INTERSTATE ENVIRONMENTAL COMMISSION

A TRI-STATE WATER AND POLLUTION CONTROL AGENCY

2010

ANNUAL REPORT

NEW YORK NEW JERSEY CONNECTICUT

Printed on Recycled Paper

INTERSTATE ENVIRONMENTAL COMMISSION

A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY

2010

ANNUAL REPORT

OF THE

INTERSTATE ENVIRONMENTAL COMMISSION

INTERSTATE ENVIRONMENTAL COMMISSION

A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY

311 WEST 43rd STREET, SUITE 201 • NEW YORK, NY 10036
PHONE: 212-582-0380 FAX: (212) 581-5719 WEB SITE: www.iec-nynjct.org

January 24, 2011

The Honorable Christopher J. Christie
The Honorable Andrew M. Cuomo
The Honorable Dannel P. Malloy
and the Legislatures of the States of
New Jersey, New York and Connecticut

Dear Governors:

The Interstate Environmental Commission (IEC) respectfully submits our 2010 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 — Patricia M. P. Sesto, Vice Chair

INTERSTATE ENVIRONMENTAL COMMISSION

COMMISSIONERS

NEW JERSEY

John M. Scagnelli,Esq.
Chairman
Poonam Alaigh, M.D., MSHCPM, FACP
Bob Martin

NEW YORK

Judith L. Baron
Vice Chair
Donna B. Gerstle, Esq.
Gerard J. Kassar
Rose Trentman

CONNECTICUT

Patricia M. P. Sesto
Vice Chair
John Atkin
J. Robert Galvin, M.D., M.P.H.
George Jepsen
Amey Marrella

***

**

*

Ross Brady, Esq.
Assistant Secretary & Counsel

INTERSTATE ENVIRONMENTAL COMMISSION

STAFF

Ross Brady, Esq.
Acting Administrator

Engineering

Peter L. Sattler
Nicholas S. Protopsaltis
Brian J. Mitchell, P.E.

Laboratory

Pradyot Patnaik, Ph.D.
Evelyn R. Powers
Inna Golberg

Field Investigation

Caitlyn P. Nichols
Gillian M. Spencer

Administrative

Carmen L. Leon
Elizabeth M. Morgan
Peter M. Del Vicario

STATEMENT OF THE CHAIRMAN OF THE INTERSTATE ENVIRONMENTAL COMMISSION

During the year 2010, the Interstate Environment Commission continued with its re-examination of Commission programs, staffing, goals and objectives to better fulfill its mission under the Tri-State Compact to address environmental issues within the Interstate Environmental District.

The Commission continued with the reinvigoration and reemphasis of the role of IEC's laboratory which has been located on the campus of the College of Staten Island 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) and the New Jersey Department of Environmental Protection (NJ DEP). IEC's laboratory is involved in a wide range of sampling and research projects, all of which are described in detail in this Annual Report. A number of projects are conducted in collaboration with CSI's Center for Environmental Science and other organizations. IEC's laboratory expanded its certification for the analysis of additional parameters, including chlorophyll a and will continue to seek certification for additional parameters as necessary. On behalf of the Commission, I wish to emphasize that IEC's laboratory is available to conduct sampling and analysis for the environmental agencies of our member states and other organizations. In addition to the Annual Report, additional descriptive material describing IEC's laboratory and its activities is available for review.

During the past year, the Commission continued to strengthen and enhance its collaborative relationship with the environmental agencies of our member states of New York, New Jersey and Connecticut. In these difficult fiscal and budgetary times, IEC's objective is to support the needs of the environmental agencies of our member states wherever possible and coordinate IEC's activities with the activities of those agencies on a cost effective and value added basis. As can be seen from this Annual Report, the IEC has undertaken projects when requested to do so by the member states. Examples include ambient water quality monitoring of New Jersey Raritan Bay shellfish harvesting beds and pathogen track down conducted on the Byram River, an interstate waterway shared by New York and Connecticut.

IEC is also re-emphasizing the important role it has played in the Tri-State Area as a 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 continuing to place its extensive scientific sampling data in a computerized format accessible by scientists, researchers and members of the public.

The Commission continues to actively seek grants to supplement its traditional state and federal funding, and those grant projects are described in this Annual Report. The Commission is involved in a number of cutting edge studies, including green technology and wastewater effluent. The Commission, continued its involvement with the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program, and conducted surveys in support of those programs. We just completed our twentieth year of monitoring Long Island Sound to document dissolved oxygen conditions, our tenth year of monitoring for pathogens in the New York-New Jersey Harbor Complex, our fifteenth year of sampling shellfish harvesting waters in the New Jersey portion of western Raritan Bay, and our eighth year of ambient and point source sampling to determine the causes of bacterial contamination in the Byram River. In addition to participating in these programs, IEC works on a daily basis with the scientists and professionals of the US Environmental Protection Agency and the environmental agencies of our member states. IEC continues to be a presence in the environmental community and conducts education and outreach.

This Annual Report offers a full review of the wide ranging scope of IEC's programs and activities. The Commission this year adopted a new logo which reflects its refocused mission. 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 the past year. I also want to acknowledge Frank Pecci, one of our New Jersey Commissioners, who retired this year after 26 years of service to the Commission. Frank was a past Chairman of the Commission, and was steadfast in his support of the Commission and its mission over the years.

We look forward to your continued support and to the Commission's continued 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

	PAGE
I. EXECUTIVE SUMMARY	1
HISTORY	1
MISSION AND MANDATE	2
WATER POLLUTION	4
AIR POLLUTION	6
II. WATER POLLUTION	7
GENERAL	7
CONNECTICUT WATER POLLUTION CONTROL PLANTS	9
NEW JERSEY WATER POLLUTION CONTROL PLANTS	17
NEW YORK WATER POLLUTION CONTROL PLANTS	25
AMBIENT AND EFFLUENT WATER QUALITY MONITORING	65
AMBIENT WATER QUALITY MONITORING	65
MUNICIPAL AND INDUSTRIAL EFFLUENT COMPLIANCE MONITORING	66
LABORATORY	69
SPECIAL INTENSIVE SURVEYS	73
2010 AMBIENT WATER QUALITY MONITORING IN LONG ISLAND SOUND TO DOCUMENT DISSOLVED OXYGEN CONDITIONS	73
2009-2010 MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY	84
2010 AMBIENT WATER QUALITY MONITORING FOR PATHOGENS IN THE HUDSON RIVER FROM YONKERS TO BEAR MOUNTAIN	88
AMERICAN RECOVERY AND REINVESTMENT ACT AND CLEAN WATER ACT SECTION 604(b) FUNDING	92
WATER QUALITY MONITORING AND MODELING OF THE BYRAM RIVER	92
MS4 SURVEY OF THE CROTON - KENSICO WATERSHED	94
LONG ISLAND MS4 PHASE II PLANNING PROGRAM	95
OTHER FUNDED PROJECTS AND GRANTS	96
IMPLEMENTATION AND ASSESSMENT OF THE EFFECTIVENESS OF THE GREEN INFRASTRUCTURE TECHNOLOGY FOR REDUCING COMBINED SEWER OVERFLOWS IN NEWARK, NEW JERSEY	96
HARBOR-WIDE WATER QUALITY MONITORING ACTIVITIES IN THE NEW YORK-NEW JERSEY HARBOR COMPLEX	98
REGIONAL BYPASS WORKGROUP	99

PAGE

CLEAN WATER ACT SECTION 305(b) WATER QUALITY ASSESSMENT 100
STORET 101
REVISIONS TO DISSOLVED OXYGEN SURFACE WATER QUALITY STANDARDS FOR MARINE WATERS 103
NATIONAL ESTUARY PROGRAM 104
COMBINED SEWER OVERFLOWS AND MUNICIPAL SEPARATE STORM SEWER SYSTEMS 105
PUBLIC AND LEGISLATIVE EDUCATION, OUTREACH AND CONFERENCES 110
2010 LEGISLATIVE AND REGULATORY DIALOGUE 111
20TH ANNUAL LONG ISLAND SOUND CITIZENS SUMMIT 112
WORLD WATER MONITORING DAY 112

III. AIR POLLUTION 114
GENERAL 114
AIR POLLUTION COMPLAINTS 114
OZONE HEALTH MESSAGE SYSTEM 116
REGIONAL AIR POLLUTION WARNING SYSTEM 116

IV. LEGAL ACTIVITIES 117

APPENDIX A - WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS – 2010 A-1
APPENDIX B - DISCONTINUANCE OF SANITARY FLOW B-1
APPENDIX C - INTERSTATE ENVIRONMENTAL COMMISSION FINANCIAL STATEMENT FY 2010 C-1
APPENDIX D - GLOSSARY D-1

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

		PAGE
PHOTO	Indian Point, New York, May 2010	6
MAP	Wastewater Treatment Plants in the Interstate Environmental District	8
PHOTO	Aerial View of Upgraded Facility, Stratford WPCF, Fairfield County, Connecticut	13
PHOTO	Twin 42-inch Force Mains Being Installed Beneath New Haven Harbor, Greater New Haven WPCA, New Haven County, Connecticut	14
PHOTO	Corroded 25-year Old Ductile Iron Gravity Sewer, Milford-Housatonic WPCF, New Haven County, Connecticut	15
PHOTO	New 48-inch Effluent Line From Secondary Clarifiers to Chlorine Contact Tank, West Haven WPCP, New Haven County, Connecticut	16
PHOTOS	New Final Clarifier, and Return Sludge and Blower Buildings and New Aeration Tanks, Township of Middletown SA, Monmouth County, New Jersey	22
PHOTO	Completed Co-Generation Facility, Joint Meeting of Essex & Union Counties, Union County, New Jersey	23
PHOTO	Great Beds Light, Wards Point, Raritan Bay, March 2010	24
PHOTO	Upper New York Harbor, February 2010	34
PHOTO	Hutchinson River Storm Outfall, June 2010	35
PHOTO	Scaffolding and Heated Sludge Return Piping, North River WPCP, New York County, New York	44
PHOTO	Aerial View of 26th Ward WPCP, Kings County, New York	48
PHOTO	Aerial View of Wards Island WPCP, New York County, New York	50
PHOTOS	Pre-equalization Tanks with Nissquogue River in Background and Newly Installed Sequence Batch Reactor, SCSD #6, Suffolk County, New York	56
PHOTOS	Refurbished Trickling Filter with New Distribution System and Media and New Final Clarifier, Camp Smith, Westchester County, New York	59
PHOTO	The Palisades, May 2010	64
PHOTO	TransCanada Ravenswood Generating Station, July 2010	68
PHOTOS	IEC Laboratory Located at College of Staten Island, July 2010	70
TABLE	Laboratory Certified Parameter List	71
PHOTO	Sampling Byram River from Mill Street Bridge, August 2010	72
MAP	2010 Long Island Sound Study - Ambient Water Quality Sampling Stations	74
TABLE	2010 Long Island Sound Study Sampling Stations	75

		PAGE
CHARTS	Long Island Sound Study — 2010 Dissolved Oxygen Monitoring - Surface and Bottom Waters — Pie Charts	78
CHARTS	Long Island Sound Study — 2009-2010 Dissolved Oxygen Monitoring - Surface and Bottom Waters — Pie Charts	79
CHARTS	Long Island Sound Study — 2010 Dissolved Oxygen Monitoring - Average and Range of All Bottom and Surface Waters Sampled — Profiles	81
TABLE	NCA Assessment Thresholds for Selected Parameters	82
CHARTS	2010 Monthly Bottom Water Temperature Profiles in Long Island Sound	83
CHART	Water Quality Index for the Upper East River and Western LIS	84
MAP	2009-2010 Sampling Stations for Microbiological Surveys in the Shellfish Harvesting Waters of Western Raritan Bay	85
TABLE	2009-2010 Sampling Station Locations for Microbiological Surveys in the Shellfish Harvesting Waters of Western Raritan Bay	86
PHOTO	Destroyed Seawall at Leonardo, New Jersey, March 2010	87
PHOTO	Bear Mountain Bridge as Viewed from Iona Island, Mid-Hudson River, May 2010	89
MAP	2010 Ambient Water Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain	90
TABLE	2010 Sampling Station Locations for Ambient Water Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain	91
TABLE	2006-2010 Pathogen and Water Quality Monitoring on the Hudson River	91
PHOTO	Byram River Site BR5- Sherwood Avenue, March 2010	92
MAP	2010 Water Quality Monitoring and Modeling of the Byram River	93
DESIGN	West Ward Pride Garden Site Plan	97
CHART	2010 Bypass Events - Common Causes Non-wetweather — Pie Chart	99
CHART	2010 Bypass Events Per Waterway — Pie Chart	100
MAP	Assessment Units in the Interstate Environmental District	102
PHOTO	CSO Outfall on the Upper East River, July 2010	106
TABLE	CSO Dry Weather Inspections, New York and Kings Counties, New York	107
PHOTO	Water Quality Monitoring Aboard the R/V Natale Colosi, June 2010	111
PHOTO	Mark Tedesco, Director, US EPA LISO, Moderates Panel Discussion, May 2010	112
PHOTO	Bronx River, September 2010	113
CHART	Air Pollution Complaints, 1982-2010 — Bar Graph	115
CHART	Communities Impacted by Odors, 1982-2010 — Bar Graph	115

I. EXECUTIVE SUMMARY

IEC's 75th Anniversary is more than a diamond jubilee, it is an opportunity to review decades of accomplishments in preservation of the environment and to look ahead to meeting IEC's mission and mandate. IEC's work is even more important as fiscal restraints have caused our States and nation to marshal resources for the most cost effective benefit of the people. IEC is uniquely situated to utilize its professional staff and to be nimble, responding to needs of member-State agencies, legislators and environmental entities and providing the citizen's with environmental protection.

The Interstate Environmental Commission (IEC) remains the guardian of the waters of the tri-state District and we continue to make optimum use of limited resources. 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.

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 is 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. 2011 marks the 75th 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 needs and best utilize 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 to ensure compliance, open waters for commercial and recreational shellfishing, open waters for swimming, develop water quality and/or effluent criteria, determine immediate environmental conditions, respond 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 has been 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 ten 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 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 Workgroup. 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 next report is planned to be released during 2011 and distributed by the New York-New Jersey Harbor Estuary Program.

The Commission continues to put great emphasis on public involvement, education and outreach activities. Activities include, without limitation, 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. Commission staff has had hands-on interactions with volunteer citizen water quality monitoring groups for many years.

This report provides a record of the water and air pollution activities of the Interstate Environmental Commission for the period December 2009 through November 2010. 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 delighted 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. Several IEC proposals are supported by pass through grants afforded by the NYS DEC and funded by the ARRA funds (Federal Stimulus funds) for projects in 2010 and 2011, including monitoring and modeling of the Byram River in Fairfield County, Connecticut and Westchester County, New York; Long Island (Nassau and Suffolk Counties, New York) MS4 Phase II Planning Program; and GIS work in the Croton-Kensico watershed, Westchester County, New York.

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 are 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 $11.88 billion has been allocated by municipalities and bond act dispersements in the District for over 297 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 2010 proved to be yet another very active year of water quality monitoring. This was IEC's 20th consecutive year as a participant in the multi-agency intensive survey in Long Island Sound to continue to document dissolved oxygen conditions. At the request of NJ DEP, and for the 15th year in a row, 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 completed its fourth year of pathogens monitoring on the Hudson River. 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.

The Commission took the lead in coordinating the efforts of the Regional Bypass Workgroup, which is comprised of 16 federal, interstate, state, county and local agencies for the 13th consecutive year. 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 including, without limitation:

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

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

The Commission again took an active role commemorating the Clean Water Act on World Water Monitoring Day. Water quality monitoring took place in a coordinated effort around the globe between September 18 and October 18. 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 upper East River and western Long Island Sound and the results were input to an international data base. Another event was conducted with a nonprofit on the Bronx River.

The IEC laboratory, located on the campus of the College of Staten Island (CSI), 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 NELAC Institute's (TNI) National Environmental Laboratory Accreditation Program (NELAP). 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. In addition to its day-to-day operations, IEC's laboratory personnel continue to collaborate with CSI and other academic and environmental stakeholders on environmental projects of mutual concern. 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 2009 through September 2010, 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. During the reporting period until June 1, four (4) advisories were posted in April and June for fine particles (3) and ozone (1). On June 1, 2010, the States and IEC starting using the US EPA's EnviroFlash notification system. EnviroFlash is a free e-mail alert system that delivers air quality information. For the remaining four months of the reporting period, seven unhealthy ambient alerts for ozone were e-mailed to the IEC office.

Indian Point, New York, May 2010
Photo by P. Sattler, IEC

II. WATER POLLUTION

GENERAL

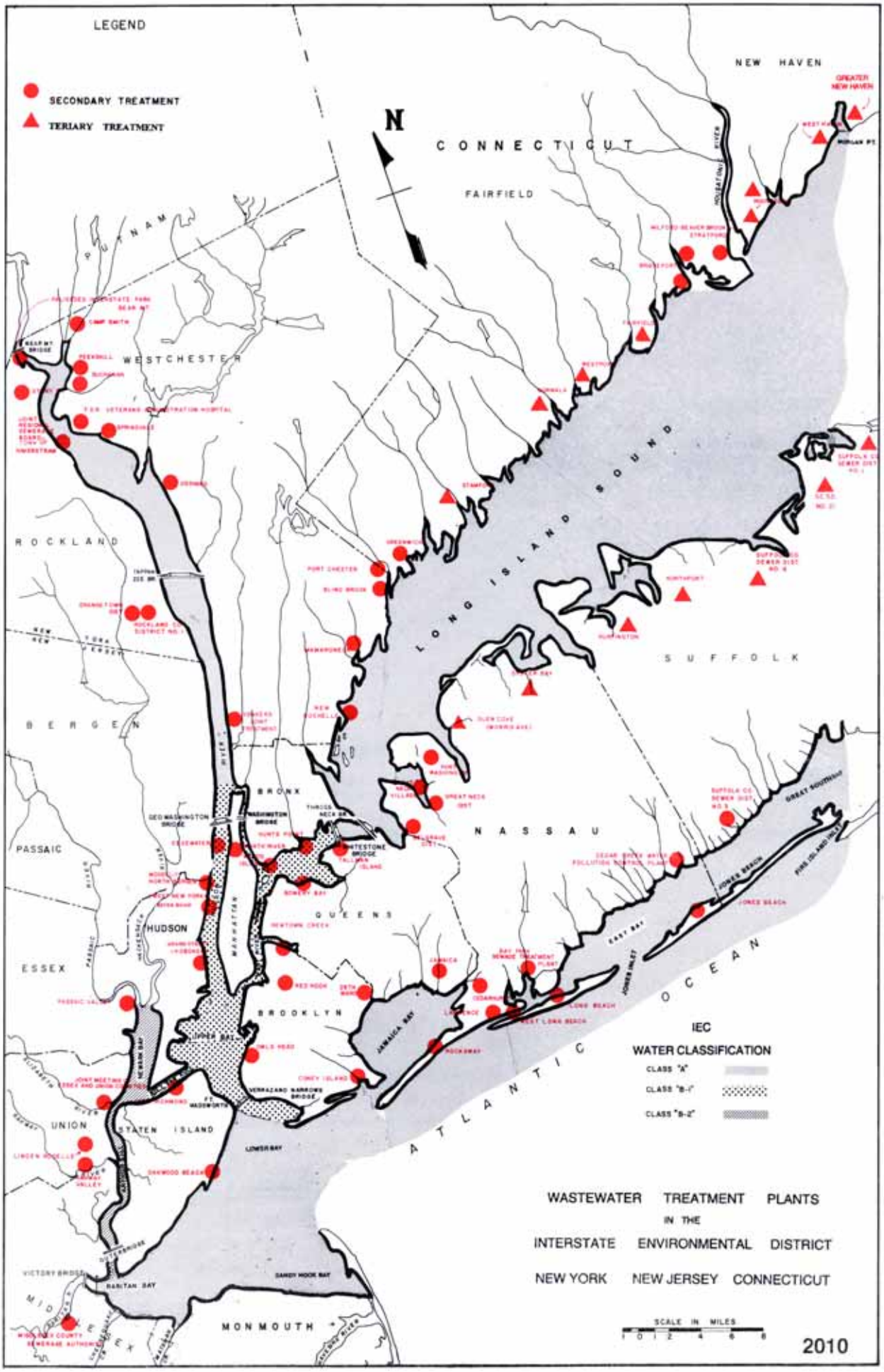
Within the Interstate Environmental District in 2010, over $11.88 billion was allocated for over 297 water pollution control projects which were either completed, in progress, or planned for the future. These monies were allocated in the following manner: over $387.2 million for 63 completed projects, more than $10.3 billion for 166 projects in progress, and more than $1.2 billion for 68 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 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 2010.

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
TERIARY TREATMENT
N
CONNECTICUT
NEW HAVEN
FAIRFIELD
PUTNAM
WESTCHESTER
ROCKLAND
BERGEN
PASSAIC
HUDSON
ESSEX
UNION
STATEN ISLAND
MIDDLESEX
MONMOUTH
BRONX
QUEENS
BROOKLYN
NASSAU
SUFFOLK
LONG ISLAND SOUND
ATLANTIC OCEAN
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
2010

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.

FAIRFIELD COUNTY

Bridgeport - East Side and West Side Plants

Completed Projects

The East Side Wastewater Dechlorination Project was operational on May 30 and incurred a final cost of $997,000. All punch list items are planned to be complete during December 2010. The Harborview pump station rehabilitation was completed during 2010 and incurred estimated costs of $1 million.

Projects in Progress

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 by 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. Presently, the CSO Contract H design, estimated to cost $2.62 million is anticipated to be ready during January 2011.

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 late January 2011. Low level nitrogen removal has a cost of over $299,000 and a completion date was set for late January 2011. The River Street pump station and Island Brook Interconnect sewer design have a cost of over $651,000 and a completion date is planned for May 2011.

Future Projects

At an estimated cost of $8.5 million, the River Street pump station and Island Brook interconnect sewer is planned to be under way during January 2011 with a two-year construction agenda. Out-to-bid recently, CSO H1 Phase A lining is estimated to cost $1.5 million. Two additional pump station construction projects, Lake Forest and Sequoia, went to bid during this past April with a planned completion of August 2011. The pump station work is estimated at $1 million.

Fairfield Water Pollution Control Facility

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. The SSES for Section II (Phase II) was completed during 2010. Based on the findings of the SSES (2009) for Section I, rehabilitation of the sewer lines are nearly complete. Construction estimates for Section I were $180,000.

Future Project

Based on completed SSES portions of Fairfield, a contract to rehabilitate the sewer lines in Section II will remove excess infiltration and inflow. The approximate construction start-up date is during the spring season of 2011. Cost estimates are $220,000.

Grass Island Waste Water Treatment Plant

Completed Project

A pump station telemetry system upgrade was completed during April which incurred construction costs of about $457,000. The replacement of the existing system at all 29 remote pump stations provides a more reliable level of alarming and status information on each station's operating equipment. The information is accessed by a centralized computer system, as well as by remote handheld devices.

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 (complete November 2008), perform an I/I study, evaluate force mains, and implement a collection system maintenance program and findings of the SSES. The facility is in compliance with all Order dates.

Engineering studies are under way to address asset management planning of the collection system (85% complete), grit (15% complete) and BNR process control modeling (95% complete).

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).

Recently under way (10% complete), aeration tank upgrades are anticipated to cost $389,800. The work entails automating select slide gates inside the aeration tankage that will provide the plant with better control during varying flow conditions. The goal is to reduce final nitrogen loading during wet weather events.

Future Projects

Proposed plant process improvements include new return activated sludge pumps, waste activated pumps and final effluent pumps. In addition, all supporting equipment will be installed. The rehabilitation of the wastewater treatment plant equipment has a cost estimate of $4.5 million. These proposed projects are currently in the design phase with construction to start during mid-2011. Additional plant process upgrades involve the aeration system. Under design, the $2.5 million modernization will include new blowers, associated controls and various structural repairs of the existing concrete tanks. Construction and installations are planned for the 2011 fall season.

