "Harbor-Wide Water Quality Monitoring Report for the New York-New Jersey Harbor Estuary" was issued. This water quality report is the first where the data from New York and New Jersey have been combined and analyzed together. The report presents bacterial and dissolved oxygen information for the Harbor as a whole, as well as for the principle geographical regions of the Harbor. The report can be accessed electronically at www.harborestuary.org. The next published report is planned for 2010.

REGIONAL BYPASS WORKGROUP

The Regional Bypass Workgroup (RBWG) was formed in 1997 to address the issue of unplanned bypasses of raw and partially treated sewage, i.e., treatment plant upsets, broken pipes due to age, or construction mishaps. The Commission has chaired the RBWG since its inception. The RBWG has members from the IEC's three states' environmental and health departments, IEC, National Park Service, NJHDG, NYC DEP, US EPA, US FDA, US Coast Guard, and county health officials. The Workgroup has been using the Regional Bypass model to predict which areas may be affected by a particular bypass. Specifically, the quick predictions can

determine whether a discharge occurring at a certain point will affect another area, and if there should be concern as to whether a beach or a shellfish area should be closed. Also, regional notification protocols were put in place and are updated annually.

For the first eleven full calendar years (1998 to 2008), that the model and notification protocols have been in place the Commission has received between 93 and 275 bypass event notifications. Originally, the focus of identifying bypass events was raw sewage. The focus has since been expanded to address any type of spill, i.e., chemical, oil, fuel, sludge and treatment reductions. The 201 bypass events reported to the Commission for the period January 1 to November 30, 2009, are shown below, delineated by state. The 2008 totals are included as a basis of comparison, as well as to report all bypass events for the past full calendar year.

	TOTAL EVENTS IN 2008	% OF TOTAL	TOTAL EVENTS IN 2009	% OF TOTAL
CONNECTICUT	1	0.4	0	0
NEW JERSEY	2	0.7	1	0.6
NEW YORK	275	98.9	200	99.4

The number of reported bypasses from 2004 through 2009 has been substantially higher than previous years. This may be primarily due to rainfall and reporting practices. In 2004 and 2005, the hurricane seasons were extremely active. The last four years, including 2009, can be considered "wet years" with rainfall above the yearly average or because of the number of "storms" of high intensity rain events, which led to just as many bypasses. Additionally, the hydraulic capacity of several NYC plants was diminished due to construction upgrades. The majority of the New York City and northern New Jersey collection systems are comprised of combined sewers and, when there is rain, the flows to the WPCPs increase. If the flow is greater than the plant design, part of the flow is "throttled". This throttled flow is considered to be a bypass. For the 2009 reporting period, 145 wet weather bypass events reported to the RBWG, which accounted for 72% of the reported events. For 2003, less than 10% of the reported bypasses were caused by wet weather. The discrepancy in the number of bypasses reported by the States is partly because of the different reporting criteria of the States. Connecticut requires reporting of dry weather discharges only. For those municipalities with CSOs (i.e., Norwalk, Bridgeport, New Haven), no wet weather reporting is required. In New Jersey, any time a WPCP discharges any amount of untreated or partially treated wastewater (meaning it has bypassed some or all

Oyster dredge in Norwalk Harbor *Photo by P. Sattler, IEC*

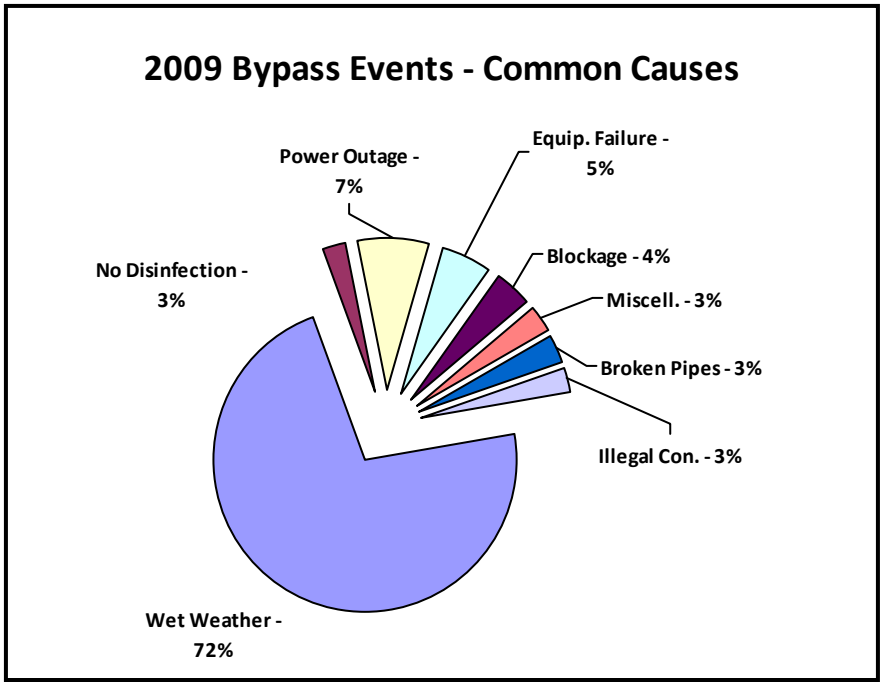
treatment), they must report the incident. NYS DEC requires reporting of all wet weather bypasses.

Although the majority of the bypass events occur in NYS DEC - Region 2 which encompasses the five boroughs of New York City, it should be noted that the majority of the treatment facilities, pump stations, regulators and gravity sewers and force mains that exist in this region are in New York City. A more detailed breakdown of the bypass events in New York is below:

	Total NY Events in 2009
Region 1 (Nassau/Suffolk)	0
Region 2 (5 NYC Boroughs)	198
Region 3 (Westchester/Rockland) [1]	2

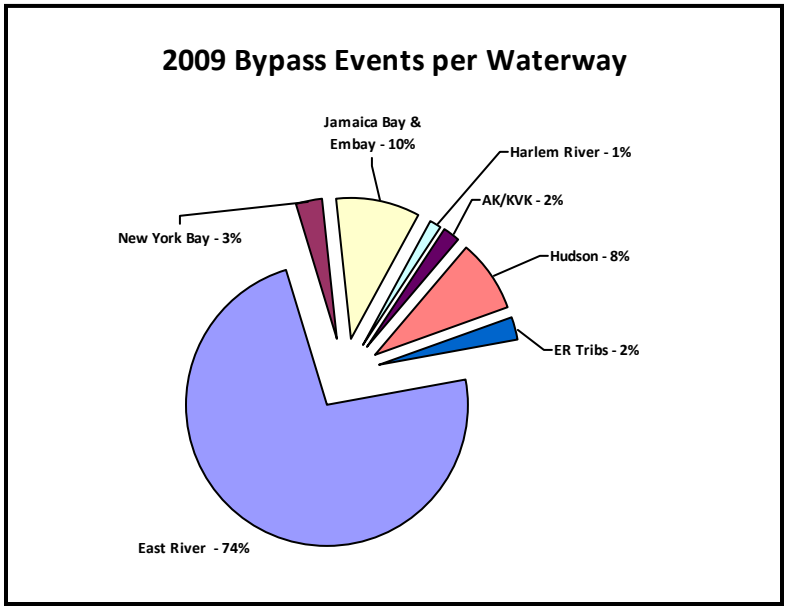
[1] NYS DEC-Region 3 also includes the counties of Putman, Dutchess, Orange, Ulster and Sullivan

During the reporting period, all bypass event details were disseminated in a timely fashion by e-mail. For the most part, any missing data from the event was reported by conventional mail subsequent to repairs. Minor events or ongoing investigations of illegal discharges were reported by mail. Volumes bypassed ranged from a less than 10 gallon sludge spill to wet weather bypasses that were over 100 million gallons. During 2009, the common causes for bypass events were rain (145), equipment failures (11), disinfection problems (5), blockages (8), power outages (15), broken pipes/lines (6), illegal connections (5) and 6 events were caused by miscellaneous reasons including tank overflows and the tidal impacts. The breakdown is displayed on the pie chart shown on the left. The majority of the 201 bypass events were comprised of raw sewage (184). Other types of bypasses included disinfected wastewater with primary treatment, secondary treatment with no disinfection, low chlorine residual and sludge spills.



The critical time of the year when the majority of the public is recreating on local waters and beaches is during the "official" bathing season - Memorial Day weekend to Labor Day - May 22nd through September 7th. There were 90 releases, or 45% of the total, during this period. During 2009, the waterways impacted by bypass events are shown on the pie chart below.

During November 2005, IEC convened a special RBWG meeting and, on behalf of the Workgroup, took the lead in pursuing additional funds necessary to upgrade the model. NYS DEC indicated that New York funding would be available through the NYS Environmental Benefit Projects Fund administered by the Natural Heritage Trust. At the annual spring 2006 meeting, all Workgroup attendees authorized IEC to apply for the aforementioned NYS DEC funds on behalf of the Workgroup. In May 2007, IEC received a commitment from NYS DEC to provide monies for the model upgrade. IEC worked with the other Workgroup members and commitments were made, including a commitment by IEC, to fund the model upgrade.



During 2008, the Regional Bypass Model, version 2.0 was released. While the original bypass model has been a valuable tool in predicting the extent of bypasses over the years, it had its limitations. Some of the upgrades to the new model include but are not limited to (1) use of calibrated enterococci and total/fecal coliform kinetics; (2) a spatial domain encompassing NY/NJ Harbor, LIS, the New Jersey coastline south to Cape May and the Passaic/Hackensack/Raritan Rivers; (3) discharge into any segment; (4) multiple discharges; (5) time of discharge with proper position in the tidal cycle and temperature conditions; (6) temperature assignment; and (7) specific duration and quantity. All members of the RBWG were given the upgraded model software. 2009 was the first full year that version 2.0 of the model was used.

