COMBINED SEWER OUTFALLS

IN THE

INTERSTATE SANITATION DISTRICT

INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY

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COMBINED SEWER OUTFALLS
IN THE
INTERSTATE SANITATION DISTRICT

NEW YORK. NEW JERSEY CONNECTICUT

F/C

INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY

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COMBINED SEWER OUTFALLS IN THE INTERSTATE SANITATION DISTRICT

Prepared by

Patricia C. Hick

Staff Attorney

October 1988

ACKNOWLEDGEMENTS

This Report would not have been possible without contributions from a number of people. Assistance in the form of technical review or field investigation was provided by Howard Golub, Henry Anusiak, and William McCormack of the Commission staff. Carmen Leon and Claire Biunno offered assistance and support during the production of the Report.

Municipal authorities, too numerous to mention here, responded to Commission inquiries. Staff of the New York City Department of Environmental Protection was particularly responsive in trying to solve the number of questions raised during the Commission's research. Personnel from Connecticut's Department of Environmental Protection, New Jersey's Department of Environmental Protection, and New York's Department of Environmental Conservation provided comments on the Report.

Special thanks are given to Eileen Higgins for her careful attention to whatever facet of the Report needed the most work at the time, to Frank Filippo for undertaking a variety of tasks and to Tina Ramos for her willingness to type and retype.

EXECUTIVE SUMMARY

Because combined sewer systems account for much of the infrastructure in its District, the Interstate Sanitation Commission believed that a study to investigate combined sewer overflow (CSO) outfalls in the District would be valuable for long-term pollution control planning. This is especially so because with the ongoing construction to upgrade publicly owned treatment works (POTWs) throughout the District, CSOs will remain the major region-wide source of untreated sanitary waste discharging into the District. As part of this study, the Commission began to catalogue and to assemble data on CSO outfalls in all of the areas where they exist in its District.

This Report has focused on the CSO outfall rather than the overflow. The outfall is the structure through which an overflow from a combined sewer system discharges to a receiving water. A combined sewer system is one in which the municipal wastewater system does not have separate storm and sanitary sewer lines. Under dry weather conditions, a properly functioning combined system carries only sewage. During storms, however, it also collects and transports storm water runoff. These systems are designed to divert the combined wastewater at the regulators when its volume exceeds the capacity of the sewer lines. This diversion protects the sewer lines and the POTW. It also results in the discharge of raw sewage into the receiving water, unless a mechanism for storage or treatment has been incorporated into the system. Such a diversion, with the same results, can occur during dry or wet weather, in combined or separate systems, due to inflow or infiltration into the system or undersized, inadequate or poorly maintained equipment.

The Commission's District is shown on Map I-1. The District extends from the northern boundary of Westchester and Rockland Counties on the Hudson River and a line west from New Haven, Connecticut to Port Jefferson on the northern shore of Long Island, down through the Hudson and East Rivers, the Kills around Staten Island, Newark Bay, and the Upper and Lower Bay to Sandy Hook and a portion of the Atlantic Ocean. This area includes waterbodies that are heavily polluted with industrial waste, as well as waterbodies that are

appropriate for swimming, fishing, shellfishing, and other primary contact recreation. It encompasses rich commercial and recreational resources surrounding one of the most populous areas in the world.

This study is the first and only effort to gather CSO data on a region-wide basis. Although municipal CSO or regulator studies analyzed certain municipal systems, any larger analysis was beyond the scope and responsibility of any one of the governmental bodies that had generated such a report. For this reason, the Commission, as the interstate environmental agency in the metropolitan area, undertook this broad investigation.

The highlighted shoreline on Map I-2 shows the areas within the District where CSOs are located. Based on available information, the Commission has identified approximately 680 CSO outfalls in the District. For purposes of this Report the outfalls from the few separated sewer systems or unsewered areas that discharge during dry or wet weather are included in this number.

The discussion of the CSOs in the District is organized by waterbody for this Report. The reason for organizing in this way is simply that it provides discrete areas on which to focus efforts to remedy overflows. By viewing the entire District in this manner, it is possible to identify waterbodies where CSOs have the greatest impact and where CSO reduction would lead to the greatest water quality improvement. In addition, this type of analysis by waterbody is particularly helpful when it crosses jurisdictional boundaries, as do most waterbodies in the District. Unsanitary overflows are a regional problem, not confined to one municipality or even to one state.

The nine sections into which the District has been broken for this Report are shown on Map I-3. The chapters discuss the following waterbodies: 1) Western Long Island Sound; 2) the East River; 3) the Harlem River; 4) the Hudson River; 5) the Upper Bay; 6) the Kills and Newark Bay; 7) the Lower Bay; 8) Jamaica Bay/Rockaway Inlet; 9) the Atlantic Ocean. The final chapter summarizes the conclusions and recommendations from the Report.

The goals of this first phase of the Commission's ongoing study of CSOs in its District were to locate as many CSOs as possible, to identify areas in which information was unavailable or unclear, and to discover what action is being taken by the responsible municipalities to eliminate them. These goals were accomplished through field investigations, review of reports and maps, and conversations with local and state officials.

The recommendations emerging from the review of available information can be placed into two categories--data gathering and interjurisdictional coordination. Within these two categories, six specific recommendations apply to all of the waterbodies discussed in this Report:

1. Require a comprehensive outfall inventory of each permit-holding municipality or agency;

2. Identify each outfall in addition to each regulator overflow;

3. Reconcile all contradictory outfall and regulator information;

4. Obtain statistically valid sampling data on volume and constituents being discharged from outfalls;

5. Coordinate among jurisdictions to develop a plan and priorities for action;

6. Initiate action to abate and, where possible, to eliminate CSOs.

First, additional information would be useful in formulating an effective program to control or, where possible, eliminate, CSOs. Emphasis should be placed on inspecting outfalls in the District. Municipalities must obtain information on all outfalls within their jurisdiction and verify the accuracy of the information already assembled. Due to the magnitude of the task and its limited resources, the Commission was unable to make the large scale effort necessary to inspect all of the outfalls in the District. The

Commissions has inspected and will continue to inspect as many as possible within its budgetary and programmatic constraints. Also CSO sampling should be planned to determine the constituents of the wastewater. Although some of this sampling has been done, no properly validated, comprehensive reports of such sampling exist.

Second, governmental bodies in the District should convene to discuss CSO abatement strategy on a regional level. In such a forum it will be possible to look at the District as a whole and to establish methods of prioritizing the segments of waterbodies where, with the concerted efforts of all of the municipalities involved, amelioration of CSOs could lead to notably improved water quality. Each waterbody in the District has its own unique characteristics and each governmental body adjacent to the waterbody has specific needs or goals relating to that waterbody. Thus, for any CSO control plan to be effective, all relevant municipalities must be in communication and reach some type of consensus about the plans for the waterbody.

As a follow-up to this phase of the program, the Commission proposes to convene a CSO conference to which it will invite the relevant governmental entities that have jurisdiction over CSOs in the District. This conference will provide an opportunity for the beginning of interjurisdictional communication.

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INTRODUCTION

Over a year ago, the Interstate Sanitation Commission undertook a project to update the information it had previously gathered on outfalls of combined sewer overflows (CSOs). As part of this program, the Commission began to catalogue and to assemble data on CSO outfalls in all of the areas where they exist in the Interstate Sanitation District (District).

The emphasis in this Report is on the CSO outfall rather than the overflow itself. The outfall is the structure through which an overflow from a combined sewer system discharges to a receiving water. A combined sewer system is one in which the municipal wastewater collection system does not have separate storm and sanitary sewer lines. Under normal, dry weather conditions, a properly functioning combined system carries only sewage and an amount of commercial and industrial wastes to the publicly owned treatment works (POTW). During storm or thaw periods, however, it also collects and transports storm water runoff. These systems are designed to divert the combined wastewater at the regulators when its volume surpasses the capacity of the sewer lines. This diversion protects the sewer lines and the POTW. It also results in the discharge of raw sewage into the receiving water, unless a mechanism for storage or treatment has been incorporated in the sewer system. Such a diversion, with the same results, can occur during dry or wet weather, in combined or separate systems, due to inflow or infiltration into the sewer system or undersized, inadequate or poorly maintained equipment.

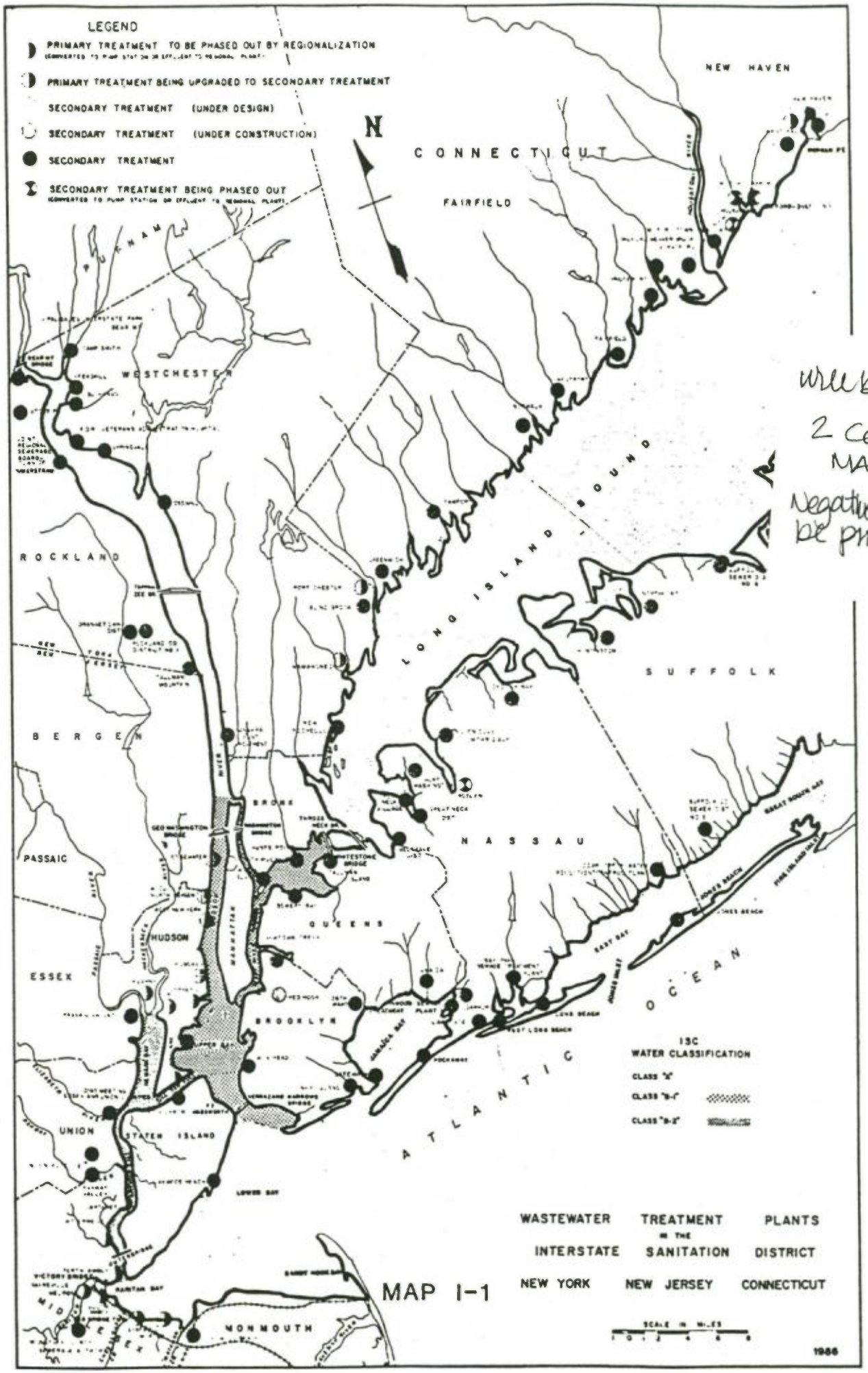
Because combined sewer systems account for much of the infrastructure in the District, the Commission believed that a study to investigate the extent of CSOs in the District would be valuable for long-term pollution control planning. It would be especially so because CSOs comprise a large but essentially unmeasured source of pollution in the metropolitan region. Available studies done by some of the municipalities in the District have not presented a comprehensive view of CSOs in the region, leaving many areas inadequately evaluated or entirely uncatalogued. Only by surveying the entire District and noting individual outfalls rather than overflows, as the

Commission has done in this Report, is it possible to assess the number of discrete points of discharge into a water body and, consequently, the number that must be addressed. This Report is an attempt to present a picture of the CSO problem in the entire District.

The area included in the District is described in the Tri-State Compact[1] and is shown on Map I-1. The District extends from the northern boundary of Westchester and Rockland Counties on the Hudson River and a line west from New Haven, Connecticut to Port Jefferson on the northern shore of Long Island, down through the Hudson and East Rivers, the Kills around Staten Island, Newark Bay, and the Upper and Lower Bay to Sandy Hook and a portion of the Atlantic Ocean. This area includes waterbodies that are heavily polluted with industrial waste, as well as waterbodies that are appropriate for swimming, fishing, shellfishing, and other primary contact recreation. It encompasses rich commercial and recreational resources surrounding one of the most populous regions in the world.

Regardless of the various water quality classifications, CSOs exist throughout the District. In fact, with the ongoing construction to upgrade POTWs in the District to meet Commission effluent standards, CSOs will remain the major region-wide source of untreated sanitary waste discharging into the waters of the District. Consequently, they remain the largest obstacle to improving water quality in the District. As was noted in the New York State Department of Environmental Conservation's (NYS DEC) Use Attainability Analysis of the New York Harbor Complex (Use Attainability Analysis), "CSO abatement is the crucial factor in meeting the swimmable/fishable water quality goals."[2] However, before any action can be taken, or even proposed, to alleviate pollution from CSOs, it is necessary to know the extent of the problem.

This study is the first and only effort to gather CSO data on a region-wide basis. This is the reason that the Commission, as the interstate environmental agency in the metropolitan area, undertook this broad investigation. Although municipal CSO or regulator studies analyzed certain



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municipal systems, any larger analysis was beyond the scope and responsibility of any one of the governmental bodies that had generated such a report. An overview of the impacts of CSO sources on the District was necessary before a comprehensive control strategy could be formulated.

This Report is the result of the Commission's inquiry. In this study, the Commission looked at all outfalls through which sanitary wastes enter the waters of the District. CSOs comprise the greatest number of these discharges. However, conditions similar to those present in combined sewer systems can be observed in areas with separated sewers due to surcharging in the sanitary lines. This phenomenon, no less than discharges from a combined sewer system, must also be addressed in order to improve the water quality of the District. The Commission has attempted to identify and discuss both combined sewer and surcharging areas in the text of this Report.

ORGANIZATION OF THE REPORT

The highlighted shoreline on Map I-2 indicates the areas within the District where CSOs are located. Based on available information, the Commission has identified approximately 680 CSOs in the District. Table I-1 summarizes the CSOs in the District by waterbody. These outfalls serve as relief points for combined sewer systems that may bypass during wet weather because of the addition of storm water to the sanitary flow. Most of the combined sewer systems are old and, consequently, also suffer from leaking regulators and general system disrepair, which exacerbate the overflow problem. These maintenance issues, when identified, are discussed in this Report.

As mentioned above, several of the separated sewer systems in the District have operations and maintenance problems that have led to water quality degradation in nearby waterbodies. Tidal inflow or illegal hookups to these separated systems can cause significant amounts of extraneous water to enter the sanitary lines and cause bypassing during wet weather. Diligence in controlling these inputs to the system can eliminate the bypassing of the

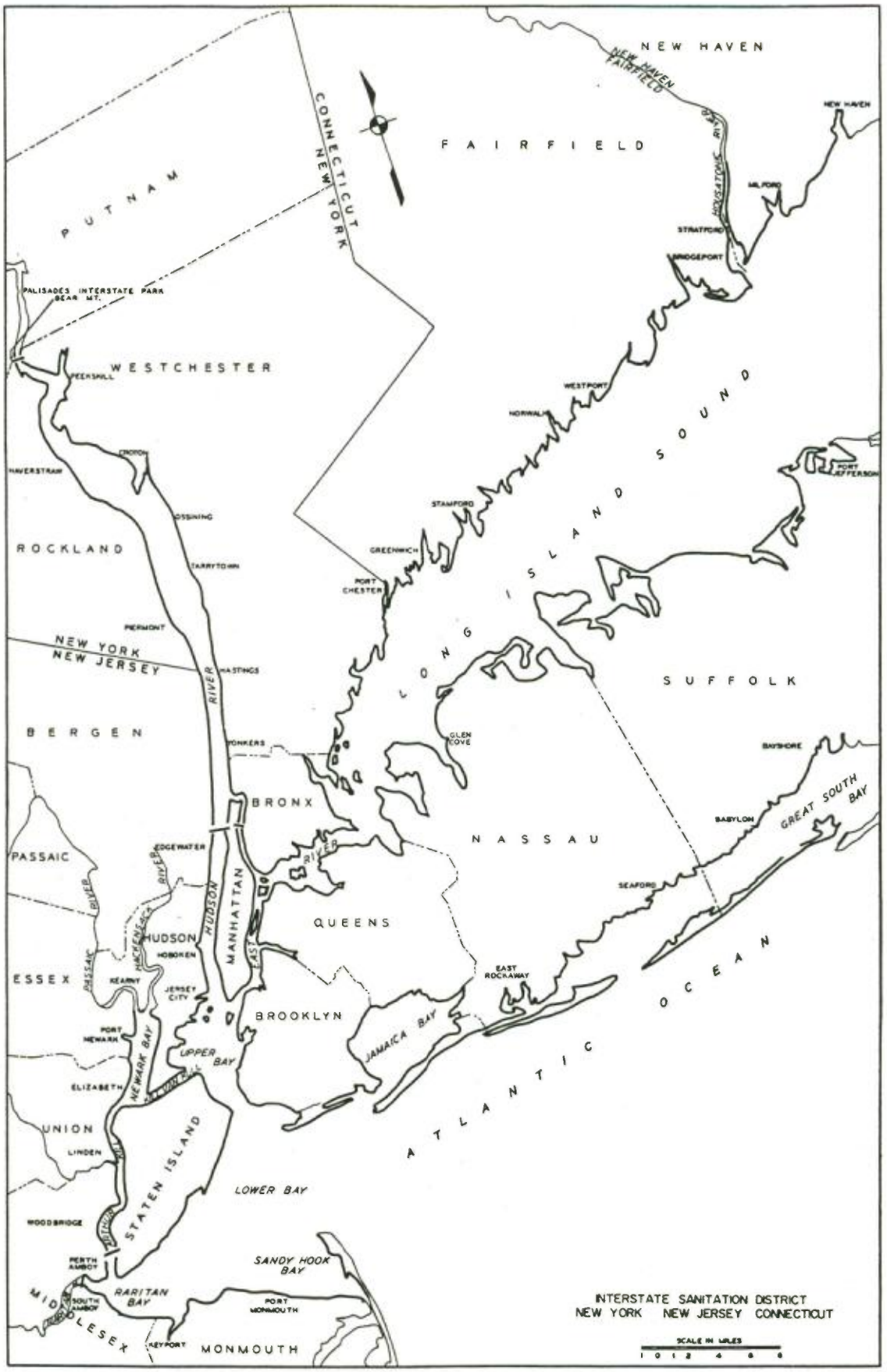

NEW HAVEN
NEW HAVEN
FAIRFIELD
FAIRFIELD
CONNECTICUT
NEW YORK
PUTNAM
PALISADES INTERSTATE PARK
BEAR MT.
WESTCHESTER
ROCKLAND
NEW YORK
NEW JERSEY
BERGEN
PASSAIC
ESSEX
HUDSON
UNION
MIDDLESEX
MONMOUTH
BRONX
QUEENS
BROOKLYN
NASSAU
SUFFOLK
STATEN ISLAND
LONG ISLAND SOUND
ATLANTIC OCEAN
HUDSON RIVER
EAST RIVER
MANHATTAN
UPPER BAY
LOWER BAY
NEWARK BAY
JAMAICA BAY
GREAT SOUTH BAY
RARITAN BAY
SANDY HOOK BAY
NEW HAVEN
MILFORD
STRATFORD
BRIDGEPORT
WESTPORT
NORWALK
STAMFORD
GREENWICH
PORT CHESTER
CROTON
OSSINING
TARRYTOWN
PIERMONT
HASTINGS
YONKERS
GLEN COVE
BAYSHORE
BABYLON
SEAFORD
EAST ROCKAWAY
EDGEWATER
HOBOKEN
KEARNY
JERSEY CITY
PORT NEWARK
ELIZABETH
LINDEN
WOODBRIDGE
PERTH AMBOY
SOUTH AMBOY
KEYPORT
PORT MONMOUTH
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 2 4 6 8