Pump station rehabilitation at the Ballwood, Huested, Meadow, Chapel Lane, Cos Cob, Old Greenwich, and South Water locations are currently in the design stage. Construction is planned for the 2011 spring season. Cost estimates are about $4.4 million. Residential sewer system rehabilitation in various neighborhoods is in the design phase. Construction will be concurrent with the pump station upgrades and is estimated to cost $2.3 million.

The Riverside Railroad Force Main Crossing Project is in the design phase and has a cost re-estimate of $750,000. The project will include replacing a 14-inch (14"Ø) sanitary force main underneath the Metro-North Railroad station in Riverside. Designs were completed during 2010; review comments were received from Metro North and CT DOT; and construction is planned for 2011.

Norwalk Waste Water Treatment Plant

Completed Projects

A slip line and point repair of the South Side forty-eight inch diameter (48"Ø) interceptor line had a final cost of $4.3 million and was complete during March 2010. An engineering study with the facility-wide energy conservation was completed during October ($95,000). The rebuilding of the Fort Point pump station was complete and operational during April 2010 ($454,000).

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. A regional facility evaluation is under way to address fats-oils-grease disposal. The study is presently 30% complete ($40,000). The Ely Avenue study is evaluating sewer rehabilitation and I/I. The study is 75% complete and is anticipated to be complete during February 2011. A third study is addressing SCADA instrumentation needs and remote control logistics for plant-wide operations ($40,500/95% complete).

Facility-wide upgrades are 30% complete. The $36.5 million modernization includes a headworks building, bar screens, main influent lift pumps, aerated grit chambers and a partial SCADA upgrade. An operational start-up is planned for January 2011.

A federal informational request Order dated September 30, 2010, concerns bypass reporting and assessment of the Norwalk collection system. Formal replies are due December 21, 2010.

Future Projects

Scheduled to begin during October 2011, CSO remediation on the Norwalk River will include new fine screen racks and a building to house the collections. At the main facility, aeration system updates will be under taken, a 30 MG membrane treatment system will be installed, as well as a stormwater treatment system and additional SCADA updates. These installations and improvements are estimated to cost $85 million and are anticipated to be operational during March 2014.

Stamford Water Pollution Control Authority

Completed Project

The Intervale sewer project addressed failing septic systems for about 70 homes.

Completed during June 2010, $5 million was the final cost estimate.

Future Project

A future project that would convert wastewater biosolids to energy using a gasification process has been proposed. However, pending approvals, no construction or operational dates are available.

Stratford Water Pollution Control Facility

Completed Project

Capacity expansion of this 11.5 MGD secondary treatment plant in conjunction with a facility-wide upgrade was under way during October 2006. The total costs to complete all construction phases were estimated at $61 million. As of March 2009, the project was completed and treatment units were on line.

Aerial View of Upgraded Facility
Photo Courtesy of Stratford WPCF

Westport

Project in Progress

Additional residential gravity sewer extensions are being installed in the Imperial Avenue/Keyser Road neighborhood. The installations are 75% complete and are anticipated to be operational during December 2010. The final cost estimate is $650,000.

NEW HAVEN COUNTY

Greater New Haven Water Pollution Control Authority - East Shore Water Pollution Abatement Facility

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. The facility plan has been under way since January 2010 ($500,000) to address design, construction schedules, and costs for low level nitrogen removal. The increased capacity upgrades will enable the Authority to treat the wet weather flows as per the Long-term Control Plan for CSOs. In addition, an Affordibility Study ($50,000) is being conducted to compliment the facility plan. The Authority is operating under a State Consent Order to determine low level nitrogen and CSO elimination construction needs. The time frame to implement will be determined by the aforementioned study.

Sewer separation construction will continue until combined sewers discharging to New Haven Harbor are eliminated for up to a 2-year storm event through storage and sewer separation. This work will not be completed until approximately 2024 at an estimated cost of $600 million; overall, this work is 25% complete. Phased components showing progress include the Prospect Street sewer separation ($20 million-60% complete), CSO flow monitoring ($1.5 million), and tide gate improvements ($1.2 million). These components were initiated between June and October 2008. Under way during April 2009, the State Street I/I work is 15% complete with associated costs of $2.3 million.

Twin 42-inch Force Mains Being Installed Beneath New Haven Harbor
Photo Courtesy of GNHWPCA

Future Projects

The Long-Term CSO Control Plan, which was completed and approved in 2003, is an ongoing 15-year program. As mentioned in last year's Report, several components were completed during 2009. The comprehensive Long-Term CSO Control Plan includes an increase in plant wet weather capacity, additional upgrades to the main facility ($114 million-2012), an upgrade to the East Street pump station during 2014 for $45 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 late 2010, Phase I began at a cost of $12 million. Phase II is scheduled to start during 2015 at a cost of $18 million.

Milford - Housatonic

Completed Project

The replacement of a 36-inch diameter gravity sewer to the West Avenue pump station was completed during January 2010. The ductile iron pipe was replaced with PVC. The final cost incurred was $3.1 million.

Corroded 25-year Old Ductile Iron Gravity Sewer
Photo Courtesy of Milford-Housatonic WPCF

Projects in Progress

Several pump stations including West Avenue and Gulf Pond are being upgraded with associated gravity sewers and force mains. The collection system designs were complete during 2009. Construction and installations began during October 2009 and collectively are 10% complete. The cost is estimated at $37 million and has an operational start-up date of October 2013.

West Haven

Completed Project

A bypass line was installed at the Dawson Avenue pump station during September 2010. This bypass enabled the replacement of existing valves and cleaning of the wet well. The final estimated cost incurred was $58,000.

Projects in Progress

Under way since November 2009, upgrade construction is 40% complete 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 primary and secondary 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 required by 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.

New 48-inch Effluent Line from Secondary Clarifiers to Chlorine Contact Tank
Photo Courtesy of West Haven WPCP

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

Bergen County Utilities Authority-Edgewater

Projects in Progress

Updating of the BCUA Wastewater Management Plan is being prepared by a consulting engineer. The Edgewater wastewater management planning area will incorporate the Borough of Edgewater and parts of the Boroughs of Cliffside Park, Fort Lee, and North Bergen. The final report is anticipated to be submitted to NJ DEP for approval during 2011.

Design of the Phase I SCADA and security improvements which includes a new entrance gate and closed-circuit television monitoring was completed during 2009. Both the SCADA and security improvements will be integrated into BCUA's Little Ferry WPCF systems. The construction cost is estimated to be $2.8 million with an anticipated completion date of June 2011. The work is 25% complete.

Future Projects

Anticipated to begin March 2, 2012, a variety of treatment unit upgrades and facility improvements will be under taken. The work will include replacement of the manual bar screen with a mechanical bar screen, repair of the UNOX reactors, upgrades to the grit screening compactor and the influent pumping station, installation of a redundant disinfection system and a total plant water reuse system. Main facility building needs include repairs to roofs and structures. Cost estimates are about $6.3 million with phased operational dates through June 2014.

It is planned to extend the existing 42-inch diameter (42"Ø) outfall pipe from the main facility bulkhead 650 linear feet further into the Hudson River. The purpose of

extending the outfall and providing effluent diffusers to a deeper location is to achieve better dilution of the treated effluent with the receiving river waters. The estimated construction cost is $10 to $15 million with an anticipated completion by February 2015.

The Borough of Cliffside Park is proposing to separate storm and sanitary sewers. Costs and construction dates are to be determined.

ESSEX COUNTY

Passaic Valley Sewerage Commissioners

Completed Projects

Completed during September 2010, the North Arlington Trash Skimmer Facility and a weir wall replacement at the main facility accrued costs of over $1.722 million.

Projects in Progress

PVSC continued several engineering studies in 2010. These studies include computer monitoring of final clarifiers at high flows experienced during wet weather ($174,000) and filter press/decant facilities operation optimization ($89,000).

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). Several projects are under way involving the final clarifiers polymer system, final clarifiers electrical improvements, final clarifiers effluent troughs and weirs, forebay improvements, utility tunnels and galleries leak and crack repairs, thickening centrifuge procurement and thickening process improvements. The cost estimate of the current construction projects totals over $48.44 million. Phased operational start-up dates will be in July 2012.

Future Project

Planned to begin during December 2010, the final clarifiers scum removal system will be replaced. Anticipated to be complete in June 2012, the cost estimate is over $22.1 million.

HUDSON COUNTY

North Bergen Municipal Utilities Authority - Woodcliff Plant

Projects in Progress

Negotiations are ongoing between the Authority and NJ DEP to re-rate the plant design flow from 2.9 MGD to 3.4 MGD. This facility is currently waiting for NJ DEP approval.

The primary treatment units are being upgraded. At the main facility, two mechanically cleaned bar screens and two comminutors which are used in conjunction with the coarse screens are being replaced. In addition, the SCADA system is being upgraded. Collectively, this work is 90% complete and was operational during October 2010. Final costs are estimated at over $503,000. In the collection system, one regulator is being reconditioned. Under way during June, the work is 50% complete and will incur estimated costs of over $21,700.

North Hudson Sewerage Authority - Adams Street Wastewater Treatment Plant

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 were 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). Old wooden sewers in the Hoboken collection system will be replaced ($2 million). CSO regulator improvements were planned for 2008 ($860,000). Bids were requested during January 2008 for the construction of a new wet weather pump station; costs are re-estimated at $18 million. An operational start date is during mid 2011. Another collection system project involves the installation of another floatables module ($9.792 million).

North Hudson Sewerage Authority - River Road Wastewater Treatment Plant

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 2010.

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.

MIDDLESEX COUNTY

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

Completed Projects

Under way during December 2006, two new force main installations to convey flows from the Edison pump station were operational during October 2010. The work was re-estimated to cost $93 million. The 60-inch diameter (60"Ø) force mains are 4,160 linear feet each and are encased in a 14-foot (outside diameter) tunnel. An actual completion date is scheduled for December 2011. In addition, two 16-inch diameter

(16"Ø) landfill gas transmission lines were installed which supply the MCUA Co-Gen electrical power plant. Substantial completion of the upgrades at the Edison pump station was accomplished during this period also. At the main facility, an additional grit chamber was put on line.

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 and the operational start-up date of November 15, 2010, was met.

Three projects are under way at the main facility; overall, the work is 40% complete. In order to supply an alternate electric power source, installations consist of two (2) 2.75 MW diesel generators in conjunction with upgrades to the electrical distribution system. Secondly, a new primary influent line with a new flowmeter is being installed. Finally, a second RTO in the biosolids processing facility is being implemented. These improvements are estimated to cost $30 million with a target operational start date of January 2012.

Future Projects

Estimated to cost $15 million, upgrades will be implemented at the original Sayreville pump station. Construction is planned to begin during May 2011. A rehabilitation of 200 LF of CMP interceptor is planned for 2012. Approximate costs are estimated at $7.5 million.

MONMOUTH COUNTY

Middletown Sewerage Authority, Township of

Completed Projects

Engineering studies completed during 2010 include an energy audit at a cost of $47,000, an electrical coordination study ($21,000) and a digester gas study ($13,000).

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 90% complete, with an operational start-up date scheduled for October 2010.

New Final Clarifier, and Return Sludge and Blower Buildings
Photo Courtesy of TOMSA

An infiltration/inflow study for drainage basin 12, which includes repair and rehabilitation of sewers, is 95% complete and has a cost of $427,000. The same agenda will be applied to basins 11, 14 and 15. The cleaning, repairs, television survey and rehabilitation of the sewers are estimated to cost $650,000.

New Aeration Tanks
Photo Courtesy of TOMSA

One engineering study is under way which involves the conversion of digester gas to energy. A preliminary design is scheduled for 2011.

UNION COUNTY

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

Completed Project

A new 3.2 MW co-generation facility utilizing anaerobic digester gas to produce electricity was on line September 14, 2009. The final cost estimate was $16 million.

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

Project in Progress

Under way during 2010, two plant-wide projects were initiated. First, pump and valve replacements and second, service water system upgrades. An estimate to implement these projects is re-estimated at $8.5 million; combined these projects are 5% complete. A target date for an operational start-up is September 2011.

Future Project

Designs were completed during 2009 for plant site security and parking improvements. An estimate to implement these projects is $2 million. These projects have an approximate construction start of March 2011.

Linden Roselle Sewerage Authority (Union County)

Completed Projects

Replacement of two transformers and an upgrade of the UV system electric controls were operational during July; the actual completion date was October 2010. The final cost was $550,000.

Project in Progress

An engineering study was completed for the Liquid End Facility improvements. Designs are under way with an expected completion during February 2011.

Future Project

A plant upgrade to the Liquid End Facility including improvements to aeration tanks, clarifiers, and microgeneration has a cost re-estimate of $12 million. This project has an approximate construction start-up date during late 2011.

Great Beds Light, Wards Point, Raritan Bay, March 2010
Photo by P. Sattler, IEC

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

Engineering evaluations of the preliminary treatment phase for sewage treatment within Nassau County was completed during early 2010. 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. Presently, Glen Cove which is located on the north shore of Long Island is under the auspices of the County. Plans are moving ahead with Cedarhurst and Lawrence. Refer to these write-ups for additional information. Additional engineering studies were completed which address outfall dilution and the condition of the facility's digester gas storage sphere.

At a final cost of over $6.785 million, the chilled and hot water piping in the main facility were modified to eliminate all leaks. The piping was operational on May 22, 2009.

Projects in Progress

Engineering studies are under way to evaluate a portion of the electrical distribution system and the installation of an interim sludge thickening system.

Plant-wide permanent lighting upgrades to enhance safety and security is currently 90% complete and has a re-estimated cost of over $2.655 million. The project is scheduled to be operational in December 2010. Estimated to cost over $4.11 million, a dechlorination system using bisulfate is being constructed. Anticipated to be operational during January 2011, the project is 85% complete and is a NYS DEC SPDES permit requirement. In order to enhance the operation of the facility's sludge thickening system, a dedicated pump station in under construction ($2.9 million/82% complete). An approximate operational date is planned for March 2011. Recently under way (8% complete), the raw influent sewage pumps and accessories are being updated and

modified. A cost estimate for this work is about $7.693 million with an operational start-up in October 2012.

Future Project

Miscellaneous improvements are planned which will address several operational problems throughout the facility. Cost estimates are about $2.557 million, but construction and operational start-up dates are still to be determined.

Belgrave Sewer District

Projects in Progress

Denitrification and UV disinfection facilities are being installed at this 2 MGD trickling filter plant. The construction is 72% complete. 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 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 Projects

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. Additional studies were recently completed regarding the condition of the facility's digester gas storage sphere, as well as the gas valves, swivel joints and other appurtenances atop the digester covers. Finally, an evaluation of the final sedimentation tanks' electrical system and the domestic-seal-protected water systems was completed.

Repairs were completed to the digester cover valves and swivel joints on January 5, 2010. The final cost was $440,000.

Projects in Progress

Improvements to the sludge dewatering system are 96% complete and are re-estimated to incur costs of over $33.66 million. The project includes the installation of new belt filter dewatering equipment and ancillary systems. The system is on line with a planned completion on December 31, 2010. The installation of the new gravity belt thickeners (98% complete) which replace the dissolved air floatation thickening tanks began during August 2007. The cost estimate is over $18.33 million with a start-up of late October 2010. Recently under way (3% complete), improvements and modifications to the stormwater discharge system will incur costs of about $1.458 million. An estimated completion date is late August 2011.

Cedarhurst

Projects in Progress

The Village of Cedarhurst has concurred and negotiated with the County to develop agreements whereby the County would assume control and operation of the collection system and treatment plant. Under way during April 2010, this facility will divert final treated non-chlorinated effluent flows to the Bay Park STP for treatment and discharge. A force main installation to connect the Inwood pump station is the scope of work. Presently, the work is 10% complete and will incur costs of about $11.7 million. See the Bay Park STP write-up for additional information.

Glen Cove

Completed Project

A Master Plan was completed by Nassau County addressing the feasibility of the consolidation of various sewage collection and treatment entities under the auspices of Nassau County. The City of Glen Cove concurred in principle and during March 2008 the County assumed control and operation of the collection system and treatment plant. The transfer of ownership occurred during 2010. See the Bay Park STP write-up for more County-wide information.

Future Projects

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. In addition, upgrades to the electrical system and diesel fuel tank will be under taken and the process air blowers will be replaced. A proposed construction schedule will start during 2011 and have a one-year installation agenda.

Greater Atlantic Beach Water Reclamation District

Future Project

As per a modification of the existing SPDES permit issued by NYS DEC the plant is required to reduce effluent ammonia concentrations and total residual chlorine concentrations. The estimated cost for this project is $2.4 million. Construction is slated to start late 2010 or early 2011 and be complete during 2012.

Great Neck, Village of

Completed Project

Operational during mid-2010, collection system rehabilitation involved lining of 1,200 LF of 12-inch diameter (12"Ø) and 300 LF of 8-inch diameter (8"Ø) gravity sewers. This work had a final cost estimate of $220,000.

Project in Progress

This facility is operating under an updated State Consent Order to modernize the facility or divert flows. The selected alternative involves diverting flows to the Great Neck Water Pollution Control District for treatment and provide additional nitrogen removal. Completion of substantial construction is required by December 31, 2013. Refer to the Bay Park and Great Neck Water Pollution Control District write-ups for additional information.

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, as well as accepting flows from the Village of Great Neck. 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, 2013.

The District is pursuing several Green projects. As part of the facility upgrade, drawings and specifications for the use of micro turbines was completed. Digester gas will be used to generate electricity and heat for anaerobic digester systems and three on site buildings. The District is currently producing 40 to 60 gallons per week of biofuel utilizing waste vegetable oil from local restaurants. This biofuel, generated on site, is used to power five diesel vehicles and used by a 40-300 Kw generator to co-generate electricity for the facility. 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 $55 million and is 13% complete. An anticipated operational start date is December 31, 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, three 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 two new gravity belt thickener. Miscellaneous upgrades will include the installation of a new plant generator for back-up power.

Future Projects

At a cost estimate of $35,000, a 10 kilowatt solar array will be installed on the maintenance garage roof. The 4-month agenda is planned to begin during December 2011.

Anticipated to begin during the 2010 fall season, in-house staff will perform manhole restoration. Repairs and inspections will be based upon televised sewer and manhole reconnaissance. The purchase (~$350,000) of cured in-place lining equipment will ensure manhole to manhole relining.

Huntington

Completed Project

Under way in November 2010 with a one-month construction agenda, approximately 630 linear feet of 2-inch diameter (2"Ø) HDPE pipe will be installed utilizing directional drilling for a low pressure sewer to serve five parcels along NYS Route 110. Estimated costs were over $188,600.

Jones Beach State Park

Completed Projects

Several treatment unit upgrades were completed including the removal of the existing trickling filter recirculation pumps and motors, installation of new VFD pumps and motors, new flow meters and new automatic composite influent and effluent samplers. This work was completed during March 2010.

Project 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. Under way since the 2010 spring season, this facility will divert treated flows from the New York State Sloop Channel and tie into the Nassau County Cedar Creek facility final discharge which empties into the Atlantic Ocean. Cost estimates are $2.5 million. See the Cedar Creek WPCP write-up for additional information.

Future Project

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. Construction start-up is planned for the 2010 winter season.

Lawrence, Incorporated Village of

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. Final effluent flow diversion to the Bay Park STP is proposed; treated effluent flows from this facility to Jamaica Bay would cease. Bids are being prepared for the force main connections. No cost estimates or construction start dates were available. See the Bay Park STP write-up 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. These plans would be abandoned if flows are diverted to the Bay Park STP. 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 STP write-up 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.

Currently, work is in progress to modify one lift station on New York Avenue at a cost re-estimate of $2.0 million. The construction began during spring 2009, is 80% complete and is estimated to be operational during spring 2011.

Oyster Bay Sewer District

Completed Projects

An engineering investigation of I/I was completed during December 2010. Replacement of the control building roof had a final cost of $71,820 and was completed during March 2010. Complete during August, the influent pump station control panel and an auto alarm system were replaced at the Highwood pump station. Final costs incurred amounted $112,750.

Main facility preventive maintenance included the replacement of 18 building doors ($89,000) and paving ($67,190). All work was completed during November 2010 and December 2010, respectively.

Port Washington

Completed Projects

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). Nearly complete (99% complete), additional plant modifications are being constructed for nitrogen removal capabilities. Presently, only minor punch list items remain to be addressed. Final costs were re-estimated at $23 million. 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 the UV system was April 2010.

Future Project

Planned to begin during the spring 2011 season, a force main from pump station "C" located on Smull Place to the main plant will be replaced. An operational start-up is anticipated for summer 2011. Costs are estimated at $750,000.

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 seven of the existing 14 treatment plants. The sludge is transferred from the other seven 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 consisted 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.

During February 2010, the City, NYSDEC and four environmental groups announced an agreement-in-principle to upgrade four plants discharging to Jamaica Bay to reduce nitrogen discharges on a schedule through 2020, implement marsh restoration ($15 million) through 2015, resolve SPDES permit terms and improve water quality monitoring efforts in the bay.

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).

Upper New York Harbor, February 2010
Photo by P. Sattler, IEC

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.

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.

Hutchinson River Storm Outfall, June 2010
Photo by P. Sattler, IEC

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 that no surcharging conditions occur in the upstream sewer system. Presently, the proposed facilities will be installed under a single contract which began in June 2009 and planned through June 2012. The work is 17% complete and will incur costs of $27 million.

The Bronx River Watershed Initiative is funded by approximately $7 million obtained through settlements with several municipalities and Yonkers Raceway in cases arising from the illegal discharge of sanitary sewage into the river. The settlements provide that the funds be applied to stormwater retrofit projects designed to improve water quality and river ecology. Managed by the National Fish and Wildlife Foundation, 2010 is the third annual grant cycle in which $3.84 million will be invested in 11 projects dealing with stormwater retrofits and water quality improvements. In addition, two projects received additional funding amounting to $1.14 million in combined funding and in kind support from US EPA's LISS and HEP and NOAA-Northeast Fisheries Science Center. IEC staff has been involved with the BRWI Review Team since its inception.

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 nitrification 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 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. BNR was implemented at 26th Ward on June 1, 2010. BNR implementation is 60% and 45% complete at Bowery Bay and Tallman Island, respectively.

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 replacements were completed under another contract. The bid price for Phase I was $214 million. Phase I construction has been under way since December 2000. This phase is scheduled to be complete during February 2011 and is presently 95% 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 98% 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. Six of the ten aeration tanks have been completed and the new blowers were installed. The cost for this work is estimated at $258.6 million and was under way in November 2006. The scheduled end date is 2012; overall, this phase is 60% 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

Under way during October 2006, an engineering study is addressing the use of a catalyst for primary influent channel grease removal.

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 cost for design and construction is approximately $13 million and substantial completion is currently scheduled for late November 2010.

Due to an August 2004 fire, the primary settling tank odor control building sustained extensive damage. Aspects of the repair work include replacement of the 11 carbon absorbers, replacement of two wet scrubbers, modification of the existing chemical pumping systems, install improved odor control technology and control systems, improve the fire suppression and building life safety systems and repair damaged structural and architectural components. Completion is anticipated for December 2012 and will incur costs of $24 million for design and implementation.

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 and other associated equipment for a ferric chloride system, a 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. The cost for design and construction of this work is about $12.25 million and substantial completion is scheduled for April 2011.

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 8,500 LF 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; the failed pipe will be abandoned in place and the outfall structure will be demolished. The cost for the design and construction (July 2011) is about $33 million.

Paerdegat Basin Water Quality Facility

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 are $408 million for all phases. Phases I and IA were completed during 2002 and 2005, respectively. Phase II ($131 million) of the CSO facility foundations was completed during 2010.