CLEAN WATER ACT SECTION 305(b) WATER QUALITY ASSESSMENT

Under Section 305(b) of the federal Clean Water Act, States, Territories, the District of Columbia, Interstate Water Commissions, and participating American Indian Tribes assess and report on the quality of their waters. The results of a 305(b) assessment are not raw data, but rather statements of the degree to which each waterbody supports the uses designated by water quality standards. The IEC has made submissions since the inception of this reporting format which began in 1984. Each State and Tribe aggregates these assessments and extensive programmatic information in a 305(b) report, which is a comprehensive document, usually

involving information from multiple agencies. US EPA then uses these individual 305(b) reports to prepare a biennial National Water Quality Inventory Report to Congress.

The goals for 305(b) reporting include comprehensive coverage characterizing all waters in the Interstate Environmental District which adds to the extensive national coverage; reducing paperwork while increasing the amount of assessed waters; electronic updates of key information for all assessed waters during the previous two years; geo-referencing 305(b) information to identify and map specific waterbodies, including whether they meet water quality standards, and to enable long-term tracking of trends; and more rapid, real-time public availability of water quality information.

Since 1998, the IEC has been providing 305(b) reports consisting of both narrative and electronic portions. As US EPA's Guidance requires, the narrative report contains the Commission's assessment methodology, in addition to a great deal of other important information. The assessment of the Commission's nearly 797 square miles of estuarine waters is based on data collected from its ambient and effluent monitoring programs. It is supplemented with data from the Commission's member states' environmental and health departments dealing with information on water quality, health advisories, fish kills, shellfish closure areas, and beach closings. For the 2008 reporting period, which reflects 2007 information, IEC accessed the US Environmental Protection Agency's Assessment Database (ADB) software and used it as a tool to store and report assessment information generated under Section 305(b) of the Clean Water Act. The Commission's waterways were divided into assessment units and a methodology was developed for the statistical analysis of several use support categories. The most important function of the ADB software is to store assessment information in compliance with US EPA's Guidance on generating 305(b) and 303(d) reports. The software standardizes reporting nationwide and facilitates the generation of the National Assessment Database and the biennial National Water Quality Inventory.

STORET

Since its beginnings, the Commission has amassed a huge database of ambient and effluent water quality data. These data have been collected for a variety of reasons, which have been highlighted throughout this Report, previous Annual Reports, and in special reports. The Commission has always been a water quality data depository and an advocate of water quality data collection, analyses and dissemination for the Tri-State Region.

Originally under the auspices of the Public Health Service, the US EPA now has the responsibility of maintaining the National Water STOrage and RETrieval (STORET) database. STORET is a national database that contains biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, Indian tribes, volunteer groups, academia, and others. The original database underwent a complete modernization and overhaul between 1991 and 1998. Since then, the system has been subjected to continuous updates and improvements resulting in the present operating system, STORET, Version 2.0.

The Commission's first input to this repository dates back to 1970. Since then, the Commission has been a steady contributor. Currently, IEC is represented by well over 100,000 entries of parametric data as well as metadata. Parameters recorded include dissolved oxygen, temperature, salinity, Secchi depth, chlorophyll a, fecal and total coliform, fecal streptococcus and enterococcus bacteria. The modernized version of STORET has been enhanced to contain ancillary information such as climatological and tidal data, type of monitoring instrumentation, personnel expertise and visual observations. All the data sets generated by the Commission that are suitable for input have been entered into STORET.

STORET data are available on the Internet. The data can be retrieved from two separate databases, the STORET Legacy Data Center (LDC) and the more current, Modernized STORET system. In contrast to the LDC, which is a static, archived database, the Modernized STORET is an operational system, actively being populated with water quality data. The Commission's data sets supplied to US EPA prior to 1999 were all placed in the Legacy Data Center, whereas those supplied to US EPA since January 1, 1999, reside in the Modernized STORET System.

As of September 2009, the Water Quality Exchange, or WQX, provides the main mechanism for submitting data to the publicly-accessible National STORET Data Warehouse. WQX is a new data transfer system that uses the technology, standards, and protocols of the National Environmental Information Exchange Network, or Exchange Network, to improve the upload of data from states, tribes, interstate agencies and other environmental organizations to the National STORET Data Warehouse via the web. WQX is not a distributed database, but rather, a new web technology with the ability to generate Extensible Markup Language (XML) files to submit data. The WQX framework replaces the Oracle-based STORET database.

REVISIONS TO DISSOLVED OXYGEN SURFACE WATER QUALITY STANDARDS FOR MARINE WATERS

In November 2000, US EPA issued the final guidance document "Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras". This document recommended guidelines for revising water quality criteria for dissolved oxygen (DO). As a result of the release of this document, the Commission's member states, as well as the Commission, have or are considering revisions to current DO standards. Subsequent to public hearings, US EPA - Region 1 approved Connecticut's proposed revisions during May 2001. Connecticut adopted the revised dissolved oxygen ambient water standards in certain portions of Long Island Sound.

The NYS DEC adopted revised water quality regulations for DO on February 16, 2008. Monitoring methodologies will be addressed in a TOGS to be developed by NYS DEC. To date, NJ DEP has not proposed any revisions to their DO criteria in the New Jersey waters of the NY-NJ Harbor Complex, which also encompasses the Interstate Environmental District. Since the interstate waters in Connecticut, New York and New Jersey are also IEC waters, whatever is done by IEC's member states in those waters is going to affect IEC and the course of action the Commission might have to take regarding its DO regulations.

NATIONAL ESTUARY PROGRAM

The National Estuary Program was established in 1984 and provides assistance to estuaries of national significance, which are threatened by pollution, development or overuse. The NEP provides federal assistance to develop a Comprehensive Conservation and Management Plan (CCMP) for designated estuaries. There are 28 estuaries located along the Atlantic, Pacific and Gulf of Mexico coastlines, as well as in Puerto Rico and the US Virgin Islands, that are developing or implementing CCMPs. Within the Interstate Environmental 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 (LISS) is being done by the US EPA - Regions 1 and 2. The New York-New Jersey Harbor Estuary Program (HEP) is being coordinated by the US EPA - Region 2.

During 2009, the Commission continued its active participation as a member of the Management Committees, implementation and planning teams, as well as various workgroups for the LISS and the HEP. Commission staff members have taken active roles in the preparation and dissemination of outreach materials intended for legislators and the public. IEC staff also attends the spring and fall meetings of the Association of National Estuary Programs (ANEP). The spring meetings in Washington, DC, give the NEPs access to the appropriate legislators. The fall meetings, which are hosted by different NEPs, give the opportunity to share successes and failures, as well as program management, and education/outreach. The Commission has been involved with these national programs since their inception.

The Governors of New York and Connecticut and the Administrator of the US EPA signed the final CCMP for the LISS in September 1994. The Long Island Sound is bounded by Connecticut and Bronx and Westchester Counties, New York, on the north and by Long Island on the south. It is about 110 miles long ranging from the East River to the Race. 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 LISS 2003 Agreement more clearly defines desired outcomes of the CCMP actions in measurable, trackable terms, proposes a better link between monitoring/research and environmental indicators to established goals and results, promotes implementation, and addresses new issues. It affirms targets for nitrogen reduction and habitat restoration. The “vision” is to restore the health of the Sound by 2014, the 400th anniversary of Adrian Block’s first exploration of the region. The Agreement focuses on hypoxia, pathogens, toxic substances, living resources and their habitats, open space and public access, watershed management, public education and community involvement and partnerships. US EPA conducts a review of each NEP every three years to assess program progress, evaluate effectiveness, and recommend areas of improvement. The LISS was one of the programs reviewed in 2009. On June 2, 2009, IEC hosted the Triennial Review Team from US EPA-HQ aboard the R/V Natale Colosi. An annotated water quality survey was conducted; water quality issues were discussed; and local and historical points of interest were shown to the team. Many of the team members were first visitors to the area.

For the past several years, the Management Committee's quarterly meetings have been enhanced with a fall two-day meeting. This allows for a full agenda where all participants can interact in a professional and social atmosphere. During the October 2009 meeting, with the help of a facilitator, Management Committee members and/or their representatives focused on key 2010 priorities. By consensus, potential needs for 2010 and beyond were discussed. Major topics include, but are not limited to nonpoint and stormwater management, a restructured LIS Agreement, education and outreach, nitrogen TMDL, climate change, research, habitat restoration, bioextraction implementation, a near shore environmental focus and ecosystem based management.

US EPA Triennial Review Team aboard the R/V Natale Colosi. *Photo by P. Sattler, IEC*

The Governors of New York and New Jersey and the US EPA Administrator signed the final CCMP for the HEP in August 1997. The estuary includes the waters of New York-New Jersey Harbor Complex and the tidally influenced portions of all rivers and streams that empty into the Harbor Complex. The plan addresses habitat and living resources, toxic contamination, dredged material, pathogens contamination, floatable debris, nutrients and organic enrichment, rainfall-induced discharges, and public involvement and education. Simultaneous with the 1997 closure of the Mud Dump Site (MDS) in the Atlantic Ocean, the site and surrounding areas that had 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.

The TMDL efforts for nutrients, pathogens and toxics for the New York-New Jersey Harbor Estuary Program (NY-NJ HEP) have been making advances in both management strategy refinement and modeling during 2009. These efforts are expected to result in completed TMDLs in the next year. IEC has been involved with these workgroups and will assist in the process, especially for the interstate waters within IEC's jurisdiction. Both the Pathogens and

Nutrients Workgroups have evaluated model outputs related to current conditions and, in a general way, what it would take to meet water quality standards. These groups are now taking the next steps which include refining modeling run scenarios and working with partners to develop cost analyses for pollution reduction options.

IEC is managing a project to assess the effectiveness of green infrastructure (GI) technologies for reducing combined sewer overflows. IEC is working in collaboration with the NY-NJ HEP, NY/NJ Baykeeper, the City of Newark, the Greater Newark Conservancy and a local environmental firm. The program is seen as a pilot study to see if GI measures can, in a cost effective manner, improve the quality and reduce the quantity of water collected by combined sewers. Refer to the other Funded Projects and Grants section for more details.