TABLE I-1

COMBINED SEWER OUTFALLS IN THE INTERSTATE SANITATION DISTRICT

SEGMENT	WATERBODY	NUMBER OF OUTFALLS	
1	NEW HAVEN HARBOR	3	
	Mill River	5	
	Quinnipiac River	6	
	West River	2	
		16	
	BRIDGEPORT HARBOR	6	
	Ash Creek	6	
	Black Rock Harbor	1	
	Cedar Creek	8	
	Johnson's Creek	4	
	Pequonnock River	10	
	Rooster River	1	
	Yellow Mill River	12	
		48	
	NORWALK RIVER	1	
	EASTCHESTER BAY	6	
	Hutchinson River	5	
		11	
	LITTLE NECK BAY	2	
	Alley Creek	2	
	Little Bay	1	
	Little Neck Basin	1	
		6	
	CSO TOTAL FOR SEGMENT 1		82
2	EAST RIVER	153	
	Bowery Bay	3	
	Bronx River	5	
	Flushing Bay	10	
	Flushing River	3	
	Powell's Cove	1	
	Pugsley's Creek	1	
	Steinway Creek	1	
	Westchester Creek	4	
	Dutch Kills	7	
	English Kills	1	
	Maspeth Creek	1	
	Newtown Creek	11	
	Wallabout Bay	1	
	CSO TOTAL FOR SEGMENT 2		202

TABLE I-1 (Continued)

SEGMENT	WATERBODY	NUMBER OF OUTFALLS	
3	HARLEM RIVER	45	
	Bronx Kill	3	
	CSO TOTAL FOR SEGMENT 3		48
4	HUDSON RIVER	113	
	Morris Canal	1	
	Tidewater Canal Basin	1	
	CSO TOTAL FOR SEGMENT 4		115
5	UPPER NEW YORK BAY	34	
	Atlantic Basin	4	
	Buttermilk Channel	4	
	Gowanus Bay	2	
	Gowanus Canal	15	
	CSO TOTAL FOR SEGMENT 5		59
6	NEWARK BAY	18	
	Great Ditch	2	
	Hackensack River	3	
	Passaic River	1	
	Peripheral Ditch	1	
		25	
	KILL VAN KULL	20	
	Bodine Creek	1	
		21	
	ARTHUR KILL	34	
	Crane Creek	1	
	Elizabeth River	6	
	Mill Creek	6	
	Richmond Creek	1	
		48	
	CSO TOTAL FOR SEGMENT 6		94

TABLE I-1 (Continued)

SEGMENT	WATERBODY	NUMBER OF OUTFALLS	
7	LOWER NEW YORK BAY	5	
	Coney Island Creek	1	
	Gravesend Bay	1	
	Great Kills Harbor	1	
	Raritan Bay	19	
	Raritan River	8	
	CSO TOTAL FOR SEGMENT 7		35
8	JAMAICA BAY	25	
	Bergen Basin	4	
	Fresh Creek Basin	3	
	Mott Basin	1	
	Norton Basin	1	
	Paerdegat Basin	3	
	Sheepshead Bay	1	
	Shell Bank Basin	1	
	Spring Creek	1	
	Thurston Basin	1	
	CSO TOTAL FOR SEGMENT 8		41
9	ATLANTIC OCEAN		
	Banister Creek	1	
	CSO TOTAL FOR SEGMENT 9		1

TOTAL NUMBER OF OUTFALLS = 677

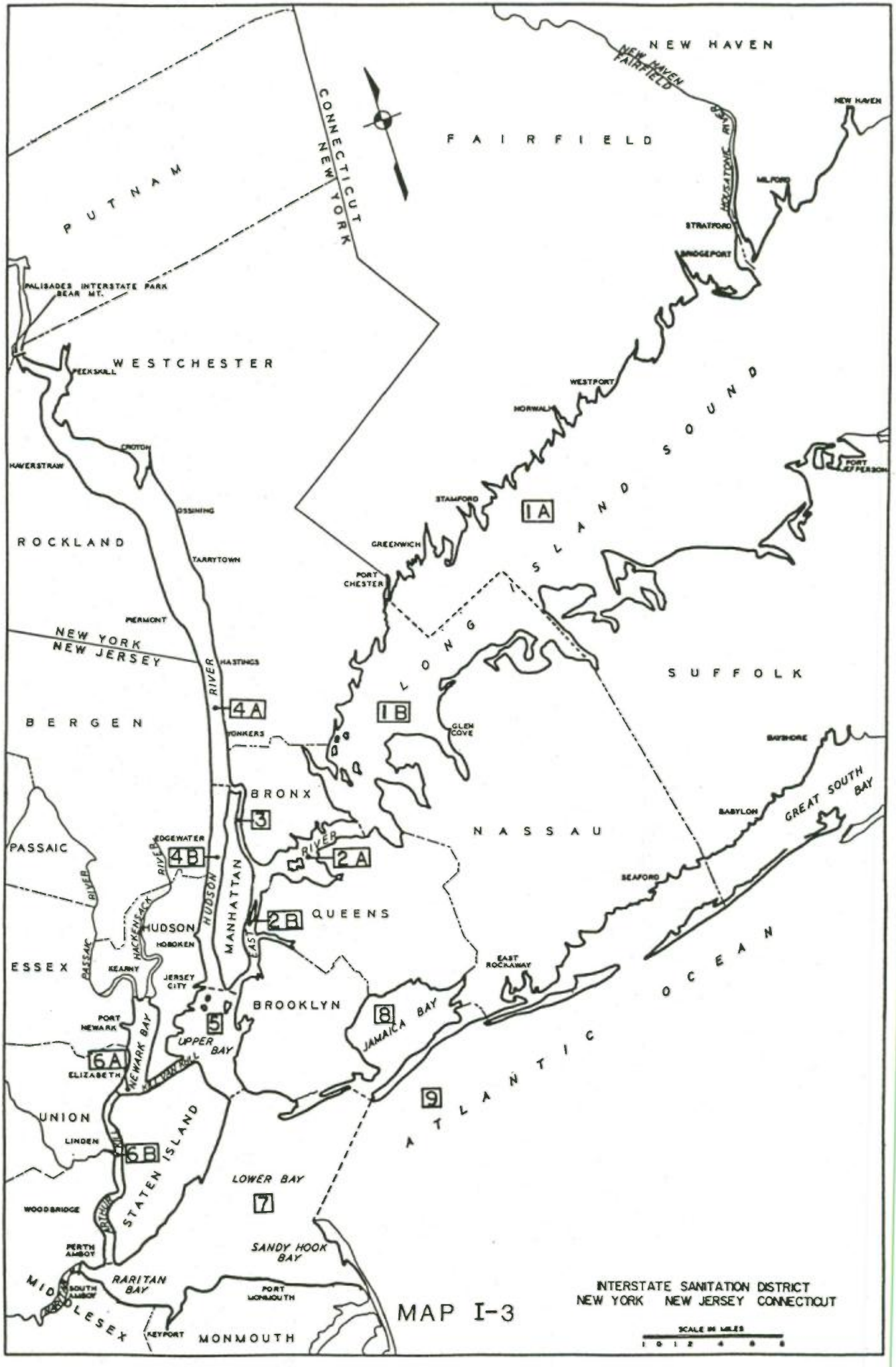
system almost entirely. Areas where such surcharging is an issue are identified in this Report along with efforts undertaken to address it.

The areas within the District will be discussed in relation to their impact on nine waterbody segments into which the District has been divided for purposes of this Report. The segments that will be described in greater detail below are:

1) Western Long Island Sound;
2) the East River;
3) the Harlem River;
4) the Hudson River;
5) the Upper Bay;
6) the Kills and Newark Bay;
7) the Lower Bay;
8) Jamaica Bay-Rockaway; and
9) the Atlantic Ocean.

Map I-3 depicts these nine sections.

The reason for organizing in this way is simply that it provides discrete areas on which to focus efforts to remedy overflows. An evaluation of all of the CSO inputs into a waterbody is necessary to determine the degree to which CSOs affect water quality in the area. By viewing the entire District in this manner, it is possible to identify waterbodies where CSOs have the greatest impact and where CSO reduction would lead to the greatest water quality improvement. On this basis, it is possible to assign priorities to the improvement of these areas. Remediation of CSO outfalls may not always lead to attainment of water quality goals, but in most cases it will lead to water quality improvement in a waterbody. In planning this coordinated improvement, however, detailed information on the number of effluent points in that area and the governmental or regulatory entity with control over these points is essential. This is the information that the Commission has gathered in this Report.


NEW HAVEN
NEW HAVEN
FAIRFIELD
FAIRFIELD
CONNECTICUT
NEW YORK
PUTNAM
HOUSATONIC RIVER
MILFORD
STRATFORD
BRIDGEPORT
PALISADES INTERSTATE PARK
BEAR MT.
WESTCHESTER
PEEKSKILL
WESTPORT
NORWALK
CROTON
HAVERSTRAW
OSSINING
ROCKLAND
STAMFORD
GREENWICH
PORT CHESTER
TARRYTOWN
LONG ISLAND SOUND
1A
PIERMONT
NEW YORK
NEW JERSEY
HASTINGS
RIVER
4A
BERGEN
YONKERS
1B
GLEN COVE
SUFFOLK
BAYSHORE
BRONX
3
BABYLON
GREAT SOUTH BAY
NASSAU
PASSAIC
EDGEWATER
4B
RIVER
2A
SEAFORD
HACKENSACK RIVER
HUDSON
MANHATTAN
2B
QUEENS
HUDSON
HOBOKEN
PASSAIC RIVER
EAST
ESSEX
KEARNY
JERSEY CITY
EAST ROCKAWAY
ATLANTIC OCEAN
PORT NEWARK
BROOKLYN
8
JAMAICA BAY
NEWARK BAY
5
UPPER BAY
6A
ELIZABETH
NEWARK BAY
UNION
LINDEN
9
6B
STATEN ISLAND
LOWER BAY
7
WOODBRIDGE
ARTHUR KILL
PERTH AMBOY
SANDY HOOK BAY
SOUTH AMBOY
RARITAN BAY
PORT MONMOUTH
MIDDLESEX
KEYPORT
MONMOUTH
MAP I-3
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 2 4 6 8

This type of analysis by waterbody is particularly helpful when it crosses jurisdictional boundaries, as do most waterbodies in the District. Unsanitary overflows are a regional problem, not confined to one municipality or even to one state. An analysis by waterbody highlights the specific locations where overflows must be abated in order to improve that waterbody and adjacent waterbodies. This type of analysis, like the waterbody itself, crosses jurisdictional lines. One mode of organization used frequently in other reports of this type is arrangement by drainage basin. In choosing, instead, the waterbody as the functional division, this Report emphasizes the interjurisdictional perspective: if a river is the recipient of overflows from three drainage areas, in possibly three political jurisdictions, all three jurisdictions must act to improve that river. Isolated actions, though laudable, may not lead to significant improvement in the water quality and with little improvement resulting from one party's efforts, there is little incentive for such individual actions.

Although the need for interjurisdictional response is acknowledged throughout the District, no regional CSO improvement plan exists. The hope is that a fuller presentation of the problem will lead to a more formal recognition of the steps necessary for water quality improvement and, ultimately, action by the responsible municipalities to end these discharges.

Western Long Island Sound (Section 1)

The first section of the District, that of Western Long Island Sound, has been divided into two subsections. The first of these encompasses the Sound from the easternmost limits of the District, west of a line from New Haven across to Port Jefferson, to the Connecticut-New York border across to the Suffolk County-Nassau County line. All areas of the District in Connecticut and of the north shore of Suffolk County will be included in this subsection.

The other subsection of the area will contain the north shore of Nassau County, the Westchester County shoreline of the Sound, and the shoreline of the Bronx and Queens to the eastern side of the Throgs Neck Bridge between

Throgs Neck and Cryder's Point. Outfalls into Eastchester Bay, Little Bay, and Little Neck Bay are noted in this section.

The East River (Section 2)

The second section of the District included in this Report is the East River, which has been divided into two subsections. The Upper East River, which is addressed in the first subsection, includes the CSOs on both sides of the River in the Bronx and Queens between the Throgs Neck Bridge and the Bronx-Queens leg of the Triborough Bridge. The second subsection accounts for the CSOs discharging into the East River below both the Bronx-Queens leg and the Bronx-Manhattan leg of the Triborough Bridge. This subsection also includes discharges into smaller waterbodies tributary to the East River, such as Newtown Creek.

The Harlem River (Section 3)

The Harlem River comprises the whole of the third section of this Report. For purposes of this section, the Harlem River will be considered to be all of the waters above the Bronx-Manhattan leg of the Triborough Bridge to the Railroad Bridge at Spuyten Duyvil. This section includes outfalls from the Bronx and Manhattan into the Harlem River and the Bronx Kill.

The Hudson River (Section 4)

As the fourth section of this Report, the Hudson River will be discussed in two subsections. The first subsection will include the Hudson in the upper reaches of the District -- north from Spuyten Duyvil Point in the Bronx across to the Englewood Boat Basin in Englewood Cliffs, New Jersey up to the northern boundaries of Westchester County and Rockland County. The upper portion of Bergen County in New Jersey, as well as Bronx, Westchester, and Rockland County shorelines will be included in this subsection.

The subsection for the lower Hudson River will include the waters south from Spuyten Duyvil Point - Englewood Boat Basin to the Fire Boat Pier on the New York side of the River and the Erie - Lackawanna Railroad Pier 5 in Jersey City, New Jersey. This subsection will discuss the entire west side of Manhattan and all of the existing CSOs in the lower portion of Bergen County and the upper section of Hudson County in New Jersey.

The Upper Bay (Section 5)

The Upper Bay will be considered that body of water between the southernmost point in Manhattan (the Battery), the mouth of the Kill Van Kull between the tip of Constable Hook in Bayonne to the foot of the B & O Railroad Pier in St. George, Staten Island and the Verrazano Bridge. The CSOs in portions of Jersey City and Bayonne in New Jersey and in Brooklyn and on northeastern Staten Island will be included in this section.

The Kills and Newark Bay (Section 6)

This section of the Report will encompass the waterways from the mouth of the Kill Van Kull to the southernmost tip of Staten Island and the southernmost tip of Perth Amboy at the mouth of the Raritan River. It will be divided into two subsections: Kill Van Kull/Newark Bay and the Arthur Kill. The dividing line between the two waterbodies will be the line from Port Ivory, at the foot of Richmond Avenue on Staten Island, to the foot of Elizabeth Avenue in Elizabeth, New Jersey. Newark Bay and the lower portions of the Hackensack and Passaic Rivers will be included in the Kill Van Kull subsection. The Arthur Kill and its tidal tributaries are included in the other subsection.

The Lower Bay (Section 7)

For purposes of this Report, the Lower Bay will extend from the Verrazano Bridge and Victory Bridge on the Raritan River to a line between Oriental Beach to Rockaway Point and to Sandy Hook. The discussion will include

outfalls into Raritan Bay where they exist in Middlesex County, and discharges from the southern side of Staten Island and southern Brooklyn to Rockaway Inlet.

Jamaica Bay-Rockaway (Section 8)

This section will address the CSO problems in the bays and inlets in the southeastern sections of Brooklyn and Queens. It will mention the outfalls occurring into Jamaica Bay, Rockaway Inlet, and Sheepshead Bay in New York, including all associated bays and tributaries.

Atlantic Ocean (Section 9)

The last section includes those CSOs that directly discharge into the waters of the Atlantic Ocean. This area within the District extends from the Sandy Hook, New Jersey transect to Breezy Point in Rockaway Point, Queens and eastward to the easterly side of Fire Island Inlet on Long Island.

METHODOLOGY

This Report reflects the first phase of the Commission's ongoing study of CSOs in its District. The goals of this first phase were to locate as many CSOs as possible, to identify areas in which information was unavailable or unclear, and to discover what action is being taken by the responsible municipalities to eliminate them. These goals were accomplished through field investigations, review of reports and maps, and conversations with local and state officials.

The starting point for this Report was the review of municipal CSO reports, when they existed. In most cases, these reports had been generated as part of a sewer system evaluation required by the state or federal government and they contained data on the diameter of the outfalls, their locations, and the regulators associated with them. Most of these reports are

dated anywhere from the late 1970s through the present. Available reports, studies, and maps provided the bulk of the information presented in this Report.