Phase III ($225 million) 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 June 2011.

Phase IV ($25 million) includes the creation of a natural area park. The anticipated construction completion for this park is slated for June 2012.

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 in order to 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 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 substantially complete.

Phase II construction, under way since June 2003, has been re-estimated to cost $213.5 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 aeration tanks, air headers and diffusers. Phase II is 90% 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 $9 million and is substantially 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 with a construction cost of $36 million and is currently under way. 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.

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 was started during 2009.

Jamaica

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.

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 ten-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. On going construction between July 1998 and June 2009, is substantially complete.

Phase 1B, re-estimated to cost $1.468 billion, is an 11-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 are substantially complete. 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 47% 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 76% complete, is re-estimated to cost $242 million, and has a planned completion date of July 2011. The final element of Phase 1B involves the centrifuge automation and upgrade including modernization of 24 thickening centrifuges and ancillary systems. This work is estimated to cost $20 million and is scheduled to begin July 2011.

Phase 2, 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 (12% complete) and is anticipated to be complete during November 2013.

Phase 3, scaled back to a seven-year construction schedule and re-estimated to cost $893 million involves 7 elements of which three are under way. First, the rebuilding of the existing south battery of grit, aeration, and sedimentation tanks will match the north battery. The existing control building will be demolished and a new building will be constructed. The construction notice to proceed was given during September 2008 and the work is currently 62% complete. Secondly, as of March 2010, three new sludge vessels are being built with 140,000 cy capacities. Finally, various process enhancements will update and/or upgrade equipment. This work addresses systems involving digester odor, digester gas, various inspections, aeration tank foam, building structures, and electrical lines. This work was under way during June 2010.

Future Projects

The remaining 4 elements of Phase 3 have scheduled start dates during the next several years. With the suspension of the rehabilitation of the existing East River sludge dock and sludge force mains, construction of a new sludge loading facility ($46 million) on Whale Creek is scheduled to begin during January 2011. Preliminary design and permitting began July 2010, for the Nature Walk: Phase 2 is located above Whale Creek and Phase 3 is along Kingsland Avenue. Final design efforts will commence January 2012, followed by construction in October 2013 ($14 million). Preliminary design for the northwest addition to the main building and the extension of the fountain on Greenpoint Avenue are on hold. 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 final element is also on hold.

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), We Act for Environmental Justice, 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, the 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 are ongoing.

Scaffolding and Heated Sludge Return Piping
Photo Courtesy of NYCDEP

Inspections, cleaning and reconstruction of the remaining six of eight digester tanks is well under way. The work needed to repair the six digester tanks include internal inspections; furnishing and installation of new piping, couplings, gaskets and pipe sleeves; installation of pipe support systems; weld repairs of the steel liner and attachments; grouting, concrete spall repairs and application of a protective coating. Costs for all repairs and inspections are estimated at $13 million. Completion is re-scheduled to the end of 2011.

Engineering studies are continuing dealing with diffusers, air headers and other odor control improvements, centrifuge thickening, 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 primary sludge pumping and degritter replacement improvements was

completed during 2010.

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 status was not available.

Future Projects

Anticipated to begin June 1, 2011, a new thickening centrifuge will be installed. A major issue to be addressed involves lead-containing paint in various structures that are to be destroyed. Construction costs are estimated at $11.4 million. Improvements to the engine room will entail new exhaust grills and a second ventilation system, as well as additional supply and exhaust fans and repairs to the existing HVAC system. Design work is complete; installation start dates were not available.

Owls Head

Projects in Progress

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 water quality of Coney Island Creek 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 March 2012.

The pumping station upgrade includes construction of a wet well extension for temporary pumping, automation, a new network protection building, a new generator building, and architectural restoration. 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 cost of the upgrade including structures, equipment, electrical, HVAC, and plumbing (4 contracts) with registered change orders is now estimated at over $72.48 million. Construction was under way during December 2005. The percent complete status of the contracts range between 2.9% and 61.2%.

The existing 24-inch diameter (24"Ø) and 30-inch diameter (30"Ø) force mains will be upgraded to 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. The installations are to accommodate the increased pumping capacity and are located along Shore Parkway. Construction began July 2007 and completion is anticipated for May 2011. Costs are re-estimated at over $109.07 million; installations are 96% complete.

Red Hook

Project in Progress

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

Rockaway

Projects in Progress

Ongoing engineering studies are addressing total residual chlorine management, chlorine disinfection system improvements, and the first planning phase of plant-wide improvements. Recently under way during September, a pilot study is evaluating the use of an algal turf scrubber. This is a solar technology to build biomass for additional nutrient capture.

Tallman Island

Projects in Progress

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. 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.

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 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 work is substantially completed with few punch list items remaining. 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 construction phase is estimated to cost $23 million. Two of the four aeration tanks have been rehabilitated. The new main substation is scheduled for completion during mid-2011. Overall, contract work is 45% complete with an anticipated end date of mid-2012.

Several engineering experiments conducted at this facility address 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 status of these studies was not provided.

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. Alley Creek Stage 2 work is 90% complete. The Old Douglaston pump station and storage tank are complete and await final inspections. 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. The contract work for Stage 3 is nearly complete. A change order to provide additional improvements to the park has been registered. A completion date is anticipated for May 2011; work is presently 80% complete. Total costs are estimated at $130 million.

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. The status of these studies was not provided.

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.

Aerial View of 26th Ward WPCP
Photo Courtesy of NYCDEP

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. As of April 2010, construction is substantially complete.

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. Presently, the contract work is 79% complete. BNR was operational on June 1, 2010. Overall completion is scheduled for the end of 2012.

Engineering designs, completed in July 2009, and construction 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 Act (ARRA) funding. Construction started January 2010 with an anticipated completion date of October 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 (complete), and the use of fuel cells for co-generation.

Future Projects

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 construction will begin during mid-2011 and be operational by the end of 2015. The multi-phase construction will include two additional preliminary settling tanks, a new residuals handling building, a flow distribution structure and an odor control and scum removal system. The estimated construction cost for these combined projects is re-estimated at $165 million.

Regulator reconstruction located at the main facility is planned as an emergency and Consent Order contract. An existing structure over 100 years old, sustained structural damage in October 2008. Construction is slated for February 2011 with a 12-month agenda. An emergency contract to replace three low level main sewage pumps and ancillary equipment due to age is expected to begin in August 2011 and be on line during July 2013.

Additional contracts are planned for the period 2016 through 2022. First, upgrades to the sludge digesters and thickeners and a new administration block will start in 2016 at costs estimated at $146 million. Second, construction of a new raw sewage pumping station is planned to start in mid-2015 ($411 million). Finally, an additional

chlorine contact tank will be built starting in 2018 ($46 million).

Wards Island

Completed Projects

Phase III of the Wards Island WPCP upgrading previously included all work necessary to provide 20 years of reliable service for the solids handling facility. Due to budget constraints, this phase had been deferred. 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 under this contract. The construction began during June 2005. The work on the thickeners, digesters, gas booster room and gas holder was completed in July 2010. Additional digester work, the sludge transfer system and steam/hot water systems were on line during October 2010. Substantial completion of work was achieved on November 15, 2010. The bid price was $42.4 million and the current cost including change orders is $55.2 million.

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 was on-line between March and July 2010. The bid price for this work was $8.1 million and with pending change orders, the current cost is $8.5 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

Aerial View of Wards Island WPCP
Photo Courtesy of NYCDEP

New York City landmark.

The physical facilities of the Bronx and Manhattan grit chambers are Phase II construction. The rehabilitation is under way including automation of grit handling (on line between May 2011 and October 2012) electrical upgrades (on line November 2009), HVAC (on line May 2011) and other equipment as needed. The bid price was $91 million and the current re-estimated cost is $125.1 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.

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, WAS pumps, final settling tank drives, control panels and concrete repair will be performed. Construction began during April 2006 with three completion dates between September 2011 and November 2012. A fourth stabilization element, the south return sludge pumping station substation was on line during December 2009. The bid price was $173.4 million and the current cost with pending change orders is $222.5 million. Existing Consent Order requirements mandate BNR completion and operational by October 31, 2013.

Upgrades to the chemical and petroleum bulk storage systems to meet federal, State, and local regulations were under way during August 2008 and is anticipated to be complete during July 2011. The costs are re-estimated to be $12.3 million.

Future Projects

Plant Stabilization 4 will implement improvements to the primary sludge pumping and degritting system and other miscellaneous components of the primary settling tanks. All of the equipment being replaced is past its useful life and requires replacement in order to maintain reliable plant operations. The construction on these improvements commenced in December 2009 and will be on line between March 2011 and May 2012. The bid price and current cost for this work is $15.7 million and the current forecast budget, including pending change orders, is $18.7 million.

ROCKLAND COUNTY

Joint Regional Sewerage Board-Town of Haverstraw

Projects in Progress

A twelve-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 $750,000 project is planned to be complete during November 2011. An estimate of $850,000 was made for the proposed upgrade of the Dr. Girling Drive pump station. The 7-month undertaking is anticipated to be on line during May 2011.

Orangetown

Completed Project

Tier II-Phase I of the Pumping Station Improvement Plan at the treatment plant included the replacement of sludge pumps, lighting and the installation of internal heating systems. These improvements incurred final costs of $3.3 million. These improvements were operational during September and all punch list items were addressed during November 2010.

Projects in Progress

Operating under a NYS DEC Consent Order, this facility is required to upgrade disinfection capabilities and odor controls at the main facility. The Order also addresses sewer system overflows. The District is in compliance with all Order dates.

Tier II-Phase II of the Pumping Station Improvement Plan includes rehabilitation of sludge holding tanks Nos. 1 and 2. This work has an approximate operational start-up date of November spring 2011. The work is 10% complete and is estimated to cost $2.3 million.

Future Project

Another phase of the Pumping Station Improvement Plan will include rehabilitation of three (3) pump stations. Construction is planned for the 2011 spring season and is estimated to cost of $500,000.

Rockland County Sewer District No. 1

Completed Project

The goals of the Village/Town sewer extension and reconstruction project are to replace or rehabilitate existing sanitary sewers and extend sewer service to unsewered areas with failing septic systems. Rehabilitated or rebuilt sewers are being installed

to service existing homes and the new laterals are for existing homes with failing septic systems. The project is essentially complete and incurred final costs estimated at $19.8 million.

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. The wet weather inflow identification and removal project is 60% complete. Various field investigations are being carried out to identify sources of inflow. Once complete, detailed designs for repair and construction will follow. Cost estimates for all phases are estimated at $9.37 million.

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 essentially complete. The associated pump stations are under construction. The sanitary sewers in the Village of Hillburn are complete and homes are being connected. Sanitary sewers are being installed in the Village of Sloatsburg. The plant process will incorporate sand filters, microfilters, and post-aeration. 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 addition of the new facility was done to provide public sewer service to the aforementioned villages, eliminate failing septic systems and protect the Ramapo River aquifer. The Western Ramapo sewer extension is an interconnection between the new plant and the existing sewer system. This diversion force main provides redundancy should a failure of the plant occur that warrants temporary diversion of a part or all of the wastewater generated in Western Ramapo. This work is 70% complete and has an estimated cost of $94.6 million.

The modernization of the existing Rockland County 28.9 MGD secondary facility includes replacement of debilitated treatment units and pump station improvements. Presently, Phase I is 50% complete. This work involves the installation of a SCADA/Security system, replacement of electrical substation #2, replacement of the VFD units at three pump stations (Twin Lakes, Saddle River and North Centenary), as well as process improvements and new treatment units. Costs are re-estimated at $9 million. Phase II (60% complete) includes masonry and roofing repairs, repair of the primary digester cover, replacement of the secondary digester cover and high voltage switchgear and antiquated process equipment and the installation of underground conduits. Pumping station rehabilitation includes replacement of the VFDs and upgrading the Hackensack pump station. Costs are re-estimated at $17.02 million.

Recently under way, the Clarkstown infrastructure upgrade and the Interceptor

improvements-Phase I projects are both 5% complete. The Clarkstown project involves eight pump station upgrades, installation of three gravity sewers and two force mains. Estimates for this work are about $10 million. The interceptor work includes replacing sections of the North Pascack interceptor that are at capacity, extending this interceptor through New Square, rebuilding a section of deteriorated pipe on Union Road in Spring Valley, as well as constructing new sewers near Route 45 and Maple Avenue in Spring Valley. Cost estimates for Phase I are over $6.835 million.

SUFFOLK COUNTY

Huntington Sewer District

Project in Progress

Recently under way, 630 LF of 2-inch diameter (2"Ø) HDPE pipe is being installed for a low pressure sewer to serve five parcels along NYS Route 110. The one-month construction agenda will incur estimated costs of over $188,000.

Northport

Future Projects

Phase II Facility upgrades to meet 2014 SPDES permit limitations and requirements are 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. A construction schedule has not been determined.

Phase II collection system improvements include sewer and manhole lining and repairs (I/I remediation) and shoreline sewer and pump station replacement. These upgrades have a re-estimated cost of $4.53 million. Construction start-up dates have yet to be determined.

Suffolk County Sewer District #1, Port Jefferson

Projects in Progress

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. Additional pump station improvements, if needed, will continue. Design work is under way for residential sewer replacements and a new lift station in lower Port Jefferson ($150,000). An engineering evaluation is addressing excess capacity and potential treatment issues at the main facility. Recently awarded, a study will identify treatment needs and sewer installations in four areas of Suffolk County including Port Jefferson.

Future Project

Sewer rehabilitation and pump station upgrades are planned for lower Port Jefferson. An approximate construction start-up date is January 2012. Slated costs are estimated at $1.5 million and an operational start-up date is anticipated during January 2013.

Suffolk County Sewer District #3, Southwest

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. Completed to date, nine (9) 20,000 gallon oil tanks have been removed. The facility is in compliance with all Order dates and negotiations are ongoing.

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 management program for beneficial reuse 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 and expansions including grit handling, plant security, UV disinfection, odor control and infrastructure improvements have been re-estimated at a cost of $125 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 collection system improvements including evaluations for I/I. Additional funding ($3 million) has been obtained for I/I remediation. A contract is being awarded ($400,000) to evaluate sewer systems 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 75% complete. Phase II design scope is currently under development. Phase II estimated costs include engineering management ($2 million) and construction ($8 million). Final cost of all phases is estimated at $20 million.

Suffolk County Sewer District #6, Kings Park

Completed Project

At a final cost of $14.8 million, an SBR system and supporting equipment renovation was completed during 2010. The installation included a second SBR and an UV disinfection system.

Pre-equalization Tanks with Nissoquogue River in Background
Photo Courtesy of SCDPW

Newly Installed Sequence Batch Reactor
Photo Courtesy of SCDPW

Future Projects

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 re-estimate of $60 million. A construction start date is anticipated for 2013 with a two-year agenda. Designs are under way for the gravity sewer system expansion. 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.

Suffolk County Sewer District #21, SUNY

Completed Projects

At a final cost of $1.3 million, an emergency generator for the effluent pump station was installed. Enhancements to the oxidation ditch were also completed. These improvements were operational during September.

Project in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities and upgrade the facility. A revision of compliance dates is being negotiated due to the facility expansion needs. 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 late 2010 will address additional treatment processes for this capacity expansion. 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 2014 and will incur re-estimated costs of $38 million; groundwater recharge costs escalated the expenditures. Additional improvements to the collection system will also be necessary ($300,000).

WESTCHESTER COUNTY

Blind Brook

Completed Project

Upgrades to the aeration tanks to increase nitrogen removal before discharge to Long Island Sound was completed during September 2010. The upgrade included internal

recycle pumps, instrumentation and controls. The estimated total cost was $1.92 million with funding from the NYS DEC Water Quality Improvement Projects contributing up to $1.47 million.

Projects 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.

A performance maintenance contract to upgrade the plant process equipment was awarded during November 2009. The work began during January 2010 and is now 35% complete. This project will incur costs of about $9 million.

Buchanan, Village of

Completed Project

Complete and operational during 2010, the draft tubes for the aeration tank were repaired. In addition, new aeration blowers were installed.

Project in Progress

Recently under way, the sludge collection equipment is being replaced.

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. Under the auspices of the same project, additional upgrades and repairs were on line during October 2010. These recent completions include trickling filter equipment repairs, new twin recirculation pumps with VFD drives and a new final clarifier mechanism installation.

Refurbished Trickling Filter with New Distribution System and Media
Photo Courtesy of R. Morlock, WWTP Supervisor, Camp Smith

Future Projects

Additional plant upgrades are planned which include aluminum dome covers for the trickling filters and a building to contain the clarifiers and chlorine contact chamber. All work schedules and costs are to be determined.

New Final Clarifier
Photo Courtesy of R. Morlock, WWTP Supervisor, Camp Smith

Mamaroneck

Completed Project

Variable frequency drives were replaced on the sludge force main pumps. The installations were complete during November 2009 and operational in early 2010. The final cost estimate was $229,000.

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. As required by this Consent Order, construction of a BNR upgrade is slated to begin in late 2010 with an estimated cost of $55 million. Operational levels are planned for December 2012.

A construction contract was awarded during October 2010 for the repair and rehabilitation of the screening and grit facilities. Costs are estimated at $3.75 million. An operational start-up is anticipated for 2011.

Rehabilitation of the Magnolia and Woodbine pump stations are under way. A target date for completion is 2011.

Future Projects

Steel sheet piles that encase one of the Long Island Sound outfalls will be replaced at an estimated cost of $5 million. The design work is slated for 2011. Another design ($800,000) is planned for the primary and secondary heating systems, as well as the chemical handling facility. The useful life of these systems has been reached and must be replaced or upgraded.

A design award for the replacement of the administration building roof and tower are nearly complete and should be in place by the end of 2010. This project has an estimated budget of $2.13 million.

New Rochelle

Completed Project

In preparation for the composite performance implementation project, demolition of obsolete equipment was completed during 2010. A final cost estimate was $1.55 million.

Projects in Progress

This facility is operating under a 2004 State Order to meet SPDES permit effluent limitations for total nitrogen, flow, carbonaceous biochemical oxygen demand (CBOD), 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. A construction award was made during March and the work is 5% complete. Cost estimates are about $145 million. The BNR upgrade project is estimated to cost $176 million. The design work was completed during December 2010 and will go to bid during early 2011.

Future Projects

Collection system improvements are anticipated for the next two years. Three pump stations—East Basin, West Basin and Edgewater Point—will be rehabilitated. Design work will commence during 2011 with construction to follow in 2012; cost estimates are about $7.9 million.

Ossining

Completed Projects

Sludge handling improvements include two new sludge holding tanks and a new sludge loading building with odor control capabilities. Construction was completed during 2010; the estimated final costs were approximately $9.5 million. The sludge loading and chemical unloading areas were enclosed and operational during December 2009. This work was performed to provide additional odor control and address other miscellaneous upgrades.

Under way since April 2007, installations at five pump stations include alarm systems and remote monitoring of various facility functions. These upgrades were operational during June 2008, but punch list items were not closed-out until 2010. Final costs incurred were estimated at $2.29 million.

Projects in Progress

Designs for the replacement of twin feeder aerial cables were awarded during March 2010 (30% complete) with construction to follow 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, a design award was made during August 2010 (30% complete) and has an estimated budget of $2.2 million. This project will include new sodium bisulfate tanks, piping, induction mixers, instrumentation, and controls.

Future Project

Structural rehabilitation of the chlorine contact tank is scheduled for 2011. This project has an estimated cost of $1.5 million.

Peekskill

Completed Project

Upgrades to the aeration system at the main facility are essentially complete (99% complete). The upgrades included new aeration diffusers, controls, blowers, and instrumentation. The final cost estimate for this project was $3.81 million and was operational during May 2011.

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 late 2010.

Rehabilitation of the Mill Street pump station began in April 2009 with a cost estimate of $5.1 million. At this point the project is 95% complete and was operational during June 2010.

Electrical upgrades at one pump station and at the main facility ($6.1 million) were under way during August 2010 (5% complete). An upgrade to the influent pumping stations is planned for February 2011. These upgrades include new screens, motors, structural upgrades, and HVAC. Presently, the design phase is nearly 100% complete and construction bonding will take place during 2011. Costs are re-estimated at $3.1 million.

Due to the new total residual chlorine limits in the current SPDES permit, modified October 2008, design for total residual chlorine reduction is 30% complete. 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

Projects in Progress

Funded by a grant under the ARRA through NYS DEC, the Commission is conducting a monitoring and modeling project on the upper Byram River which is an interstate waterway. Refer to the Ambient and Effluent Water Quality Monitoring 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, 2014, and obtain operational levels by December 31, 2014.

An HVAC upgrade is in the design phase. The final design study is awaiting final approvals. An estimated final cost was $200,000. The replacement of the roof on the primary settling tank building is planned. Costs are estimated at $105,000; construction start dates are to be determined.

Springvale Apartments

Completed Project

The replacement of the gear drive, reducer, and motor with identical replacement parts on a primary settling tank was completed and on line on October 19, 2010. The cost estimate for this construction ranged between $30,000 and $40,000.

VA Hudson Valley Health Care System (Montrose)

Completed Project

Over the course of the 2010 summer season, the influent mechanical screen was replaced. A final cost estimate was $75,000.

Yonkers Joint Wastewater Treatment Plant

Projects in Progress

Currently, the plant is upgrading the primary digester system, which includes roof replacements. These upgrades are 80% complete with a cost estimate of $4.75 million. The dewatering building is also being upgraded and is 98% complete. The total cost for this project is $3.65 million and includes upgrades to the centrifuge drives, control panels, and ancillary equipment. The installation of automatic skimmers on the final clarifiers is 95% complete and is estimated to cost $3.69 million. The chlorine contact tank and piping upgrade began recently during October 2010 and is estimated to cost $3.6 million. Designs for HVAC rehabilitation in the screen and grit building are complete with construction bids to be received during early 2011. Cost estimates are about $9.64 million. Designs and construction management costs totaled $200,000 for an additional water service at the main plant. Construction is planned to be under way during November 2010, with costs estimated at $1.72 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 substantially complete by January 2011.

Future Projects

Three installations are planned for 2011. Phase II construction of the cellular bulkhead rehabilitation on the Hudson River is scheduled. The cost was re-estimated at $2.5 million. The replacement of the emergency generator (design 95% complete) includes ATS, controls, duct banks, and associated electrical work ($9.9 million). Upgrades to the engine generators (design 95% complete) have associated cost estimates of $9.8 million. This work includes new cabling, generator, associated electrical work, and a siloxane treatment system.

Design awards ($550,000) are anticipated during December 2010 for the Alexander Street influent structure and tower upgrade. Construction ($1.5 million) is planned for 2012. This work includes replacement of the sluice gates, and the evaluation and rehabilitation of existing structures. Design and construction of ten (10) sub-grade surge chambers are planned in order to relieve pressure and protect the North Yonkers pump station 54-inch (54"Ø) diameter force main. Design costs are estimated at $400,000 with construction ($3.1 million) to follow. Planned for 2011, the roof will be replaced on the CSO building. Estimated costs will total $765,000.

The Palisades, May 2010
Photo by P. Sattler, IEC

AMBIENT AND EFFLUENT WATER QUALITY MONITORING

During 2010, the Commission continued its 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, 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 Interstate Environmental District's 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. Outfall reconnaissance inspections at CSOs, SSOs and MS4s were conducted during dry weather to detect illicit discharges and to take steps to have them eliminated.