COMBINED SEWER OVERFLOWS AND MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Since the passage of the Clean Water Act and the implementation of secondary treatment, the quality of the Region's waters has improved dramatically. However, waterbodies are still negatively impacted by urban and suburban stormwater runoff. Combined sewer overflows (CSOs) and municipal separate storm sewer systems (MS4s) are major sources of pollution that are permitted to discharge during wet weather only.

The Commission's continuing activities with combined sewer overflows include in-house programs and participation in the aforementioned National Estuary Programs. The Commission has maintained an active dialogue with its member states, US EPA and POTW owners/operators to keep abreast of the status of CSO abatement activities in the District.

During the past six years, interest in the operation and control of municipal separate storm sewer systems has intensified. Phase I of the US EPA's stormwater program (1990), administered as NPDES permit requirements, addresses medium and large municipal separate storm sewer systems, construction activities, and industrial activities. Phase II is an effort to preserve, protect, and improve the nation's water resources by implementing programs and practices to control polluted stormwater runoff in small communities.

Long Island communities were informed of the requirements of the new Phase II Stormwater Program announced by NYS DEC on September 18, 2002. Among the documents released by NYS DEC were two draft Phase II general SPDES permits — one for Small Municipal Separate Storm Sewer Systems (MS4s) and one for construction activities. According to the draft permits, all New York regulated entities (communities with stormwater discharges from MS4s and construction activities) were required to apply for coverage by SPDES permits by March 10, 2003. Communities with MS4s were then required to proceed with preventing pollution using appropriate technologies and management practices outlined in the permit. The permittees were expected to report annual progress to the NYS DEC and fully implement the proposed program by March 2008.

In Connecticut, 113 municipalities are required to comply with Phase II Stormwater Management plans. The federal government created the Clean Water State Revolving Fund to provide low-cost financing for water quality remediation efforts, to be matched by state funds. Primarily intended to fund modernizing wastewater treatment facilities, this fund has expanded through state bonding to assist with CWA compliance. Due to the limit on grants imposed by required state allocation levels, this fund is grossly inadequate for meeting current water quality needs.

The State of New Jersey's CSO abatement mandates are regulated by the CWA's National CSO Control Policy, the New Jersey Sewerage Infrastructure Improvement Act-Solids/Floatables Control and the HEP's CCMP. The CWA's Nine Minimum Controls require the State to meet existing technology-based criteria and implement immediate corrective actions. The Long-Term Control Plan sets forth requirements to meet water quality-based criteria, conduct intensive CSO monitoring and modeling studies and to implement significant infrastructure activity.

Phase II CSO Control Program Objectives are to develop and evaluate alternatives, as well as formulate cost and performance relationships. A State-wide General Permit for Combined Sewer Systems was issued on January 27, 1995, reissued on February 28, 2000; revoked and reissued on June 30, 2004, effective August 1, 2004 with a five-year expiration date. The Long-term Control Plan requirements include a public participation process and a report of the public's activities, matters of concern, a summary of public views and comments and the permittee's specific responses in terms of modifications or basis for rejections of the public input and suggestions. The General Permit also has a Re-opener Clause which allows for the legal, if necessary, adjustment or amendment.

In addition, Cost and Performance Analysis Reports were required to document the process of identifying and evaluating alternatives; a basis for sizing alternatives; a list of alternatives considered, but rejected; preliminary construction and implementation costs; and a basis for performance assumptions. These reports were due on February 1, 2007. Several permittees requested and were granted a two month extension. The General Permit was subsequently modified with a due date of April 1, 2007.

US EPA, Region II will address state water quality standards inequity between New Jersey and New York, determine an equitable pathogen reduction between New Jersey and NYC and determine a pathogen reduction in terms of a TMDL based upon feasibility studies and cost information. NJ DEP and NYC DEP will make cost performance available by June 2007. US

EPA - Region 2 will provide load allocation under the TMDL during 2010. The Clean Water Act gives guidelines on how to develop a TMDL, but leaves some flexibility to the states through interpretation on the length of the time frame to base it upon. US EPA presented different scenarios on which to base the timeframe. Both New Jersey and New York support using a seasonal average to base the TMDL upon.

The goal of any stormwater program should be to achieve significant and measurable improvements in water quality, and this may require actions beyond those required by Phase II. Stormwater utilities are a promising option for providing a dedicated funding stream and professional staff to manage stormwater at the local level. Enabling legislation at the state level is the first requirement for creating a stormwater utility. Once that is established, the municipality must determine whether to create a real or paper entity. Challenges facing small municipality administrators include a disconnect from the decision making process for funding, new housing construction with its accompanied increase in impervious surfaces. Stormwater is not a visible problem and tends to receive a lower priority from elected officials who set budget priorities. There is no clear vision, goals or expectations from the program. Thus, public education where elected officials are the ultimate target is important.

The draft general MS4 permits require six minimum controls including: 1) public education/outreach on stormwater issues, 2) public involvement/participation in decisions involving stormwater, 3) illicit discharge detection and elimination, 4) construction and stormwater site runoff control, 5) post-construction management of stormwater facilities, and 6) pollution prevention at facilities operated by municipalities.

Initiated in 2002, the Commission was asked by US EPA - Region 2 to investigate the feasibility of conducting dry weather investigations of MS4s in the District, somewhat like the IEC's ongoing CSO program. IEC received some information from US EPA on MS4s (locations, sizes, and discharge waterways) in Nassau County, New York, and started conducting outfall inspections. Because of the importance of the track down of this pollution source, the Commission has continued this program. When field inspections reveal outfalls flowing under dry weather conditions, the appropriate state environmental agency is contacted for remediation. The table on the following page shows the 2009 summary of MS4 inspections. This program will continue during 2010.

INTERSTATE ENVIRONMENTAL COMMISSION
MS4/CSO DRY WEATHER INSPECTIONS
RICHMOND COUNTY, NEW YORK[1]

LOCATION	OUTFALL ID	DATE INSPECTED	NUMBER OF OUTFALLS INSPECTED	NUMBER OF OUTFALLS FLOWING
Eylandt Street	699	5/21/09	1	0
Luten Ave. Pond	709	5/21/09	1	0
Androvette Street	708	5/21/09	1	0[2]
Wolfe's Pond	N/A	5/21/09	1	0
Shirley Avenue	701	5/21/09	1	0
Koch Pond	700	5/21/09	1	0
Jansen & Holdridge Streets	N/A	5/21/09	1	1
Philip Avenue	N/A	5/21/09	1	0
Sala Court	710	5/21/09	1	0
Poillon Avenue	704	5/21/09	1	0
Newton Street	702	5/21/09	1	0
Manor Road	616	5/21/09	1	0
Clove Road	614	5/21/09	1	0
Forest Avenue	618	5/21/09	1	1
Clove Road	617	5/21/09	1	0
Forest Hill Road	620	5/21/09	1	0
St. Andrews Road	692	4/14/09	1	1
Draper and Travis Avenues	653	4/14/09	1	1
Lighthouse Avenue	693	4/14/09	1	0
Mill Pond	691	4/14/09	1	0
Meisner & Richmond Roads	N/A	4/14/09	1	0
Richmond & Richmond Hill Roads	N/A	4/14/09	1	0
St. Georges Road	695	4/14/09	1	0
Mace St. & Lighthouse Ave.	694	4/14/09	1	0
Bard Avenue (CSO)	004	5/21/09	1	0
Rector Street (CSO)	036	5/21/09	1	0

(1) All observed flowing outfalls were referred to NYSDEC-Region 2.
(2) Sewage odor present.

PUBLIC AND LEGISLATIVE EDUCATION, OUTREACH AND CONFERENCES

The Commission continues its commitment to participating in an active public involvement, education and outreach program. IEC continues to lecture at local schools and colleges, community boards, scuba and fishing clubs and related forums on a variety of environmental topics and Commission activities. Many of the Commission's staff members participate in this effort.

In past years, the Commission's public education and outreach program has encompassed a variety of topics and venues. IEC personnel have been called upon to participate in various seminars and forums in various roles such as a moderator, speaker, panelist, chairperson and/or a faculty member. The Commission is a member of various engineering, legal and professional organizations, and takes an active role on those organization's committees, boards and workgroups. The technical staff is involved with ASIWPCA, ICWP, WEF, NY WEA, NWQMC and other professional organizations and activities. The IEC conducted a presentation on the role of interstate water quality commissions at the NYWEA legislative dialogue and conference in Albany, New York, in February 2009. Commission personnel have published articles on a variety of environmental topics, including interstate compacts, laboratory research and water pollution control. In addition, the IEC has presented programs for community groups, testified before the New York State Senate Committee on Environmental Conservation, and co-sponsored and presented at the Environmental Justice Conference at the College of Staten Island of the City University of New York in conjunction with the college's Center for Environmental Studies. Activities such as these enhance the Commission's visibility and make IEC and its functions known to a broad audience.

This year, the Commission staff continued its spring and fall programs with the marine science students from Bayonne High School. The students visited the IEC laboratory to learn and observe laboratory testing. Due to inclement weather, the IEC conducted land based hands-on water quality monitoring and data recording in the classroom.

2009 Legislative and Regulatory Dialogue

The Commission and its interstate counterparts with New York membership co-sponsored the New York Water Environment Association's (NYWEA) Legislative Forum for the first time during May 2001 in Albany, New York. Meeting in New York's capitol gives the six interstate commissions the opportunity to emphasize to the New York Legislature the scope of the combined agencies' efforts being undertaken to promote water pollution control and carry out water pollution abatement activities. This venue continued each May until 2005.

Collectively, the Delaware River Basin Commission, the Great Lakes Commission, the Interstate Environmental Commission, the New England Interstate Water Pollution Control Commission, the Ohio River Valley Water Sanitation Commission, and the Susquehanna River Basin Commission represent 20 states, the federal government and the Canadian provinces of Ontario and Quebec. These Commissions combined serve a population of 72.4 million people within drainage basins ranging to 164,000 square miles.