These documents, however, often contained anomalies or discrepancies due to sewer system improvement or construction along the shoreline. Consequently, the next step was to verify and to refine this information. All of the available information on a sewer system was compared with that included in the State Pollutant Discharge Elimination System (SPDES) permit, which ideally lists all outfall locations in the drainage basin and assigns them outfall numbers. When, after all this information was gathered, clarification or additional information was necessary, Commission personnel contacted local and state officials, although in certain cases it was still impossible to obtain unequivocal information. Often, the officials identified which among a number of documents was the most reliable. When possible, field investigations were performed by Commission personnel. These inspections were valuable because they often provided answers to questions not available in existing reports and resulted in the discovery of unlisted outfalls or of outfalls with dry weather flow. Usually after a review of the existing material and necessary supplementary conversations or inspections, few discrepancies remained. Those few that did remain are noted in this Report.

The Commission's approach to the New York City sewer system deserves a brief discussion because with its approximately 490 CSOs it is the largest investigated in this Report. The Commission reviewed numerous documents, conducted field inspections, and perhaps most important, spoke to City staff at several points in the progress of the Report. Commission personnel reviewed City Sewer maps as well as the City's City-wide Combined Sewer Overflow Study (CSO Study), but relied primarily on the Regulator Improvement Program documents and the supplemental memorandum that followed. The Regulator Improvement Program, Task 1-Drawings and Task 2.5.2-Outfall Inspection, which will be referred to throughout this Report as simply Task 1 and Task 2.5.2, list the location and the diameter of almost all of the outfalls in the City, as well as inspection information on a number of them.

Although these materials supplied much basic information, they also contained a number of discrepancies. The "New York City, Regulator Improvement Program, Supplemental Memo of State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies," was supplied to the Commission by the City in order to clarify discrepancies between the Task 1 and the Task 2.5.2. Both the "Supplemental Memo" and the more recent document entitled "NYC Outfall Table", dated October 6, 1988 have been used to resolve contradictions among the other documents. The recently issued SPDES permits for the 14 POTWs in the City contain much information that has been taken directly from the "Supplemental Memo."

Within each section and subsection of this Report, each individual outfall is identified by its SPDES permit outfall number. In instances where such numbers have not been assigned, reference is made to the outfall by the regulator or regulators associated with it. One recommendation resulting from this review is that all outfalls be identified and assigned a SPDES outfall number, so that each outfall in the District will have a specific number by which it can be referenced individually.

CONCLUSION

Although the study and writing of this Report were originally planned for a much shorter time frame, the staggering amounts of information required to do justice to the topic expanded to more than fill the time allotted for it. This exploration of the problem only scratches the surface.

Yet, the Commission's review of the existing information leads to several recommendations that are applicable throughout the District. Although these recommendations will be discussed in detail in the "Conclusion" chapter of this Report, they can be broken down into two categories: data gathering and interjurisdictional coordination. First, additional information would be useful in formulating an effective program to control or, where possible, eliminate CSOs. Emphasis should be placed on inspecting outfalls in the District. Municipalities must obtain information on all outfalls within their

jurisdiction and verify the accuracy of the information already assembled. Due to the magnitude of the task and its limited resources, the Commission was unable to make the large scale effort necessary to inspect all of the outfalls in the District. The Commission has inspected and will continue to inspect as many as possible within its budgetary and programmatic constraints. Also, CSO sampling should be planned to determine the constituents of the wastewater. Although some of this sampling has been done, no properly validated, comprehensive reports of such sampling exist. The Commission will continue to gather these data where available and will, in the future, update the information provided in this Report. This is necessary for municipalities to categorize the outfalls and to assess where expenditures would most effectively be applied.

Second, governmental bodies in the District should convene to discuss CSO abatement strategy on a regional level. In such a forum it will be possible to look at the District as a whole and to establish methods of prioritizing the segments of waterbodies where, with the concerted efforts of all of the municipalities involved, amelioration of CSOs could lead to notably improved water quality. Each waterbody in the District has its own unique characteristics and each government body adjacent to the waterbody has specific needs or goals relating to that waterbody. Thus, for any CSO control plan to be effective, all relevant municipalities must agree on the priority assigned to a waterbody. This last effort should be initiated as soon as possible and such meetings should proceed concurrently with the data gathering and analysis stages. These recommendations and specific strategies for targetting improvement efforts are discussed more fully in the "Conclusion" chapter of this Report.

The Commission views each of these waterbody divisions of the District as a functional area for water quality improvement. This is the case even though adjacent waterbodies have an impact on each other. Only by subdividing and analyzing the District in this way can the problem of CSO discharges be placed within more manageable proportions. The following chapters discuss in detail the existing CSOs and their impacts on the water quality of the areas delineated in Map I-3.

FOOTNOTES

[1] Conn. G.S.A. 22a-294 et seq.; N.J.S.A. 32: 18-1 et seq.; NY (McKinney's Cons. Laws) ECL 21.0501 et seq.; Congressional Consent 49 Stat. 932 (1935).

[2] New York State Department of Environmental Conservation, Use Attainability Analysis of the New York Harbor Complex. August 1985, p. 22.

CHAPTER 1

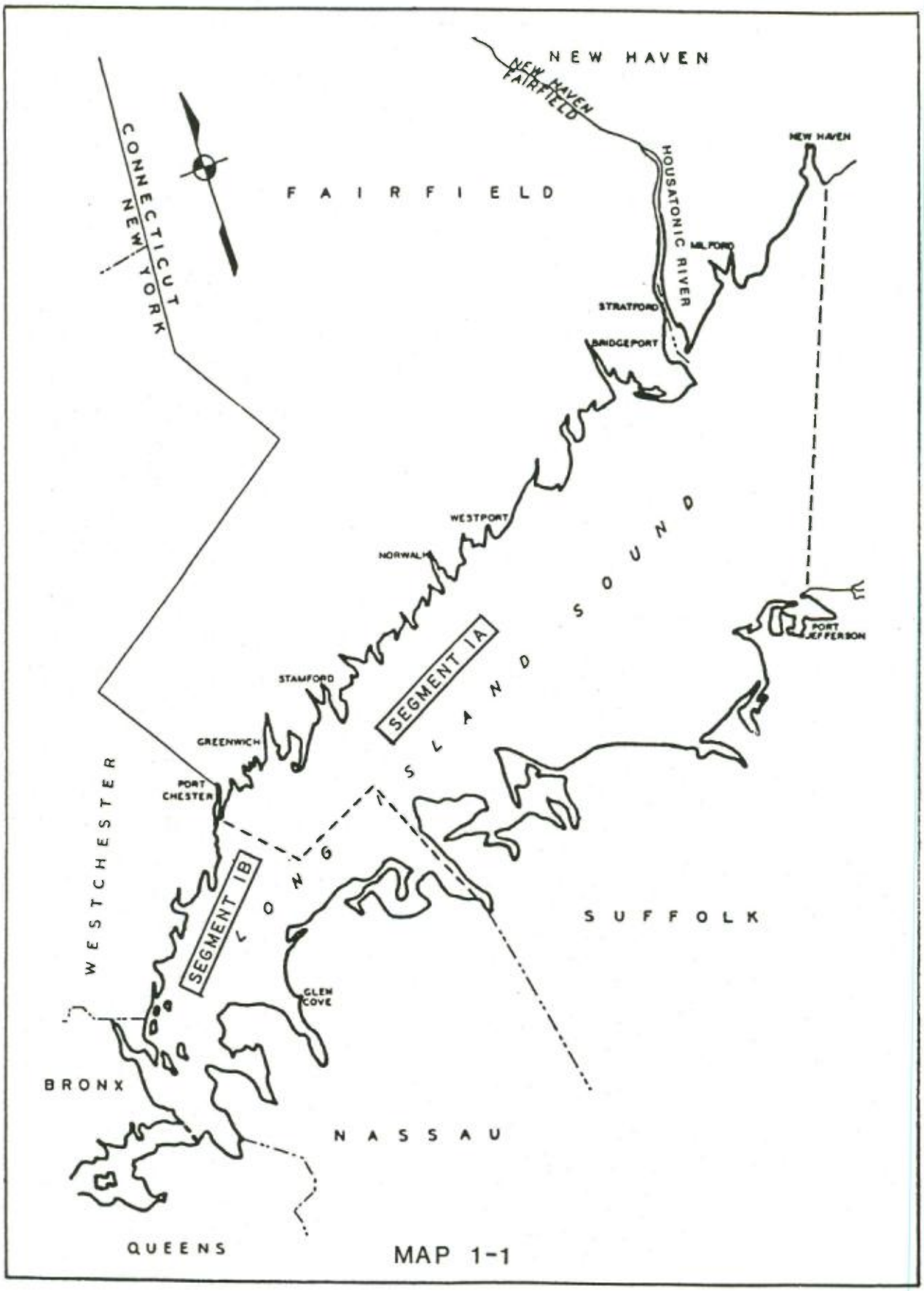
WESTERN LONG ISLAND SOUND

For ease in discussion, this waterbody has been divided into two sections, as depicted in Map 1-1. Section 1A includes the southern shore of Connecticut west of New Haven and the northern shore of Suffolk County west of Port Jefferson. Section 1B begins at the eastern side of the Throgs Neck Bridge and includes the Long Island Sound east to the Connecticut border on its north shore and the Suffolk-Nassau County line on its south shore. The waters of Long Island Sound have been classified by the Commission as class "A" waters.

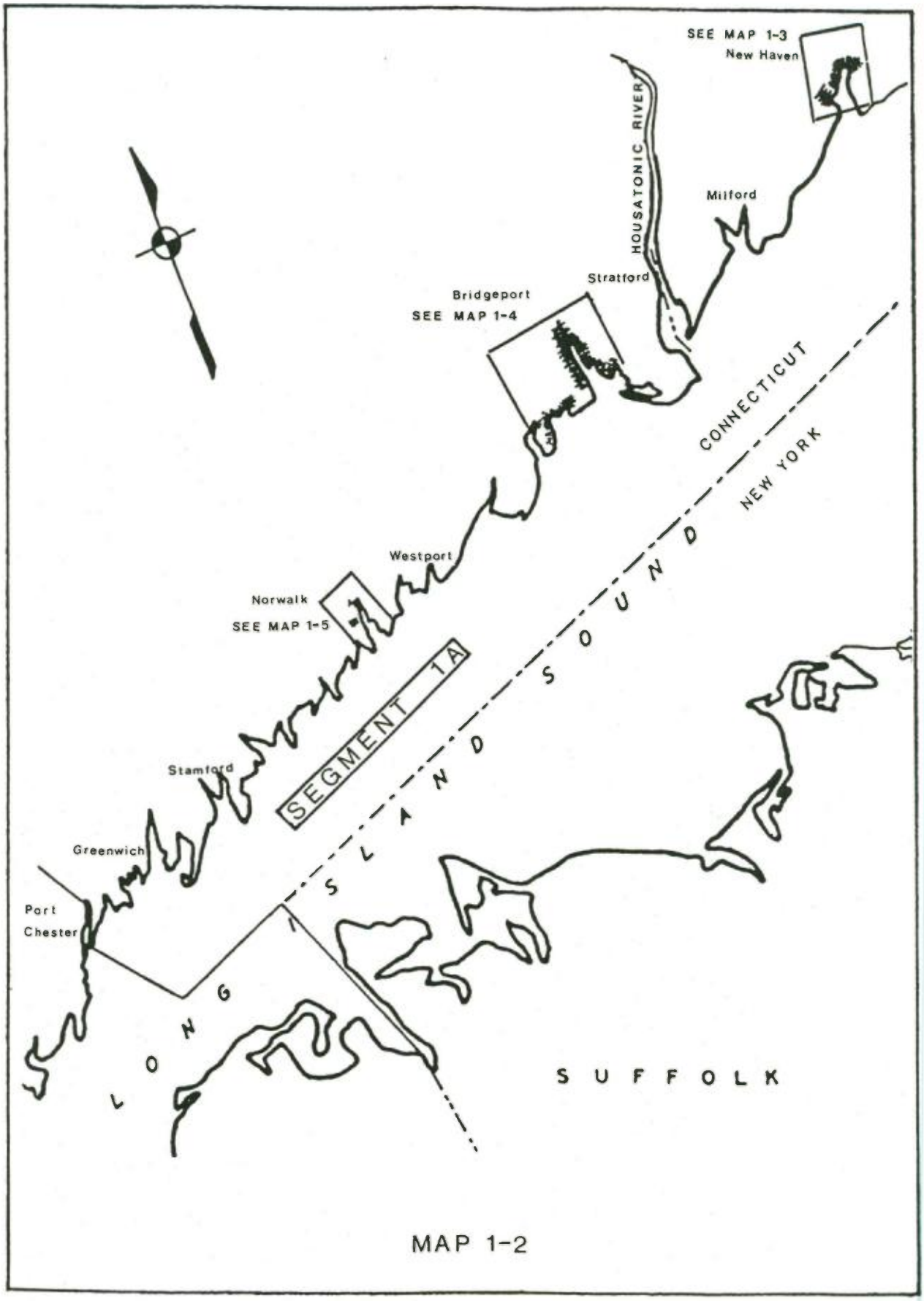
These areas comprise perhaps the single largest recreational resource in the District. Long Island Sound and its adjacent waterbodies host multitudes of boaters throughout the year. Three state parks and numerous municipal parks as well as private beaches or recreational areas are found along the shore in this section. One of the largest resources in the Western Long Island Sound is the abundant fish and shellfish life found there. High levels of contamination caused by sewer overflows disturb aquatic life and make the recreational activities unpleasant and unhealthy. Because of these resources, providing consistently good water quality should be a priority in planning for this part of the District.

SECTION 1A: CONNECTICUT AND SUFFOLK COUNTY

In this geographic area there are 21 POTWs, all of which directly affect Long Island Sound.[1] Although both Connecticut and New York have shoreline in Section 1A, Suffolk County is the only part of New York in this study area and it has no combined sewer systems. The combined sewer discharges in Section 1A emanate primarily from two combined sewer areas in Connecticut: Bridgeport and New Haven. The conditions in Norwalk will also be discussed. The entire area of Section 1A is shown on Map 1-2. The


NEW HAVEN
NEW HAVEN
FAIRFIELD
NEW HAVEN
HOUSATONIC RIVER
MILFORD
STRATFORD
BRIDGEPORT
FAIRFIELD
CONNECTICUT
NEW YORK
WESTPORT
NORWALK
L I S O U N D
SEGMENT IA
PORT JEFFERSON
STAMFORD
GREENWICH
PORT CHESTER
WESTCHESTER
SEGMENT IB
L O N G
SUFFOLK
GLEN COVE
BRONX
NASSAU
QUEENS

MAP 1-1


SEE MAP 1-3
New Haven
HOUSATONIC RIVER
Milford
Stratford
Bridgeport
SEE MAP 1-4
CONNECTICUT
NEW YORK
Westport
Norwalk
SEE MAP 1-5
SEGMENT 1A
Stamford
Greenwich
Port
Chester
L O N G I S L A N D S O U N D
S U F F O L K

MAP 1-2

outfalls for the section are catalogued in Tables 1-1, 1-2, and 1-3.

Suffolk County

All areas of Suffolk County within the study area have separate sanitary and storm sewers. Consequently, no combined sewer outfalls exist.[2] In addition, several county and municipal sewage districts recently underwent inflow and infiltration evaluation to determine sources of extraneous input into the sewer system. These districts are now in the process of correcting problems in areas where excessive flow has been found.

Connecticut

Three cities in Connecticut within the District have combined sewer overflows: New Haven, Bridgeport, and Norwalk. In relative terms, the CSOs in New Haven and Bridgeport present a more serious water quality problem than those in Norwalk. In contrast to Norwalk, both Bridgeport and New Haven have numerous CSOs and, because of the configuration of the system, those CSOs discharge as a result of a smaller increase of flow into the system than would be necessary to cause an overflow in Norwalk. For both New Haven and Bridgeport, plans to alleviate the combined sewer discharges have been submitted and in both cases, some action has been taken toward this end. As of this date, however, the problem has not been remedied.

New Haven

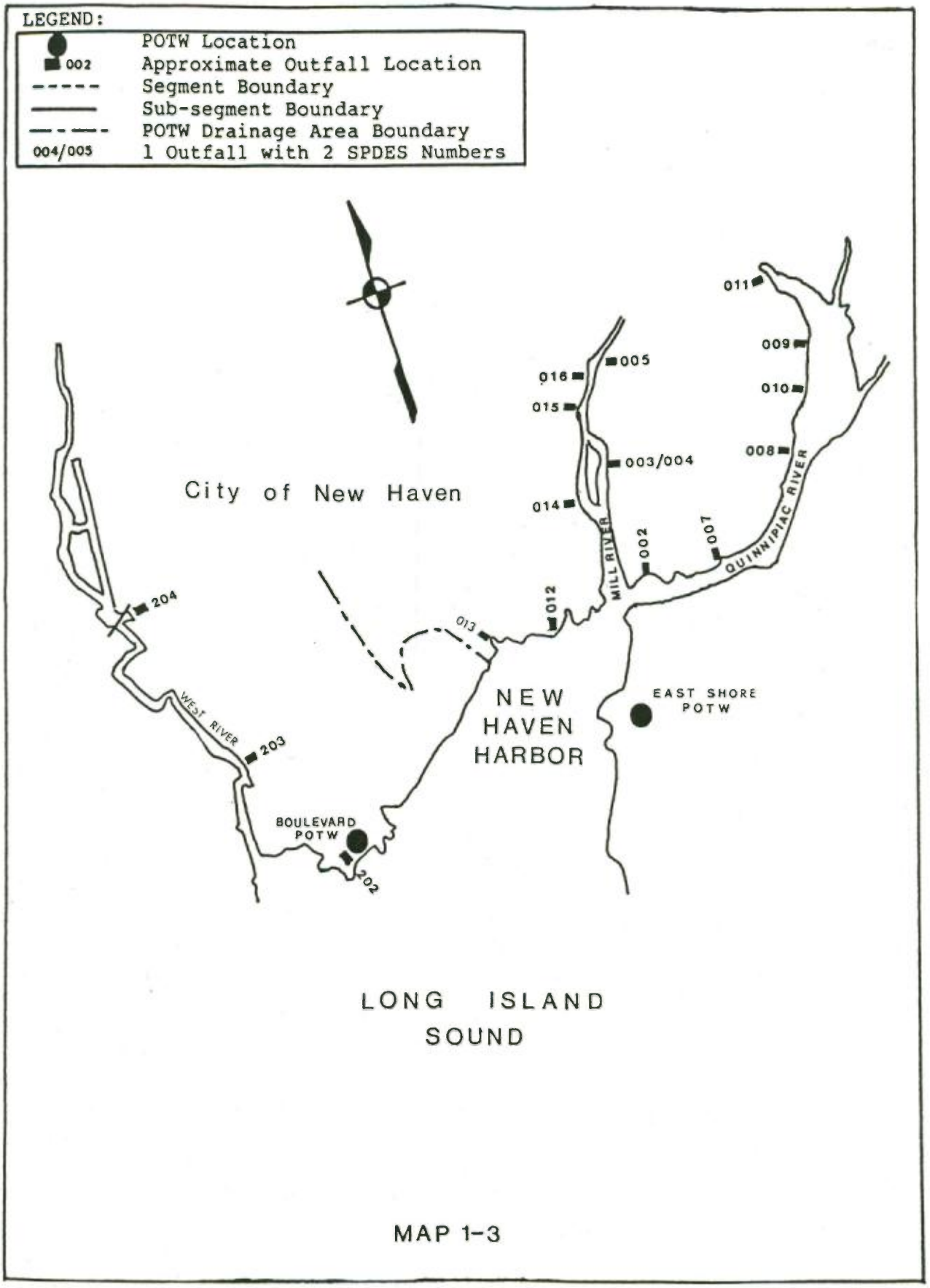
Two sewage treatment facilities serve the City of New Haven. The East Shore POTW, SPDES permit CT0100366, is a secondary activated sludge facility and handles an average dry weather flow of approximately 29.1 MGD.[3] The Boulevard POTW, permit CT0100340, provides primary treatment for an average 9.9 MGD.[4] In 1985, the East Street sewage treatment facility, also a primary treatment plant, was eliminated and the sewage that had previously gone to the East Street facility was diverted to the East Shore plant. The Boulevard facility will also eventually be eliminated and a pump station constructed to

transport sewage to the East Shore plant for treatment. This construction began in early 1987 and although progress has been "a little delayed," flow should be diverted to the East Shore POTW by July 1989.[5]

The sewer system, according to the Facility Plan, Sewage Collection System in the City of New Haven, "consists of 220 miles of sewers of which 125 miles (57%) are combined sewers."[6] As is the case with most of the municipalities in the District, the sewer system in New Haven is old and and in need of improvement and expansion. The Facility Plan states that "[s]ixty percent of New Haven sewers were constructed between 1880 and 1930, 30% between 1931 and 1960 and 10% after 1961."[7] This same document identifies numerous segments of the sewer system that are not adequate to meet the existing flow and will present more overflow problems in the future.