Ambient Water Quality Monitoring

The Commission continued its weekly summer sampling to document hypoxic (low dissolved oxygen) conditions in western Long Island Sound and the upper East River. 2010 was the 20th 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. Beginning with the 2010 sampling season, the weekly runs were expanded to include an additional station, E12, at the confluence of the Hutchinson River and Eastchester Bay. This station was added as awareness has increased of the water quality impact nutrient and pathogen loadings resulting from runoff and combined sewer overflows to tributaries, such as the Hutchinson River, may have on western Long Island Sound. As in previous years, IEC collected surface water samples for chlorophyll a analysis. Previously, these samples were filtered and delivered to the Center for Environmental Sciences and Engineering at the University of Connecticut for analysis. Beginning with the 2010 sampling year, these analyses were performed in house by the Interstate Environmental Commission's laboratory, which received NELAP certification for chlorophyll a analysis through the state of New Jersey Department of Environmental Protection.

Beginning with the 2011 summer sampling season, IEC will have use of updated multi-parameter meters for Long Island Sound ambient water quality surveys as a result of a Revocable License Agreement with the US EPA. IEC currently uses hand held DO meters to monitor temperature, DO, conductivity and salinity during the surveys. With the current meters, a separate meter was necessary to measure pH and temperature. The DO meters used were manufactured between 1998 and 2001 and reached the end of their usable lifespan. The new meters, procured by the US EPA's Long Island Sound Study office, combine all necessary monitoring parameters in one instrument; with the addition of nitrate as a monitored parameter beginning with the 2011 summer sampling season. Nutrient loadings, specifically nitrogen, can lead to hypoxic conditions resulting in fish kills and general deterioration of water quality.

Monitoring of nitrate during future Long Island Sound surveys may help assess and identify the sources of any hypoxic conditions found, and predict where areas of future hypoxia may occur.

The 2009-2010 winter season was the 15th 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 2010-2011 winter and spring seasons.

In support of the New York State Hudson River Estuary Program, IEC staff, aboard the R/V Natale Colosi, continued an ambient water quality monitoring program in 2010 on the Hudson River for pathogens under dry and wet weather conditions from Yonkers to Bear Mountain, New York. The R/V Natale Colosi returned 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 was the 4th such survey since 2006. All water quality samples were analyzed by the IEC laboratory for fecal and total coliform, 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 results of this multi-year project were summarized and synthesized into an interim report to be submitted to the US EPA in early 2011 entitled "Ambient Water Quality Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain."

The Commission participated in the eighth World Water Monitoring Day which grew out of the 2002 National Water Monitoring Day; IEC has participated in this event since its inception. In 2010, 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 20th. The second event, on September 22nd, on the Bronx River, was a cooperative with 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 water quality 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 and is available from the IEC office.

Municipal And Industrial Effluent Compliance Monitoring

IEC conducts year-round investigations at municipal, private, and federal wastewater treatment plants, as well as industrial facilities that discharge into Interstate Environmental District waterways. The purpose of these investigations is to inspect the physical facilities, as well as to ascertain whether discharges from those facilities are in compliance with IEC Water

Quality Regulations and the limitations and requirements of the facility's current National Pollution Discharge Elimination System permits (NPDES).

Investigations of private, municipal, and federal wastewater treatment plants typically involve an unannounced six-hour sampling period, an interview and a "walk through" to review processes, equipment, and plant records. During these inspections, IEC's field staff collects grab and composite samples for the following parameters to evaluate the facility's compliance with IEC Water Quality Regulations: Fecal Coliform, BOD_5, Total Suspended Solids, Settleable Solids, Chlorides and Turbidity. IEC records hourly instantaneous field measurements for pH, total residual chlorine and temperature. In addition, visual observations for the presence of oil & grease, foam and floating solids in the effluent are made hourly and recorded. Any detected odors are recorded. IEC conducted 59 inspections at private and municipal facilities during 2010. Final reports from these investigations are distributed to the facility, regional offices of the state environmental agencies and the US EPA. Data generated from compliance investigations are also electronically reported to the US EPA's Integrated Compliance Information System (ICIS). ICIS benefits the US EPA, environmental agencies and the public by combining, in a national database, information on enforcement, compliance assurance, NPDES permits, limits, discharge monitoring data and other program reports. ICIS provides US EPA and state and regional agencies with data and support for federal enforcement tracking, targeting, and reporting.

In 2010, in addition to conducting unannounced effluent surveys, the IEC continued for the seventh 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. In 2010, the IEC began conducting some of these inspections jointly with NYSDEC - Region 2. The purpose of these joint inspections is to foster a cross-training program where IEC and NYS DEC – Region 2, coordinate inspection schedules and procedures in order to make inspections more effective and consistent, as well as identify compliance issues and assess WPCP compliance.

Beginning in 2010, IEC has also expanded its scope of effluent sampling parameters at a specific set of 10 municipal plants within the IED that discharge into the Hudson River. The supplemental parameters selected for this project are *enterococcus,* total nitrogen and total phosphorus. Although these parameters are not in IEC's Water Quality Regulations, they are important water quality indicators. *Enterococcus* is used as the indicator organism that triggers beach closures for marine beaches in all three member states of the Commission (NY, NJ, CT). Nutrient loadings, specifically nitrogen, can lead to hypoxic conditions resulting in fish kills and general deterioration of water quality. Hypoxia is a major problem in marine waters throughout the nation. Specifically, the IED includes two National Estuary Programs (NEPs) where hypoxic conditions are prevalent. Phosphorus is also a nutrient of concern that could have a negative effect on the environment. Phosphorus is closely tied with nitrogen since many of the nitrogen reduction methods also help its reduction.

There are 17 WWTP's that discharge directly into the Hudson River (or a nearby tributary) in the IED. There are 5 in Rockland County, 7 in Westchester, 1 in New York City and 4 in New Jersey. IEC evaluated the geography and size of the plants in the IED that discharge into the Hudson River. The plants were categorized by size and the facilities with the lowest discharges were disregarded. That left five moderately-sized plants, which are relatively spatially disparate, remaining on each side of the Hudson River. IEC decided to target these plants with the larger design flows, specifically: Peekskill, VA-Hudson Valley, Ossining, Yonkers, North River, Haverstraw, Rockland County SD#1, Edgewater, West New York and Hoboken. IEC will complete 3 sampling rounds including the additional parameters at each of these 10 plants. The collection and analysis of the additional parameters will take place over a two-year period during IEC's regular unannounced compliance investigations. IEC completed one round of collection and analysis of these parameters in 2010.

The Interstate Environmental Commission (IEC) conducts effluent surveys of industrial facilities throughout the Interstate Environmental District (IED). Typical types of industrial facilities inspected include power plants, oil refineries and other types of refineries that discharge into District waterways. A list of candidates for IEC compliance monitoring is produced annually and prioritized in conjunction with the regional offices of NYSDEC, NJDEP and CTDEP. Pre-compliance questionnaires are mailed to the candidates to obtain necessary information for both planning the compliance monitoring investigation and report generation.

Many industrial facilities (e.g. power plants) operate on a seasonal, or as needed basis, frequently on a weather-dependent basis or when other facilities are shut down for planned or unplanned maintenance. Therefore, advance coordination is usually required at such facilities. In addition, these facilities pose special circumstances as many of them have restricted access requiring advance health, safety and security orientations and briefings. Congress directed the federal government to issue biometric security credentials as per the Maritime Transport Security Act (MTSA) of 2002 for port safety. The Transportation Worker Identification Credential (TWIC) is a common ID credential for all personnel requiring unescorted access to secure areas of regulated facilities and vessels. Since 2008, an increasing number of the industrial facilities in the IED have initiated policies requiring all personnel to have TWIC as a

TransCanada Ravenswood Generating Station, July 2010
Photo by E. Powers, IEC

requirement for entry or for unescorted access, pursuant to the MTSA. Due to this heightened security and the fact that many SPDES outfalls are accessed via piers, docks, or other port TWIC zones, IEC obtained TWIC IDs for all environmental field technicians, as well as certain lab and engineering personnel. These credentials ensure that IEC has ample personnel available with the proper clearance to access, sample, and inspect SPDES outfalls in the IED.

Compliance monitoring at industrial facilities involves a 24-hour sampling event (or a full days' production). If the facility intakes ambient District water, either to be used as cooling water or in some other process, the influent (inlet) and outfall are both sampled to determine the net discharge of each parameter on its existing SPDES permit. If the facility uses municipal water supply as its intake, only the effluent is sampled. Compliance monitoring at industrial facilities encompasses not only IEC's Water Quality Regulations, but also involves sampling for all parameters on the facilities current National Pollutant Discharge Elimination System (NPDES) permit, whenever possible. Hourly instantaneous field measurements for pH, temperature and total residual chlorine are taken for the duration of the sampling event at each sampling point. In addition, visual observations for the presence of oil & grease, foam and floating solids are made hourly and recorded, as well as any detected odors. Grab and composite samples are collected for Fecal Coliform, BOD_5, TSS and additional parameters in accordance with each industrial facility's unique permit and transported to the IEC laboratory. 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. Final reports from these investigations are distributed to the facility, regional offices of the state environmental agencies, and the US EPA. Data generated from compliance investigations are also electronically reported to the US EPA's Integrated Compliance Information System (ICIS). IEC conducted 11 inspections at industrial facilities during 2010.

Laboratory

The Commission's laboratory has been located on the campus of the College of Staten Island, CUNY (CSI) since December 1993. The laboratory director and staff continually have research papers and articles published, make presentations at prestigious environmental forums and are involved with mentoring students enrolled in the CES Masters Degree program.

All analyses performed by the Commission's laboratory are completed in accordance with IEC's Laboratory Quality Control Manual, Project 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 NELAC Institute's (TNI) National Environmental Laboratory Accreditation Program (NELAP) through the NJ DEP and the NYS DOH. TNI is a non-profit organization which aims to provide a national accreditation program, through NELAP, dedicated to uniform, comprehensive and nationwide standards. The purpose of TNI is to foster the generation of environmental laboratory data of known and documented quality through the development of national performance standards.

IEC Laboratory Located at College of Staten Island
Photo by P. Sattler, IEC

In order to maintain certification under NELAP, laboratories must meet extensive quality control requirements. These requirements include semi-annual proficiency tests for all microbiology and chemistry parameters, annual reviews and revisions of its quality control manuals and standard operating procedures (SOP) manuals, annual internal laboratory and field audits by the Commission's Quality Assurance Officer, and biennial on-site assessments by the New York State Department of Health's Environmental Laboratory Approval Program (NYS DOH ELAP) and the New Jersey Department of Environmental Protection's Office of Quality Assurance (NJ DEP OQA), both of which are NELAP recognized accreditation bodies. Due to its physical location in New York State, the IEC laboratory holds primary NELAP accreditation from NYS DOH ELAP. As an interstate agency which samples across state boundaries, IEC maintains secondary NELAP certification through NJ DEP for all parameters for which it holds primary certification through NYS DOH ELAP, as well as primary NELAP certification through New Jersey for some parameters for which certification is not offered by NYS DOH ELAP. NJ DEP OQA completed a one-day biennial assessment of the IEC laboratory in October 2010 and NYS DOH ELAP completed a two-day biennial assessment of the IEC laboratory in November 2010.

IEC Laboratory, July 2010
Photo by P. Sattler, IEC

The IEC laboratory seeks to continually update its scope of parameter certifications as new methods are developed and new projects warrant. In 2010, the IEC laboratory sought and received NELAP certification for chlorophyll a analysis from the Office of Quality Assurance of the New Jersey Department of Environmental Protection. Chlorophyll a, a parameter sampled for in conjunction with the annual summer Long Island Sound ambient water quality surveys, was previously collected, filtered in the IEC laboratory, and delivered to the Center for Environmental Sciences and Engineering at the University of Connecticut for analysis. Beginning with the 2010 sampling year, these analyses were performed in house by the Interstate Environmental Commission's laboratory.

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. In 2010, students from the CES Masters Degree program participated in a variety of research in support of both potential and funded grant projects.

LABORATORY CERTIFIED PARAMETER LIST

	Microbiology	
Fecal Coliform	*Total Coliform*	*Fecal Streptococci*
Enterococci	*Standard Plate Count*	*E. Coli*
	Chemistry	
Alkalinity	*BOD*	*COD*
Chloride	*Fluoride*	*Hardness–total*
Oil &Grease	*Total Solids*	*Total Dissolved Solids*
Total Suspended Solids	*Settleable Solids*	*Specific Conductance*
Sulfate	*Turbidity*	*Chlorine*
Dissolved Oxygen	*pH*	*Temperature*
Chlorophyll a		
	Metals	
Aluminum	*Antimony*	*Arsenic*
Beryllium	*Cadmium*	*Chromium*
Copper	*Iron*	*Lead*
Manganese	*Molybdenum*	*Nickel*
Selenium	*Silver*	*Thallium*
Vanadium	*Zinc*	

The NYS DEC project entitled "Water Quality Monitoring and Modeling of the Byram River" funded by the American Recovery and Reinvestment Act (ARRA) and administered by the IEC, enabled a CES Masters Degree student the opportunity to perform field sampling, lab analyses, and data analysis. This Byram River project was used as a case study in his Masters Degree thesis. The thesis addresses the impact of urban development on streams and estuaries.

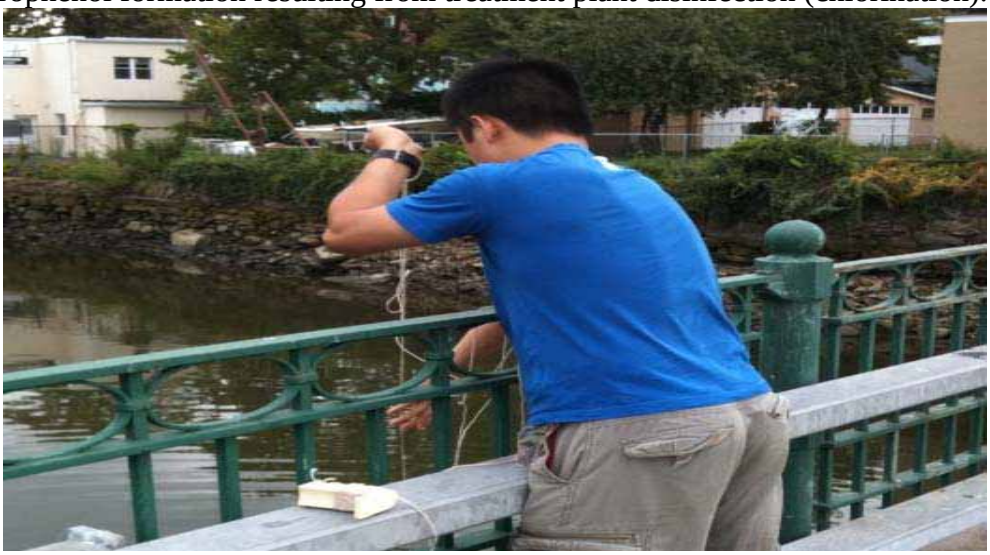
The IEC laboratory is pursuing research grants in three major areas under the direction of the Laboratory Director. One such area involves the use of multi-walled carbon nanotubes for the

removal of phthalate esters from water. Phthalates are commonly found in many surface-, ground-, and wastewaters leaching out from plastic materials. Some compounds of this class are also known to be endocrine disrupting substances. The IEC laboratory, in collaboration with the Center for Environmental Science at the College of Staten Island has succeeded in removing phthalates from water using carbon nanotubes to an extent of 95%. Currently a student from the CES Environmental Sciences Masters Degree program is working on her Master's Degree thesis project on this topic.

The IEC laboratory in collaboration with the CES is also currently investigating the removal potency of multi-walled carbon nanotubes for many haloacetic acids from water. These substances are toxic and some of these compounds are classified under emerging pollutants. Haloacetic acids currently being studied include various chloro-, bromo-, and mixed haloacetic acids that constitute a major class of the so-called halogenation disinfection by-products. A student from the Environmental Science Master's Degree program is currently working on this topic for her Masters Degree thesis under the supervision of IEC's Laboratory Director. The results from both of these studies may have potential applications in the water treatment processes.

The laboratory is also investigating the pathways of formation of chlorotoluenes in environmental waters resulting from the reactions of toluene, a gasoline component with chlorine. Such reactions taking place in the aqueous phase at ambient temperatures may throw some light on the mechanisms of formation of many chloroaromatics in ambient waters. Other simple aromatics may show similar pathways of chlorination, a subject that will be studied in the next phase.

Finally, 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).



Sampling Byram River from Mill Street Bridge, August 2010
Photo by E.Powers, IEC

SPECIAL INTENSIVE SURVEYS

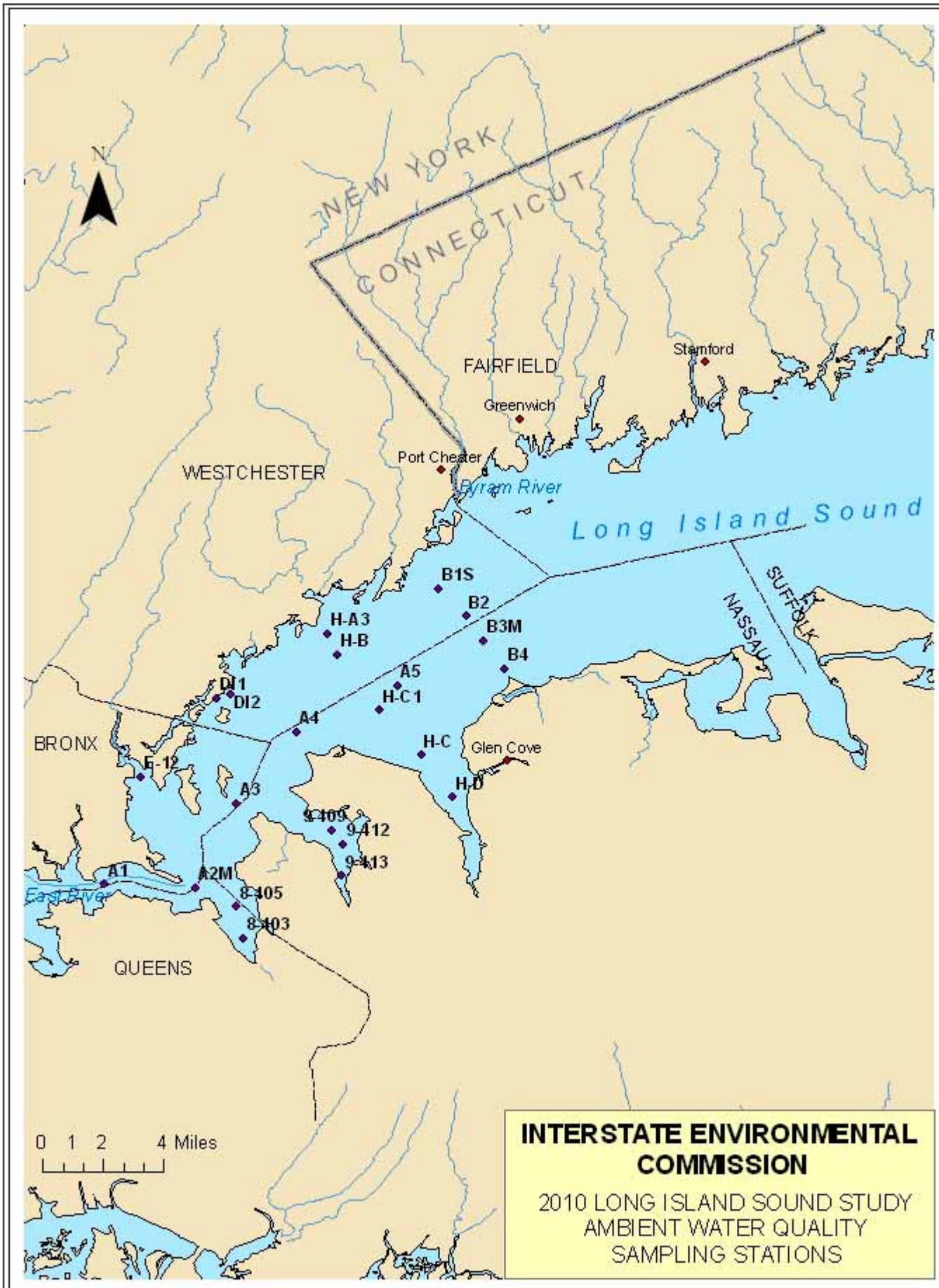
2010 Ambient Water Quality Monitoring in Long Island Sound to Document Dissolved Oxygen Conditions

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 2010. For the 20th 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 2010 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 20th for the World Water Monitoring Day data set. A second cooperative event was conducted on September 22nd on the Bronx River.

During 2010, the IEC laboratory sought certification for Chlorophyll a, a parameter sampled for in conjunction with the annual summer Long Island Sound ambient water quality surveys. Previously, these samples were collected, filtered and frozen in the IEC laboratory, and delivered to the Center for Environmental Sciences and Engineering at the University of Connecticut for chlorophyll a analysis. These analyses were funded by CT DEP. Subsequent to a laboratory audit, certification was granted and the frozen sample analyses were performed in-house by the Interstate Environmental Commission's laboratory. NELAP certification was received through NJ DEP OQA.

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 assist and respond to fish kills. Surprisingly, even with extreme ambient temperatures with corresponding elevated water temperatures, no fish kills were observed or reported to the Commission.


N
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
DI1
DI2
A4
H-C
Glen Cove
H-D
BRONX
E-12
A3
9-409
9-412
9-413
A1
A2M
East River
8-405
8-403
QUEENS
0 1 2 4 Miles
INTERSTATE ENVIRONMENTAL COMMISSION
2010 LONG ISLAND SOUND STUDY
AMBIENT WATER QUALITY
SAMPLING STATIONS

INTERSTATE ENVIRONMENTAL COMMISSION
2010 LONG ISLAND SOUND STUDY SAMPLING STATIONS

STATION	WATER COLUMN DEPTH (meters)	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
E-12	4	40-51-16	73-48-34	Eastchester Bay mid-channel at N 6
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 North of Gong "21"
B3M *	19	40-55-12	73-38-42	Matinecock Point 0.7 nm North of Gong "21"
B4	15	40-54-24	73-38-06	Matinecock Point South of Gong "21"
DI1	10	40-53-33	73-46-24	Davids Island North of Nun "10A"
DI2	6	40-53-40	73-46-00	Davids Island East of Nun "4"
H-A3 *	3	40-55-24	73-43-12	Delancy Point South of Can "1"
H-B *	12	40-54-48	73-42-54	0.7 nm Southeast of Daymarker Fl R 4 Sec
H-C	8	40-51-54	73-40-30	Hempstead Harbor East of R Bell "6"
H-C1 *	11	40-53-12	73-41-42	Hempstead Harbor~ 2.0 nm East of Sands Point
H-D	7	40-50-42	73-39-36	Hempstead Harbor East of Can "9"

* In situ measurements of dissolved oxygen, salinity, temperature and water clarity conducted for World Water Monitoring Day, September 20, 2010.

In response to the typical summer hypoxic event, 12 weekly sampling runs were conducted from the end of June through September 13th. Except for one dissolved oxygen observation in bottom waters of Manhasset Bay, all readings were above 5 mg/l at this end date. To confirm the end of the 2010 hypoxia event, Manhasset Bay was revisited on September 20th as part of the annotated cruise conducted for World Water Monitoring Day. All DO observations were above 4.1 mg/l.

The ambient network of 22 stations was sampled weekly and in situ measurements were made for pH, temperature, salinity and dissolved oxygen (DO). This year, the cruise plan was expanded by one sampling station located in Eastchester Bay at the confluence of the Hutchinson River. 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 ninth 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 3.0 meters. This range is nearly the same as in the past seven 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 2010, observations below 1.0 meter were common in the embayments throughout the summer. 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, and frozen. Subsequent to a laboratory audit in October, certification was granted and analyses were performed in-house by the Interstate Environmental Commission's laboratory. NELAP certification was received through NJ DEP OQA. 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 and Region 2, 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 2010 ambient water quality monitoring in Long Island Sound is shown on the pie chart on the following page entitled "2010 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 2010 marks the tenth 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 1.2 to 19.6 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 July 12th. This is about 30 days earlier than typical of summer surface minimums. Bottom waters ranged from 0.8 to 9.2 mg/l with the low values representing extreme hypoxia and, in some areas, anoxic conditions. These extremely low values were recorded from early July through mid-August. The temporal range of poor surface and bottom dissolved oxygen concentrations were about the same over those of the 2009 survey.