In order to have a more focused discussion of issues, the Government Affairs Committee of NYWEA, of which IEC is an active member, changed the Forum in 2007 to an intimate Dialogue. Subsequently, for the third consecutive year the Legislative and Regulatory Dialogue was held on February 24, 2009, with agenda topics including Challenges of Infrastructure Funding-Stimulus/Recovery Plan and Water Quality and Regulatory Issues. The agenda also included visits from the House Chairs of the Environmental Conservation Committees. Discussion items presented by the Interstate Commissions included monitoring activities, TMDL development, emerging contaminants, applied research and Marcellus Shale development.

The Interstate Commissions' continuous assistance to New York State and NYS DEC were emphasized. As a whole, the Commissions were established by independent legislative action and operate in accordance with compacts; allow comprehensive coordination among three or more member States; provide watershed management and coordination; provide regulatory, monitoring, and technical assistance as appropriate; are able to leverage New York State money by other States' appropriations; and coordinate grants and projects with States' priorities.

19th Annual Long Island Sound Citizens Summit

On March 6, 2009, the Annual Long Island Sound Citizens Summit was held in Bridgeport, Connecticut. Sponsored by Save the Sound and the Long Island Sound Study, this year's summit was titled, "Investing in Clean Water: For Sound Health, Jobs and the Economy". The agenda had keynote speakers focusing on infrastructure, clean water and jobs, as well as creating sustainable investments through infrastructure. Panel discussions addressed clean water needs in Connecticut and New York; the State roles in clean water investments; and national and regional support for infrastructure. Attended annually by Commission staff, the Commission maintained an information booth at the summit.

Issues being discussed at the IEC Information booth. *Photo by P. Sattler, IEC*

Environmental Justice Conference: History, Issues and Outlook

The Interstate Environmental Commission co-sponsored and presented at the Environmental Justice Conference on May 8, 2009. The Conference, presented by the Center for Environmental Science of the College of Staten Island, received additional sponsorship from Con Edison and attracted environmental stakeholders concerned about the environment. Environmental justice refers to the social movement that developed from grass-roots, community-based organizations in reaction to environmental hazards that have disparately affected communities of color and low income populations. Panel presentations and discussions addressed access to information and public awareness, impacts, the role of academia as a community resource, interstate perspectives and politics.

Ross Brady, IEC Acting Administrator at the IEC Information Booth. *Photo by P. Sattler*

National Marina Day

On August 8, 2009, IEC staff maintained an information booth for National Marina Day. Hosted by the NJ DEP-Leonardo State Marina located on Raritan Bay, the focus was to educate the public about the importance of marinas for local communities. Marinas provide access to recreational area waters, provide an economic basis for the nautical community and promote a unique way of life.

The IEC Information Booth and Interested Attendees at the Leonardo State Marina. *Photos by P.Sattler, IEC*

World Water Monitoring Day

On July 28, 2006, the Water Environment Federation announced its adoption of World Water Monitoring Day. Founded by the America's Clean Water Foundation in 2002 with a national focus, the first National Water Monitoring Day in the United States was a great success. To continue to promote water quality awareness around the globe, the seventh annual World Water Monitoring Day was held on September 18, 2009, with sampling taking place between September 18th and October 18th. It was originally celebrated on October 18th to commemorate the anniversary of the enactment of the federal Clean Water Act. IEC has participated in this monitoring effort since its inception.

The IEC joined thousands of volunteers to sample water quality and report their results. While comprehensive monitoring goes on throughout the year, IEC conducted in situ testing of water quality parameters on September 21st at nine sites in the upper East River and western Long Island Sound, covering a distance of about 29 nautical miles. These are the same sites monitored by IEC since 2002. The ambient water quality stations represent a subset of the LISS sampling network (see the 2009 LISS Sampling Station table for specific locations). In addition to meteorological and tidal conditions, parameters collected include dissolved oxygen, salinity, temperature, and water clarity. All IEC data has been submitted to the World Water Monitoring Day website, www.worldwatermonitoringday.org for inclusion into an international data bank.

On September 22, 2005, the R/V Natale Colosi sailed to the Bronx River. In conjunction with the Long Island Sound Office and Rocking the Boat, a non-profit organization, another World Water Monitoring Day event was held. As an after school event, students experienced hands-on water quality monitoring and data recording.

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On the Bronx River, Rocking the Boat students learn about water quality monitoring on the R/V Natale Colosi. *Photo by P. Sattler, IEC.*

III. AIR POLLUTION

GENERAL

The Commission's air program was initiated in 1962 after passage of supplemental statutes in New York and New Jersey. In 1969, Connecticut passed legislation mirroring that of New York and New Jersey, extending the IEC's air investigation and study authority. To aid the primary control agencies in the solution of air quality problems of an interstate nature, the Commission maintained two mobile vans capable of measuring airborne pollutants. The vans were used to trace air contaminants across state lines and locate sources. The Commission also maintained fixed-site monitoring stations.

In 1964, the first Air Pollution Warning System was put into operation and, through coordination by the Commission with its member states, has been periodically updated and strengthened as new information regarding air pollution abatement practices became available. In April 1970, the Commission was designated as the coordinating agency for the New Jersey-New York-Connecticut Air Quality Control Region under the federal Air Quality Act. Pollutant values and meteorological conditions did not warrant activation of the High Air Pollution Alert and Warning System during 2009.

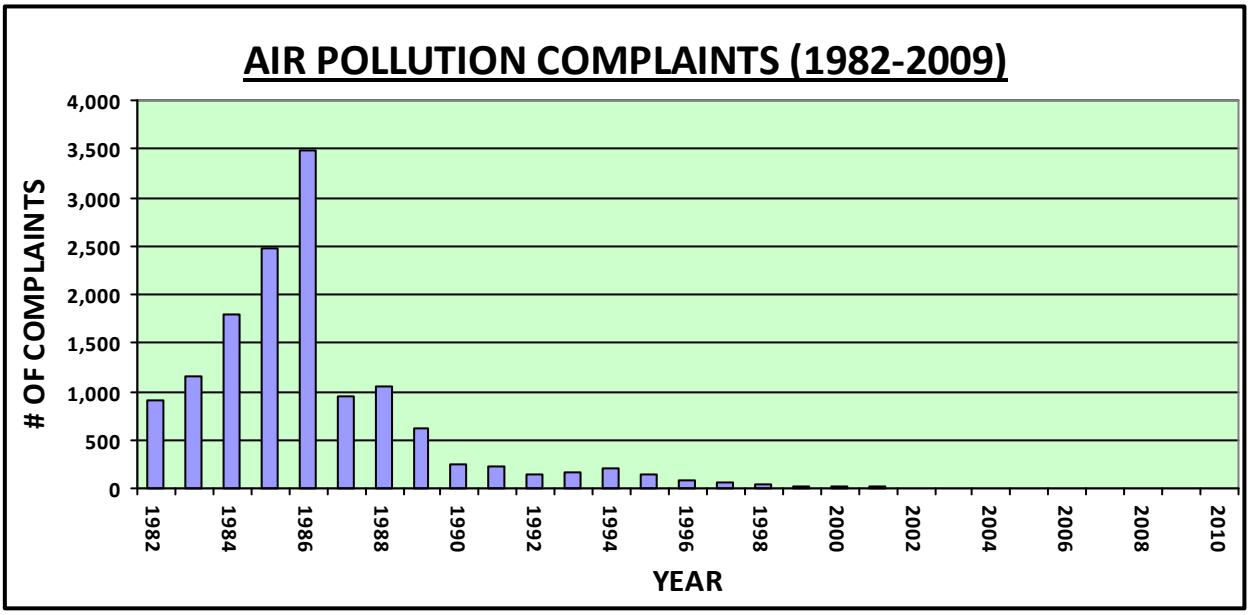
The Commission has maintained round-the-clock response for air pollution complaints since the late 1960s. To better serve the needs of the public by faster response to complainants, a field office was established on Staten Island in 1982. This presence was especially important during 1986 when odor complaints reported to the Commission peaked at nearly 3,500 complaints affecting 63 different neighborhoods throughout Staten Island. The number of complaints received by the IEC has significantly declined over the years and, although it had been a significant odor for many years, no garbage odors were reported to the Commission for the tenth consecutive year.

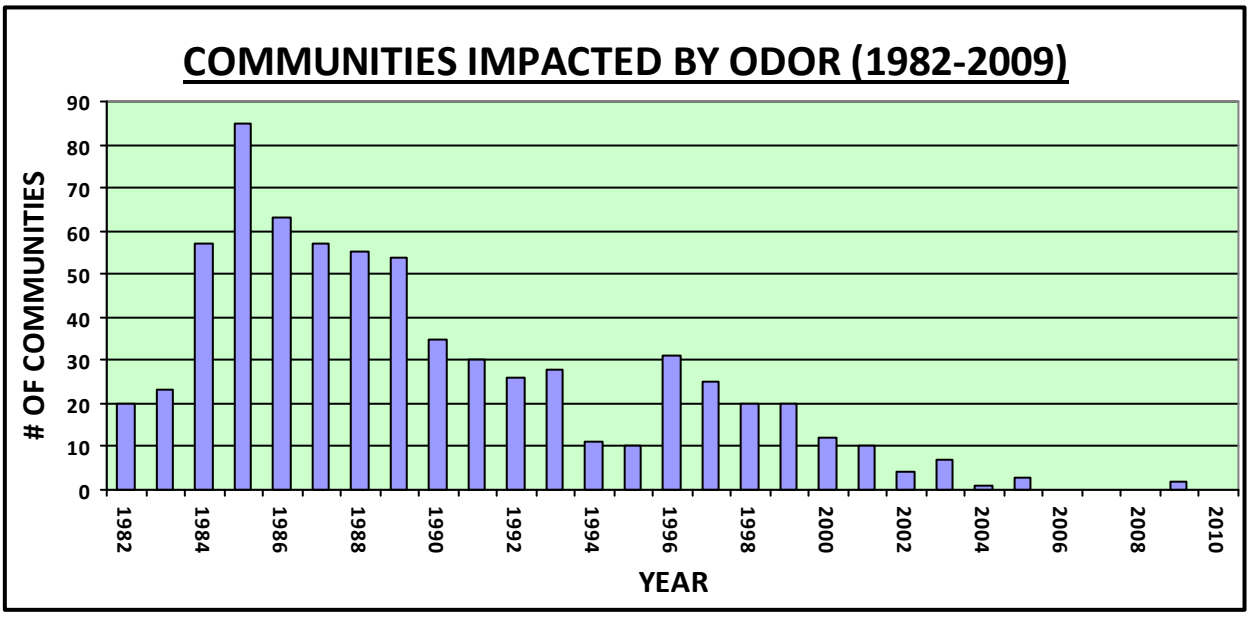
AIR POLLUTION COMPLAINTS

Over the last 20 years, Staten Island was the source of more citizens' complaints than any other area in the Commission's jurisdiction. Historically, many of the complaints came 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. However, since the landfill's closure in 2001, complaints have been minimal.