The City of New Haven has 16 combined sewer overflows within the tidal area studied, which is shown on Map 1-3. These 16 are listed on Table 1-1. The outfalls discharge into New Haven Harbor and the lower parts of the three rivers that run through the City. As shown on the map, there are two discharge points on the West River, five points on the Mill River, and six points on the Quinnipiac River. Although three outfalls discharge into the West River above outfall 204, these outfalls are above the tidegate on the River and were, therefore, omitted from this Report. Similarly, two discharge points lie on the Mill River near the New Haven City limits, but have not been considered in this Report. Three overflows empty into New Haven Harbor. One of the discharge points into the Harbor, 012, is a bypass for the East Street POTW, which has been converted to a pump station. All of these outfall points have an impact on the District when they discharge.

Almost all of the outfalls in New Haven discharge through pipes that range in size from 24" to 76" in diameter. The largest single pipes are outfalls 007, 012, 015, 202, and 204. Outfalls 007, 012, and 015 are within the East Shore drainage basin: 007 and 012 measure 54" in diameter, while 015 measures 60" in diameter. Outfall 012 discharges into New Haven Harbor, 007 discharges into the Quinnipiac River at Poplar Street, and 015 outfalls into


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
City of New Haven
011
009
010
008
005
016
015
003/004
014
012
013
002
007
MILL RIVER
QUINNIPIAC RIVER
204
WEST RIVER
203
NEW HAVEN HARBOR
EAST SHORE POTW
BOULEVARD POTW
202
LONG ISLAND SOUND

MAP 1-3

TABLE 1-1
COMBINED SEWER OUTFALLS IN NEW HAVEN
WATERWAY SEGMENT 1A

Treatment Plant Drainage Basin: New Haven - East Shore, CT0100366

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[1]	Comments/ Notes
002	OS-6	James St. Siphon Quinnipiac River	48" dia.	
003/004	OS-7	Grand Avenue Mill River	36" dia.	
005/006	OS-1	James Street " " *	30" dia.	
007	OS-5	Poplar Street Quinnipiac River	54" dia.	
008	OS-4	Grand Avenue " "	24" dia.	
009	OS-2	Lombard Street " "	Dbl.24"dia.	
010	OS-3	Pine Street " "	Dbl.24"dia.	
011	OS-2A	n/o of I-91 Middletown Street " "	36" dia.	
012	OE-8	East Street P/S New Haven Harbor	54" dia.	
013	OE-9, 9B	Long Wharf " " "	Dbl.72"x48"	tidegate
014	OE-7	Ives Place Mill River**	24" dia.	
015	OE-5, 5A	s/o of I-91 " " **	60" dia.[2]	
016	OE-4, 6A,6B	Humphrey Street " " **	48" dia.	

[1] City of New Haven, Facility Plan, Sewage Collection System, Volume 2, Map "Existing Combined Collection System, 1 Year Storm, Flood Prone Areas."

[2] Size information supplied by local officials.

* There are two outfalls above 005/006 discharging into the Mill River.

** Listed in SPDES permit as outfalling into New Haven Harbor.

TABLE 1-1 (continued)

Treatment Plant Drainage Basin: New Haven - Boulevard, CT0100340

Outfall Number SPDES	Local	Location of Outfall	Size[1]	Comments/ Notes
202	OB-2	Boulevard POTW New Haven Harbor	76" dia.	
203	OB-3	n/o of R.R. Bridge West River * (Lamberton Avenue)	42" dia.[2]	
204	OB-4	Congress Blvd. " "	54" dia.	

* There are three known overflows above outfall 204 that discharge into the Upper West River.

the Mill River just south of I-91. Outfall 017 also discharges into the Mill River, at Canner Street, which is above the boundary of the area studied in this Report. Consequently, 017 is not shown on Map 1-3, nor listed on Table 1-1. It is mentioned here, however, because with a diameter of 54", its contribution to the water quality of the Mill River and, thus, of the District should be considered.

The two large pipes in the Boulevard POTW drainage basin are outfalls 202 and 204. Outfall 204 is a 54" diameter outfall at Congress Boulevard on the West River. Outfall 202, which has a 76" diameter, discharges into New Haven Harbor as the general bypass for the Boulevard POTW.

New Haven also has three double-barreled outfalls, all of which are contained in the East Shore drainage basin. Outfalls 009 and 010 are both 24" double outfalls that discharge to the Quinnipiac River at Pine Street and Lombard Street, respectively. The double outfall at Long Wharf into New Haven Harbor is 013 and measures 72" x 48".

New Haven has committed itself to a $5 million per year program of sewer separation over the next 25 years.[8] The project is in the final planning stage and can be implemented immediately when the State grant funds are allocated. No funds were allocated for it in fiscal year 1987. The program includes work on the sanitary lines identified in the Facility Plan as being currently inadequate or that will be inadequate in the foreseeable future, as well as a sewer separation program. These improvements, especially the replacement of the combined lines, should eliminate sources of frequent discharges.

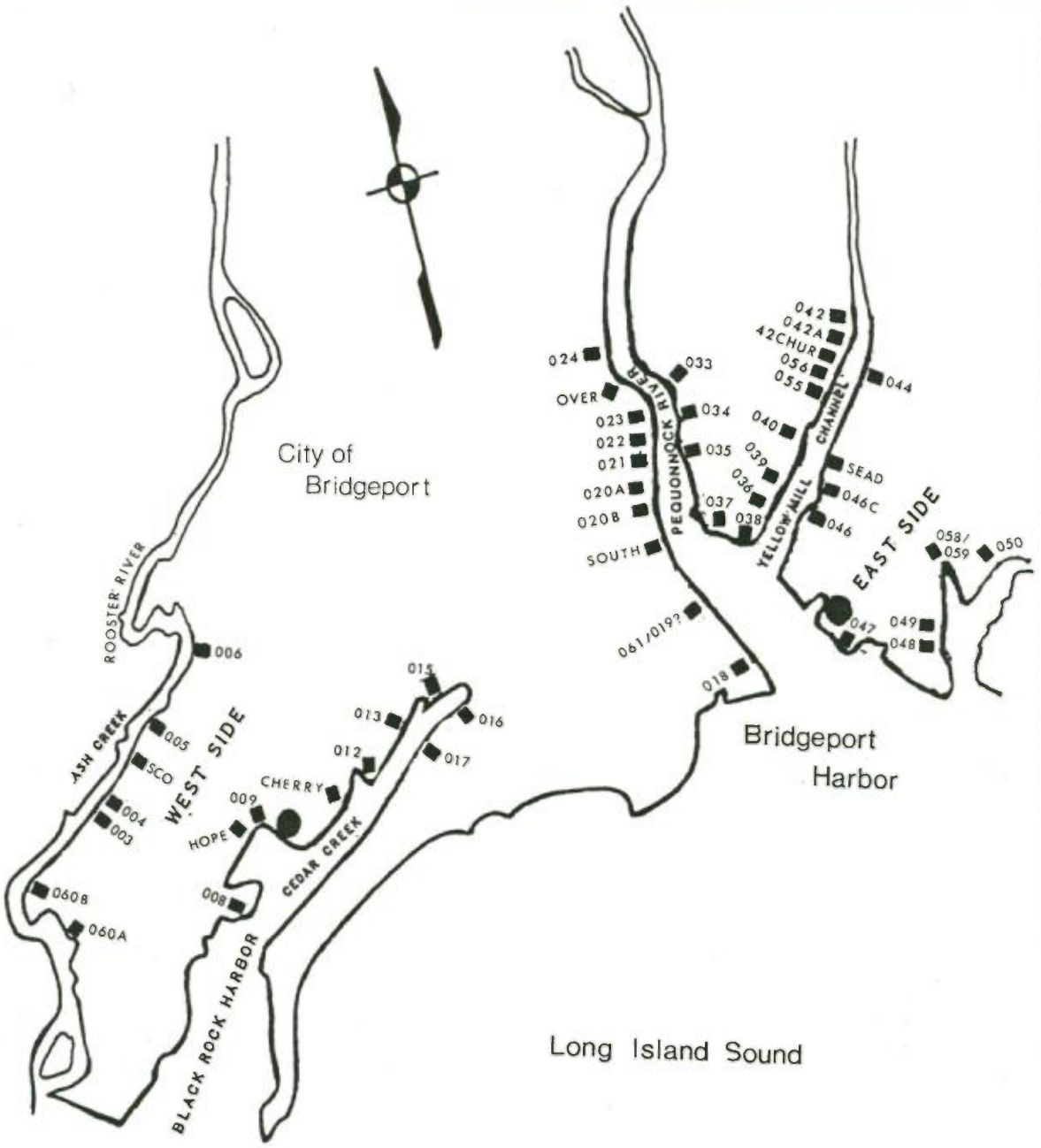
Bridgeport

The City of Bridgeport is served by two secondary activated sludge sewage treatment plants -- the West Side POTW and the East Side POTW. The West Side POTW, permit CT0100056, has a design average flow of 30 MGD and a

design maximum flow of 60 MGD. The reported average flow, obtained from treatment records for 1986, was 28.0 MGD.[9] The East Side plant, permit CT0101010, has a design average flow of 12 MGD and a design maximum flow of 24 MGD. The reported average flow for 1986 was 8.4 MGD.[10] Based on work done as a result of a previous sewer system survey, an inflow into the system of 18.7 million gallons per day of salt water was measured.[11] The recent Developmental Draft Facility Plan, Combined Sewer Improvements indicates that the inflow/infiltration amounts to 40% of the flow to the POTWs.[12]

Approximately 670,000 feet of pipe comprise the City's combined sewer system, over 70% of which have been in service for more than 40 years.[13] According to the SPDES permits for Bridgeport's two POTWs, there are 89 combined sewer overflow points in the two Bridgeport drainage basins. A number of these do not have direct outlets into receiving waters and others of them are outside of the area considered for this Report. The 48 outfalls shown on Map 1-4 and Table 1-2 are the CSOs that discharge directly into Bridgeport Harbor or the lower reaches of tributaries to the Harbor such as Cedar Creek, the Pequonnock River, Yellow Mill Pond, Ash Creek, Rooster River, and Johnson's Creek. The outfalls range in size from 15" in diameter to 60" x 96". Although apparently no outfalls discharge directly into Long Island Sound, these outfalls have an impact on waterbodies adjacent to the Sound and, consequently, on the Sound itself.

Outfall 015 at Admiral Street and Cedar Creek is the largest outfall, measuring 60" x 96". During investigations of the sewer system in Bridgeport, Commission personnel observed a heavy dry weather flow discharging from this outfall. The age of the system, as well as the City's problem with tidal inflow, results in dry weather discharges from a number of other CSOs in the system. Outfall 017 is a 36" diameter pipe characterized in the Sewer System Evaluation Survey (SSES) as having "a nearly constant overflow."[14] During investigations conducted for purposes of this Report, it was still described by local officials as having an occasional dry weather discharge. In July 1988, Commission field personnel observed a dry weather discharge from 017. During this same investigation, a Commission field inspector observed a heavy



LEGEND:

●	POTW Location
■ 002	Approximate Outfall Location
- - - - -	Segment Boundary
———	Sub-segment Boundary
—— - —— -	POTW Drainage Area Boundary
004/005	1 Outfall with 2 SPDES Numbers

MAP 1-4

TABLE 1-2
COMBINED SEWER OUTFALLS IN BRIDGEPORT
WATERWAY SEGMENT 1A

Treatment Plant Drainage Basin: Bridgeport - West Side, CT0100056

Outfall Number SPDES	Outfall Number Local	Location of Outfall[1]	Size[2]	Comments/ Notes
003	BREW	Brewster Street Ash Creek	14" x 21"	
004	PRIN	Princeton Street " "	20" dia.	
	SCO	Scofield Avenue " "	20" dia.	
005	ELLOR	Orland Street " "	18" dia.	
006	DEW	State Street Ext. Rooster River*	42" dia.	tidegate
008	SEAB	Seabright Street Black Rock Hbr.	14" x 21"[3]	tidegate
009	ANTH/ MON	St. Stevens Road Cedar Creek**	48" dia.[3]	tidegate
	HOPE	Hope Street " " **	10" x 15"	tidegate
	CHERRY	Cherry Street " "	10" x 15"	
012	WORD	Wordin Avenue " "	22" x 28"	tidegate

[1] Locations are those listed in Bridgeport - West Side permit, CT0100056.

[2] Information from Bridgeport Facility Plan. September 1987. pp. D-1 - D-50.

[3] Information taken from City of Bridgeport Sewer System Evaluation Survey. October 1983. Appendix A.

[4] Locations taken from Bridgeport - East Side permit, CT 0101010.

* There are two outfalls above 006 that discharge into the Rooster River.

** This outfall discharges into a small segment of Cedar Creek called Burr Creek.

TABLE 1-2 (continued)

Treatment Plant Drainage Basin: Bridgeport - West Side, CT0100056 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall[1]	Size[2]	Comments/ Notes
013	WORS/ WORN	Wordin/ Railroad Avenues " "	30" dia.[3]	tidegate
015	ARBOR	Admiral Street " "	60" x 96"	tidegate
016	LITT	Little Street " "	42" dia.[3]	tidegate
017	ALS	South Avenue " "	36" dia.	tidegate
018	TIC/ UNIV	Henry Street Bridgeport Harbor	48" dia.[3]	tidegate
061/ (019)	NOW/ MAIN	Railroad Court " "	27" dia.	tidegate
	SOUTH	South/Water Sts. " "	12" dia.	
020A	STATE B	State/ Water Streets Pequonnock River	66" dia.	tidegate
020B	TERS/ TERN	Union Square " "	48" dia.[3]	tidegate
021	WALL	Wall Street " "	42" dia.	tidegate
022	FAIR	Fairfield Avenue " "	26"x36" [3]	tidegate
023	HILL	Golden Hill Street " "	27" dia.[3]	tidegate
	OVER	Congress Street " "	36" dia.	
024	CON	Congress/Main Sts. " "*	18" dia.	
033	CREP/ CREW	Congress Street " "	20"x30" [3]	tidegate
034	NOB	Burroughs Street " "	15" x 20"	tidegate
060A	FOX	Fox Street Ash Creek	14" x 19"	
060B	POL	Poland Street " "	14" x 21"	

* There are 17 outfalls that discharge above 024 into the Pequonnock River and Island Brook.

TABLE 1-2 (continued)

Treatment Plant Drainage Basin: Bridgeport - East Side, CT0101010

Outfall Number SPDES	Local	Location of Outfall[4]	Size[2]	Comments/ Notes
035	NICH/ HOWE	Nichols Street Pequonnock River	24"x36"[3]	tidegate
036	MAID	Maiden Lane Yellow Mill Pond	10" x 15"	
037	PIER	Pierpont Street Bridgeport Harbor	10" x 15"	
038	PEMB	Pembroke Street " "	15" x 20"	tidegate
039	WANN/ ANN	Waterview Ave. Yellow Mill Pond	30" dia.	tidegate
040	HALL	Hallet Street " "	24" dia.[3]	tidegate
	42CHUR	Waterview/Church Sts. " "	42" dia.	
042	PCRR	Crescent Avenue " " *	15" x 20"	
042A	15CHUR/ 36CHUR	Old Church Street " "	36" dia.	
044	WASH	Crescent Avenue " "	12" dia.	
	SEAD	n/o Deacon Street " "	24" dia.	
046	STRAT	Connecticut Avenue " "	48" dia.	tidegate
046C	DEAC	Deacon Street " "	30" dia.	
047	SEAV	Seaview Avenue Bridgeport Harbor	24" x 30"	tidegate

* There are six outfalls that discharge above 042 on Pembroke Lake.

TABLE 1-2 (continued)

Treatment Plant Drainage Basin: Bridgeport - East Side, CT0101010 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall[4]		Size[2]	Comments/ Notes
048	ADAM	Adams Street	Johnson's Creek	15" dia.	tidegate
049	JEFF	Jefferson Street	"	15" dia.	tidegate
050	BAYEL	Bay Street	" *	48" dia.[3]	tidegate
055	HAM	Hamilton Street	Yellow Mill Pond	27" dia.	
056	WATER	n/o Hamilton St.	" "	27" dia.	
058/ 059	ANGE/ ORAN	Orange Street	Johnson's Creek	24" dia.	

* There are three outfalls above 050 into Bruce Brook.

dry weather discharge from outfall 033 and a slight discharge from outfall 040. In an earlier inspection, Commission personnel observed a dry weather discharge from outfall 020, a 48" diameter pipe discharging from Union Square into the Pequonnock River. Additional information obtained by the Commission indicates that this outfall bypasses most of the time because of inadequate capacity at that point in the system. Outfall 013 is also described in the SSES as having a dry weather discharge.[15]

Although during the preparation of this Report more information has become available on the Bridgeport sewer system, unanswered questions still remain. For example, no regulator or outfall information is available for several outfalls listed in the permit. It is unclear whether these outfalls have direct discharges to receiving waters or have been eliminated as part of ongoing sewer system work. Similarly, although apparently only one outfall discharges into Bridgeport Harbor at Railroad Avenue, two outfall assignments (019 and 061) with the same dimensions and the same location, have been made in the permit. No definitive information is available on this.