As shown on the pie charts depicting 2009 and 2010 monitoring data, the condition of the surface waters was significantly better during 2009 than in 2010. The 2010 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 53.33%, 35.42% and 11.25%, respectively. In the same category order, the results of the 2009 survey were 85.66%, 12.75% and 1.59%, respectively. The weather patterns for 2010 were extreme: a very wet spring followed by an extremely hot summer with little wind. The March nor'easter brought over 10 inches of rain requiring closure of shellfish beds. From late April through early September, Central Park, New York, recorded 37 days of over 90^0F.

Based on the percentage of hypoxic readings, the bottom waters of the Sound were the same in 2010 as compared to 2009. As displayed in the bottom half of the pie chart entitled "2009 - 2010 Dissolved Oxygen Monitoring," the 2010 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 19.66%, 52.13% and 28.21%, respectively. In the same category order, the bottom water results of the

INTERSTATE ENVIRONMENTAL COMMISSION

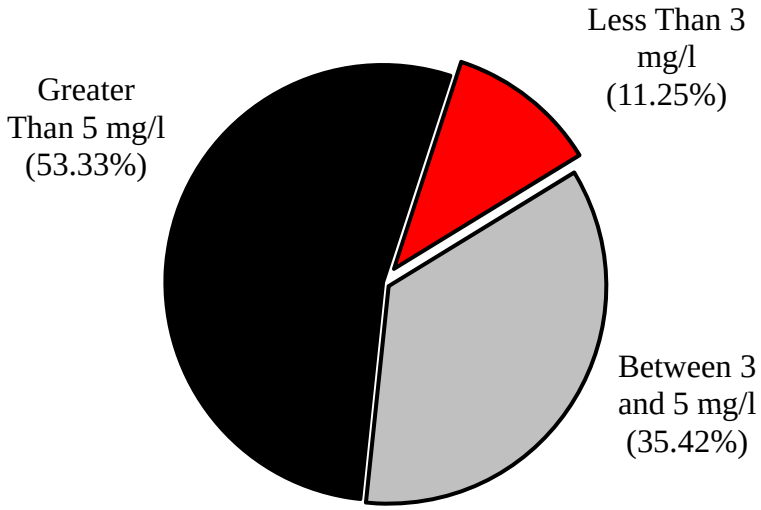
LONG ISLAND SOUND STUDY

2010 DISSOLVED OXYGEN MONITORING

SURFACE AND BOTTOM WATERS

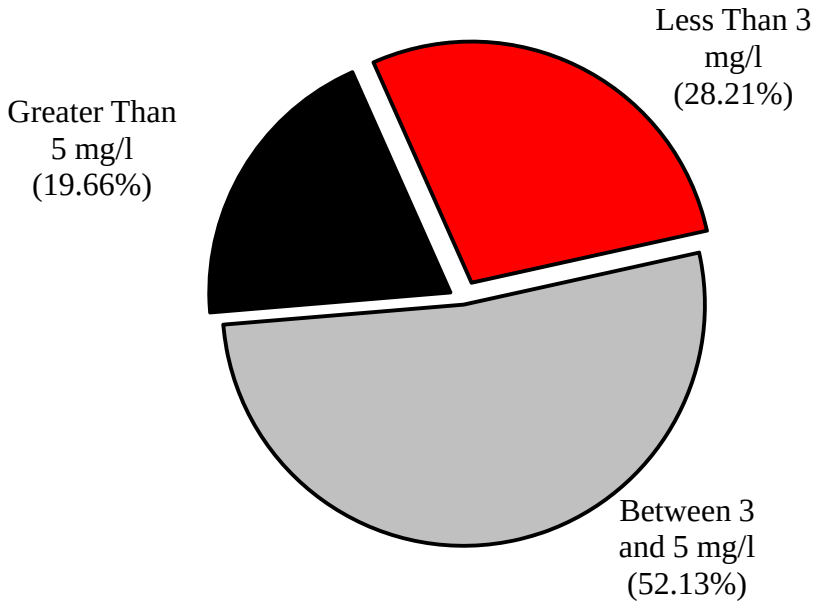
SURFACE WATERS

Range of Dissolved Oxygen Values: 1.2 to 19.6 mg/l



BOTTOM WATERS

Range of Dissolved Oxygen Values: 0.8 to 9.2 mg/l



INTERSTATE ENVIRONMENTAL COMMISSION

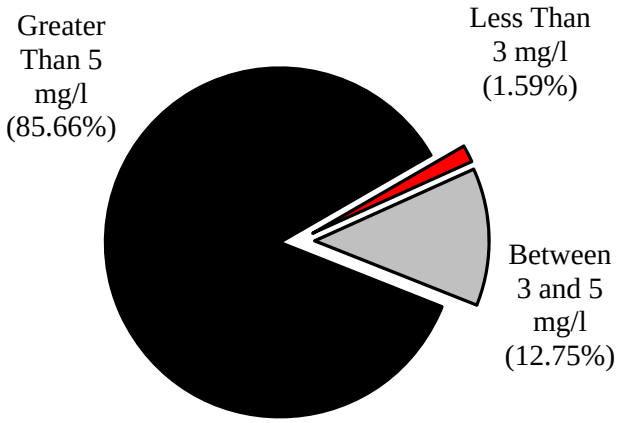
LONG ISLAND SOUND STUDY

2009-2010 DISSOLVED OXYGEN MONITORING

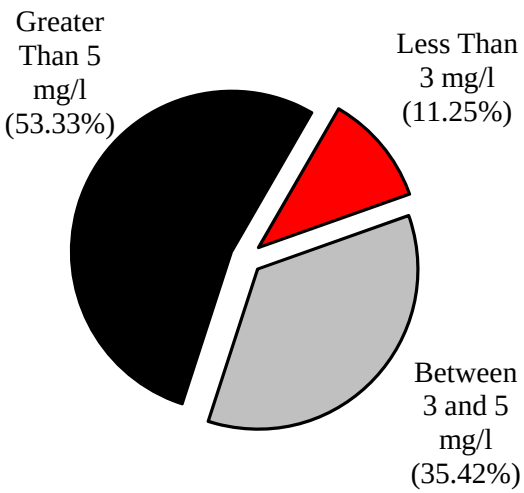
SURFACE AND BOTTOM WATERS

SURFACE WATERS

2009

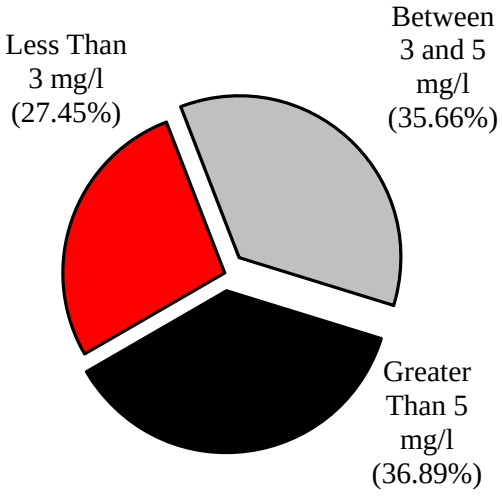


2010

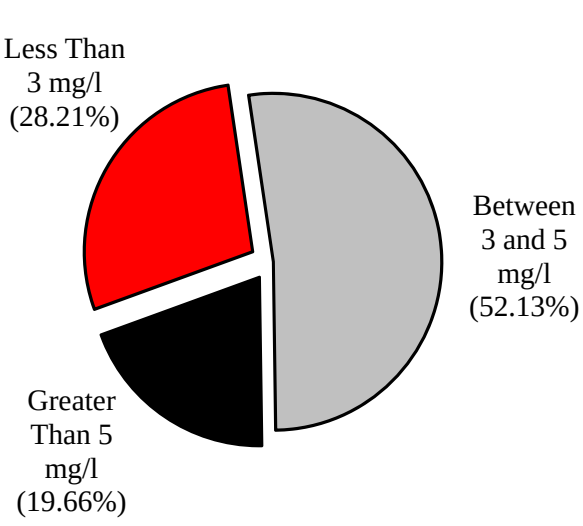


BOTTOM WATERS

2009



2010



2009 survey were 36.89%, 35.66% and 27.45%, 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 22 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 separately. The graph indicates that hypoxic conditions were observed in surface waters during the 2010 sampling; this is the tenth 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 2010, hypoxic (DO < 3 mg/l), as well as anoxic conditions (DO < 2 mg/l), were observed in bottom waters from July 6th to September 14th. As early as July 6th, two stations recorded values less than 3 mg/l. An anomaly occurred on July 12th; 20 stations recorded DO below 2 mg/l. An extremely strong rain storm on July 13-14 was followed by variable constant winds for three days. In response to this weather pattern, dissolved oxygen rebounded: only six stations had DO < 3.0 mg/l on July 19th. Although DO concentrations steadily rose for the remaining summer weeks, one station in Manhasset Bay recorded bottom DO of 2.8 mg/l on September 13th. In order to confirm the end of the summer hypoxia event, the station was revisited on September 20th; the concentration was 4.1 mg/l.

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 three year period of 2008 to 2010 lobster harvests were 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

INTERSTATE ENVIRONMENTAL COMMISSION

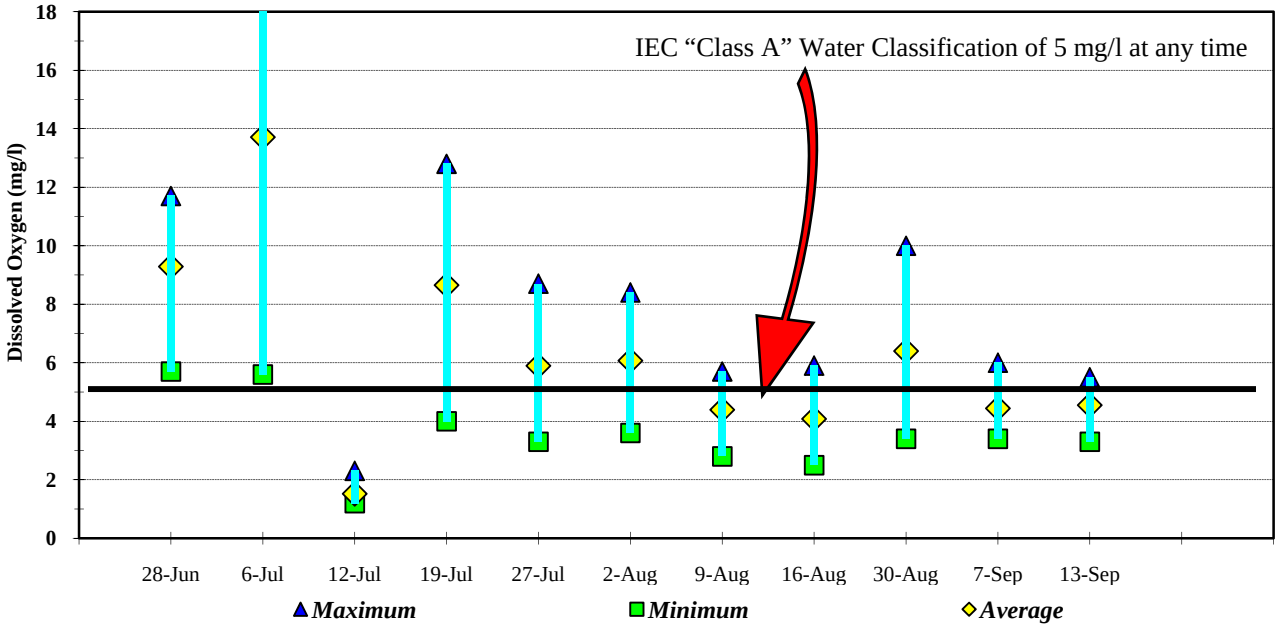
LONG ISLAND SOUND STUDY

2010 DISSOLVED OXYGEN MONITORING

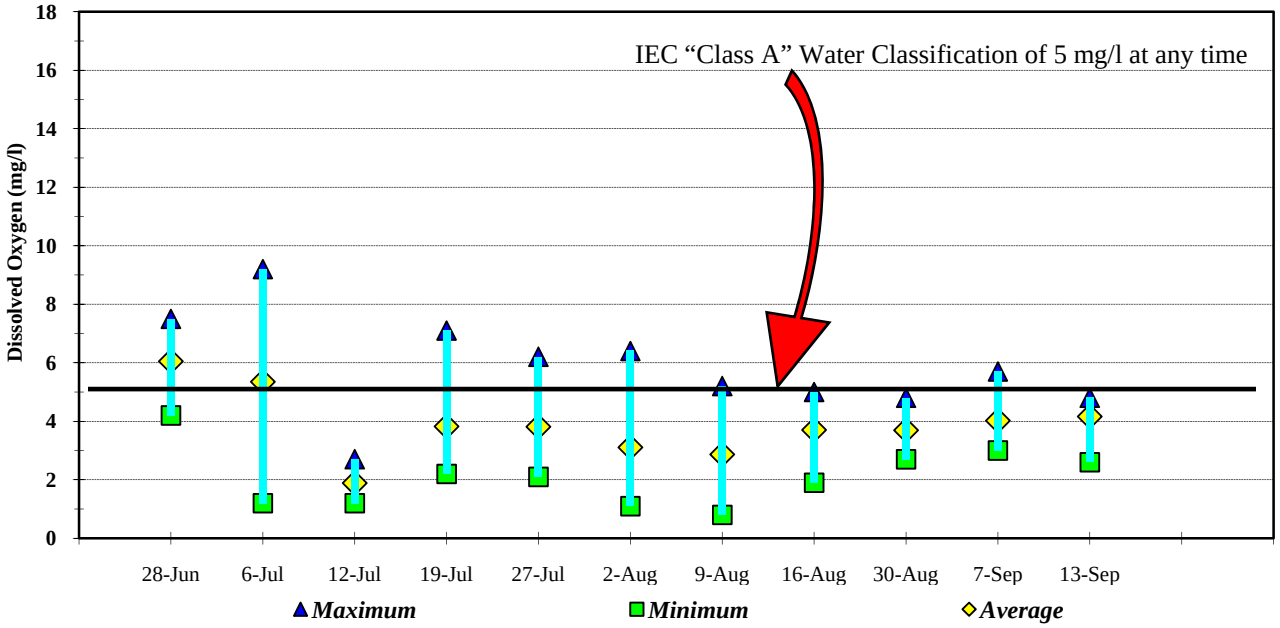
SURFACE AND BOTTOM WATERS:

AVERAGE AND RANGE OF ALL STATIONS SAMPLED

SURFACE WATERS



BOTTOM WATERS



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, "2010 Monthly Bottom Water Temperature Distribution in Long Island Sound" illustrate the temporal extent for temperature at all 22 monitoring stations from west to east. In situ measurements of bottom temperatures recorded during 2010 ranged from 16.6^0C to 26.1^0C in July; 19.0^0 C to 26.1^0C in August, and 20.4^0 C to 23.7^0C in September. Bottom temperature ranges were higher than observations made for the three-year period 2005 to 2007 measurements.

Environmental indicators provide quantitative information on ecological resources, including the state of specific environmental conditions, good or bad. There are several methods to categorize and analyze types of indicators. The US EPA's National Coastal Assessment (NCA) index was used to evaluate the water quality in Long Island Sound on a monthly basis. The NCA index is based on five chemical and biological measures: nitrogen (dissolved inorganic nitrogen in surface waters), phosphorus (phosphate, or PO4, in surface waters), Chlorophyll a (in surface waters), Dissolved Oxygen (in bottom waters) and water clarity (Secchi disk depth). The index incorporates physical, chemical and biological components. Nitrogen and phosphorus are included because of their contributions to eutrophication in the Sound. Chlorophyll concentration is included because it is a measurement of phytoplankton in the water, and too much phytoplankton has been linked to hypoxia. Dissolved oxygen concentration is included because of the harmful effects of hypoxia on living marine resources. Secchi depth is included because it is a measurement of water clarity.

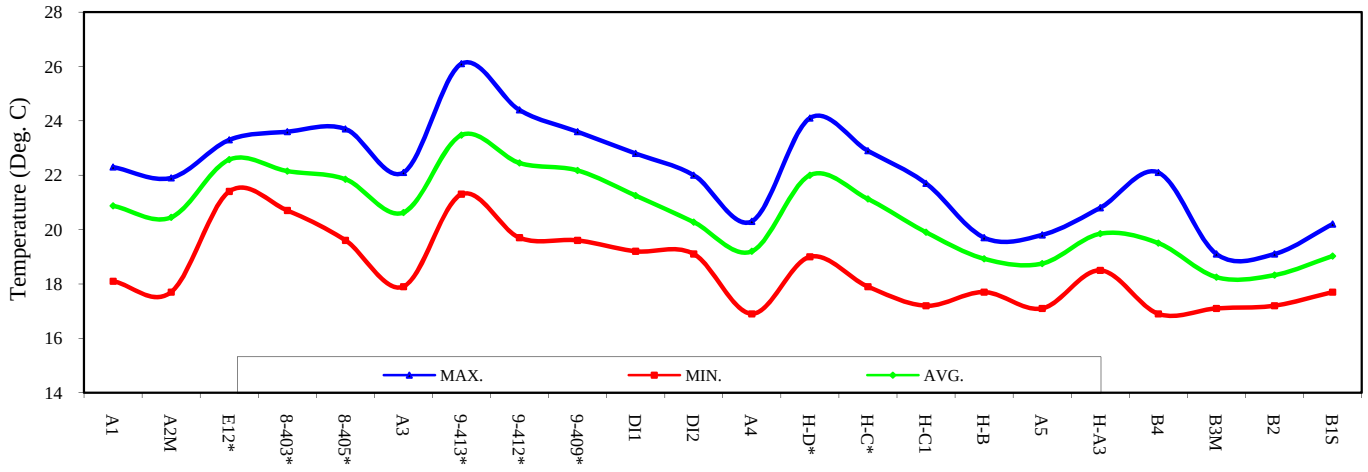
Good water quality is defined as water containing low concentrations of nitrogen, phosphorus and chlorophyll a, high concentrations of dissolved oxygen and high water clarity. The NCA Index Thresholds rate each of the measures as poor, fair or good based on the following thresholds:

NATIONAL COASTAL ASSESSMENT THRESHOLDS FOR SELECTED PARAMETERS

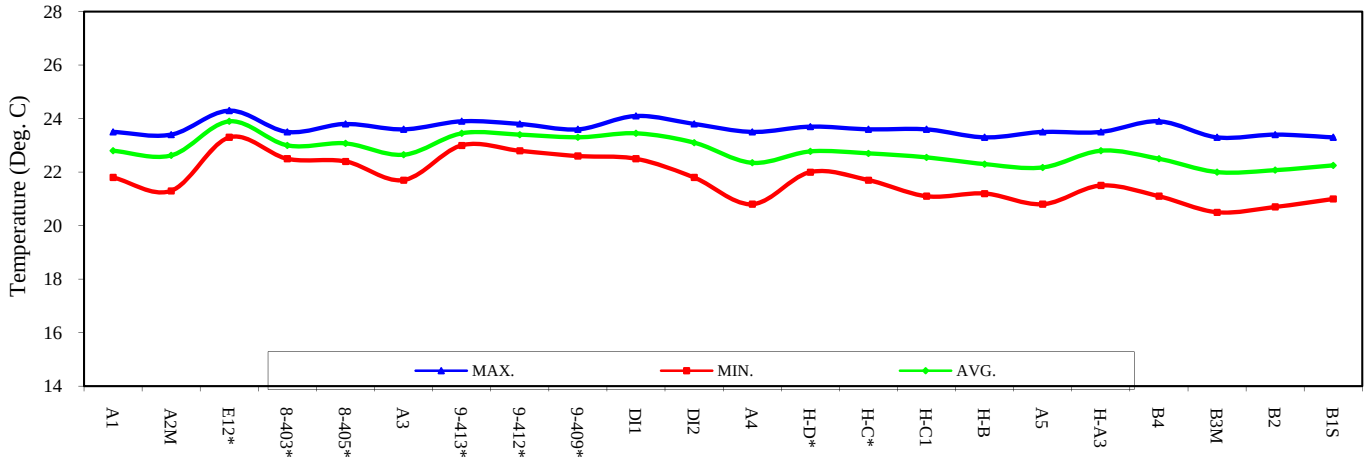
	Nitrogen (mg/l)	***Phosphorus (mg/l)***	***Ch a (ug/l)***	***DO (mg/l)***	***Secchi Depth (meters)***
Poor	< 10.1	< 0.01	< 5.0	< 2.0	< 0.7
Fair	>10.1< 20.5	> 0.01< 0.05	> 5.0< 20.0	> 2.0< 5.0	> 0.7 < 1.1
Good	> 20.5	> 0.05	> 20.0	> 5.0	> 1.1

2010 MONTHLY BOTTOM WATER TEMPERATURE PROFILES IN LONG ISLAND SOUND

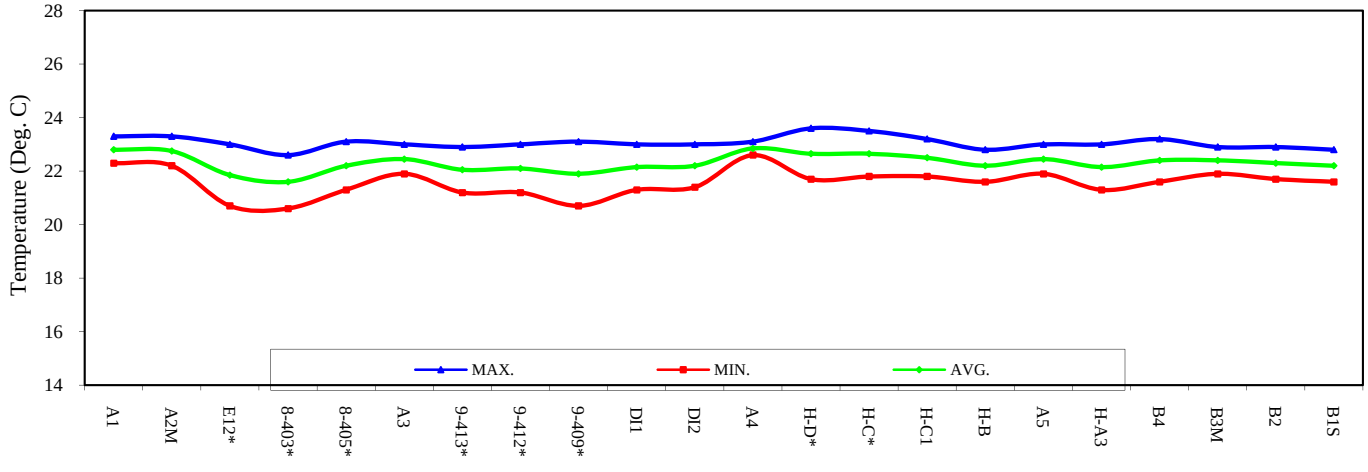
JULY



AUGUST



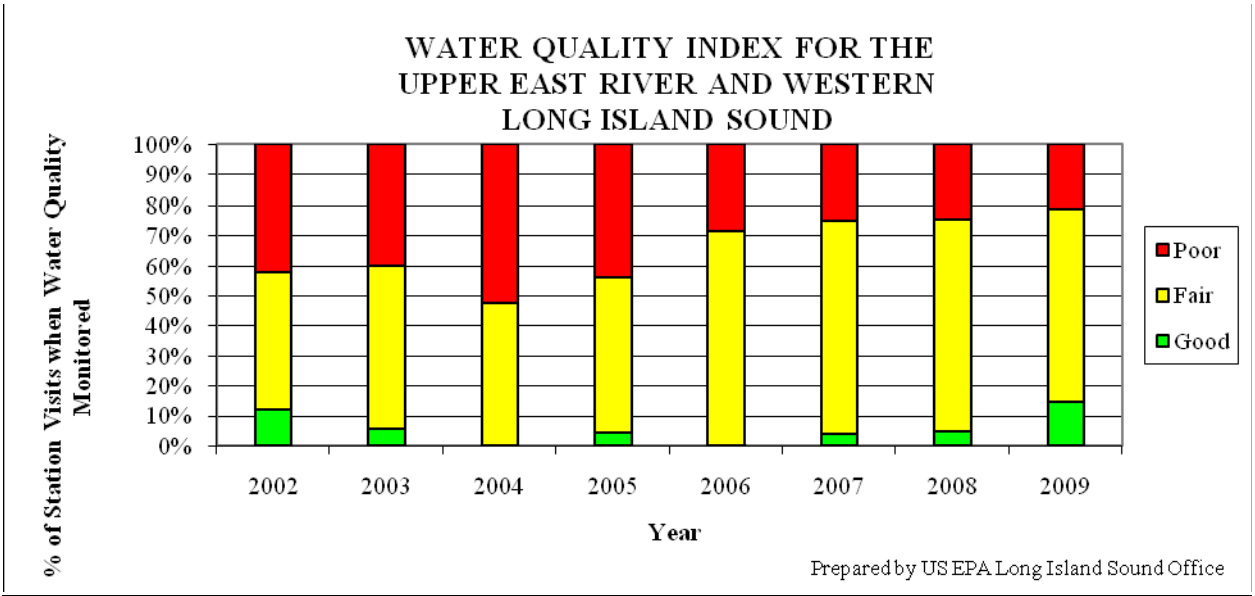
SEPTEMBER



* Stations inside embayments

IEC STATIONS (WEST TO EAST)

Monthly data from June through September for the years 2002 to 2009 for the Commission's ambient water quality data was analyzed by the US EPA's Long Island Sound Office. The IEC does not collect nitrogen or phosphorus data, so the water quality index presented below is based on surface chlorophyll a concentration, bottom dissolved oxygen concentration and Secchi disk depth. Based on the WQI bar graph presented below, 2004 was the worst year with a steady improvement through 2009.