IEC's Staten Island field office was closed in 1989 due to budgetary restraints. Since then, the Commission still maintains a 24-hour-a-day, 7-day-a-week answering service (718-761-5677) to receive complaints. Complainants are contacted during regular office hours by IEC staff and, when available, IEC personnel are dispatched to investigate ongoing complaints.

When warranted, Commission personnel are contacted during non-office hours. The IEC also contacts and works closely with the appropriate enforcement agencies and health





departments in New York and New Jersey to perform follow-up.

For the 12-month period ending September 30, 2009, the Commission received two odor complaints from two different neighborhoods. This continues the pattern of a decreasing number of complaints since the 1986 peak of nearly 3,500 complaints and from a peak of 63 different Staten Island neighborhoods.

Over the years, the majority of the complaints received by the IEC tend to come from the same group of neighborhoods. In past years, a category reflecting "nonspecific" descriptions, i.e., bad or awful or nauseating, were received regularly. 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. This is the tenth consecutive year that the nuisance odor category of "garbage" was not registered.

OZONE HEALTH MESSAGE SYSTEM

For the 22nd 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 was 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. It serves as a central source of precautionary advice on ozone to the Region during the warm weather months (May to October) when higher concentrations of ozone occur. The Metropolitan area ranks as the fourth worst in the nation for dangerous levels of particulate pollution, and the seventh worst for ground-level ozone. 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.

In 2009, the Commission continued its participation in this program. The IEC 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 IEC relayed "health advisory" messages to the appropriate government environmental and health agencies. The IEC received 11 ozone and five (5) fine particulate (soot and dust) advisories from the New Jersey Department of Environmental Protection. Ozone health advisories were received between April 24 and August 18. The number of advisories and temporal span were considerably less than past years during this decade (2000 to 2009). The majority of the advisories were made during July. Individual states issue their own health messages, which identify specific counties where ozone levels are a special health threat. During 2009, it was not necessary for IEC to issue a Region-Wide Ozone Health Message.

REGIONAL AIR POLLUTION WARNING SYSTEM

The IEC 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 IEC's Legal Counsel advances the mission of the Commission in regulation and enforcement, as well as outreach and examination of factors affecting the tri-state environmental District. The Commission is counseled on State and federal regulations and case law, and provides risk assessments both of the ramifications of member actions, as well as the cost and/or benefits to the District and to the Commission. IEC's Legal Counsel proactively assures compliance with IEC regulations, to recover damages from polluters and ensure accountability and remediation, as well as counseling IEC's staff and Commissioners on matters including insurance, ethics, contracts, personnel, labor and management issues.

IEC's Legal Counsel also synthesizes and analyzes proposed legislation, regulatory changes and local issues in the member States, which may affect the IEC's District. This includes assisting with or delivering testimony upon the request of the Commission, updating legislators seeking information and reviewing agency and interagency policies and memoranda, as well as ensuring IEC's regulations are incorporated into permits.

Some current IEC legal activities and their histories are listed below. At the time of publication, an administrative decision is pending on nitrogen issues relating to SPDES permit litigation in which the Commission is an amicus party. The SPDES litigation also concerns the impact of combined sewer overflow and New York City treatment plants. In addition, mitigation of the negative effects of the operation of the Fresh Kills Landfill remains a priority. These activities are illustrative and not all-inclusive of the legal activities of the IEC.

MITIGATING NEGATIVE EFFECTS OF NEW YORK CITY'S OPERATION AT THE FRESH KILLS LANDFILL

Fresh Kills Landfill was closed pursuant to New York City and New York State Law in March 2001, and opened briefly for limited purposes after the attack of September 11, 2001. Four years after closing the Fresh Kills Landfill in Staten Island, the City drew up a 20-year plan — a Solid Waste Management Plan (SWMP or Plan)— to handle waste by shipping the bulk of it elsewhere. It relies on the use of four transfer stations from which garbage would be barged to states west and south of New York for landfilling. Some portion of the City's garbage would be incinerated at a facility in New Jersey. The plan ends the continued renewal of short-term contracts for debris disposal that relied exclusively on truck transport with its attendant negative traffic and air quality implications.

On July 19, 2006, the City approved a 20-year Plan (Solid Waste Management Plan) for the City's management of its solid waste. The City Council benefitted from of much comment over several months of hearings and made modifications to the SWMP including: 1) the establishment of an independent office of reduction and reuse in the Mayor's Office; 2) a commitment to increase recycling; and 3) reducing the capacity of Marine Transfer Stations

(MTSs) in overburdened communities. The NYS DEC approved the comprehensive plan in October 2006.

Among the benefits of the Plan is a shift from truck traffic through the City and tunnels into New Jersey, to a system that relies more on barges and trains. The City would create five City-run marine transfer stations - 91st Street on the east side of Manhattan, one on Hamilton Avenue in Brooklyn at the Gowanus Canal, a second one in Brooklyn on Shore Parkway at Bay 41st Street, one in Queens at 31st Avenue and 122nd Street, and one in lower Manhattan at Gansevoort Pier. NYS DEC has held hearings where applicable but, to date, has only issued an air facility permit for the Queens MTS and a permit for the Hamilton Avenue site in Brooklyn. Most environmental groups approve of the Plan. Among those who disapprove are residents living near 91st Street in Manhattan, and Hudson River Park advocates. New York City has made assurances regarding odor control and leachate, but residents remain leery. NYS DEC issued a permit in October 2009. The State of New York amended the Hudson River Park Act in order for the Gansevoort facility to proceed. This facility will also relieve a facility at 59th Street in Manhattan of recyclables.

The genesis of the Fresh Kills landfill case was a 1979 lawsuit filed by the Township of Woodbridge, New Jersey, in New Jersey federal District court relating to waterborne debris that enters the Interstate Environmental District's waters as a result of the garbage unloading operations at the Fresh Kills Landfill (Township of Woodbridge v. City of New York, Civil No. 79-1060). 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 was transported to the Fresh Kills Landfill by barge.

In 1986, the IEC intervened in the action. Approximately thirteen (13) Court orders were issued in the intervening years prior to IEC'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 New York City, the problem of debris from the landfill operations entering adjacent waterways persisted in contravention of the IEC's Water Quality Regulations. IEC sought and succeeded in obtaining a Contempt Citation against the City of New York for violation of the Court order.

In order to find a solution to the region's waterborne garbage problems, the parties to the suit entered into a Consent Order. The Consent Order required the City of New York in the Fresh Kills landfill case to implement water cleanliness procedures, install interim remedial equipment, including construction of a superboom and hiring an independent monitor. The

Order also provided for an Independent Consultant to evaluate the effectiveness of the interim equipment and procedures, and to recommend 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 of New York 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 implementing it. The IEC submitted a revised Consent Decree in January 1991. During 1992, the Commission requested assurances that monies be set aside, dedicated solely to the design and construction of the single-barge enclosed unloading system. With only a minor adjustment in compliance dates, the Consent Decree was accepted by the parties in the spring of 1993. The 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. Litigation resumed in the case during 1996 when the township of Woodbridge sought relief from medical waste washing up on its shores. Ultimately, a monitor determined that while debris, including medical waste, had escaped from the landfill, the evidence was insufficient to establish the landfill as the sole source.

The City of New York sought relief from the Consent order requiring it to build the enclosed unloader system in 1996, after the passage of a 1996 New York law requiring that no garbage be brought to Fresh Kills landfill for disposal after the end of 2001. IEC was willing to consider appropriate alternative solutions which offered the same safeguards the enclosed barge unloader to ensure that floatable debris does not enter the waterways around the landfill.

What remains is for all parties to agree upon a negotiated to resolve the remaining issues relating to Fresh Kills landfill. The State's approval of the Plan will go a long way toward achieving that goal. The issues have been dormant, but discussions of uses for the Fresh Kill site as park land or for transportation have sporadically taken place.

ADDRESSING NITROGEN AND COMBINED SEWER OVERFLOW IMPACTS OF SOME NEW YORK CITY SEWAGE TREATMENT PLANTS

In April 2006, NYS DEC issued revised draft SPDES permits, primarily revising provisions to address potential combined sewer overflow issues, but also revising some nitrogen provisions. Pending before the NYS DEC Deputy Commissioner were prospective appeals in an administrative proceeding from a November 2005 ruling on CSOs and an April 2004 nitrogen issues ruling. The Interstate Environmental Commission is an amicus party to this administrative proceeding.

In February 2006, New York City and the NYS DEC entered into a Judicial Consent Order (JCO) concerning nitrogen discharges. The JCO was an outgrowth of a 2005 court case. The JCO is essentially a Court Order governing the City and State's agreement to attain certain nitrogen discharge limits from City treatment plants. This JCO only applies to the nitrogen issue

(not CSOs) and binds only the City and NYS DEC, not the intervening parties to the administrative proceeding concerning the SPDES permits for WPCPs owned and operated by the City. This JCO supplants a 2002 Administrative Order on Consent (ACO) relating to CSOs and NYS DEC's proposed nitrogen TMDL requirements for the SPDES permits and permits larger amounts of nitrogen than did the 2002 JCO.