In addition to this clarification regarding 019/061, it is necessary for Bridgeport to obtain outfall numbers for the several outfalls that have been identified but that are not presently included in the permit. These outfalls are shown in Table 1-2.

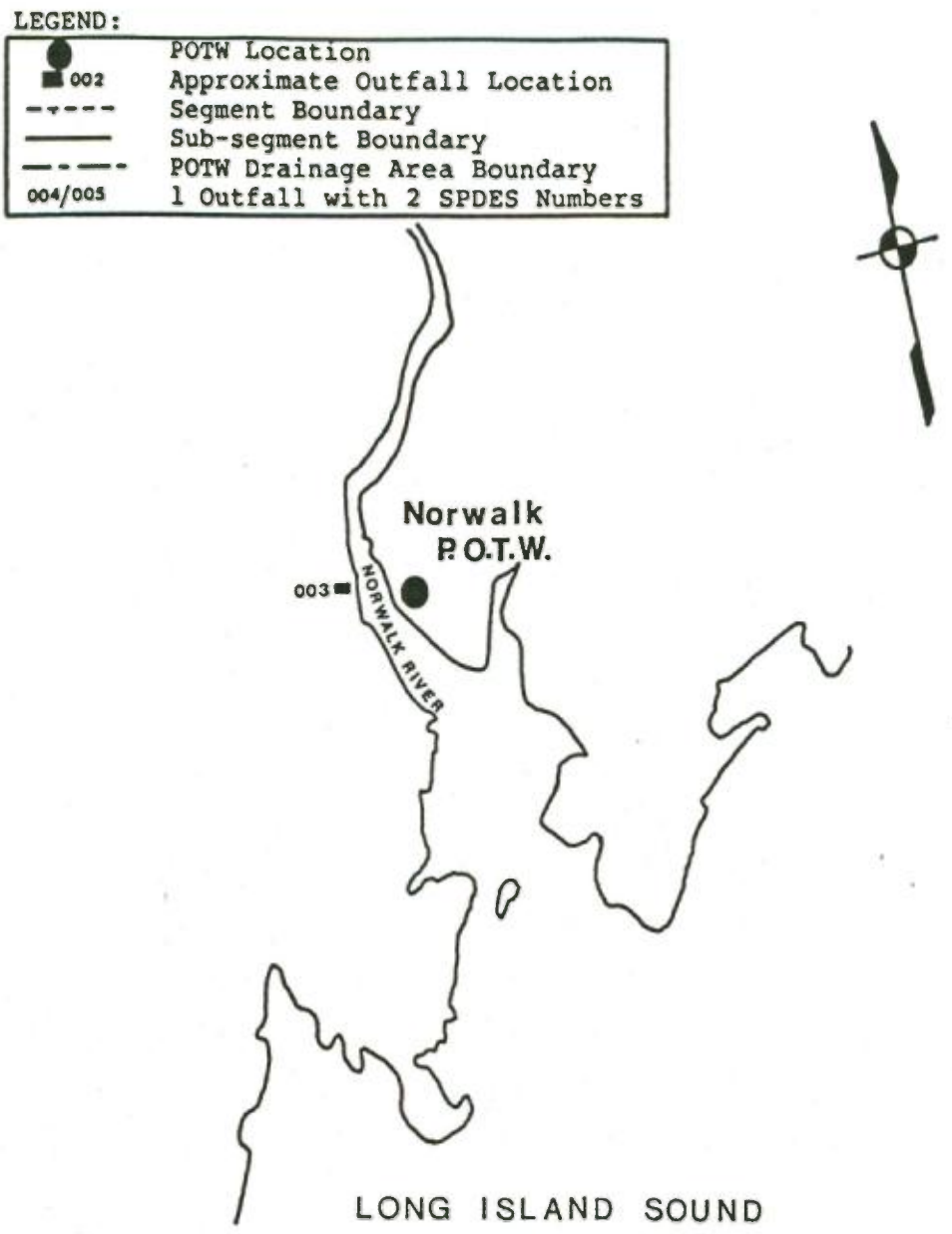
Several initiatives have been undertaken to reduce the amount of bypassing in the sewer system. First, in order to stem some of the tidal inflow, most of City's 31 tide gates have been replaced within the last several years.[16] City officials estimate that this replacement has reduced the amount of inflow by 18 MGD. Second, during the past ten years a number charge points in the system have been eliminated. Among these were "WALD", which had been the only direct discharge point into Long Island Sound. Third, some repair and maintenance work has been performed; the weirs in some regulators have been raised in an effort to increase the wastewater flow to the POTWs. No action has, thus far, successfully addressed the existing dry

weather flow. The recent Facility Plan identifies several additional recommendations for improvement in the sewer system. In addition to improvements at the pump stations and siphons, they include sewer separation for 292 acres of the drainage basin. Construction of 11,750 feet of new sewer lines will convey flows to a reduced number of regulators.[17] The goal for the Bridgeport system is to reduce the ultimate number of direct discharge points from 71 to 19.[18]

The City of Bridgeport recognizes the problems that it has in its system: the condition of its facilities, the excessive infiltration and inflow, and the numerous combined sewer outfalls. The City also recognizes that additional personnel must be hired to have adequate staffing and optimal plant operation. Although all of these conditions must eventually be remedied, action on any one of them would lead to an improvement.

Norwalk

In Norwalk, permit CT0101249, three federally-funded projects have eliminated the majority of the overflows, but approximately 10% of the City's area still has combined sewers.[19] At present, only one functional overflow remains, although it drains a large area. According to public works officials, this outfall 003 -- the Ann Street Siphon -- apparently discharges only very rarely and serves as a protection for the POTW from excessively large flows. This outfall will theoretically discharge at a flow of 105 MGD; there has been no recorded flow in excess of 65 MGD. Based on recent conversations with officials, the focus of the overflow control strategy is to maximize the flow that reaches the plant by working within the existing system rather than undertaking additional sewer separation at this time. Map 1-5 shows the location of the Ann Street overflow and it is listed on Table 1-3.


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
Norwalk
P.O.T.W.
003
NORWALK RIVER
LONG ISLAND SOUND

MAP 1-5

Table 1-3

COMBINED SEWER OUTFALLS
IN NORWALK
WATERWAY SEGMENT 1A

Treatment Plant Drainage Basin: Norwalk, CT0101249

Outfall Number		Location of Outfall	Size[1]	Comments/ Notes
SPDES	Local			
003		Ann Street & Norwalk River	Dbl.30" & 42"	

[1] Size information supplied by local officials.

SECTION 1B: NASSAU COUNTY, EASTERN WESTCHESTER COUNTY, AND PARTS OF BRONX AND QUEENS

Of the 14 POTWs that service Section 1B, only two of them have associated combined sewer systems. These two drainage basins are part of the New York City system. However, some water degradation is traceable to inflow and infiltration into the separate sewer systems in Westchester County. This problem will be discussed briefly. Section 1B is shown on Map 1-6. The outfalls for the entire section are catalogued in Table 1-4.

Nassau County

The sewer systems from the northern shore of Nassau County all contain separate sanitary and storm systems.[20] Consequently, wet weather CSO discharge from this area does not contribute to the degradation of District waters.

Eastern Westchester County

The eastern shore of Westchester County contains no combined sewer overflows.[21] Wet weather water quality, however, remains a problem along parts of this shoreline for several reasons related to the system itself.

These problems are a result of the excessive inflow/infiltration into the sewer system. This input into the sewer system of several Westchester County communities during wet weather causes flows to exceed design capabilities of the sanitary systems and leads to sanitary overflows, which have the same impact as combined sewer discharges. Summer rainfall quite often results in beach closings along the Sound in Westchester County due to elevated coliform counts. Mamaroneck, among other communities, has a severe wet weather overflow problem, which has been identified by the Commission and other governmental agencies. More specific information should be obtained on individual discharge points in the Mamaroneck system. As part of the Long Island Sound Study, Mamaroneck has received a $250,000 demonstration grant in

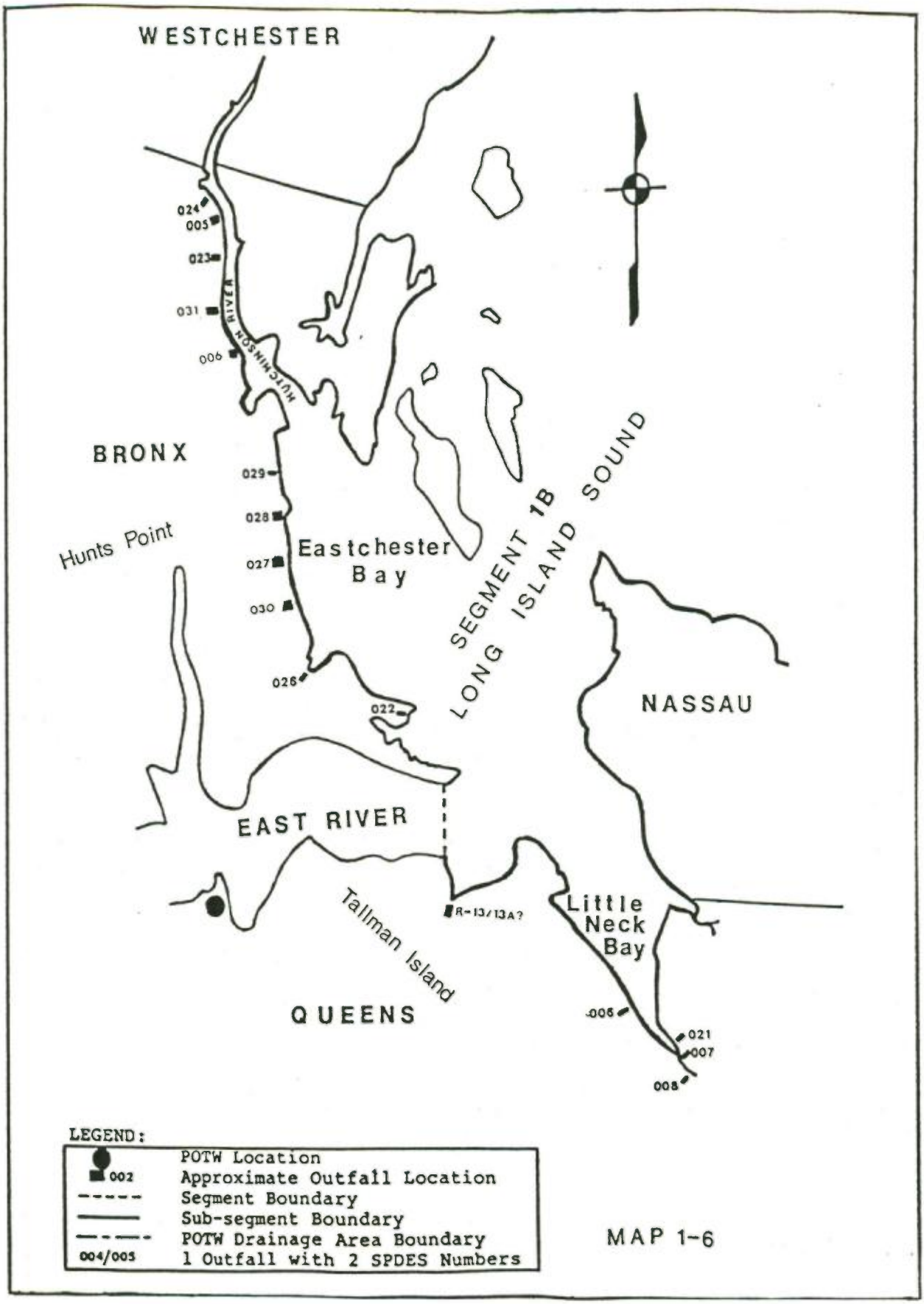

WESTCHESTER
024
005
023
031
006
HUTCHINSON RIVER
BRONX
029
028
027
030
026
022
Hunts Point
Eastchester Bay
SEGMENT 1B
LONG ISLAND SOUND
NASSAU
EAST RIVER
Tallman Island
R-13/13A?
Little Neck Bay
QUEENS
-006
021
007
008
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
MAP 1-6

TABLE 1-4
COMBINED SEWER OUTFALLS INTO WATERWAY SEGMENT 1B

Treatment Plant Drainage Basin: Hunts Point, NY0026191[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
005	P/S	Holler Avenue	Hutchinson River	12" dia.	
006	P/S	Bartow Avenue	" "	15' x 8'6"	
022	R-1	E. 177th Street	Eastchester Bay	8' x 8'	2, 3
023	R-15	Conner Street	Hutchinson River	12' x 6'6"	3
024	R-15A	E. 233rd Street	" "	12'6"x10'	3
026	R-14	Ellsworth Avenue	Eastchester Bay (Weir Creek) *	9' x 8'	2, 3
027	CSO	Westchester Ave.	Eastchester Bay	12" dia.	
028	CSO	Outlook Avenue	" "	12" dia.	2
029	CSO	Watt Avenue	" "	15" dia.	2
030	CSO	Barkley Avenue	" "	15" dia.	
031	P/S	Bellamy Loop North	Hutchinson River	72" dia.	

[1] SPDES number assignment, street address, and size taken from Hunts Point permit, Part I, page 9 of 32.

[2] Location verified by Commission personnel.

[3] Inspected as part of Task 2.5.2.

[4] SPDES number assignment, street address, and size taken from Tallman Island permit, Part I, page 9 of 32.

[5] Information regarding R-13/R-13A is taken from Commission shoreline surveys and from New York City Department of Environmental Protection's, East River CSO Facility Plan, Project No. 32025. "Tallman Island Outfalls." Prepared by URS Co. July 1988.

* Characterized in permit as discharging to the East River.

TABLE 1-4 (continued)

Treatment Plant Drainage Basin: Tallman Island, NY0026239[4]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
006	CSO	24th Avenue (Bayside P/S)	Little Neck Bay	10' x 7'6"	
007	P/S	Northern Blvd.	Alley Creek	18" dia.	
008	R-46, R-47, R-48, R-49	46th Street	" "	10' x 7'6"	
009	P/S	Douglaston Bay P/S	Little Neck Basin	*	
021	CSO	233rd Street	Little Neck Bay	42" dia.	2
	R-13/ R-13A	Cryder's Lane	Little Bay	13'6" x 8'	2, 5

* Dimensions are not available from existing City documents or inquiries to City officials.

order to study the wet weather runoff and surcharging problem and to make recommendations that will be applicable to Mamaroneck as well as to other Long Island Sound communities.

A number of initiatives to improve the problem are already underway. The Mamaroneck sewer district has completed all of its I/I work and has completed approximately 70% of the rehabilitation of the trunk and lateral sewers in the system. The New Rochelle sewer district has completed about 70% or both the I/I work and the sewer rehabilitation. The villages of Mamaroneck and Larchmont have launched a public awareness campaign in order to educate citizens about the illegality of certain inputs into the system. Westchester County has made a smoke testing crew available to communities to locate illegal hook-ups to the sewer system. This infiltration, no less than CSOs in other sections of the District, has a severe impact on the quality of waterbodies in the District and should be corrected.

The Stevenson Interceptor in New Rochelle has an overflow that occasionally results in a discharge to the Stevenson Creek and Echo Bay. Due in part to the previously mentioned infiltration to the sewer systems in this section of Westchester County, this overflow serves as a relief valve for the system. According to conversations with local officials, this outfall discharges only infrequently and visual inspection of the outfall by Commission personnel during wet weather has substantiated this.

Eastchester Bay

The CSOs discharging into Eastchester Bay and the lower part of the Hutchinson River are contained in the Hunts Point POTW drainage basin of New York City. The outfalls into these waterbodies are depicted on Map 1-6. These include five outfalls on the Hutchinson River and six outfalls on Eastchester Bay.

There is disagreement among the City reports on the number of outfalls

into Eastchester Bay. The City's Regulator Improvement Program Task 1[22] for this area indicates that four outfalls discharge into Eastchester Bay, while the City's CSO Study lists five for the same area.[23] The Commission's field investigation of this area located outfalls for 022, 026, 028, and 029. These four outfalls as well as 027 and 030 are shown on Map 1-6. Because the outfall for 027 was not located by Commission personnel, only an approximate location is shown on Map 1-6. None of the City's publications discussed the construction of a large outfall at Layton Avenue and Shore Drive, although such construction has been progressing. It is not known whether this is a replacement regulator or an addition to the existing regulators. Conversations with NYS DEC indicate that this structure is part of the partial separation program for the sewer system through a large portion of the western side of Eastchester Bay.

There are five outfalls that discharge into the Hutchinson River. Three of these are related to pump station overflows: 005, 006, and 031. Outfall 006 is the largest of all of the five outfalls on the Hutchinson River, measuring 15' 0" x 8'6". It is the overflow for the Co-op City (south) pump station. Outfalls 024 and 023 are the next largest, measuring 12' 6" x 10' and 12' x 6' 6", respectively. The Co-op City (north) pump station outfall (031) measures 72" in diameter, while the Holler Avenue pump station outfall (005) measures only 12" in diameter.

Eastchester Bay and the Hutchinson River, in addition to Westchester Creek, the Bronx River, and Pugsley's Creek in Section 2A, are part of the Hunts Point Tributary Group, which is a City initiative to identify tributaries stressed by CSO inputs and to improve their water quality. Action in this area should commence in 1993.

Little Neck Bay and Little Bay

Little Neck Bay and Little Bay are located within the Tallman Island drainage basin. Map 1-6 shows the outfalls into these waterbodies. This

includes two outfalls into Alley Creek (007 and 008). Outfall 008 measures 10' x 7'6". Although the outfall for the Douglaston Pump Station (009) also discharges in this vicinity, it is not shown on Map 1-6 because the outfall location could not be verified by reference to City documents.