2009-2010 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 15th consecutive year, to assist in sample collection in western Raritan Bay during the 2009-2010 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.


N
W
E
S
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
2009-2010 SAMPLING STATIONS FOR MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY

INTERSTATE ENVIRONMENTAL COMMISSION

2009-2010 SAMPLING STATION LOCATIONS FOR MICROBIOLOGICAL SURVEYS IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY

SAMPLE No.	STATION	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
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

During October 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 January 26 until April 30, 2010, two survey runs were completed. All sample collection, storage and delivery to the US EPA Edison laboratory adhered to Chain of Custody procedures and followed standard operating methods as outlined in the NJ DEP Field Sampling Procedures Manual. The Commission, at the request of BMWCA, will again conduct this survey over the 2010-2011 winter and spring seasons.

Typical of winter conditions in the northeast, severe cold and ice conditions kept the research vessel in port. Heavy snow accumulations from late January through early March, as well as ice conditions in the marina required constant attention and vigilance. A nor'easter impacted the region March 13 to 15, 2010. Sea conditions and floatables created a hazardous condition to navigation which prevented the Commission vessel from leaving the dock on March 16 to assess the sanitary conditions. Regardless, on March 17, a public notice was issued by NJ DEP, Water and Monitoring Standards, for the closure of all shellfish harvest beds in the waters of Raritan and Sandy Hook Bays, and the Navesink and Shrewsbury Rivers. This closure was put in effect to protect public health from adverse water quality. This area represents 27,800 acres. The closure ended on March 27, 2010.

Destroyed Seawall at Leonardo, New Jersey, March 2010
Photo by P. Sattler, IEC

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 2010.

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 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.

2010 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,

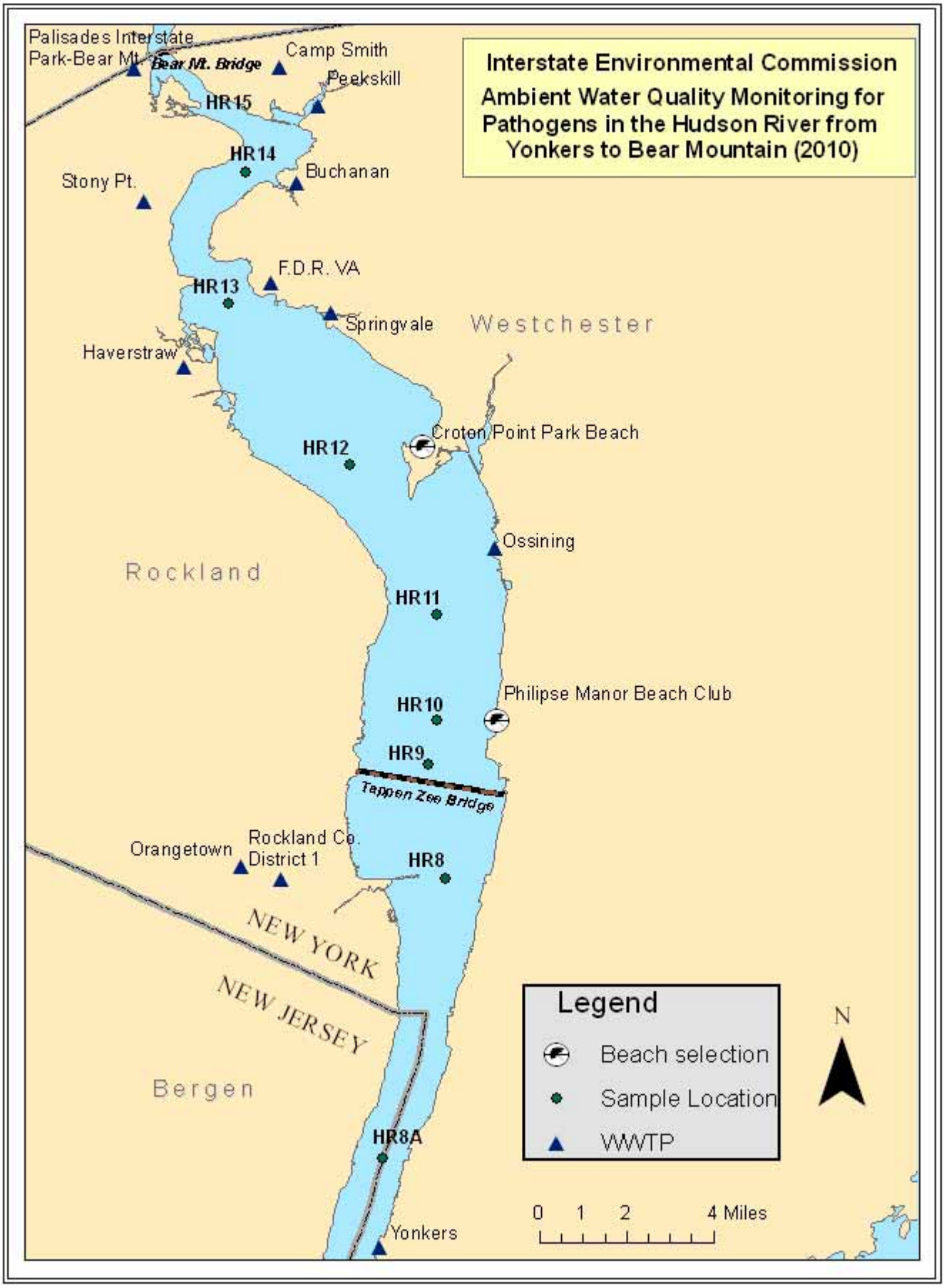
NJ, sampling location was added in order to expand the 2007 survey and this is the southernmost station. This expanded survey was conducted in 2008 and 2010. A map and listing of the sampling stations are on the following pages. All samples were transferred to the IEC laboratory and analyzed for pathogens including enterococcus, and fecal and total coliform and E. coli.

Bear Mountain Bridge as Viewed from Iona Island, Mid-Hudson River, May 2010
Photo by P. Sattler, IEC

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 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 May 4, 2010, to resume sampling in the Hudson River. Between May 4th and June 23rd, all dry and wet weather samplings were completed. This survey will continue during the 2011 spring season. A summary of the four year effort on the Hudson River follows the map and station list.

Due to frequent rain events and minimal mechanical failures, IEC successfully completed the fourth year of ambient sampling on the Hudson River. The IEC laboratory and engineering staff have compiled four years worth of data collection and analysis into an interim report entitled “Ambient Water Quality Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain”. This report is an effort to present a summary and synthesize results of the water quality data collected during the period 2006 to 2010, inclusive. The report is undergoing internal reviews and should be finalized in early 2011.


Interstate Environmental Commission
Ambient Water Quality Monitoring for Pathogens in the Hudson River from Yonkers to Bear Mountain (2010)
Palisades Interstate Park-Bear Mt.
Bear Mt. Bridge
Camp Smith
Peekskill
HR15
HR14
Buchanan
Stony Pt.
F.D.R. VA
HR13
Springvale
Westchester
Haverstraw
Croton Point Park Beach
HR12
Ossining
Rockland
HR11
Philipse Manor Beach Club
HR10
HR9
Tappan Zee Bridge
Orangetown
Rockland Co. District 1
HR8
NEW YORK
NEW JERSEY
Bergen
HR8A
Yonkers
Legend
Beach selection
Sample Location
WWTP
N
0 1 2 4 Miles

2010 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., E.coli 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.

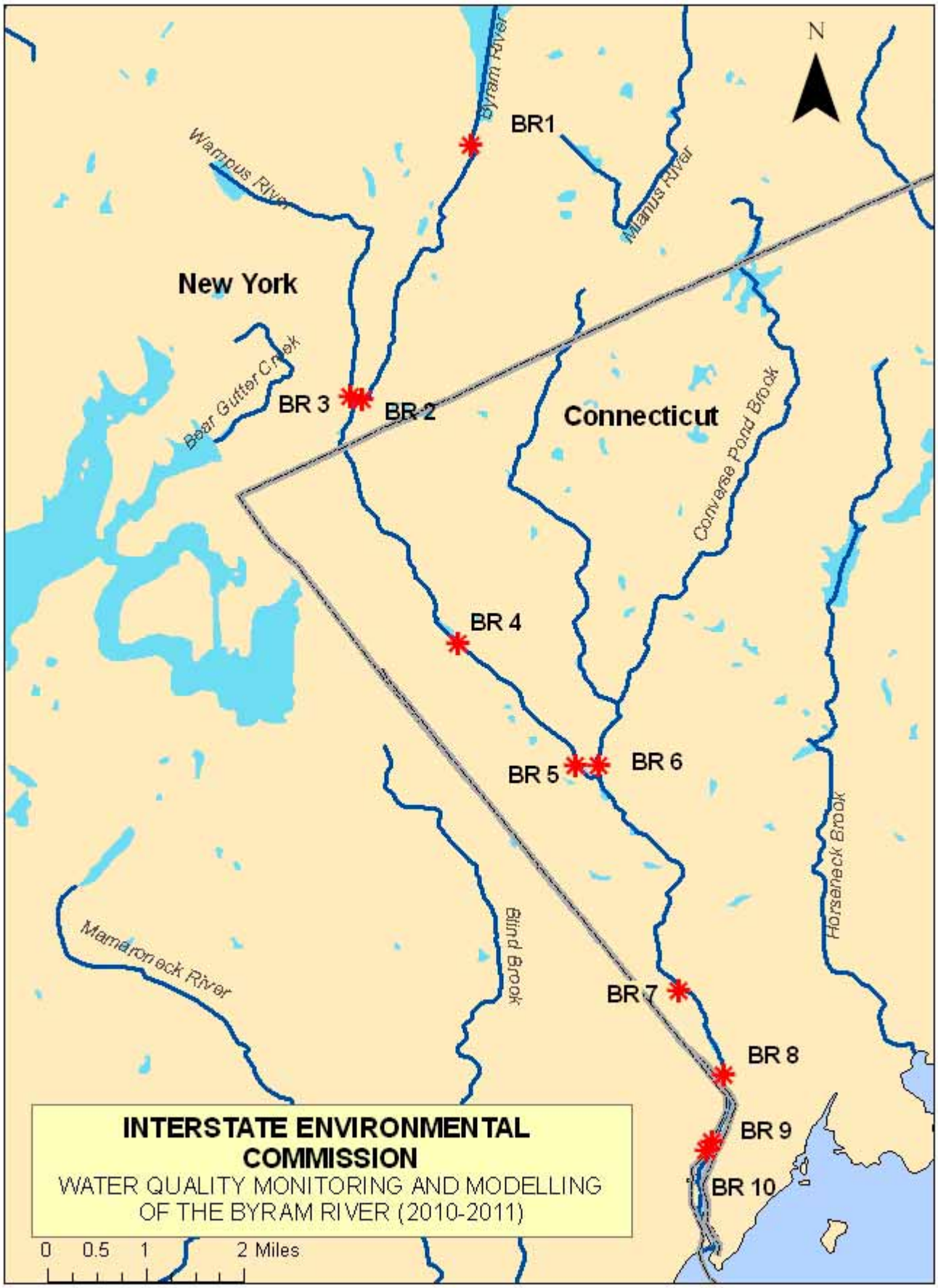
AMERICAN RECOVERY AND REINVESTMENT ACT AND CLEAN WATER ACT SECTION 604(b) FUNDING

The IEC is the recipient of three grant awards from 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 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. For the period 2002 to 2009, IEC in conjunction with a multi-agency work group, conducted pathogen track down on the navigable portion of the lower Byram River. In early 2010, IEC developed and subsequently received NYS DEC approval for a new QAPP for water quality monitoring of another portion of the Byram River. During the summer of 2010, IEC began performing ambient water quality sampling mid-stream at 10 locations on the Byram River to assess water quality of the river and the watershed. On the following page is a map of the study area.

Byram River Site BR5 – Sherwood Avenue, March 2010
Photo by E. Powers, IEC


N
Byram River
BR1
Wampus River
Mianus River
New York
Bear Gutter Creek
BR 3
BR 2
Connecticut
Converse Pond Brook
BR 4
BR 5
BR 6
Horseneck Brook
Blind Brook
Mamaroneck River
BR 7
BR 8
BR 9
BR 10
INTERSTATE ENVIRONMENTAL COMMISSION
WATER QUALITY MONITORING AND MODELLING OF THE BYRAM RIVER (2010-2011)
0 0.5 1 2 Miles

The Byram River was sampled four times: twice during dry weather (July 6 and August 3, 2010) and twice during wet weather (July 19 and August 16, 2010). A wet event was considered greater than 0.25 inches as recorded by the USGS Byram River at Pemberwick rain gauge during the previous 24 hours. In the field, IEC measured dissolved oxygen, temperature, pH, salinity and conductivity. In the IEC laboratory, samples were analyzed for pathogens (bacteria and viruses that cause infection or disease), metals, settleable solids, turbidity and chlorides. The phosphorus and nitrogen analysis was subcontracted to an outside certified laboratory. All samples were transported using Chain of Custody procedures. The sampling results will be used to develop and calibrate a water quality model of the Byram River watershed.

After the model has been developed by a subcontractor in 2011, IEC will sample twice more, once during dry weather and once during wet weather. This second round of sampling results will help validate the water quality model of the Byram River watershed. This model will be used as a GIS-based watershed planning tool. Its implementation will help design specific flow and water quality monitoring programs; prioritize sub-basins that contribute significant nutrient and pathogen loads; and identify green infrastructure projects for funding recommendations.

MS4 Survey of Croton-Kensico Watershed

Under the auspices of NYS DEC, another ARRA project involves IEC's collaboration with the Croton-Kensico Watershed Intermunicipal Coalition (CKWIC). The project goals are to develop a regional geographic information system-based map. The GIS layers will show the features of an MS4 in a sub-watershed of the Croton/Kensico watersheds. The sub-watershed encompasses the northern Westchester County town of Somers, New York.

In New York, urban municipalities with MS4s need a State Pollutant Discharge Elimination System (SPDES) permit for their stormwater discharges. The SPDES permit requires the development of a Stormwater Management Program to help keep harmful pollutants from entering the sewer system and flowing to a local waterbody. One important aspect of the Stormwater Management Program is identification and mapping of storm sewer features within the MS4, which is part of MS4 General Permit compliance. This work will enable source trackdown of any suspected illicit discharges identified either at outfalls or within stream systems. It is necessary for the detection and elimination of illicit connections within the MS4 system, which will ultimately ameliorate the environmental quality of receiving waterways.

The regional map is intended to assist with maintenance of each MS4 stormwater conveyance system and assist with the identification of projects related to the CKWIC's retrofit program. Maintenance of the conveyance system and implementation of retrofit projects will assist with reducing the water quality impacts of sediment, phosphorus and other pollutants that tend to collect within the conveyance system components.

This project has two phases. First, selection of a CKWIC sub-watershed and then identification of known and suspected outfalls, catch basins, stormwater manholes, stormwater

swales and other components of the municipal storm sewer system. Secondly, field verify and gather data about each storm sewer feature. This includes locations of outfalls; type of conveyance system; pipe material, shape and size for closed pipe systems; channel/ditch lining material, shape and dimensions for open drainage systems; location and dimensions of culvert crossings; drop inlet, catch basin and manhole locations; number and size of connections (inlets/outlets) to catch basins and manholes and direction of stormwater flow. The IEC will use the stormwater system data to create a map to help CKWIC/Somers meet MS4 permit requirements for a complete illicit discharge detection and elimination (IDDE) program.

In cooperation with NYS DEC and Westchester County, IEC developed a consistent MS4 Component Inventory protocol that establishes mapping standards and field data collection procedures. The primary objective of the collaborative approach was to standardize identification and classification of stormwater conveyances used to inventory and map stormwater infrastructure features. The Purdy Lake MS4 community in Somers, New York was selected as the project study area. IEC has begun verifying storm sewer features and creating a map of the Purdy Lake community that includes geographic information and existing MS4 data. IEC identified missing and conflicting MS4 data and is addressing these discrepancies.

Long Island MS4 Phase II Planning Program

In 2009, IEC received a $232,785 American Recovery and Reinvestment Act (ARRA) grant from NYS DEC to support stormwater management planning in over 100 communities in Nassau and Suffolk Counties. The focus deals with MS4s that discharge to Long Island shellfish harvest areas covered by a TMDL.

This grant enabled IEC to fund a coordinator for the New York State Sea Grant (NYSG) Long Island MS4 Planning Program. Planning support for the project enabled the coordinator to conduct site visits, consultations, presentations, chair workgroups, maintain the Long Island MS4 e-mail listserv, and provide feedback on annual municipal stormwater program reports. Supporting further inter-municipal stormwater programs is a priority for the program. The project will help Long Island MS4 communities meet federal Clean Water Act requirements to manage stormwater runoff, and protect and restore Long Island's coastal resources from pollutants such as pathogens, excess nitrogen, sediment and trash that make their way into the storm sewer system.

To date, the NYSG Long Island MS4 Planning Program coordinator has compiled a list of MS4s to focus on and has conducted in-depth consultations with groups representing more than twenty-five municipalities. Fifteen MS4 annual reports have been reviewed. Feedback has been provided during these consultations. Other activities include participation in the US EPA review of MS4 stormwater management programs, and numerous education and outreach efforts. Education and outreach efforts include meeting with communities about managing pathogens and MS4 watershed strategy planning; Long Island MS4 e-mail listserv management; and distribution of stormwater reference materials.

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.

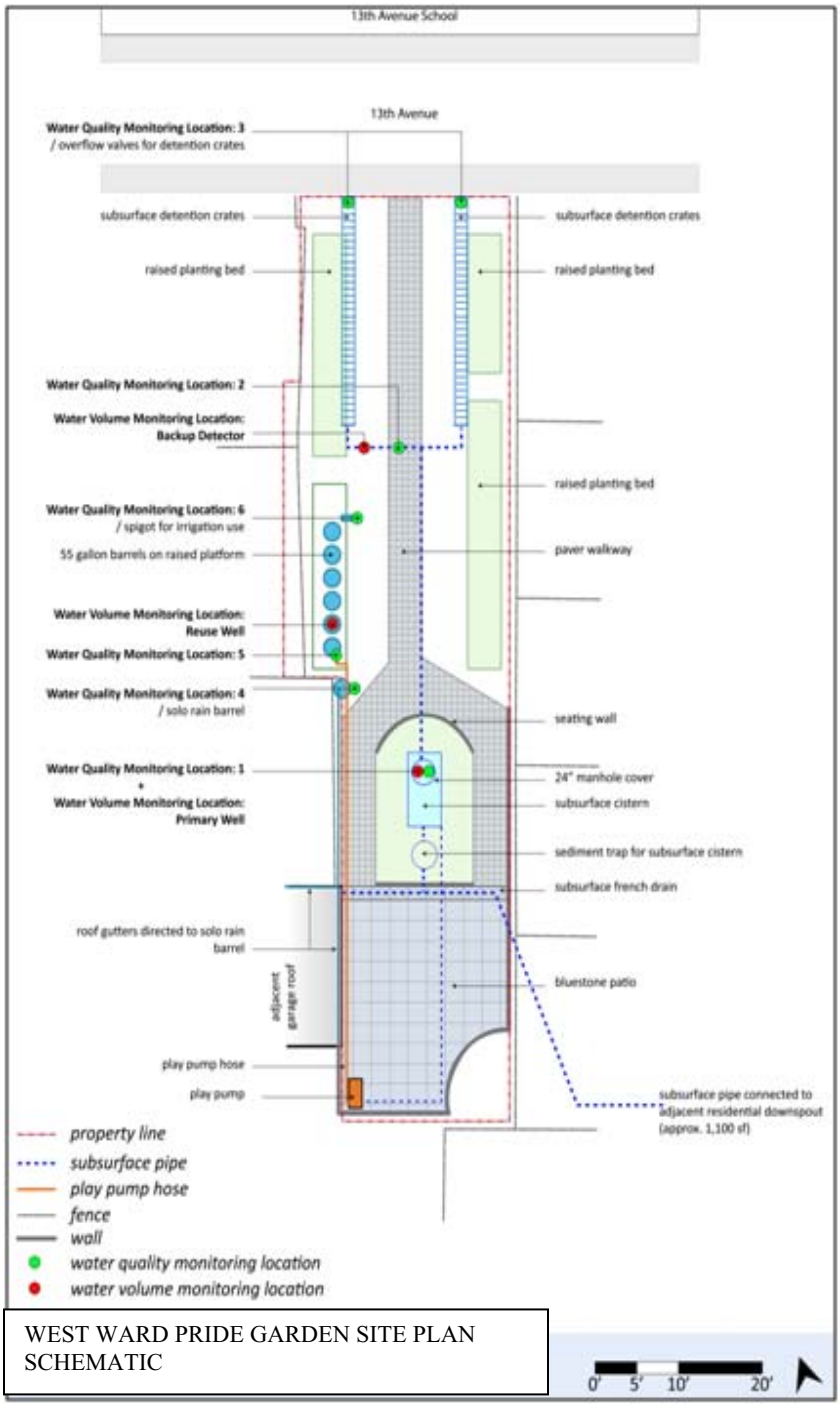
Implementation and Assessment of the Effectiveness of the Green Infrastructure Technology for Reducing Combined Sewer Overflows in Newark, New Jersey

The Interstate Environmental Commission (IEC), in collaboration with eDesign Dynamics (EDD), the New York-New Jersey Harbor Estuary Program (HEP), the New England Interstate Water Pollution Control Commission (NEIWPCC), the NY/NJ Baykeeper, the Greater Newark Conservancy (GNC), and the City of Newark, is working on a project entitled, "Assessing the Effectiveness of the Green Infrastructure Technology." This study involves installation and successive field monitoring of multiple green infrastructure (GI) technologies or alternatively low impact development (LID) technologies on a formerly vacant city-owned lot in Newark, New Jersey. The primary objective of the study is to assess the effectiveness of these measures in reducing combined sewer overflows (CSOs) from Newark, New Jersey sewersheds. The secondary objective of the project is to analyze the cost–effectiveness of the selected GI technologies. Ultimately, the project's effectiveness in reducing CSOs and associated impacts on receiving waterways will be evaluated based on water quality and quantity data assessments. This project, which is administered by NEIWPCC, leverages grant funding from the HEP and the NY/NJ Baykeeper.