During January and February 2007, the Commission, along with the Consolidated Intervenors (Natural Resource Defense Council; Riverkeeper, Inc.; Soundkeeper, Inc.; and New York/New Jersey Baykeeper); NYS DEC and NYC DEP, participated in the administrative proceeding concerning how the SPDES permits address CSOs and nitrogen discharges, through the filing of statements.

On March 16, 2007, the Administrative Law Judge (ALJ) issued a Ruling on Proposed Adjudicable Nitrogen Issues and Party Status. The ruling named the City of New York as a party on permits along with NYC DEP, and set a schedule for those who wished to appeal to the NYS DEC Commissioner from a November 2005 Ruling on CSO issues and any party who wished to appeal from rulings on nitrogen issues. As an amicus party, according to administrative law, the IEC has no appeal rights. However, in the March 2007 ruling, the ALJ specifically noted that to the extent that other participants appeal CSO or nitrogen issues, IEC could file a brief on those issues if appealed.

During April and May 2007, the IEC and the Consolidated Intervenors filed appeals addressing issues about the incorporation of the CSO ACO into the SPDES permit; whether narrative water quality based effluent limitations for CSO discharges should be included; and whether and to what extent changes to the CSO ACO should be subject to a full adjudicatory hearing. The Consolidated Intervenors touched on many other issues, which were not available to the Commission. The IEC, appearing as an amicus party, has appellate rights limited to only the issues set forth by the ALJ who has allowed the Commission to file responsive papers if the other participants appealed CSO or nitrogen issues.

The Commission has consistently maintained that with regard to CSOs, which are more complex and less straightforward than nitrogen controls, using both a SPDES permit and an Administrative Consent Order (ACO) is appropriate. An Administrative Consent Order does not supersede a permit. With regard to whether or not a full adjudicatory hearing is required whenever the permittee misses a milestone date, the IEC proposed a reasonable compromise. Given that well over 200 milestone dates exist in the ACO for CSOs, the Commission identified only 31 critical milestones dates to be incorporated into the permit which, if missed, would trigger the requirement for a full adjudicatory hearing. The IEC-selected critical milestone dates include approvable drainage basin specific long-term control plans and dates for the completion of final construction.

This portion of the administrative proceeding concerning CSO control had its genesis in the administrative proceeding on the City SPDES permits. The City's main issue of contention was nitrogen control, but since both CSOs and nitrogen were part of the modified permit, the City also raised the CSO issue in requesting a hearing. It was during the consideration of nitrogen control issues that some intersection of CSO control with nitrogen control surfaced. Thereafter, interested parties sought a fuller exploration of many CSO control issues. The initial stage of this SPDES administrative hearing on both issues is set forth below.

It was in January 2004, that five parties (including the Interstate Environmental Commission, the Natural Resource Defense Council, the Riverkeeper, Save the Sound and the State of Connecticut) who had intervened in an administrative hearing where the City of New York and the NYS DEC were the mandatory parties, were granted amicus (friend of court) status on the nitrogen control issue, and the Natural Resource Defense Council and the Riverkeeper full party status on the CSO issue (IEC was granted amicus party status). The ALJ stayed the CSO issue pending the outcome of an enforcement proceeding that followed NYS DEC's issuance of a Notice of Violation against the City, and the City's expressed intention to negotiate a settlement on CSOs.

A CSO abatement order modifying two earlier Orders of 1992 and 1996 was noticed for comment in September 2004, and a public meeting held in October. By November, all intervening parties had submitted written comments on the Order, along with approximately 600 others. NYS DEC promised responses early in 2005.

A revised CSO Abatement Order was necessitated by the City's failure to meet goals and objectives of previous Orders — in particular, water quality goals and concerns about facility plans. Among the CSO concerns raised by the Commission were the incorporation of long-term controls into the permit, which would follow the June 1993 NYS DEC decision; complying with US EPA's CSO Policy to attain water quality standards; and ensuring the timely implementation of the long-term control provisions of the CSO Abatement Order.

The impetus for the City's hearing request came from their concern that certain provisions in newly issued modified SPDES permits conflicted with other enforceable Orders on Consent regarding the nitrogen related provisions. The City's argument for a hearing on the nitrogen issue, in essence, was that since April 2002, when both the City and State signed an Administrative Order on Consent, they had been required to meet certain nitrogen control limits, and that the modified SPDES permit conditions required that NYC DEP meet more stringent nitrogen limits. An ACO of April 2002 had settled two separate court actions against the City for exceeding the limits for nitrogen discharges that affected the quality of Long Island Sound. The ACO was the culmination of two matters — one commenced with a citizen suit against the City in federal court, and the other with the State of New York suing the City in State court. The April 2002 ACO preceded the 2006 Nitrogen JCO which was the subject of supplemental briefings filed by the intervenors in October 2007. The intervenors submitted both a motion for a

sur-reply and a motion to supplement their briefing. The NYS DEC ALJ denied the motion for a sur-reply finding no new issues raised, but granted a motion to supplement briefings and admitted into evidence a Jamaica Bay Watershed report which stated New York City could not adhere to SPDES requirements or meet milestones. A decision of the ALJ on both the CSO and the nitrogen issues is pending.

The Commission involvement in this case dates to the IEC appearance and filing as an amicus curiae, brief with the New York State Supreme Court in 1999, and participated in the oral argument. Immediately following the filing in federal court, the Commission was asked to provide guidance to the State of Connecticut when they intervened in the lawsuit filed by the Hudson Riverkeeper and others. Throughout, the Commission has maintained a presence in both matters, aiding with providing historical data, data on the Long Island Sound Study's "no net increase policy," making available the comprehensive records kept by the Commission, and comparing Connecticut's permits to New York's permits.

The SPDES permits require that NYC DEP's WPCPs meet the limits established by the Long Island Sound Study. IEC has long been a key player on the Management Committee responsible for the nitrogen control limits, and has participated in the discussions that led to finalizing the Total Maximum Daily Loads (TMDL) limits set by the LISS and adopted by the US EPA as minimal requirements for the states.

The Clean Water Act (CWA), from which the New York State SPDES system is derived, requires the states to promulgate, and US EPA to approve, TMDLs for wasteload allocations (WLAs) for waterbodies for which the effluent limits promulgated pursuant to CWA are not stringent enough for a waterbody to comply with applicable water quality standards (WQS). States were required to identify those waterbodies that do not meet water quality standards after applying the technology-based effluent limitations that are required by the CWA. The CWA also established lists of impaired waterbodies identified by the states.

New York and Connecticut identified Long Island Sound as "water quality limited" due to hypoxia, mainly caused by nitrogen discharges, and made it a priority for the development of TMDLs. TMDLs establish wasteload allocations for individual pollutants, applicable to all discharges to a water body to ensure that the combined effect of the discharges does not result in violations of the applicable WQS. By definition, a TMDL specifies the allowable pollutant load from all contributing sources (e.g. point sources, non-point sources and natural background) that

will attain a water quality standard that applies to that waterbody, taking into account seasonal variations and including a margin of safety. The margin of safety takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. In essence, a TMDL defines the capacity of the waterbody to absorb and digest a pollutant and still meet water quality standards. In April 2001, US EPA approved TMDLs for Long Island Sound that were developed jointly by NYS DEC and the CT DEP. When the discussions and approvals for the adoption of final TMDLs were taking place, NYS DEC, NYC DEP, CT DEP and IEC were prominent among the participants on the LISS Management Committee.

By February 1998, the LISS Management Conference adopted a 3-phase plan for hypoxia management by nitrogen reduction. Phase III Action Limits set an overall 58.5% reduction target for any discharge to Long Island Sound (not just those discharges from NYC DEP WPCPs), from the 1990 baseline for Long Island Sound nitrogen loads. Data on nitrogen loads were fully quantified for 1990, which is why that year was established as the baseline.

The 2002 Nitrogen ACO provided for limits which are clearly superseded by the TMDLs established by the February 2005 SPDES permits issued by NYS DEC that were the subject of the administrative proceeding. NYC DEP made a request for an administrative hearing arguing for the primacy of the ACO governing nitrogen limits over the SPDES permit limits. All five interveners, including IEC, argued along with NYS DEC that the permit has primacy over any Administrative Consent Order. Especially critical to the success of achieving the TMDL limits is the cooperation and coordination of all parties involved, and specifically, the willingness of nitrogen dischargers from New York and Connecticut to abide by the LISS TMDL limits. IEC, as an interstate body with regulatory authority over the waters of both New York and Connecticut that lie within the Interstate Environmental District, has a particularized interest in ensuring adherence to the LISS TMDL limits. Critical to achieving nitrogen reduction is having all those who contribute to the nitrogen load achieve TMDL limits established by the LISS. Based upon recent estimates, the WPCPs owned and operated by NYC DEP are responsible for at least 50% of the nitrogen load to Long Island Sound.

IEC's position on the nitrogen Administrative Order is that an ACO, as a stand-alone document, is not a permit and may not be used in lieu of a permit. In addition, NYS DEC has jurisdiction to administer a program permitting discharges under certain prescribed conditions. A discharger's ability to discharge flows from a permit rather than from an administrative Order. The effluent limits in the newly issued permits for the 14 NYC DEP WPCPs in contention can be amended, modified or changed by the NYS DEC to add more stringent limits than those required

in the previously issued ACO. In addition to the updated water quality standards, this can be driven by a number of other processes such as updated regulatory requirements, latest watershed-based modeling analysis, and realization of harmful impact of the particular pollutant on the water quality. In the case of the newly developed TMDLs, put into effect by US EPA, NYS DEC has the full right to amend the effluent limitations to include more stringent TMDL-based nitrogen limits into the permits.