In Little Neck Bay, Commission personnel located outfall 021 near the mouth of Alley Creek and outfall 006, a 10' x 7'6" pipe that is the overflow from the 24th Avenue (Bayside) Pump Station. Visual inspection of the shoreline revealed a significant number of stormwater outfalls, but no outfall in Little Neck Bay, either storm or sanitary, showed evidence of a dry weather flow. A large proportion of the immediate shoreline in this area has a separated sewer system, according to the New York City Sewer Map.[24]

In surveying Little Bay, Commission field personnel discovered an outfall at Cryder's Lane and Little Bay with a spray painted number R-13A on it. They observed this outfall discharging a dry weather flow of what appeared to be sanitary waste on several occasions over a period of months. Little information is available about the source of this discharge. According to the New York City Sewer Maps,[25] it serves as the outfall for the R-13 regulator and measures 13'6" x 8'. The Task 2.5.2 and the "Supplemental Memo," however, indicate that the R-13 outfall discharges at 9th Avenue and Little Bay, which is north of the R-13A outfall.[26] Commission personnel have not been able to find the R-13 outfall at this location. A document released by the City in July 1988 lists R-13 discharging at Cryder's Lane suggesting that the outfall labelled R-13A is, in fact, the R-13 outfall.[27] However, the revised "NYC Outfall Table" dated October 6, 1988 indicates that R-13 outfalls at 9th Avenue.[28] Clearly, confusion still exists about this outfall. Neither R-13 nor R-13A has been assigned a SPDES number in the permit renewal.

CONCLUSION

Western Long Island Sound, in general, does have good water quality during most of the year that justifies its "A" classification and makes it one

of the most popular recreational resources in the area. It does, however, have isolated areas of poor water quality, including areas of hypoxia in Western Long Island Sound during the summers.[29] As shown in recent Commission ambient water quality surveys and sampling as part of the Long Island Sound Study, in which the Commission participates, these areas are more widely distributed than was originally thought. Similarly, some waters sampled show high levels of heavy metals and oil and grease, all of which would be reduced by CSO control. Several bays in Connecticut and New York suffer chronic wet weather degradation, which has a devastating effect on the adjacent beaches and marinas, but which also has an impact on the Sound itself.

In this area of the District, priority should be placed on stopping all existing dry weather flow. The task next undertaken would be to reduce sanitary discharges in the few remaining troubled areas in Western Long Island Sound. As was mentioned earlier, the discharges fall into discrete areas in which overflows should be decreased and then eliminated. In different areas, this may mean separating sewers to abate CSOs or, where CSOs already have been eliminated, it may mean preventing infiltration to the sewer system to prevent surcharging and overflowing. Much of this section of the District has fairly good water quality and the shoreline municipalities have already invested large amounts of money to protect the water. By continuing the efforts that have been made and extending them to as yet unimproved areas, everyone's interest in the water quality of the Sound will be protected.

FOOTNOTES

[1] Interstate Sanitation Commission. 1987 Annual Report. Appendix A. pp. A-1-A-3.

[2] This information was gathered through Commission inquiries to NYS DEC and local municipalities. (See also, City of New York, Environmental Protection Administration. Section 208, Task 135, Current Sewer Service Areas. Prepared by Hazen and Sawyer. August 1977. pp. A2-10).

[3] Interstate Sanitation Commission. 1987 Annual Report. Appendix A. p. A-1.

[4] Ibid.

[5] This information was obtained through conversations with state and local officials.

[6] City of New Haven, Connecticut. Facility Plan, Sewage Collection System, Volume 1, City of New Haven. Prepared by Cardinal Engineering Associates. February 1981. p. 4-122.

[7] Ibid. p. 4-90.

[8] This information was supplied through conversations with local and state officials.

[9] Interstate Sanitation Commission. 1987 Annual Report. Appendix A. p. A-1.

[10] Ibid.

[11] City of Bridgeport, Developmental Draft Facility Plan, Combined Sewer Improvements. Prepared by Watermation, Inc., Kasper Associates, Inc., and Diversified Technologies Corp. September 1987. Section 4.0.

[12] Ibid. p. 1-2.

[13] City of Bridgeport, Connecticut. Sewer System Evaluation Survey, Tidal Inflow Segment. Prepared by Watermation, Inc., Kasper Associates, Inc., and Diversified Technologies Corp. October 1983. p. 2-2.

[14] Ibid. Table 4.2. p. 4.3.

[15] Ibid.

[16] City of Bridgeport, Connecticut. Developmental Draft Facility Plan, Combined Sewer Improvements. Prepared by Watermation, Inc., Kasper Associates, Inc., and Diversified Technologies Corp. September 1987. p. 1-2.

[17] Ibid. p. 1-5.

[18] This information was obtained during conversations with local system experts.

[19] This information was obtained through conversations with local officials.

[20] This information was compiled in a review of Commission records and through conversations with local officials.

[21] This information was obtained through review of Commission records and conversations with local officials.

[22] New York City Department of Environmental Protection. Regulator Improvement Program, Task 1 - Drawings, Hunts Point. Prepared by Hazen and Sawyer. April 1985. Outfall Table.

[23] New York City Department of Environmental Protection, Bureau of Pollution Control. City-wide Combined Sewer Overflow Study. Prepared by O'Brien and Gere. November 1986. Table 2.

[24] New York City. Tallman Island Drainage Area, Comprehensive Maps. Prepared by URS Co. April 1986.

[25] Ibid.

[26] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2. -- Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3; "Supplemental Memo." Table 8.

[27] New York City Department of Environmental Protection. Bureau of Water Pollution Control. East River Facility Plan. Tallman Island Table. Prepared by URS. July 1988.

[28] "NYC Outfall Table." Hunts Point. October 6, 1988.

[29] Interstate Sanitation Commission. "Status Report on the Interstate Sanitation District Waters." An update for the State of Connecticut's 305(b) Report. April 1988.

CHAPTER 2

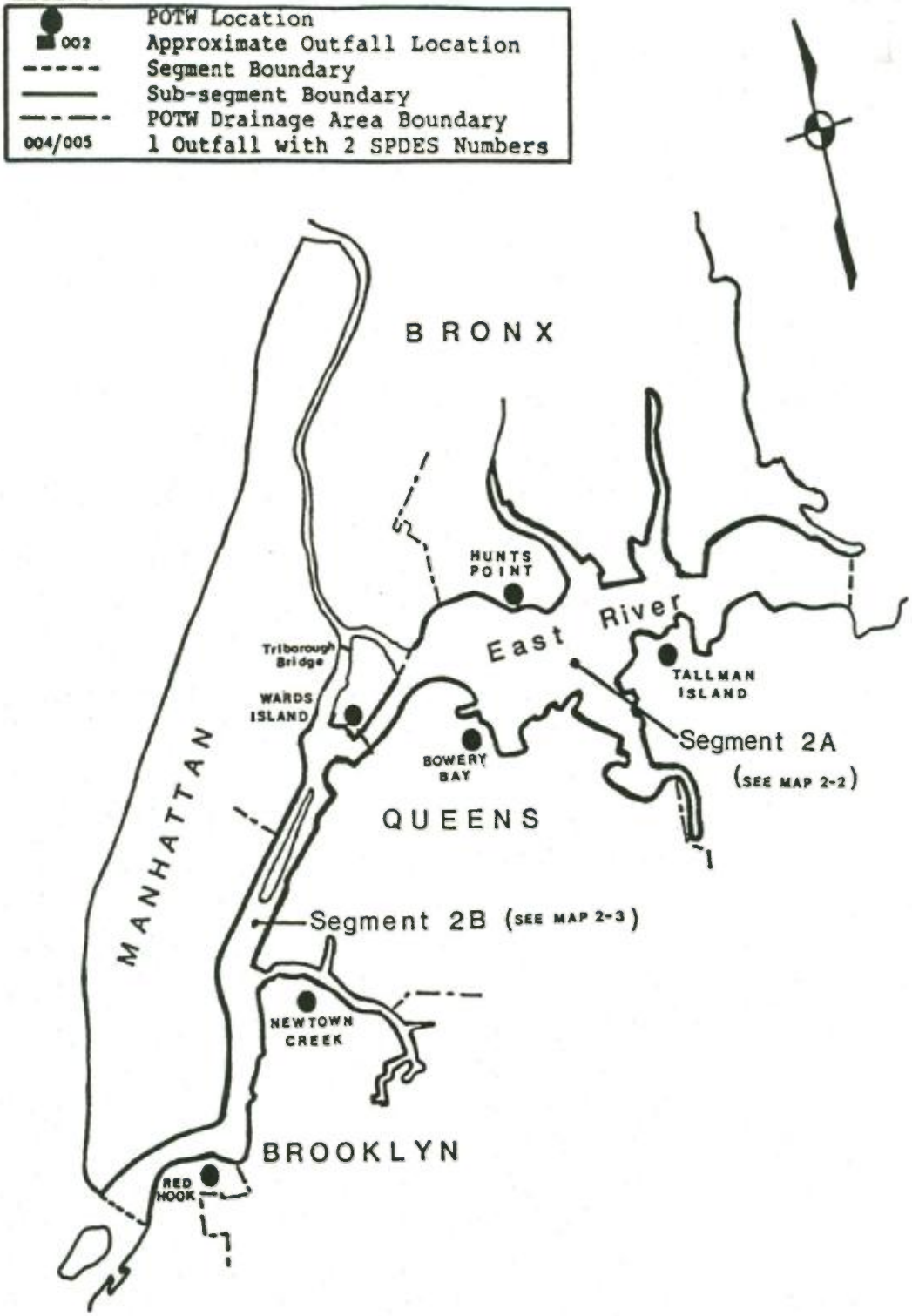
EAST RIVER

The East River runs from the Throgs Neck Bridge at the mouth of the Long Island Sound to the Battery at the southern end of Manhattan, as shown on Map 2-1. The upper segment of the East River, identified as Section 2A in this Report, lies between the Throgs Neck Bridge and the Queens leg of the Triborough Bridge. The lower segment, identified as Section 2B in this Report, is the area from the Triborough Bridge over both the East River and the lower Harlem River to the Battery and across to Montague Street in Brooklyn. Although the East River winds through one of the most heavily developed and industrialized areas in the District, Commission ambient water quality data over the past decade indicate that the water quality has been improving. This conclusion is substantiated by other studies as well.[1] In 1986, the Commission and the State of New York upgraded the water classification of a section of the East River; the Commission now classifies the East River from the Battery to the Whitestone Bridge as "B-1" and from the Whitestone Bridge to the Throgs Neck Bridge as "A". These classifications indicate a level of water quality where achievement of the standards for this classification is a reasonable goal.

In upgrading the River's classification, NYS DEC referred to evidence that the East River has improved sufficiently to be once again serving as a site for fish propagation.[2] The water quality can be expected to improve further with the completion of the Red Hook POTW, which is now providing primary treatment and disinfection for wastewater and will soon be providing secondary treatment. Progress on CSOs in this area, however, should lead to further water quality improvements.

SECTION 2A: UPPER EAST RIVER

This section of the East River lies between the Triborough Bridge and the Throgs Neck Bridge. It encompasses sections of the Wards Island, Tallman


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
BRONX
HUNTS POINT
East River
Triborough Bridge
WARDS ISLAND
TALLMAN ISLAND
Segment 2A
(SEE MAP 2-2)
BOWERY BAY
QUEENS
MANHATTAN
Segment 2B (SEE MAP 2-3)
NEWTOWN CREEK
BROOKLYN
RED HOOK

MAP 2-1

Island, Bowery Bay, and Hunts Point POTW drainage basins. There are approximately 49 CSOs emptying into this area, including those of Flushing and Bowery Bays, Westchester Creek, the Bronx River, and several other coves and creeks adjacent to the East River within this section. This section of the East River is shown on Map 2-2 and the outfalls for the entire section are listed on Table 2-1.

Between the Whitestone Bridge and Throgs Neck Bridge

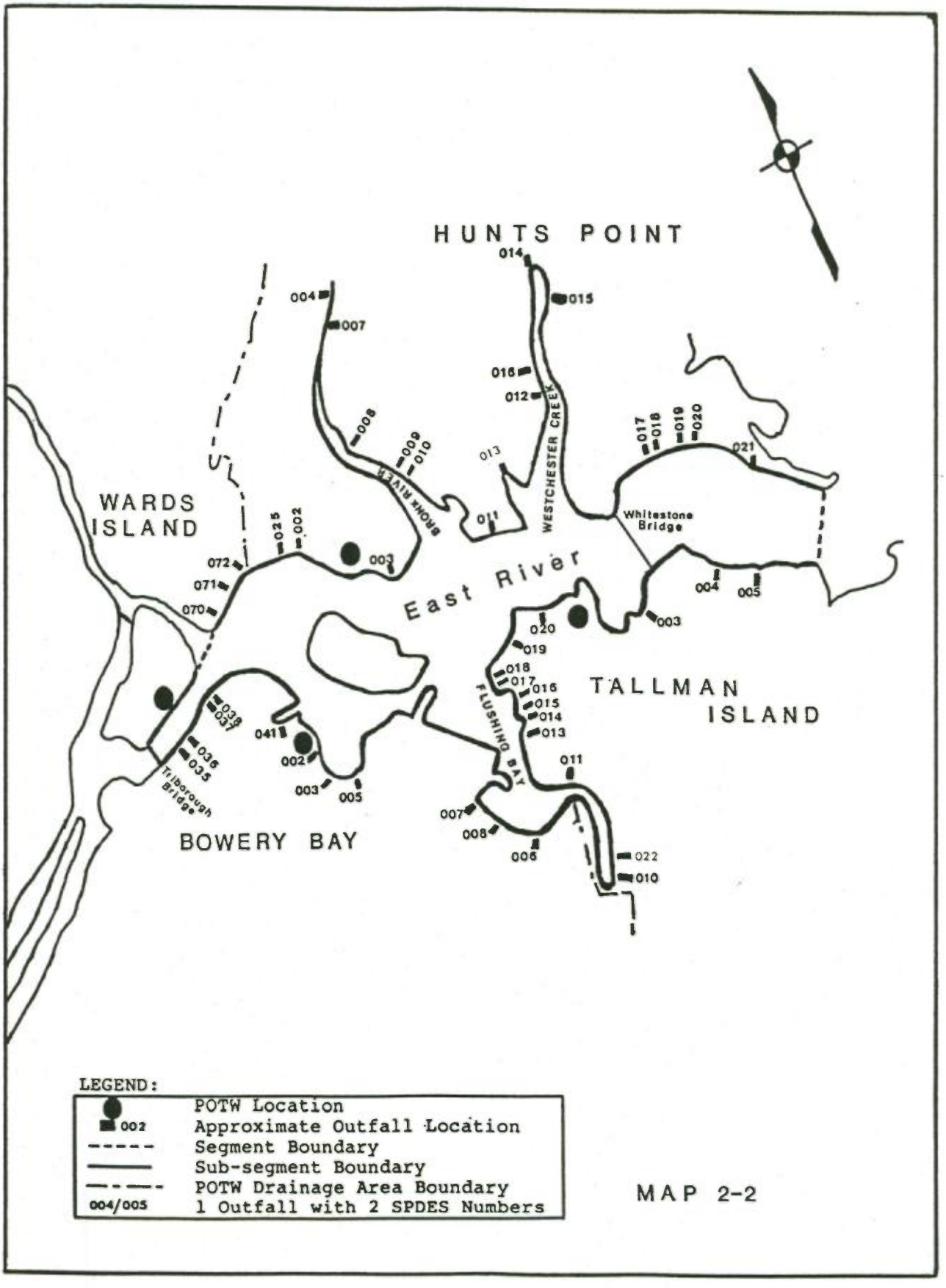
The section of the East River between the Whitestone Bridge and the Throgs Neck Bridge is the only section of the East River classified as "A". There are seven CSOs in this area associated with the Tallman Island drainage basin on the south shore (permit NY0026239) and the Hunts Point drainage basin on the north shore (permit NY0026191).

Outfalls 005 and 004 are located on the south shore of the East River. These outfalls measure 24" and 72", respectively. Their location has been identified by the Task 1.[3] The Clearview Expressway pump station is also located in this area and may have CSOs associated with it.[4]

On the north shore, outfalls 017 through 021 are associated with the Hunts Point drainage basin. Outfalls 017, 018, 019, and 020 were identified in the Task 1. The Task 2.5.2 also stated that the outfall inspection of 018 revealed that it contained heavy debris and was in a deteriorating condition. Outfall 017 also contained debris.[5] Outfalls 019 at Calhoun Avenue and 021 at Pennyfield Avenue were visually verified by Commission personnel. In neither Commission field verification was any flow observed during dry weather. The locations of the outfalls in this section are depicted on Map 2-2.

Powell's Cove

Powell's Cove, which is situated on the south shore of the East River immediately west of the Whitestone Bridge and to the east of the Tallman Island POTW, contains one CSO. This outfall is numbered 003 and measures 8' x


HUNTS POINT
WARDS ISLAND
East River
TALLMAN ISLAND
BOWERY BAY
WESTCHESTER CREEK
SHOAK RIVER
FLUSHING BAY
Whitestone Bridge
Triborough Bridge
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers

MAP 2-2

TABLE 2-1

COMBINED SEWER OUTFALLS
IN THE UPPER EAST RIVER
WATERWAY SEGMENT 2A

Treatment Plant Drainage Basin: Tallman Island, NY0026239[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
003	R-10, R-10A, R-10B	n/o 7th Avenue Powell's Cove	8' x 8'	
004	R-11	151st Street East River	72" dia.	
005	R-12	154th Street " "	24" dia.	
010	20 Regulators	Roosevelt Avenue Flushing River (Approximately 41st Street)	3 Bl. 18'6" x 10'	3
011	R-9, R-51, R-52, R-53, R-54	32nd Avenue " "	Dbl.8'x 8'	2, 3
012	R-9	29th Avenue Flushing Bay	*	
013	R-8	25th Avenue " "	18" dia.	
014	R-7	23rd Avenue " "	12" dia.	3

[1] SPDES number assignment, street address, and size taken from Tallman Island permit, Part I, page 9 of 32.

[2] Location verified by Commission personnel.

[3] Inspected as part of Task 2.5.2.

[4] Tallman Island Drainage Basin, Comprehensive Maps. Prepared by URS Co.

* Size information is not contained on available City documents.

TABLE 2-1 (continued)

Treatment Plant Drainage Basin: Tallman Island, NY0026239 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
015	R-6	22nd Avenue	Flushing Bay	1'3"xl'10"	2
016	R-5	20th Avenue	" "	60" dia.	3
017	R-4	15th Avenue	" "	12" dia.	3
018	R-3	14th Avenue	" "	1'6"xl'2"	2, 3
019	R-2	9th Avenue	East River	12" dia.	3
020	R-1	College Place	" "	24" dia.	2, 3
022	R-55, R-56, R-57, R-58	40th Road	Flushing River	7' x 6'6"	8'6" x 6'[4]

TABLE 2-1 (continued)

Treatment Plant Drainage Basin: Bowery Bay, NY0026158[5]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
002	R-2	45th Street	Bowery Bay*	9' x 9'	2, 3
003	R-3	Hazen Street	" "	66" dia.	2, 3
005	R-4	e/o 81st Street	" " **	14'7" x 8'	2, 3
006	16 Regulators 2 P/S	w/o Marina (114th Street)	Flushing Bay	4 Bl. 10'6"x9'3"	3
007	R-5	27th Avenue	" "	11' x 7'6"	
008	R-6, R-7, R-8, R-9	31st Drive (108th Street)	" "	Dbl. 13'9" x 8'	3
TI-010	R-14, R-15, R-27, R-28	Roosevelt Avenue (Same as Tallman Island Outfall 010)	Flushing River	3 Bl. 18'6"x10'	
035	L-31	Ditmars Boulevard	East River	18" dia.	3
036	L-32	21st Avenue	" "	24" dia.	3
037	L-33	20th Avenue(south)	** " "	24" dia.	3
038	L-34	20th Avenue(north)	** " "	12" dia.	3
041	R-1	19th Avenue	Steinway Creek*	6' x 6'	3

[5] SPDES number assignment, street address, and size taken from Bowery Bay permit, Part I, page 9 of 33.