Discharges from CSOs during rain events can be detrimental to the health of ambient waters that surround a community. The goal of this project is to minimize flows to CSOs during wet weather by implementing a series of GI strategies that maximize infiltration, retention and detention of stormwater. Field studies will evaluate these strategies via stormwater collection from multiple catchment areas.

The GI demonstration project is situated on an approximately 2,200 square foot city lot, which is located across from the Thirteenth Avenue School between 8th and 9th Streets in the West Ward neighborhood of Newark, New Jersey. The site is within a residential urban neighborhood that is serviced by a combined sewer system; overflows from this area drain into New York Harbor Complex via the Passaic River. The study site was identified by the project team after discussions with the City of Newark and their Sustainability Officer in the spring of 2009. The site design schematic and water quality monitoring locations are shown on the following page.

The formerly abandoned property is now entitled, "The West Ward Pride Garden" and serves as a community garden. The project site was fully completed in July, 2010, with the following GI measures implemented: a subsurface retention water tank, above ground cisterns, rain barrels, subsurface detention tanks, permeable pavement, raised planting beds and rain gardens. Subsurface pipe from the downspouts to the subsurface water tank have been installed for rainwater harvesting and stormwater detention. The intent is to capture stormwater from downspouts connected to a garage roof and multiple rooftops of homes adjacent to the project site. Runoff from the upper half of the site is also collected in the subsurface water tank. Stormwater is captured for reuse, as well as detained in order to slowly release stormwater and minimize overloading the system.



WEST WARD PRIDE GARDEN SITE PLAN SCHEMATIC

In addition to project management and oversight, IEC was responsible for conducting the water quality monitoring portion of the study. During three wet weather monitoring events IEC staff collected samples at up to six sampling locations within the designed GI network. A minimum of 0.15 inches of rain was considered a wet weather event. These sampling events occurred on August 23, September 13 and September 17, 2010. Subsequently, samples were analyzed in-house for the following water quality parameters: settleable solids, turbidity, chlorides, metals and pathogens – fecal coliform and *Enterococcus*. In addition, field measurements were taken for temperature, specific

conductance, pH and dissolved oxygen. EDD set up in situ rain gauges and data loggers to continuously record water quantity parameters.

The water quantity and quality field data will be used to demonstrate the functionality of the different GI technologies and proposed strategies to quantify the benefits for future sites. When considering replicating this design on a broad scale, it will be important to also determine if the installations are economically practical. If the results of this study prove that the implementation of green infrastructure on a small vacant lot is feasible, then it could be justified to use similar GI structures at other locations served by combined sewer systems in the District. The result will be put in terms of dollars per volume of CSO abated.

Ultimately, the garden will be managed and cared for by the West Ward community. The garden uses all sustainable features that include recycled brick for pathways and drought tolerant plant species. The water reuse system has been designed to collect water from the site and adjacent properties to provide 100% irrigation for all plantings since there is no City water supply at the project site. The project team has been working together to design and construct the community garden to study strategies that reduce CSOs but, additional goals of the project are to create a vibrant space for the community, build a "Living Lab" for students, and use the site as a demonstration for other vacant lots in Newark, as well as in other cities.

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

As part of and in cooperation with the 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

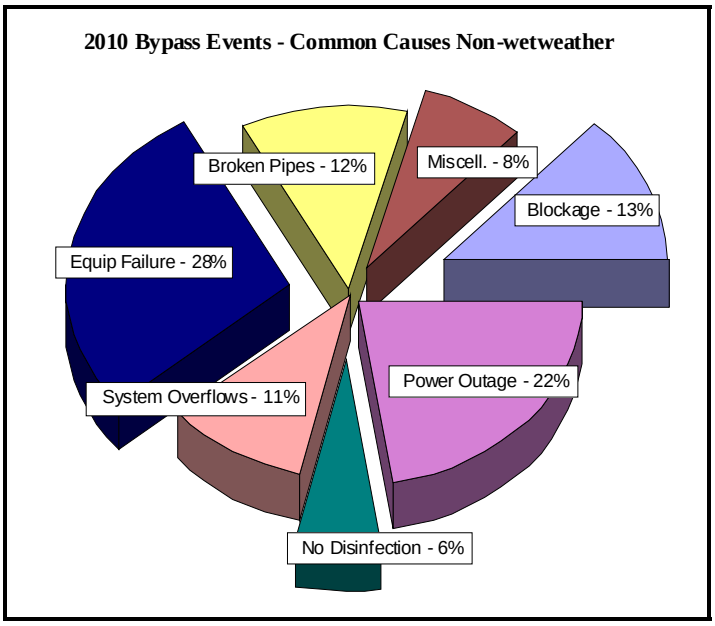
laboratories located at the Bergen County Utilities Authority, MCUA and PVSC. This program was maintained in 2010.

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 2011.

REGIONAL BYPASS WORKGROUP

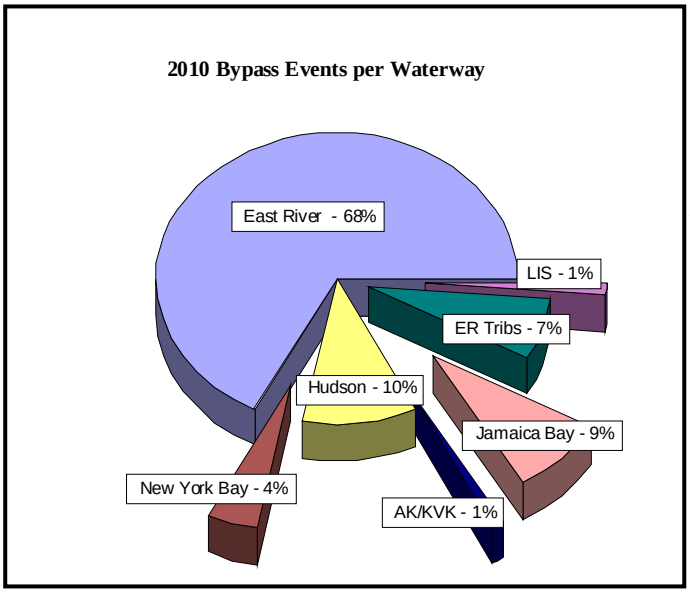
The Regional Bypass Workgroup (RBWG) was formed in 1997 to address the issue of unplanned bypasses of raw and partially treated sewage, i.e., treatment plant upsets, broken pipes due to age, or construction mishaps. The Commission has chaired the RBWG since its inception. The RBWG has members from the 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 twelve full calendar years (1998 to 2009), 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. This past year a 16,000 pound spill of sugar was called into the hotline. During this past year, 225 bypass events were reported to the Workgroup from January 1, 2010 to November 30, 2010. 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.



As in past years the majority of the events (<70%) reported to the RBWG were wet weather events. 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. Additionally, the hydraulic capacity of several NYC plants was diminished due to construction upgrades. Excluding wet weather during 2010, the common causes for bypass events were equipment failures (19), power outages (15), blockages (9), broken pipes/lines (8), system overflows (7) disinfection problems (4), and 5 events were caused by miscellaneous reasons including illegal connections and construction. The breakdown is displayed on the pie chart shown on the previous page.

Bypass events that had the potential to impact primary recreational waters occurred during the period May 29th through September 6, 2010, which represents the "official" bathing season (Memorial Day weekend to Labor Day). There were 68 releases, or 30% of the total, during this period. During 2010, the waterways impacted by bypass events are shown on the pie chart to the left.



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 New York Harbor, Long Island Sound, 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.

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. While Section 305(b) of the federal Clean Water Act requires assessments of water quality, Section 303(d) of the same Act requires that those waterbodies deemed impaired in 305 (b) assessments be prioritized in terms of their degree of impairment and how necessary it

is to implement pollution controls. Whereas two separate reports were required prior to 2010, each participating organization now aggregates these assessments and priority listings, as well as other extensive programmatic information to form an Integrated Report. Integrated Reports are submitted to the US EPA on April 1st of every even year. The US EPA then uses these individual reports to prepare a biennial National Water Quality Inventory Report to Congress to describe the condition of the nation's waters and to help Congress allocate certain Clean Water Act funds among states.

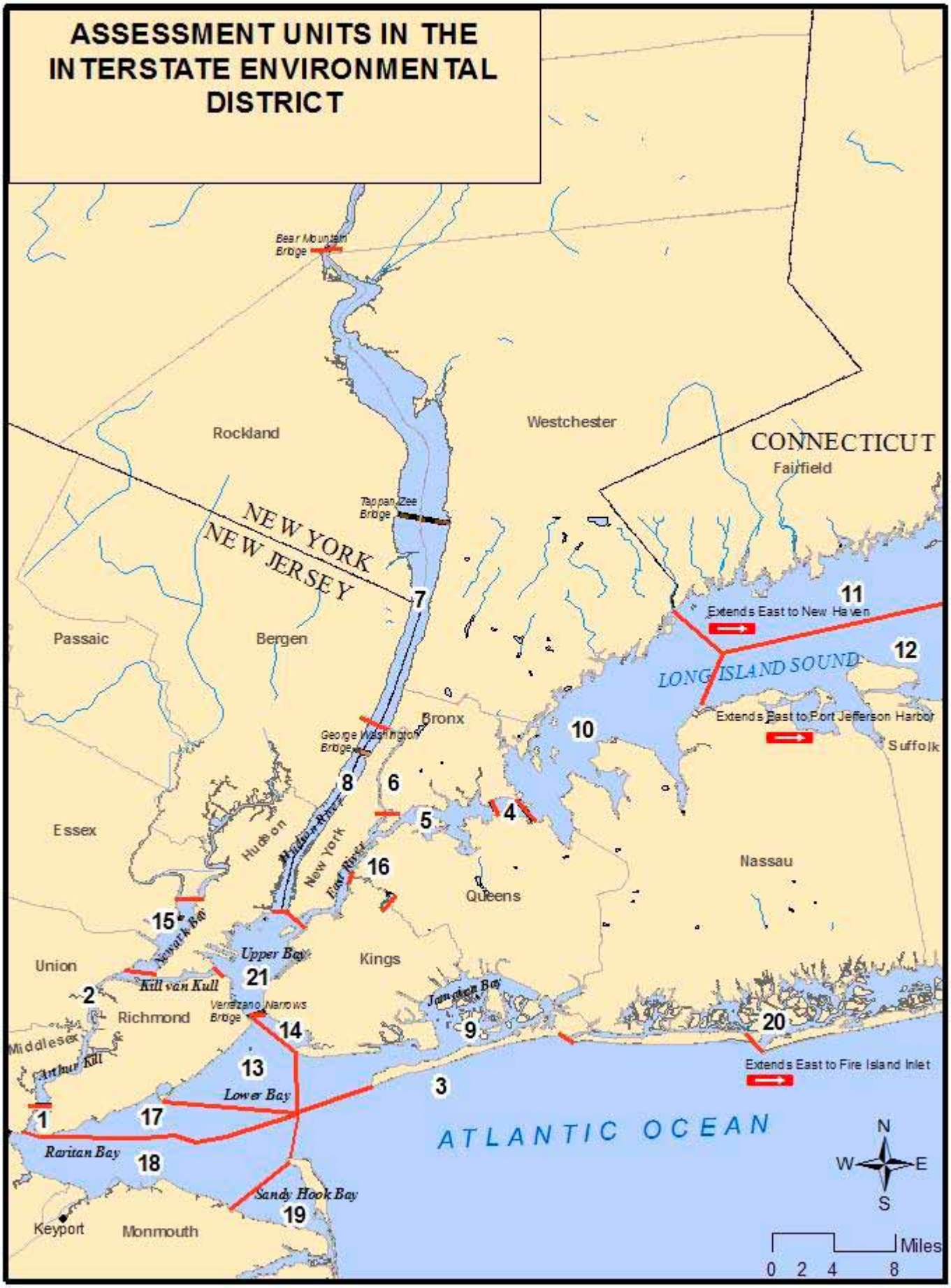
The IEC has made submissions since the inception of this reporting requirement which began in 1984. The Commission's Integrated Report is a comprehensive document involving information from multiple agencies. The goals of 305(b) assessments include coverage characterizing all waters in the Interstate Environmental District which adds to the extensive national coverage; reduces paperwork while increasing the amount of assessed waters; provides geo-referencing information to identify and map specific waterbodies, including whether they meet water quality standards, and to enable long-term tracking of trends; and allows a more rapid, real-time public access of water quality information.

As US EPA's Guidance requires, the Commission's report contains an 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 2010 reporting period, which reflects 2008 and 2009 information, the Commission's waterways were divided into assessment units and a methodology was developed for the statistical analysis of data which, along with various other types of information, determine how well each one of those assessment units supports the uses assigned to it (see the map on the following page).

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.


ASSESSMENT UNITS IN THE INTERSTATE ENVIRONMENTAL DISTRICT
Bear Mountain Bridge
Rockland
Westchester
CONNECTICUT
Fairfield
Tappan Zee Bridge
NEW YORK
NEW JERSEY
7
11
Extends East to New Haven
Passaic
Bergen
LONG ISLAND SOUND
12
Extends East to Port Jefferson Harbor
Suffolk
Bronx
George Washington Bridge
10
8
6
5
4
Essex
Hudson
Harlem River
New York
East River
16
Nassau
Queens
15
Newark Bay
Upper Bay
Union
Kings
21
Kill van Kull
2
Richmond
Verrazano Narrows Bridge
Jamaica Bay
9
14
20
Middlesex
Arthur Kill
13
Extends East to Fire Island Inlet
Lower Bay
3
1
17
ATLANTIC OCEAN
Raritan Bay
18
Sandy Hook Bay
19
Keyport
Monmouth
N
W
E
S
Miles
0 2 4 8

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 2010, 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.

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 2010. These efforts are expected to result in completed TMDLs in 2012. 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 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 system (MS4) outfalls are major sources of pollution that are allowed to discharge only during wet weather. During the past ten years, national interest in the operation and control of municipal separate storm sewer systems has intensified. Phase I of US EPA's stormwater program (1990), administered as NPDES permit requirements, addressed medium and large municipal separate storm sewer systems, construction activities, and industrial activities. The next step, Phase II, requires permits for stormwater discharges from MS4s in urban areas in 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.

Initiated in 2002, the Commission was asked by US EPA - Region 2 to investigate the feasibility of conducting dry weather investigations of MS4 outfalls in the District. IEC received some information from US EPA on MS4s (locations, sizes, and discharge waterways) in Nassau County, New York, and started conducting outfall inspections. The Commission has continued this program, expanded it, and incorporated it into a program of ongoing CSO and MS4 inspections. IEC has adopted the term Outfall Reconnaissance Inspections, which both aligns the program description with the US EPA's Center for Watershed Protection (CWP) terminology, more accurately reflects the inclusion of both combined and separate sanitary sewer outfalls and is using a standardized form for field observations. When field inspections reveal outfalls flowing under dry weather conditions, the appropriate agency is contacted for remediation. The following table shows the 2010 summary of outfall reconnaissance inspections. This program will continue during 2011.

CSO Outfall on the Upper East River, July 2010
Photo by P. Sattler

CSO DRY WEATHER INSPECTIONS
NEW YORK AND KINGS COUNTIES, NEW YORK

OUTFALL ID	SPDES PERMIT #	DATE INSPECTED	LOCATION	DISCHARGE WATERBODY	FLOW PRESENT
WIM-004	NY0026131	06/04/2010	East 75th Street	East River	No
WIM-007	NY0026131	06/04/2010	East 78th Street	East River	No
WIM-005	NY0026131	06/04/2010	East 76th Street	East River	No
NCM-005	NY0026204	06/04/2010	East 63rd Street	East River	No
NCM-40	NY0026204	06/04/2010	East 63rd Street	East River	No
NCM-40	NY0026204	06/13/2010	East 63rd Street	East River	No
WI-001	NY005177	08/19/2010	East 74th Street	East River	No
WI-002	NY005177	08/19/2010	East 73rd Street	East River	No
WI-003	NY005177	08/19/2010	East 75th Street	East River	No
NR-37	NY0026247	09/02/2010	West 79th Street	Hudson River	No
NR-37	NY0026247	09/10/2010	West 79th Street	Hudson River	No
OH-019	NY0026166	10/08/2010	69th Street	New York Harbor	No
OH-020	NY0026166	10/08/2010	~100 feet south of Owl's Head Pier	New York Harbor	No

In 2010, IEC began revising and expanding its Dry Weather Outfall Reconnaissance Inspection (ORI) Program. A new monitoring protocol is being developed based on the CWP's publication, "Illicit Discharge Detection and Elimination: A Guidance Manual," in conjunction with guidance and strategies of IEC's member states and US EPA. This ensures that field surveys, data collection and reporting methodology will be compatible. Pursuant to these program revisions, a more in-depth ORI field sheet has been developed for 2011, which includes fields to record land use, drainage or pipe shape, vegetation characteristics and indicators identifying intermittent or transitory discharge that has occurred in the past, even if the outfall is not flowing at the time of inspection. IEC plans on incorporating a spatial component to use with GPS and GIS. In addition to recording the location and structural characteristics of the features (shape, size, material, condition, etc.), IEC will incorporate field observations and sample collection procedures for any flowing or standing water observed from outfall inspections. IEC will integrate follow-up investigations to more effectively assist in illicit discharge detection and elimination (IDDE), and expand the geographic extent of the program.

New York municipalities 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. In May 2008, the NYSDEC issued a SPDES General Permit for Stormwater Discharges from MS4s. Entities covered under the general permit were authorized to discharge stormwater from small MS4s provided all of the eligibility provisions of the permit were met. The 2008 permit required permittees to develop stormwater management plans and defined 6 minimum control measures (MCMs) required by Phase II. These control measures include 1) public education and outreach; 2) public involvement/participation; 3) illicit discharge detection and elimination; 4) construction site stormwater runoff control; 5) post-construction stormwater management and 6) pollution prevention/good housekeeping. The permittees were expected to report annual progress to the NYS DEC and fully implement the proposed program by March 2008.

NYSDEC issued a new 5-year SPDES General Permit effective May 1, 2010. The 2010 permit clarified the MCMs and extended permit coverage areas to MS4s discharging to waters for which an EPA-approved TMDL required reduction of a pollutant and construction activities in town, villages and city boundaries. The new permit also allows single entities to gain coverage for one or more regulated MS4s to encourage larger scale coordinated implementation. The 2010 permit also added areas where watershed improvement strategies must be implemented and set numeric reduction criteria by waterbody for each strategy. By 2013, permittees covered under the NYSDEC general permit must assess potential sources of discharge of stormwater pollutants of concern, identify potential stormwater pollutant reduction measures and evaluate their progress.

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. However, the limited funds and great limitations have undermined the efforts to meet current water quality needs.

In New Jersey, CSO's are primarily located along the tidal portions of the Delaware River and its tributaries, the Raritan River, along tidal and non-tidal portions of the Passaic River, and throughout the New York-New Jersey Harbor Complex. There are approximately 206 CSO points authorized under the permit.

CSO abatement mandates are promulgated pursuant to the authority of the New Jersey Water Pollution Control Act, 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 Minimal Controls required 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 implement significant infrastructure activity. 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.

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 NJDEP last reissued a NJPDES General Permit for Combined Sewer Systems in 2009.

As a result of US EPA's Phase II rules, New Jersey also developed a Municipal Stormwater Regulation Program. This program has issued New Jersey Pollutant Discharge Elimination System (NJPDES) permits to municipalities throughout the state, as well as public complexes, and highway agencies. The department has issued four general permits to implement the Municipal Stormwater Regulation Program: the Tier A Municipal Stormwater General Permit; the Tier B Municipal Stormwater General Permit; the Public Complex Stormwater General Permit; and the Highway Agency Stormwater General Permit. Tier A municipalities are generally located within the more densely populated regions of the state or along or near the coast. Tier B municipalities are generally located in more rural areas and in non-coastal regions. The permits address stormwater quality issues related to new development, redevelopment and existing developed areas by requiring the development of a stormwater program and implementation of specific permit requirements referred to as Statewide Basic Requirements (SBRs). SBRs may also require the permittee to implement related best management practices (BMPs), including public education. All SBRs and related BMPs contain minimum standards, measurable goals, and implementation schedules. All four general permits were renewed in March 2009 and expire in February 2014.

In a November 2010 memorandum, US EPA suggested some revisions to the current protocols for establishing and monitoring Total Maximum Daily Loads (TMDLs) and wasteload allocations (WLAs) for stormwater sources. A TMDL is a regulatory term in the CWA, describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. Pollutants that originate from a point source are given allowable levels of contaminants to be discharged; this is the WLA. The US EPA issued this memorandum as new technologies to monitor stormwater and its impacts on water quality issues has increased since a November 2002 memorandum entitled "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs."

The 2010 memorandum encourages NPDES permit writers to address four issues revising permits or issuing new permits including water quality-based effluent limitations; that WLAs for NPDES regulated stormwater discharges should be separated into specific categories and separate WLAs defined for each source; the use of surrogate parameters (such as impervious cover or storm water flow volume) when developing TMDLs; and encourages permitting authorities to consider designation of stormwater sources in situations where coverage under

NPDES permits would afford a more effective mechanism to reduce pollutants in stormwater discharges.

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 programs 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 an effective stormwater program. Challenges facing small municipality administrators include a disconnect from the decision making process for funding and new housing construction with its accompanied increase in impervious surfaces. Stormwater is not a visible problem and historically tends to receive a lower priority from elected officials who set budget priorities. As treatment efficiency at point sources such as wastewater treatment plants has increased, awareness has grown of and more attention has been paid to non-point sources of water pollution such as stormwater. Hopefully this will lead to more regional efforts to expand and fund programs and encourage the use of technology and monitoring geared toward stormwater control.

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 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 staff is involved with ASIWPCA, WEF, NY WEA, NWQMC and other professional organizations and activities. The IEC assisted in organizing the NYWEA legislative dialogue and conference in Albany, New York, in February 2010 and participated on a panel on SPDES enforcement issues. 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 and testified before the New York State Senate Committee on Environmental Conservation. 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. On June 15, the R/V Natale Colosi sailed to Newark Bay to conduct hands-on water quality monitoring and data recording. In the coming year IEC expects to provide further opportunities for students to experience environmental science and laboratory work though a cooperative program with the College of Staten Island.

Water Quality Monitoring Aboard the R/V Natale Colosi, June 2010
Photo by T. Tokar, Bayonne High School

2010 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.

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 this intimate forum was held on February 23, 2010, with agenda topics including Challenges of Infrastructure Funding-Stimulus/Recovery Plan, Water Quality and Regulatory Issues, as well as enforcement priorities and methodologies. 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, Marcellus Shale

development, as well as regulatory guidance and participation in NYS DEC enforcement priorities and methods.

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.

20th Annual Long Island Sound Citizens Summit

On May 7, 2010, 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, "Green Cities/Blue Waters: Connecting Urban Communities to Ecosystems". The agenda had keynote speakers focusing on several success stories dealing with revitalizing urban rivers. Panel discussions addressed innovative controls to curb polluted runoff, green infrastructure and community involvement. Attended annually by Commission staff, the Commission maintained an information booth at the summit.