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. In the long-term, a Nitrogen Control Feasibility Plan would have comprehensively analyzed additional methods to meet much greater levels of nitrogen reduction for future discharges. It was because neither the limits nor the Nitrogen Control Feasibility Plan were implemented that the litigation ensued which ended with the 2002 ACO.

This ongoing proceeding is of concern to many because violations of the nitrogen loading limits contribute to the severe hypoxic conditions in Long Island Sound and Jamaica Bay, and cause damage to those ecosystems. The proximate location of these plants that had discharged pollutants into the East River and Jamaica Bay in violation of the permitted effluent limit of the SPDES permits, and the likely impact on Long Island Sound, accounts for the concern on the part of the State of Connecticut. On CSO issues, IEC has argued that long-term controls for combined sewer overflows should be finalized and, if the final plan is incorporated into the CSO Abatement Order, and then, in turn, incorporated into the permit, that would suffice. The Commission, as an interstate agency, is uniquely situated as a participant in this matter.

Every phase of the ongoing administrative proceeding requires the Commission to reexamine the issues and to comment where appropriate. The Commission will continue its efforts to both rigorously defend its regulations and to protect Interstate Environmental District waters.

ENSURING IEC REGULATIONS ARE ENFORCED AND PROPER PERMITS ISSUED BY STATE AUTHORITIES WHILE ADDRESSING NITROGEN AND COMBINED SEWER OVERFLOW IMPACTS OF NEW YORK CITY SEWAGE TREATMENT PLANTS

The Interstate Environmental Commission is a tri-state commission whose compact is part of the laws of each member state. Its regulations are enforceable and action may be brought in the courts of all of the states. The IEC received congressional consent and therefore its actions and regulations have a federal imprimatur. As such, the IEC is in a unique position to work on behalf of the interest of the environmental district. Where IEC regulations are more stringent than State regulations, the IEC Water Quality Regulations must be enforced. Article XI of the Compact provides that member states may pass stricter water quality regulations. The IEC ensured its water regulations are to be included in SPDES permits. In issuing revised draft

SPDES permits, NYS DEC revised provisions addressing combined sewer overflows and also nitrogen provisions. The IEC remains involved in the administrative proceedings as an amicus party.

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2009

PLANT	IEC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREATMENT	SLUDGE (1) GENERATED (TONS/YEAR)		SLUDGE (PERCENT SOLIDS)	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
CONNECTICUT										
Fairfield County										
Bridgeport - East Side	B-1	2002+	7.0	10.0	Secondary (AS)	1,391.0	(4)	3.65	Incineration (2)	44,750
- West Side	B-1	2002+	22.7	30.0	Secondary (AS)	4,508.0	(4)	4.6	Incineration (2)	112,500
Fairfield	A	2002+	8.3	9.0	Tertiary	5,000.0		20.0	Compost	43,000
Greenwich (Grass Island)	A	2003+	8.5	12.5	Secondary (AS)	6,741.0		25.0	Incineration (2)	38,000
Norwalk	B-1	2002+	14.4	20.0	Tertiary	2,829.0		21.0	Compost	80,000
Stamford	B-1	2005+	16.7	24.0	Tertiary	22,000.0		23.0	Landfill/Incineration	100,000
Stratford	A	1992+	8.9	11.5	Secondary (AS)	45,288.0		3.6	Incineration (2)	49,400
Westport	A	1975+	1.7	2.9	Tertiary	387.72	(5)	4.0 to 6.0	Incineration (2)	15,200
New Haven County										
Greater New Haven - East Shore	B-1	2000+	28.8	40.0	Tertiary	35,040.0		24.9	Incineration	200,000
Milford - Beaver Brook	A	1996+	1.6	3.1	Secondary (AS)	1,164.0		13.8	Incineration (2)	20,000
- Housatonic	A	1996+	6.1	8.0	Secondary (AS)	3,784.0		16.0	Incineration (2)	43,250
West Haven	B-1	2000+	6.5	12.5	Secondary (AS)	1,500.0		20.0	Incineration	54,000
NEW JERSEY										
Bergen County										
Edgewater BCUA	B-1	1989+	4.4	6.0	Secondary (PO)	13,998.69		7.8	Beneficial Reuse (2)	31,000
Essex County										
Passaic Valley Sewerage Commissioners	B-1	1991+	236.1	330.0	Secondary (AS)	87,500.0		54.7	Landfill Daily Cover	1,400,000
Hudson County										
North Bergen M.U.A. - Woodcliff	B-1	1991+	3.3	2.9	Secondary (TF)	9,139.0		8.56	Incineration (2)	22,500
North Hudson Sewerage Authority										
- Adams Street (Hoboken)	B-1	1993+	-	24.0	Secondary (TF)	-		-	Incineration	119,200
- River Road (West New York)	B-1	1993+	-	10.0	Secondary (TF)	-		-	Incineration	45,800
Middlesex County										
Middlesex County Utilities Authority	A	2001+	118.7	147.0	Secondary (AS)	201,531.0		21.6	Beneficial Reuse	750,000
Union County										
Joint Meeting of Essex & Union Counties	B-2	2001+	59.0	85.0	Secondary (AS)	36,268.57		27.72	Land Application	500,000
Linden Roselle Sewerage Authority	B-2	1989+	10.7	17.0	Secondary (AS)	38,000.0		3.7	Beneficial Reuse	65,000
Rahway Valley Sewerage Authority	B-2	1991+	28.7	40.0	Secondary (AS)	11,000.0		23.5	Trucked Out	200,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2009

PLANT NEW YORK	IEC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREATMENT	SLUDGE (1) GENERATED (TONS/YEAR)		SLUDGE (PERCENT SOLIDS)	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
Nassau County										
Bay Park	A	2003+	53.1	70.0	Secondary (AS)	33,830.43		20.83	Beneficial Reuse	527,700
Belgrave Sewer District	A	1995+	1.4	2.0	Secondary (TF)	1,588.0		4.2	Trucked out to Bay Park & PVSC	12,000
Cedar Creek	A	1997+	55.4	72.0	Secondary (AS)	49,847.57		16.36	Beneficial Reuse	570,400
Cedarhurst	A	2003+	0.8	1.0	Secondary (TF)	25.0	(4)	4.0	Trucked Out	6,000
Glen Cove	A	2007+	2.9	5.5	Tertiary	3,750.73		25.82	Landfill	28,000
Greater Atlantic Beach Water Reclamation District (Formerly - West Long Beach Sewer District)	A	2001+	0.6	1.5	Secondary (TF)	149,400.0	(4)	4.5	Trucked to Bay Park	2,000
Great Neck Water Pollution Control District	A	1990+	2.6	2.8	Secondary (AS)	920.0		25.0	Landfill	>15,000
Great Neck Village	A	1996+	0.9	1.5	Secondary (TF)	84.30	(5)	5.2	Trucked Out	9,000
Jones Beach	A	1990+	0.03	2.5	Secondary (TF)	-		-	Trucked Out	Seasonal
Lawrence	A	2002+	1.2	1.5	Secondary (TF)	586.0		4.9	Trucked Out	5,500
Long Beach	A	2003+	4.8	7.5	Secondary (TF)	602.0	(4)	26.0	Landfill	37,000
Oyster Bay Sewer District	A	2006+	1.1	1.8	Tertiary	95.8	(4)	4.0	Trucked Out	8,500
Port Washington Sewer District	A	1991+	2.7	4.0	Secondary (TF)	555.0	(4)	30.0	Incineration	35,000
New York City										
Bronx County										
Hunts Point (7)	B-1	1977+	130.8	200.0	Secondary (AS)	11,033.5		26.7	Land Application/Beneficial Reuse	630,000
Kings County (Brooklyn)										
Coney Island (7)	A	1995+	85.9	110.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	602,100
Newtown Creek (7)	B-1	1967	253.1	310.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	1,039,300
Owls Head (7)	B-1	1996+	97.6	120.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	761,500
Red Hook (7)	B-1	1987	29.1	60.0	Secondary (AS)	1,072.4		20.7	-	192,200
26th Ward (7)	A	1975+	48.3	85.0	Secondary (AS)	6,814.9		25.5	Land Application/Beneficial Reuse	271,240
New York County (Manhattan)										
North River (7)	B-1	1986	124.5	170.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	584,190
Wards Island (7)	B-1	1979+	200.7	275.0	Secondary (AS)	10,549.1		26.3	Land Application/Beneficial Reuse	1,004,200
Queens County										
Bowery Bay (7)	B-1	1978+	106.3	150.0	Secondary (AS)	1,789.9		24.7	-	727,100
Jamaica (7)	A	1978+	80.3	100.0	Secondary (AS)	890.2		25.5	Land Application/Beneficial Reuse	632,150
Rockaway (7)	A	1978+	20.9	45.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	94,500
Tallman Island (7)	B-1	1979+	56.8	80.0	Secondary (AS)	2,039.2		26.4	-	388,200