* The permit indicates that this outfall discharges into Rikers Island Channel.

** Outfall location determined from Task 1-Drawings, Bowery Bay. pp. BBLL-195 & 200.

TABLE 2-1 (continued)

Treatment Plant Drainage Basin: Wards Island, NY0026131[6]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
070	R-70	E. 134th Street East River	3'2"x4'2"	2, 3
071	R-69	E. 138th Street " "	60" dia.	3
072	R-68	E. 149th Street " "	7'6" x 6'9 1/2"[7]	3

[6] SPDES number assignment, street address, and size are taken from the Wards Island permit, Part I, page 10 of 33.

[7] "NYC Outfall Table" for Wards Island, dated October 6, 1988. See also, "Supplemental Memo," Outfall Table 2, dated June 1985.

TABLE 2-1 (continued)

Treatment Plant Drainage Basin: Hunts Point, NY0026191[8]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
002	R-9, R-9A	Tiffany Street	East River	12' x 8'2"[9]	3
003	R-10	Farragut Street	" "	Dbl. 12' x 9' 5 3/4"[9]	3
004	CSO	West Farm Road	Bronx River	8' x 8'	8
007	CSO	E. 177th Street	" "	Dbl. 11'6"x6'6"	
008	CSO	Lafayette Avenue	" "	54" dia.	
009	R-13	Metcalf Avenue	" " *	14' x 8'	3
010	CSOs	Lacombe Avenue	" "	9' x 6'	
011	R-5,6 7	White Plains Road	East River	Dbl. 13' x 9'	2, 3
012	CSOs	Lafayette Avenue	Westchester Ck.	12' x 8'	2
013	CSO	Newman Avenue	Pugsley's Creek	10'6" x 8'	
014	CSOs	East Tremont Ave.	Westchester Ck.	14' x 8'6"	
015	CSO	Latting Street	" "	4'9" x 4'	
016	R-4	Bruckner Expressway	" "	10' x 8'6"	2, 3
017	R-11	Emerson Avenue	East River	14' x 8'	3
018	R-12	Robinson Avenue	" "	48" dia.	3

[8] SPDES number assignment, street location, and size are taken from the Hunts Point permit, Part I, page 9 of 32.

[9] "NYC Outfall Table" for Hunts Point dated October 6, 1988. See also, "Supplemental Memo." Outfall Table 3. June 1985.

* The permit indicates that this outfall discharges into the East River.

TABLE 2-1 (continued)

Treatment Plant Drainage Basin: Hunts Point, NY0026191[8] (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
019	R-3	Calhoun Avenue " "	7' x 5'6"	2, 3
020	R-2A	Throgs Neck Boulevard " "	8' x 6'6"	3
021	R-2	Pennyfield Avenue " "	6'3"x6'6"	2,3
025	R-8	Truxton Street " "	11'6"x7'3"	3
032	P/S	Rikers Island " "	14" dia.	

8'. It has been confirmed on the New York City sewer maps as entering Powell's Cove north of Seventh Avenue.[6] This outfall is also shown on Map 2-2.

Westchester Creek

Westchester Creek enters the East River on its north shore, just west of the Whitestone Bridge. All outfalls on Westchester Creek are within the Hunts Point drainage basin. The permit indicates that four outfalls discharge into Westchester Creek. Commission personnel have visually verified 012 and 016. Outfall 012 is a 12' x 8' discharge point associated with the Throgs Neck pump station, while 016 measures 10' x 8'6" and is located at Bruckner Expressway. Outfalls 014 and 015 also discharge into Westchester Creek. Outfall 014 is listed as measuring 14' x 8'6" and 015 is listed as measuring 4'9" x 4'.

To the west of Westchester Creek is a small tributary called Pugsley's Creek. The Task 1 indicates that a 10'6" x 8' CSO discharges into this Creek at Newman Avenue.[7] Commission personnel have determined that the location at Newman Avenue probably does not directly enter Pugsley's Creek but outfalls into a swamp which may at one time have formed a part of the Creek. The outfall could not be located by Commission field investigators. This outfall received the assignment of 013 in the SPDES permit reissuance, replacing the previous 013, which was determined to be a stormwater discharge.[8]

Between Powell's Cove and Flushing Bay on the south shore and Pugsley's Creek and the Bronx River on the north shore, there are three CSO outfalls. Outfall 011 in the Hunts Point drainage basin has double 13' x 9' pipes that enter the East River on its north shore at White Plains Road. This outfall has been visually verified by Commission personnel. Field personnel have also located outfall 020 on the River's south shore. This outfall lies within the Tallman Island POTW drainage basin. Outfall 019 is identified in both Task 1 and the City sewer maps as discharging at 9th Avenue and the East

River at the mouth of Flushing Bay.

Bronx River

Five outfalls from the Hunts Point drainage basin discharge into the Bronx River: outfalls 010, 009, 008, 007, and 004. The locations of outfalls 010, 009, and 008 have been mentioned in both the CSO Study and the Task 1, although they were not inspected as part of the Task 2.5.2. In addition to these three outfalls, outfalls 004 and 007 discharge into the Bronx River above Bruckner Boulevard. They have not been verified by Commission inspection. Both are large: 004 measures 8' x 8' and 007 is a double barreled outfall measuring 11'6" x 6'.

Flushing Bay and the Flushing River

Flushing Bay and the Flushing River contain approximately 12 CSOs and encompass portions of both the Tallman Island and the Bowery Bay POTW drainage basins. Tallman Island outfalls 018, 017, 016, 015, 014, and 013 have been confirmed by reference to the Task 1 and Task 2.5.2. Commission field personnel have visually verified 018 and 015. The Old College pump station is also located in this vicinity and may have CSOs associated with it.[9]

Although 012 at 29th Avenue and Flushing Bay appears on the permit, there is apparently some question as to the type of outfall that it is. The previous permit issued in 1983 indicated that 012 was supposed to have been eliminated by March 1, 1987. It is not shown on the Tallman Island drainage area sewer maps nor were Commission personnel able to locate it. According to the "Supplemental Memo", "012 is assigned for an unknown reason."[10] Recent conversations with City officials indicate that it is not a CSO and should not be listed in the permit. However, the recently issued permit still lists an outfall 012 at 29th Avenue and Flushing Bay, although no dimensions for the outfall are listed. Because of this confusion, 012 has not been placed on Map 2-2, although it is listed in Table 2-1.

The Flushing River, which flows into Flushing Bay, contains three CSO outfalls. Outfall 011 of the Tallman Island drainage basin was identified in the Task 1 and Task 2.5.2 and visually verified by Commission personnel. Outfall 010, at the southern tip of the Flushing River, was confirmed on the Tallman Island Sewer Maps[11] and was inspected by New York City personnel for the Task 2.5.2.[12] There are approximately 20 regulators in the Tallman Island drainage basin associated with outfall 010[13] and four additional regulators from the Bowery Bay high level system overflow through this outfall 010 as well. One of the 20 Tallman Island regulators, R-50, is a particular problem because it bypasses during dry weather due to undersized equipment.[14] Between outfalls 011 and 010, lies outfall 022, which is the outfall from overflows at regulators R-55, R-56, R-57, and R-58. According to the sewer maps, this outfall has an 8'6" x 6'0" pipe,[15] while the permit and all other City documents reviewed indicate that it measures 7' x 6'6".[16]

Three outfalls within the Bowery Bay POTW drainage basin (permit NY0026158) discharge to Flushing Bay: 006, 007, and 008. These outfalls are referenced in the Task 1 and Task 2.5.2 and confirmed on the drainage area comprehensive maps.[17] All three of these outfalls are large and previous discrepancies regarding locations, sizes, and regulators associated with them appear to have been resolved. Outfall 008 is located at 108th Street and Flushing Bay. It is a double-barreled outfall with each pipe measuring 13'9" x 8'. These dimensions are taken from the documents considered most reliable by the City.[18] Outfall 007 is a 11' x 7'6" discharge point at 27th Avenue associated with regulator R-5. Outfall 006 is a four-barreled discharge point, each pipe of which measures 10'6" x 9'3". This outfall is fed by overflows from 16 regulators and CSOs from the Corona and the Pell pump stations. It discharges into the Flushing Bay Boat Basin. Outfall 010 in the Bowery Bay permit is the same outfall as 010.

The various Regulator Improvement Program reports are clear on the inadequacy of the existing equipment. Outfall 007 is noted as having a deteriorated outfall.[19] This same outfall is listed as one of the outfalls in the City that evidences a dry weather discharge, due to inadequate capacity.[20]

According to Task 2.5.2, the outfall end of 008 is also badly deteriorated and there is some deterioration in 006.[21] In addition, at least two regulators outfalling through 006 are listed as having inadequate capacity or equipment leading to dry weather flow.[22]

Inflow and infiltration elimination is proceeding as part of the New York initiative to improve the water quality in Flushing Bay. It is estimated that the I/I work planned will remove approximately 20 MGD of dry weather flow from the Tallman Island and Bowery Bay drainage basins.[23]

The first project undertaken in the City's CSO abatement initiative is a 40 million gallon storage facility in the Flushing River for the largest of the outfalls discharging into that waterbody. The remaining outfalls will be combined or eliminated and six screening facilities will remove floatables from those that remain. The rationale of this abatement program has been to target tributaries such as the Flushing River for CSO improvements because these waterways will most directly benefit from such action.

Rikers Island Channel

Four CSO outfalls discharge into Bowery Bay and Steinway Creek, which are waterbodies that flow into the Rikers Island Channel. Three of these (005, 003, and 002), according to the SPDES permit for the Bowery Bay POTW, empty into Bowery Bay itself, while one, 041, discharges at the southern end of Steinway Creek. Commission personnel have located outfalls for 005, 003, and 002 and they have also been inspected as part of the Task 2.5.2. Outfall 005 is a 14'7" x 8' discharge point that receives the overflow from regulator R-4, which is located at LaGuardia Airport. According to the Task 2.5.2, the outfall end of the line for the R-4 overflow is "deteriorated."[24] Outfall 002 is a 9' x 9' discharge point emptying into the East River at 45th Street in Queens. It was inspected as part of the Task 2.5.2 and found to contain "moderate debris."[25]

The Steinway Creek outfall (041) enters the Creek at 19th Avenue. The

Task 2.5.2 inspection report characterizes it as "acceptable." It measures 6' x 6'.

Hunts Point to the Triborough Bridge

There are eleven CSO outfalls in the section of East River extending west from Hunts Point to the Triborough Bridge. The CSOs in this area fall within the Hunts Point drainage basin, the Wards Island drainage basin, and the Bowery Bay drainage basin.

The four outfalls within the Hunts Point drainage basin are 003, 002, and 025. All three are identified in the SPDES permit for the Hunts Point POTW and were inspected in the course of the Task 2.5.2. All three outfalls are large: 002 is 12' x 8'2", 003 is a double 12' x 9'5 3/4", and outfall 025 is 11'6" x 7'3". The fourth outfall, 032, is the discharge from the Rikers Island pump station which is located in the Hunts Point drainage basin. Commission field investigators were unable to determine the location of this outfall and, consequently, it is not shown on Map 2-2.

The three in the Wards Island drainage basin (permit NY0026131) were all inspected for Task 2.5.2. The SPDES numbers assigned to these outfalls, according to the Wards Island permit, are from east to west 072, 071, and 070. Outfall 072 measures 7'6" x 6' 9 1/2". The other outfalls are smaller with 071 measuring 60" in diameter and 070 measuring 3'2" x 4'2".

Four outfalls within the Bowery Bay drainage basin were inspected for the Task 2.5.2. Those listed in the permit and inspected were 038, 037, 036, and 035. Outfall 038 is noted as containing "heavy debris."[26]

No outfalls into this section of the East River exist on Randalls Island or Wards Island. These areas have separate systems and all sanitary wastes go to the Wards Island POTW.

SECTION 2B: LOWER EAST RIVER

The East River from the Triborough Bridge to the Battery contains part of four drainage basins: Wards Island, Bowery Bay, Newtown Creek, and Red Hook. Into this same stretch of River over 100 CSOs discharge. Although the outfalls in this area have been mentioned in several New York City reports, the information available in any one of these reports is not always consistent with the other reports. A number of discrepancies remain unresolved and they will be noted in this part of this Report. This section of the East River is shown on Map 2-3 and the outfalls for the entire section are listed on Table 2-2.

Triborough Bridge to the Top of Roosevelt Island

Thirty-three CSOs exist south from the Triborough Bridge to the uppermost tip of Roosevelt Island. These consist of twenty-six outfalls on the Manhattan side of the River that are in the Wards Island drainage basin and seven on the Queens side of the River that are within the Bowery Bay drainage basin. Fifteen of these outfalls lie between the Manhattan-Bronx leg of the Triborough Bridge and the Wards Island footbridge. Of the 33 outfalls, 28 were inspected in some manner during the course of preparation of the Task 2.5.2.

All of the 15 outfalls into the River from Manhattan in the area of the River west of Wards Island and south of the Triborough Bridge are within the Wards Island drainage basin. Thirteen of them have been inspected, with the sole uninspected outfall being 026, which discharges to the East River at 115th Street. Three of these inspected outfalls are notably large: 023, 024, and 025. Outfalls 023 and 024 are double-barreled outfalls, with two pipes measuring 7'6" x 6' and 8'6" x 7'6", respectively. Outfall 025's single pipe measures 8' x 5'3". Outfall 025 is identified in the Summary Report as bypassing in dry weather due to inadequate capacity of the R-25 regulator.[27]

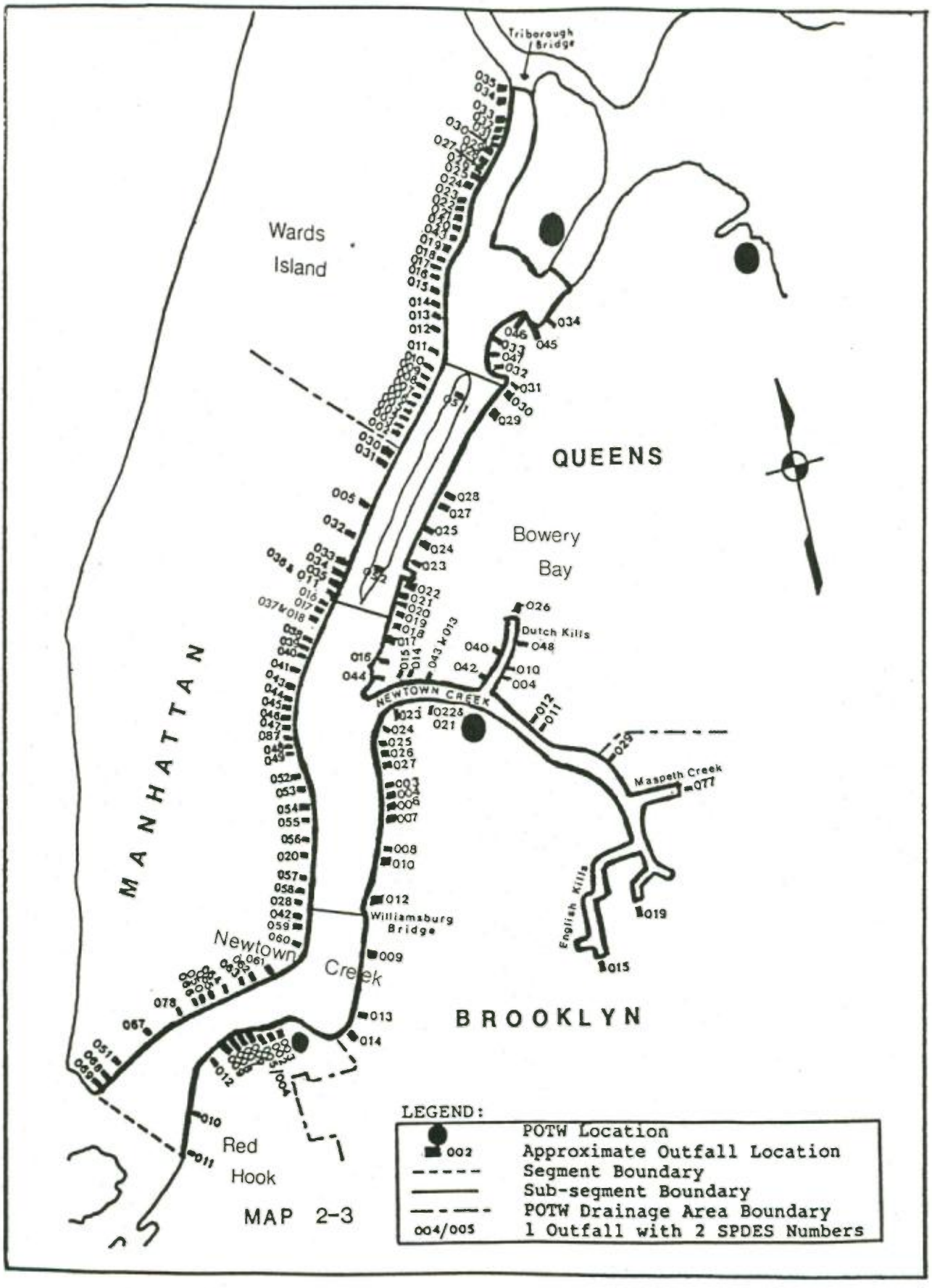

Triborough Bridge
Wards Island
QUEENS
Bowery Bay
Dutch Kills
NEWTOWN CREEK
MANHATTAN
Maspeth Creek
English Kills
Williamsburg Bridge
Newtown Creek
BROOKLYN
Red Hook
MAP 2-3
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers

TABLE 2-2
COMBINED SEWER OUTFALLS
IN THE LOWER EAST RIVER
WATERWAY SEGMENT 2B

Treatment Plant Drainage Basin: Wards Island, NY0026131[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
002	R-1	E. 73rd Street East River	2' x 3'6"	2
003	R-2A,2B	E. 74th Street " "	8'6" x 7'	2
004	R-3	E. 75th Street " "	2' x 3'6"	2
005	R-4	E. 76th Street " "	2' x 3'6"	2
006	R-5	E. 77th Street " "	2'4" x 3'6"	2
007	R-6	E. 78th Street " "	2' x 3'	2
008	R-7	E. 79th Street " "	7' x 5'	2
009	R-8	E. 83rd Street " "	15" dia.	
010	R-9	E. 84th Street " "	16" dia.	
011	R-10	E. 86th Street " "	5' x 5'	2
012	R-11	E. 89th Street " "	48" dia.	2
013	R-12	E. 90th Street " "	2'4" x 4'	
014	R-13	E. 91st Street " "	2'4" x 4'	2
015	R-14	E. 92nd Street " "	5' x 4'6"	2

[1] Information taken from Wards Island permit, Part I, page 9 of 33.