Mark Tedesco, Director, US EPA LISO, Moderates Panel Discussion
Photo by P. Sattler, IEC

World Water Monitoring Day

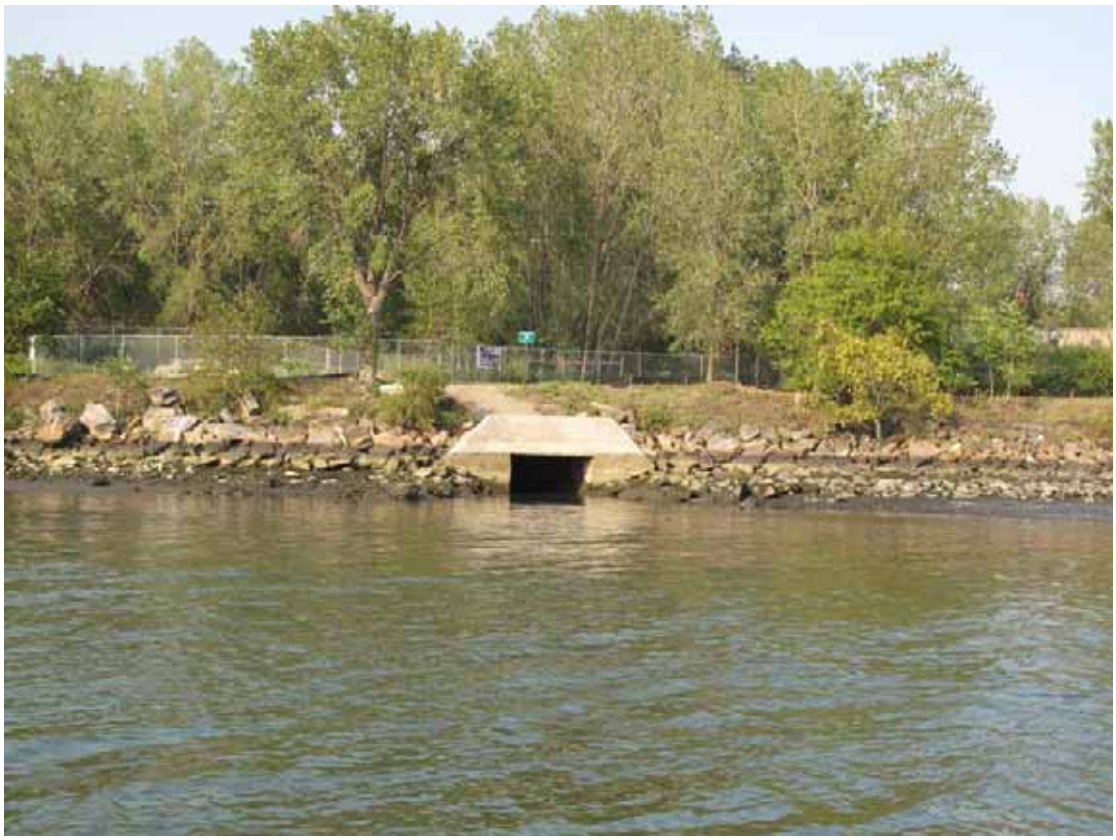
On July 28, 2006, the Water Environment Federation announced its adoption of World Water Monitoring Day. Founded by the America's Clean Water Foundation in 2002 with a national focus, the first National Water Monitoring Day in the United States was a great success. To continue to promote water quality awareness around the globe, the eighth annual World Water Monitoring Day was held on September 18, 2010, 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 20th 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 every year since 2002. The ambient water quality stations represent a subset of the LISS sampling network (see the 2010 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, 2010, the R/V Natale Colosi sailed to the Bronx River. In conjunction with 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.

.



Bronx River, September 2010
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 2010.

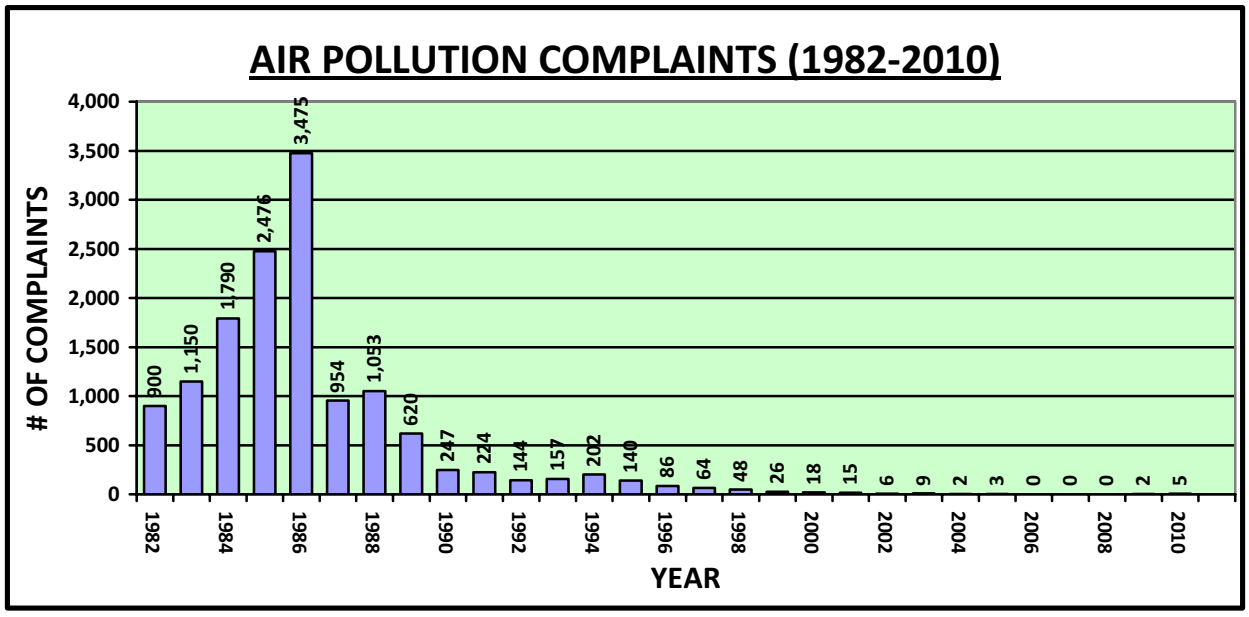
The Commission has maintained round-the-clock response for air pollution complaints since the late 1960s. To better serve the needs of the public by faster response to complainants, a field office was established on Staten Island in 1982. This presence was especially important during 1986 when odor complaints 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 eleventh consecutive year.

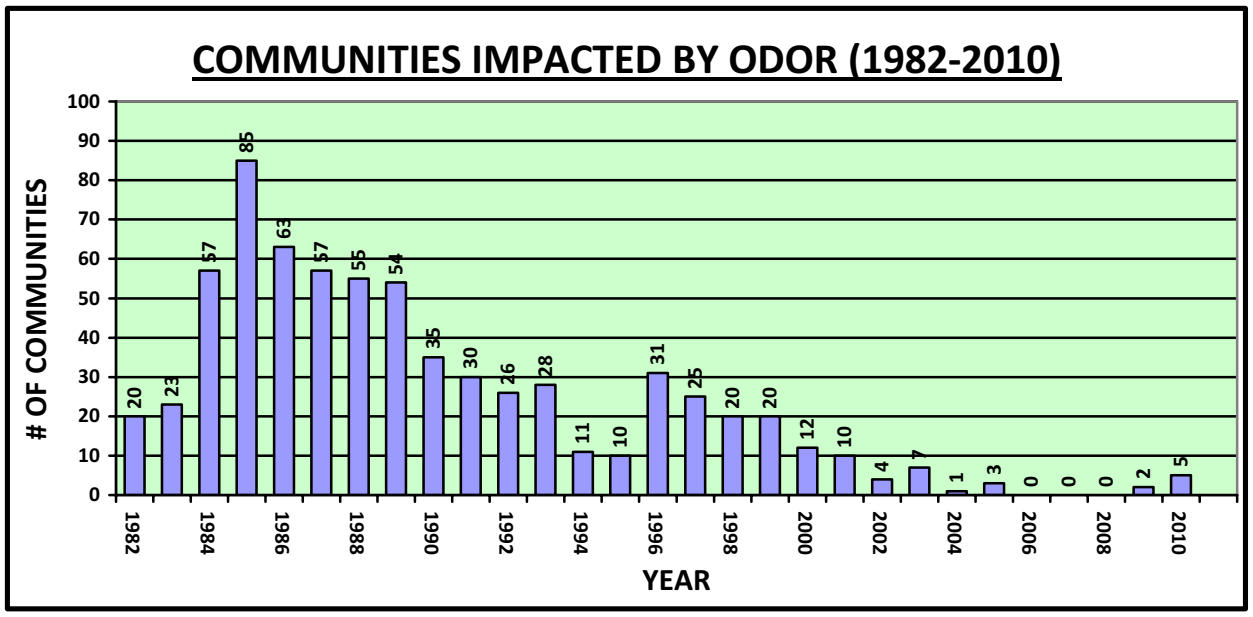
AIR POLLUTION COMPLAINTS

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, 2010, the Commission received five odor complaints from five 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 eleventh consecutive year that the nuisance odor category of "garbage" was not registered.

OZONE HEALTH MESSAGE SYSTEM

For the 23rd 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 2010, the Commission continued its participation in this program. The IEC took an active role in alerting the public to unhealthful conditions. From October 1, 2009 through June 1, 2010, the IEC relayed "health advisory" messages to the appropriate government environmental and health agencies. The IEC received one (1) ozone and three (3) fine particulate (soot and dust) advisories from the New Jersey Department of Environmental Protection. On June 1, 2010, the States and IEC started using the US EPA's EnviroFlash notification system. EnviroFlash is a free e-mail alert system that delivers air quality information; www.enviroflash.info. For the remaining four months of the reporting period, seven unhealthy ambient alerts for ozone were e-mailed to the IEC office. 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. During 2010, 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 include testimony before legislative committees, SPDES permit litigation and ensuring sound environmental practices at landfills.

An administrative decision was issued by the NYS DEC Commissioner on June 10, 2010, concerning nitrogen remediation and problems of combined sewer overflows (CSOs), as well as permit language for New York City's 14 municipal wastewater treatment plants. The Commission was an amicus party in the nitrogen remediation litigation, for which the Commissioner held that a 2005 Consent Order must be attached to SPDES permit renewals. While the decision holds that narrative water quality regulations are not necessary given reference to applicable law and attachment of the Consent Order, NYS DEC retained mention of the Water Quality Regulations of the IEC on the first page and footnotes concerning IEC Water Quality Regulations in the reissued permits. NYS DEC issued the SPDES permits valid through 2015.

IEC continues to monitor development plans for the Fresh Kills Landfill, which closed in 2001. IEC had intervened in an ongoing proceeding in 1986 to protect the environment from debris released and leachate from the landfill, eventually evolving into an agreement for a barge system. The case remains dormant and intermittent discussion has occurred during the past year among elected officials and stakeholders concerning development at the site. Once parties agree upon a plan and resolve any remaining issues, New York State would have to approve the plan.

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2010

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	A	2002+	7.5	10.0	Secondary (AS)	1,399.0	(4)	4.2	Incineration (2)	44,750
- West Side	A	2002+	24.8	30.0	Secondary (AS)	4,121.0	(4)	4.8	Incineration (2)	112,500
Fairfield	A	2002+	8.6	9.0	Tertiary	5,000.0		20.0	Compost	43,000
Greenwich (Grass Island)	A	2003+	9.0	12.5	Secondary (AS)	6,587.0		24.0	Incineration (2)	38,000
Norwalk	A	2002+	14.6	30.0	Tertiary	2,785.0	(4)	21.0	Compost	80,000
Stamford	A	2005+	16.9	24.0	Tertiary	15,600.0		25.0	Drying/Pelletizing	110,000
Stratford	A	2009+	8.4	11.5	Secondary (AS)	1,461.1		3.69	Incineration (2)	49,400
Westport	A	1975+	1.8	2.9	Tertiary	410.9	(5)	4.0 to 6.0	Incineration (2)	15,200
New Haven County										
Greater New Haven WPCA	A	2000+	29.2	40.0	Tertiary	35,040.0		24.9	Incineration	200,000
Milford - Beaver Brook	A	2009+	1.9	2.25	Secondary (AS)	433.4		13.5	Incineration (2)	20,000
- Housatonic	A	2009+	6.7	8.0	Secondary (AS)	1,491.3		16.0	Incineration (2)	43,250
West Haven	A	2000+	6.5	12.5	Secondary (AS)	1,500.0		20.0	Incineration	54,000
NEW JERSEY										
Bergen County										
Edgewater BCUA	B-1	1989+	3.6	6.0	Secondary (PO)	9,387.8		7.98	Beneficial Reuse (2)	31,000
Essex County										
Passaic Valley Sewerage Commissioners	B-1	2009+	239.8	330.0	Secondary (AS)	86,973.32		54.98	Landfill Daily Cover	1,400,000
Hudson County										
North Bergen M.U.A. - Woodcliff	B-1	1991+	3.4	2.9	Secondary (TF)	-		-	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+	121.3	147.0	Secondary (AS)	188,011.0		22.0	Beneficial Reuse	750,000
Union County										
Joint Meeting of Essex & Union Counties	B-2	2001+	59.3	85.0	Secondary (AS)	30,645.10		26.83	Land Application	500,000
Linden Roselle Sewerage Authority	B-2	1989+	11.4	17.0	Secondary (AS)	28,500.0		3.7	Beneficial Reuse	65,000
Rahway Valley Sewerage Authority	B-2	2009+	29.9	105.0	Tertiary (AS)	12,600.0		23.5	Trucked Out	200,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2010

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
NEW YORK										
Nassau County										
Bay Park	A	2003+	49.9	70.0	Secondary (AS)	32,267.24		20.47	Beneficial Reuse	532,400
Belgrave Sewer District	A	1995+	1.5	2.0	Secondary (TF)	1,601.0		4.3	Trucked out to Bay Park	14,000
Cedar Creek	A	1997+	58.6	72.0	Secondary (AS)	38,269.42		19.31	Beneficial Reuse	569,000
Cedarhurst	A	2003+	0.8	1.0	Secondary (TF)	3,390.0	(4)	0.033	Trucked Out	6,100
Glen Cove	A	2007+	3.0	5.5	Tertiary	8,834.67		23.19	Incineration/Landfill	28,000
Greater Atlantic Beach Water Reclamation District	A	2001+	0.6	1.5	Secondary (TF)	27.67	(5)	4.48	Trucked to Bay Park	2,000
Great Neck Water Pollution Control District	A	1990+	2.5	3.8	Secondary (AS)	184.3		25.08	Landfill	>15,000
Great Neck Village	A	1996+	0.9	1.5	Secondary (TF)	116.4	(5)	6.2	Trucked Out	9,000
Jones Beach	A	1990+	0.05	2.5	Secondary (TF)	-		-	Trucked Out	Seasonal
Lawrence	A	2002+	1.3	1.5	Secondary (TF)	-		-	Trucked Out	5,500
Long Beach	A	2003+	5.0	7.5	Secondary (TF)	513.0	(4)	25.6	Landfill	37,000
Oyster Bay Sewer District	A	2006+	1.3	1.8	Tertiary	97.6	(5)	3.0	Trucked Out	8,500
Port Washington Sewer District	A	1991+	2.8	4.0	Secondary (TF)	-		-	Incineration	35,000
New York City										
Bronx County										
Hunts Point (7)	B-1	1977+	129.0	200.0	Secondary (AS)	119,436.2		26.2	Land Application/Beneficial Reuse	630,000
Kings County (Brooklyn)										
Coney Island (7)	A	1995+	85.0	110.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	602,100
Newtown Creek (7)	B-1	1967	238.0	310.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	1,039,300
Owls Head (7)	B-1	1996+	93.0	120.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	761,500
Red Hook (7)	B-1	1987	29.0	60.0	Secondary (AS)	13,180.2		20.3	-	192,200
26th Ward (7)	A	1975+	51.0	85.0	Secondary (AS)	81,403.1		25.8	Land Application/Beneficial Reuse	271,240
New York County (Manhattan)										
North River (7)	B-1	1986	123.0	170.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	584,190
Wards Island (7)	B-1	1979+	205.0	275.0	Secondary (AS)	125,936.1		27.1	Land Application/Beneficial Reuse	1,004,200
Queens County										
Bowery Bay (7)	B-1	1978+	103.0	150.0	Secondary (AS)	26,036.0		24.5	-	727,100
Jamaica (7)	A	1978+	80.0	100.0	Secondary (AS)	6,948.4		25.9	Land Application/Beneficial Reuse	632,150
Rockaway (7)	A	1978+	22.0	45.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	94,500
Tallman Island (7)	B-1	1979+	56.0	80.0	Secondary (AS)	(3)		-	-	388,200

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2010

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+	29.9	40.0	Secondary (AS)	36,395.4		26.4	Land Application/Beneficial Reuse	151,600
Port Richmond (7)	B-2	1978+	28.0	60.0	Secondary (AS)	(3)		-	Land Application/Beneficial Reuse	172,300
Rockland County										
Joint Regional Sewerage Board										
- Town of Haverstraw	A	2009+	4.4	8.0	Secondary (AS)	4,132.62	(2)	18.9	Composting	58,500
Orangetown Sewer District	A	1996+	8.1	12.75	Secondary (TF)	4,467.96		25.3	Compost (2)	50,300
Palisades Interstate Park Commission										
- Bear Mountain	A	2007+	0.03	0.25	Secondary (TF)	417.25	(5)	-	Landfill	Seasonal
Rockland County Sewer District # 1	A	1995+	19.6	28.9	Secondary (RBC)	-		-	Composting	200,000
Stony Point	A	1985+	0.7	1.0	Secondary (AS)	249.88		18.7	Composting	12,000
Suffolk County										
Huntington Sewer District	A	2007+	2.3	2.6	Tertiary	4,825.0		17.7	Landfill	25,000
Northport	A	2005+	0.3	0.45	Tertiary	19.19	(5)	2.0	Incineration (2)	3,500
Suffolk County Sewer District # 1	A	2007+	0.8	1.15	Secondary (RBC)	116.80	(5)	2.8	Landfill	12,000
Suffolk County Sewer District # 3	A	2009+	27.2	30.0	Secondary (AS)	13,485.0	(6)	25.7	Landfill	280,000
Suffolk County Sewer District # 6	A	2010+	0.3	0.6	Secondary (AS)	111.40	(5)	1.5	Landfill	6,000
Suffolk County Sewer District # 21	A	1989	1.7	2.5	Tertiary	375.9	(5)	1.7	Landfill	20,000
Westchester County										
Blind Brook (Rye)	A	2000+	3.5	5.0	Secondary (AS)	653.5	(5)	0.23	Pumped to Port Chester	25,000
Buchanan	A	1999+	0.2	0.5	Secondary (AS)	187.8		3.0	Trucked Out	2,100
Coachlight Sq. on the Hudson Association, Inc.*	A	1992+	0.03	0.05	Secondary (AS)	-		-	Trucked Out	210
Mamaroneck	A	1993+	15.0	20.6	Secondary (AS)	2,149.8	(5)	0.2	Pumped to New Rochelle	80,000
New Rochelle	A	1997+	15.5	13.6	Secondary (AS)	21,547.0		22.4	Beneficial Reuse	80,000
Ossining	A	1981	4.7	7.0	Secondary (AS)	889.4	(5)	3.0	Trucked Out	36,000
Peekskill	A	1980	6.6	10.0	Secondary (AS)	758.4	(5)	2.3	Trucked to Landfill	32,500
Port Chester	A	1990+	4.9	6.0	Secondary (RBC)	2,055.7	(5)	4.5	Trucked Out	25,000
Springvale Sewerage Corporation*	A	1992+	0.1	0.13	Secondary (RBC)	-		-	Trucked Out	1,700
Yonkers Joint Treatment	A	2002+	87.2	120.0	Secondary (AS)	39,983.0		23.9	Land Application/Beneficial Reuse	525,000

WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

2010

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	2009+	0.04	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.

(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
TBTA Brooklyn Battery Tunnel	NY 0005461	Kings	02-28-10		Newtown Creek	X
NYC DEP Meadowmere Warnerville	NY 0267686	Queens	02-28-10	X	Jamaica	

(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 2010

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, 2009 to June 30, 2010:

CASH BOOK BALANCE AS OF JUNE 30, 2009			$912,140.11
RECEIPTS			
Connecticut - FY '10	$73,173.75		
New York - FY '10	15,000.00		
New Jersey - FY '10	383,000.00		
EPA - FY' 09	171,849.00		
EPA - FY' 10	340,000.00		
Section 604(b) ARRA Funds:			
Water QM & Modeling of the Byram River	21,792.75		
MS4 Survey of the Croton-Kensico Watershed, Westchester, NY	7,125.00		
Long Island MS4 Phase II Planning Program	58,223.25		
Interest	2,064.08		
Miscellaneous Receipts	4,010.00		
TOTAL RECEIPTS			1,076,237.83
		Sub-Total	$1,988,377.94
DISBURSEMENTS			
TOTAL DISBURSEMENTS			1,566,466.33
CASH BOOK BALANCE ON JUNE 30, 2010			$421,911.61

U.S. Treasury Bills	$0.00
Insured Money Market Accounts	381,679.52
Checking Accounts	40,232.09
	$421,911.61

G L O S S A R Y

ACO	administrative consent order
ADB	assessment database
ADG	anerobic digester gas
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
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
BRWI	Bronx River Watershed Initiative
CAVF	Corona Avenue vortex facility
CBOD	carbonaceous biochemical 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
CKWIC	Croton-Kensico Watershed Intermunicipal Coalition
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
ELAP	Environmental Laboratory Approval Program
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
GNC	Greater Newark Conservancy
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
ICIS	Integrated Compliance Information System
ICWP	Interstate Council on Water Policy
IDDE	Illicit Discharge Detection and Elimination Program

GLOSSARY
(CON'T)

IEC	Interstate Environmental Commission
IED	Interstate Environmental District
IFAS	integrated fixed film activated sludge
I/I	infiltration/inflow
ISC	Interstate Sanitation Commission
LDC	legacy data center
LF	linear feet
LID	low impact development
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	Mud Dump Site
MF	membrane filter
MG	million gallons
MGD	million gallons per day
MPN	most probable number
MS4	municipal separate storm sewer system
MUA	Municipal Utilities Authority
MW	megawatt
NCA	National Coastal Assessment
NCHD	Nassau County Health Department
NEIWPCC	New England Interstate Water Pollution Control Commission
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NEP	National Estuary Program
NERL	National Environmental Research Laboratory
NFWF	National Fish and Wildlife Foundation
NHSA	North Hudson Sewerage Authority
NJHDG	New Jersey Harbor Dischargers Group
NJPDES	New Jersey Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanographic and Atmospheric Administration
NOV	notice of violation
NPS	National Park Service
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
NYSG	New York Sea Grant
O & M	operation and maintenance
OQA	Office of Quality Assurance
OPRHP	Office of Parks, Recreation and Historic Preservation
ORD	Office of Research and Development
ORI	outfall reconnaissance inspection
PCCP	pre-stressed concrete cylinder pipe
POTW	publicly owned treatment works
PVSC	Passaic Valley Sewerage Commissioners
QAPP	quality assurance project plan

GLOSSARY
(CON'T)

QA/QC	quality assurance/quality control
RAS	return activated sludge
RBC	rotating biological contactor
RBWG	Regional Bypass Workgroup
RFP	request for proposal
RTO	regenerative thermal oxidizer
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
TNI	The Nelac Institute
TRC	total residual chlorine
TSS	total suspended solids
TWIC	transportation worker identification credential
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
WLA	waste load allocation
WPAF	water pollution abatement facility
WQIP	water quality improvement project
WPCA	Water Pollution Control Authority
WPCP	water pollution control plant
WQS	water quality standard
WQX	water quality exchange
XML	extensible markup language