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2009

PLANT NEW YORK (con't)	IEC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREATMENT	SLUDGE (1) GENERATED (TONS/YEAR)		SLUDGE (PERCENT SOLIDS)	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
Richmond County										
(Staten Island)										
Oakwood Beach (7)	A	1979+	27.7	40.0	Secondary (AS)	2,367.5		25.5	Land Application/Beneficial Reuse	151,600
Port Richmond (7)	B-2	1978+	28.4	60.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	172,300
Rockland County										
Joint Regional Sewerage Board										
- Town of Haverstraw	A	2002+	4.2	8.0	Secondary (AS)	3,819.46	(2)	19.3	Composting	58,500
Orangetown Sewer District	A	1996+	8.1	12.75	Secondary (TF)	4,198.0	(5)	25.4	Compost (2)	50,295
Palisades Interstate Park Commission										
- Bear Mountain Plant	A	1967+	0.03	0.3	Secondary (TF)	20.0		-	-	Seasonal
Rockland County Sewer District # 1	A	1995+	-	28.9	Secondary (RBC)	-		-	Composting	200,000
Stony Point	A	1985+	0.8	1.0	Secondary (AS)	401.0		19.1	Composting	12,000
Suffolk County										
Huntington Sewer District	A	2007+	2.1	2.6	Tertiary	3,887.0		20.5	Landfill	25,000
Northport	A	2005+	0.3	0.45	Tertiary	31.29	(5)	2.5 to 3.0	Incineration (2)	3,500
Suffolk County Sewer District # 1	A	2007+	0.7	1.15	Secondary (RBC)	140.36	(5)	2.9	Landfill	12,000
Suffolk County Sewer District # 3	A	1989+	26.4	30.0	Secondary (AS)	14.606	(6)	24.8	Landfill	280,000
Suffolk County Sewer District # 6	A	1973+	0.3	1.2	Secondary (AS)	1.81	(5)	1.5	Landfill	6,000
Suffolk County Sewer District # 21	A	1989	1.8	2.5	Tertiary	248.1	(5)	1.9	Landfill	20,000
Westchester County										
Blind Brook (Rye)	A	2000+	3.5	5.0	Secondary (AS)	218,000.0		0.19	Pumped to Port Chester	25,000
Buchanan	A	1999+	0.3	0.5	Secondary (AS)	386.99	(5)	7.0	Trucked Out	2,100
Coachlight Sq. on the Hudson Association, Inc.*	A	1992+	0.03	0.05	Secondary (AS)	105.1		15.0	Trucked Out	210
Mamaroneck	A	1993+	14.7	20.6	Secondary (AS)	945,000.0		0.14	Pumped to New Rochelle	80,000
New Rochelle	A	1997+	15.4	13.6	Secondary (AS)	24,778.0	(9)	21.2	Landfill	80,000
Ossining	A	1981	4.8	7.0	Secondary (AS)	22,360.0	(5)	3.0	Trucked Out	36,000
Peekskill	A	1980	6.1	10.0	Secondary (AS)	28,950.0		1.9	Trucked to Landfill	32,500
Port Chester	A	1990+	4.6	6.0	Secondary (RBC)	1,693.0	(6,10)	4.6	Trucked Out	25,000
Springvale Sewerage Corporation*	A	1992+	0.1	0.13	Secondary (RBC)	35.6	(5)	3.0	Trucked Out	1,700
Yonkers Joint Treatment	A	2002+	89.1	120.0	Secondary (AS)	35,556.0		24.2	Compost	525,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2009

PLANT	IEC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREATMENT	SLUDGE (1) GENERATED (TONS/YEAR)	SLUDGE (PERCENT SOLIDS)	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
Federal and Military									
Camp Smith (Westchester County)	A	1997+	0.03	0.24	Secondary (TF)	18,000.0	3.0	Trucked Out	200 to 2,000
Veterans Administration Hudson Valley Healthcare System (Westchester County)	A	1982+	-	0.4	Secondary (TF)	-	-	Trucked Out	Patient Count

NOTE: Except for the IEC 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.
(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.
(6) Metric dry tons.
(7) Starting April 1, 2003, plants are permitted on a 12-month rolling average of daily flows instead of dry weather flows.
(8) All volumes are flow weighted.
(9) Includes sludge generated at Mamaroneck which pumps about one million gallons per day to New Rochelle.
(10) Includes sludge generated at Blind Brook which pumps about 264,248 gallons per day to Port Chester.

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

INTERSTATE ENVIRONMENTAL COMMISSION
DISCONTINUANCE OF SANITARY FLOW

NAME	SPDES #	COUNTY	DATE (1)	CEASE FLOW (2)	DRAINAGE BASIN	DIVERT TO MUNICIPAL SYSTEM
Con Edison Astoria	NY 0201201	Queens	08-31-09			X
NY Organic Fertilizer Company	NY 0006327	Bronx	11-16-09	10-31-09		
Hess Service Station	NY 0200697	Richmond	12-31-09	06-17-09		

(1) Official notice of action and notification by NYS DEC - Region 2.

(2) Operation of the facility has ceased permanently. A discharge is no longer occurring from this site.

INTERSTATE ENVIRONMENTAL COMMISSION
FINANCIAL STATEMENT FY 2009

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, 2008 to June 30, 2009:

CASH BOOK BALANCE AS OF JUNE 30, 2008		$ 661,995.48
RECEIPTS		
Connecticut - FY'09	$ 97,565.00	
New York - FY'09	387,203.00	
New Jersey - FY'09	383,000.00	
EPA - FY'08	708,100.00	
EPA - FY'09	537,151.00	
LIS Fund Grant	12,320.00	
Interest	8,256.99	
Miscellaneous Receipts	2,054.50	
TOTAL RECEIPTS		2,135,650.49
Sub-Total		$2,797,645.97
DISBURSEMENTS		
TOTAL DISBURSEMENTS		1,885,505.86
CASH BOOK BALANCE ON JUNE 30, 2009		$ 912,140.11

U.S. Treasury Bills	$199,822.50
Insured Money Market Accounts	657,019.79
Checking Accounts	55,297.82
	$912,140.11

GLOSSARY

ACO	administrative consent order
ADB	assessment database
ALJ	administrative law judge
ARRA	American Recovery and Reinvestment Act
ASIWPCA	Association of State and Interstate Water Pollution Control Administrators
ATS	automatic transfer switches
AWPCP	auxiliary water pollution control plant
BCS	Biological Consulting Services
BGD	billion gallons per day
BLRA	Bayonne Local Redevelopment Authority
BMP	best management practice
BMWCA	Bureau of Marine Water Classification and Analysis
BNR	biological nutrient removal
BOD	biochemical oxygen demand
CAVF	Corona Avenue vortex facility
CBOD	carbonaous bio chemical oxygen demand
CCMP	Comprehensive Conservation and Management Plan
CDX	central data exchange
CES	Center for Environmental Science
CESE	Center of Environmental Science and Engineering
CI	cast iron
CO	consent order
CSI	College of Staten Island
CSO	combined sewer overflow
CT	Connecticut
CWA	Clean Water Act
CW/CA	Clean Water/Clean Air Bond Act
DEC	Department of Environmental Conservation
DEF	Department of Environmental Facilities
DEP	Department of Environmental Protection
DESA	Division of Environmental Science and Assessment
DO	dissolved oxygen
DOH	Department of Health
DOS	Department of Sanitation
DPH	Department of Public Health
DPR	Department of Parks and Recreation
EPA	Environmental Protection Agency
EPF	Environmental Protection Fund
ESAR	environmental sampling, analysis and results
FDA	Food and Drug Administration
FEIS	final environmental impact statement
FY	fiscal year
GI	green infrastructure
GIS	geographic information system
GNHWPCA	Greater New Haven Water Pollution Control Authority
GPM	gallons per minute
GPS	global positioning satellite
HARS	Historic Area Remediation Site
HDPE	high density polyethylene
HEP	Harbor Estuary Program
HVAC	heating, ventilating and air conditioning
ICWP	Interstate Council on Water Policy
IE	Independent Expert
IEC	Interstate Environmental Commission
IED	Interstate Environmental District
IMT	interim monitoring team
I/I	infiltration/inflow
ISC	Interstate Sanitation Commission
JCO	judicial consent order
LDC	legacy data center
LF	linear feet
LIS	Long Island Sound
LISO	Long Island Sound Office
LISS	Long Island Sound Study
LTCP	long-term control plan
LWRP	local waterfront revitalization program
MBR	membrane bioreactor
MC	management committee
MCUA	Middlesex County Utilities Authority
MDS	**M**ud Dump Site

G L O S S A R Y
(continued)

MF	membrane filter
MG	million gallons
MGD	million gallons per day
MPN	most probable number
MS4	municipal separate storm sewer system
MTS	marine transfer station
MUA	Municipal Utilities Authority
MW	megawatt
NCHD	Nassau County Health Department
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NEMO	Nonpoint Education for Municipal Officials
NEP	National Estuary Program
NERL	National Environmental Research Laboratory
NHSA	North Hudson Sewerage Authority
NJHDG	New Jersey Harbor Dischargers Group
NJPDES	New Jersey Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NOV	notice of violation
NPS	National Park Service
NRDC	Natural Resources Defense Council
N/SPDES	National/State Pollutant Discharge Elimination System
NSSP	National Shellfish Sanitation Program
NWQMC	National Water Quality Monitoring Council
NYC	New York City
NYS	New York State
O & M	operation and maintenance
ORD	Office of Research and Development
OPRHP	Office of Parks, Recreation and Historic Preservation
PCCP	pre-stressed concrete cylinder pipe
POTW	publicly owned treatment works
PVSC	Passaic Valley Sewerage Commissioners
QAPP	quality assurance project plan
QA/QC	quality assurance/quality control
RAS	return activated sludge
RBC	rotating biological contactor
RBWG	Regional Bypass Workgroup
RFP	request for proposal
R/V	research vessel
SBR	sequencing batch reactors
SCADA	supervisory control and data acquisition system
SCSD	Suffolk County Sewer District
SOP	standard operating procedure
SPDES	State Pollutant Discharge Elimination System
SSES	sewer system evaluation survey
SSO	storm sewer overflows
STORET	STOrage and RETrieval, EPA's national water quality data base
STP	sewage treatment plant
SUNY	State University of New York
SWMP	solid waste management plan
TOGS	technical and operational guidance series
TMDL	total maximum daily load
TRC	total residual chlorine
TSS	total suspended solids
UCONN	University of Connecticut
USA	Use and Standards Attainment Project
USCG	United States Coast Guard
UV	ultraviolet
VCP	vitrified clay pipe
VFD	variable frequency drive
VOC	volatile organic carbon
WCDEF	Westchester County Department of Environmental Facilities
WEA	Water Environment Association
WEF	Water Environment Federation
WHEACT	West Harlem Environmental Action
WLA	waste load allocation
WPAF	water pollution abatement facility
WPCA	Water Pollution Control Authority
WPCP	water pollution control plant
WQS	water quality standard
WQX	water quality exchange
XML	extensible markup language