[2] Inspected as part of Task 2.5.2.

[3] Information taken from Bowery Bay permit, Part I, pages 9 and 10 of 33.

[4] Information from "Supplemental Memo." Outfall Table 10. June 1985.

[5] Information from the Newtown Creek permit, Part I, pages 9 and 10 of 33.

[6] Information taken from the Red Hook permit, Part I, page 9 of 31.

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Wards Island, NY0026131 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
016	R-15	E. 95th Street East River	48" dia.	2
017	R-16	E. 96th Street " "	8'6" x 5'3"	2
018	R-17	E. 100th Street " "	2'4" x 4'	2
019	R-18	E. 101st Street " "	2'4" x 4'	2
020	R-20	E. 103rd Street " "	2'4" x 4'	2
021	R-21	E. 104th Street " "	2'4" x 4'	2
022	R-22	E. 105th Street " "	2'4" x 4'	2
023	R-23	E. 106th Street " "	Dbl.7'6"x6'	2
024	R-24	E. 110th Street " "	Dbl. 8'6" x 7'6"	2
025	R-25	E. 114th Street " "	8' x 5'3"	2
026	R-26	E. 115th Street " "	2'4" x 4'	
027	R-27	E. 116th Street " "	2'4" x 4'	2
028	R-28	E. 117th Street " "	2'4" x 4'	2
029	R-29	E. 118th Street " "	3' x 5'	2
030	R-30	E. 119th Street " "	2'4" x 4'6"	2
031	R-31	E. 120th Street " "	4'6" x 5'	2
032	R-32	E. 121st Street " "	2'4" x 4'	2
033	R-33	E. 122nd Street " "	4' x 4'9"	2
034	R-34	E. 124th Street " "	2'4" x 3'6"	2
035	R-35	E. 125th Street " "	2'8" x 4'	2
043	R-19	E. 102nd Street " "	5'3"x5'3"	2

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Bowery Bay, NY0026158[3]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
004	L-3	Borden Avenue	Dutch Kills (east side)	6'6" x 3'3"	
010	L-3C	Midtown Tunnel	Dutch Kills	30" dia.	2
011	L-1	Greenpoint Avenue	Newtown Creek	24" dia.	2
012	L-2	35th Street	" "	24" dia.	
013	L-8	11th St. (west side)*	" "	72" dia.	2
014	L-9	Vernon Boulevard	" "	22" dia.	2
015	L-10	5th Street	" "	15" dia.	2
016	L-11	51st Avenue	East River	24" dia.	2
017	L-12	50th Avenue	" "	15" dia.	2
018	L-12A	49th Avenue	" "	18" dia.	2
019	L-13	48th Avenue	" "	12" dia.	2
020	L-14	47th Road	" "	12" dia.	2
021	L-15	47th Avenue	" "	48" dia.	2
022	L-16	5th Street	" "	18" dia.	2
023	L-17	44th Drive	" "	66" dia.	2
024	L-18	43rd Avenue	" "	7'8" x 7'7"	2
025	L-19	41st Avenue	" "	47" dia.	2
026	L-4 L-39 L-40 L-42	Between 28th & 29th Streets	Dutch Kills	9' x 4'6"	

* Task 1-Drawings, Bowery Bay. p. BBLL-55.

Table 2-2 (continued)

Treatment Plant Drainage Basin: Bowery Bay, NY0026158 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
027	L-20	38th Avenue	East River	72" dia.	2
028	L-21	37th Avenue	" "	Dbl. 12' x 8'1 3/4"	2
029	L-22	Broadway	" "	16' x 7'	2
030	L-23	30th Road	" "	24" dia.	2
031	L-24	Main Avenue	" "	48" dia.	2
032	L-29	Astoria Boulevard	" "	48" dia.	
033	L-27	27th Avenue	" "	15" dia.	2
034	L-30	Hoyt Avenue	" "	10'8"x7'4"	2
040	L-5	49th Avenue	Dutch Kills	24" dia.	2
042	L-6	w/o 27th Street	" "	12" dia.	2
043	L-7	11th Street (east side)*	Newtown Creek	54" dia.	2
044	L-22A	54th Avenue	East River	24" dia.	2
045	L-25	9th Street	" "	8" dia.	
046	L-26	3rd Street	" "	8" dia.	2
047	L-28	Astoria Boulevard (w/o 1st Street)**	" "	18" dia.	2
048	L-3B L-37 L-38	Hunters Point Avenue	Dutch Kills	11' x 4'6"	

* Task 1-Drawings, Bowery Bay. p. BBLL-50.

** Task 1-Drawings, Bowery Bay. p. BBLL-165.

Table 2-2 (continued)

Treatment Plant Drainage Basin: Bowery Bay, NY0026158 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
049	CSO	21st Avenue[4] Dutch Kills	2'8" x 4'	
050	P/S	Roosevelt Island East River	36" dia.	
051	P/S	Roosevelt Island " " Birds Coler Hospital	18" dia.	
052	P/S	Roosevelt Island " " Goldwater Hospital	24" dia.	

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204[5]

BROOKLYN & QUEENS

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
003	B-11	Greenpoint Avenue East River	24" dia.	2
004	B-10	Quay Street " "	7'6" x 5'9"	2
006	B-9	N. 12th Street " "	Dbl. 11'2" x 8'	2
007	B-8	N. 5th Street " "	3' x 3'9"	2
008	B-7	Metropolitan Avenue " "	60"&18" dia	2
009	B-5A	S. 8th Street " "	36" dia.	2
010	B-6A	Grand Street " "	1'6" x 1'6"	2
012	B-6	S. 5th Street " "	144" dia.	2
013	B-5	Division Avenue " "	10' x 8'	2
014	B-3, B-4	Kent Avenue Wallabout Bay	Dbl. 17' x 11'	2
015	B-1	Johnson Avenue English Kills	15'8" x 10'	2
019	B-2	Metropolitan Ave. Newtown Creek	36" dia.	2
021	CSO	McGuiness Boulevard " "	36" dia.	
022	B-17	" " " "	4'6"x6'3"	2
023	B-16	Franklin Street " "	24" dia.	2
024	B-15	Dupont Street East River	18" dia.	2
025	B-14	Freeman Street " "	24" dia.	2
026	B-13	Green Street " "	2' x 2'6"	2
027	B-12	Huron Street " "	7'9" x 6'3"	2

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204 (continued)

BROOKLYN & QUEENS

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
029	Q-2	43rd Street	Newtown Creek	66" dia.	
077	Q-1	w/o Rust Street	Maspeth Creek	Dbl. 11'x7'	3

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204 (continued)
MANHATTAN

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
005	M-51	E. 63rd Street	East River	24" dia.	2
011	M-47A	E. 48th Street*	" "	2'8" x 4'	2
016	M-46	E. 46th Street	" "	72" dia.	2
017	M-45A	E. 42nd Street	" "	2'8" x 4'	
018	M-45	E. 41st Street	" "	30" dia.	2
020	M-31	E. Houston Street	" "	6' x 4'6"	2
028	M-28	Delancey Street	" "	4' x 4'	2
030	M-51C	E. 71st Street	" "	2' x 3'	2
031	M-51A M-51B	E. 70th Street	" "	2' x 3'	2
032	M-50	E. 61st Street	" "	Dbl.6'6"x5'	2
033	M-49	E. 57th Street	" "	2'4" x 4'	2
034	M-48	E. 54th Street	" "	4' x 5'	2
035	M-48A	E. 53rd Street	" "	2'4" x 4'	2
036	M-47	E. 49th Street	" "	8'6"x7'6" & 54" dia.	2
037	M-44	E. 41st Street	" "	9' x 7'	2
038	M-43B	E. 38th Street	" "	4' x 5' & 3' x 1'	2
039	M-43A	E. 37th Street	" "	2'8" x 5'6"	2
040	M-43	E. 36th Street	" "	2'8" x 5'6"	2

* Task 1-Drawings, Newtown Creek. p. NCM-275.

Table 2-2 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204 (continued)

MANHATTAN

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
041	M-42	E. 33rd Street	East River	Dbl.8' x 6'	2
042	M-27	Broome Street	" "	4' x 4'	2
043	M-41	E. 30th Street	" "	2'4" x 4'	2
044	M-41A	E. 29th Street	" "	4' x 5'6"	2
045	M-40	E. 26th Street	" "	Dbl.6'x6'6"	2
046	M-39	E. 24th Street	" "	4' x 5' & 4' x 6'	2
047	M-38B	E. 23rd Street	" "	4' x 5'	2
048	M-38	E. 21st Street	" "	4' x 5'	2
049	M-37	E. 18th Street	" "	3' x 6' & 8' x 6'	2
050	M-19	s/o Catherine Slip	" "	4' x 4'6"	2
051	M-12	Old Slip	" "	2'8" x 3'4"	2
052	M-36	E. 14th Street	" "	Dbl.7' x 6'	2
053	M-35	E. 11th Street	" "	8'9" x 5'	2
054	M-34	E. 8th Street	" "	6'6" x 5'	2
055	M-33	E. 6th Street	" "	4' x 5'6'	2
056	M-32	E. 3rd Street	" "	6'6" x 6'	2
057	M-30	Stanton Street	" "	5' x 5'6"	2
058	M-29	Rivington Street	" "	5' x 5'	2

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204 (continued)

MANHATTAN

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
059	M-26	s/o Grand Street East River	3' x 6' & 24"dia.	2
060	M-25, M-24	s/o Corlears Street " "	4' x 5'	2
061	M-23	Jackson Street " "	3' x 4'	2
062	M-22	Gouverneur Street " "	48" dia.	2
063	M-21	Jefferson Street " "	9' x 5'	2
064	M-20	Market Street " "	54" dia.	2
065	M-18	s/o Catherine Slip (Oliver Street)* " "	9' x 5'	2
066	M-17	Robert Wagner Sr. Place " "	48" dia.	2
067	M-13	Maiden Lane (Fletcher Street)* " "	6'4" x 6'	2
068	M-11	Coenties Slip " "	4'6" x 3'8"	2
069	M-10	Broad Street " "	4' x 5' To Bulkhead 48" dia. Along Pier	2
078	M-16	n/o Dover St. (Fulton Street)* " "	12' x 6'	2
087	M-38A	E. 22nd Street " "	5' x 3'6"	2

* Alternate location taken from current Newtown Creek permit, effective November 1, 1982.

TABLE 2-2 (continued)

Treatment Plant Drainage Basin: Red Hook, NY0027073[6]

Outfall Number SPDES	Outfall Number Local	Location of Outfall			Size	Comments/ Notes
003	R-21	Hudson Avenue	East	River	4'6" x 7'3"	
002	R-21A	Hudson Avenue	"	"	15" dia.	
004/ 005	R-20, R-20A	Gold Street	"	"	168" dia.	2
006	R-19A	Pearl Street	"	"	36" dia.	
007	R-19	Adams Street	"	"	15" dia.	
008	R-18A	Washington Street	"	"	36" dia.	
009	R-18	Main Street	"	"	36" dia.	
012	R-17	Cadman Plaza	"	"	6' x 6'	
010	R-16	Orange Street	"	"	18" dia.	
011	R-15	Montague Street	"	"	4' x 4'	

Below these 15 on the Manhattan side of the River, outfall 019 was inspected by City personnel as part of the Task 2.5.2 and found to have "heavy deposition."[28] The location of outfalls 011 through 018 and 020 were verified by the reference to the Task 1, Task 2.5.2, and the SPDES permit. An outfall was noted in the Task 1 for R-19, at 102nd Street, but it was not inspected as part of the Task 2.5.2. Outfall 016 in this subsection is noted in the Summary Report as one of the outfalls having dry weather bypassing due to inadequate equipment.[29]

On the Queens side of the River, five out of seven outfalls were inspected in the Task 2.5.2: 031, 033, 034, 046, and 047. The inspection report for outfall 034, which is 10'8" x 7'4", remarked that the outfall was "heavily damaged."[30] This outfall has also been identified as one having dry weather bypass due to inadequate capacity and equipment.[31] The inspection of the 047 outfall revealed "heavy debris" in the pipe.[32] Outfalls 033 and 046 were visually inspected as part of the Task 2.5.2.

Channels around Roosevelt Island

There are a total of 32 outfalls that discharge into the East River channels surrounding Roosevelt Island that are shown on Map 2-3. The eleven outfalls that empty into the east channel are all associated with the Bowery Bay drainage basin. Three additional outfalls from the Bowery Bay drainage basin discharge from Roosevelt Island. Of the 18 outfalls into the west channel, nine are within the Wards Island drainage basin and nine are within the area of Manhattan falling within the Newtown Creek drainage basin (permit NY0026204). Twenty-seven of these outfalls were inspected by City personnel for the Task 2.5.2 either visually by divers or with a video camera.

Although seven of the outfalls in the Wards Island drainage basin were visually inspected, only one was evaluated in depth. Outfall 003 at 74th Street and the East River was considered "acceptable" in the Task 2.5.2.[33] In the Summary Report, however, the regulators associated with this outfall are

listed as among those that have dry weather bypassing due to inadequate equipment.[34]

Five of the outfalls in the Bowery Bay drainage basin are of notable size: 023, 024, 027, 028, and 029. According to Task 2.5.2, the outfall ends of both 024, which is 7'8" x 7'7" pipe, and 029, which has dimensions of 16' x 7' were "heavily damaged."[35] Outfall 028 is a double outfall, which measures 12' x 8' 1 3/4" in each pipe.

The three outfalls from Roosevelt Island are all 36" in diameter or less. The approximate location of two of these are shown on Map 2-3. The location of outfall 050 has not been identified by the City and, consequently, is not shown on the map.

Of the nine outfalls within the Newtown Creek drainage basin, two outfalls should be noted. First is outfall 032, which has two discharge pipes each measuring 6'6" x 5'. The other is outfall 036 at East 49th Street that has two outfall pipes -- one measuring 8'6" x 7'6" and one measuring 54" in diameter. The Task 2.5.2 indicates that 036 has "partial wood construction" and is "acceptable."[36]

Between Roosevelt Island and Newtown Creek

From the southernmost tip of Roosevelt Island to the mouth of Newtown Creek, 12 outfalls discharge: four on the eastern shore of the East River that fall within the Bowery Bay drainage basin, and eight on the western shore that are within the Newtown Creek drainage basin. Of the eight outfalls on the Manhattan side of this River segment, seven were inspected for the Task 2.5.2. The only outfall not inspected was 017, which discharges at East 42nd Street and the East River. Of these seven inspected outfalls, two of them are large single discharge points and two of them double pipes. Outfall 016 has a 72" diameter and outfall 037 measures 9' x 7'. Outfall 041 is a double-barreled outfall, with both pipes measuring 8' x 6', while outfall 038 has two different size outfalls -- one measuring 4' x 5' and one measuring 3'

x 1'. Outfalls 016 and 041 are listed in the Task 2.5.2 as containing "heavy debris"; the pipe for 016 is deteriorated[37] and the barrel of 041 is described as being full of concrete.[38]

On the Queens side of the River in this subsegment, none of the four outfalls is very large, ranging in size from 15" to 24" in diameter. All four were visually inspected for debris in the outfall in the Task 2.5.2.

Newtown Creek and its Adjacent Kills

There are approximately 19 CSOs into Newtown Creek and the adjacent Kills from the Bowery Bay and Newtown Creek drainage basins. The information on outfalls into these waterbodies, especially from the Bowery Bay drainage basin, is not straightforward.

In the Newtown Creek drainage basin, outfalls 019, 021, 022, 023, and 029 discharge into Newtown Creek. Outfalls 022 and 029 are relatively large measuring 4'6" x 6'3" and 66" in diameter, respectively. Outfalls 019, 022, and 023 were inspected for the Task 2.5.2.[39] Outfall 022 was characterized in the Summary Report as among the outfalls having dry weather bypassing due to an inadequate capacity and equipment.[40]

Two large outfalls within the Newtown Creek drainage basin discharge to waterbodies adjacent to Newtown Creek and should be mentioned. Outfall 077, located at 49th Street west of Rust Street and Maspeth Creek, is a double 11' x 7' discharge point. It was characterized in the Task 2.5.2 as having "heavy timber debris."[41] Outfall 015 into English Kills is 15'8" x 10' and received an "acceptable" notation in the Task 2.5.2.[42] This is the outfall for the Johnson Avenue Regulator.

As for the Bowery Bay drainage basin, the outfall nearest to the mouth of Newtown Creek is 015. The outfall for 043 having a 54" diameter is located adjacent to outfall 013 in Newtown Creek. Above Newtown Creek's intersection with Dutch Kills lie two outfalls from the Bowery Bay drainage basin. These

outfalls, 011 and 012, are both small, each measuring 24" in diameter.

The locations of the outfalls into Dutch Kills are unclear and many of them were assigned a SPDES number only in the most current permit. There apparently remains some confusion regarding outfalls into this waterbody. Outfall locations and dimensions for discharge points associated with regulators L-3, L-3B, L-3C, L-4, L-5, and L-6 are contained in the Task 1 and Task 2.5.2. The outfalls for regulators L-37, L-38, L-39, L-40, and L-42 are also described in the Task 1, but are not included in the Task 2.5.2. The outfall for regulators L-39, L-40, and L-42 is assigned the permit number 026. It is located between 28th Street and 29th Street on Dutch Kills and measures 9' x 4'6". This is precisely the same outfall location and dimensions of the discharge point for regulator L-4 in the Task 1.[43] In a similar instance, the outfall for regulators L-37 and L-38 is described in the Task 1 as an 11' x 4'6" outfall at Hunters Point Avenue and Dutch Kills -- the same location and dimensions as the L-3B regulator outfall. Although the information in the Task 1 and Task 2.5.2 suggests that only two outfalls may service these seven regulators, the DRAFT Bowery Bay permit, based on assignments in the "Supplemental Memo", indicated that four permit numbers would be assigned to these outfalls.[44] After an investigation undertaken by the City in response to questions by Commission staff, City officials indicated that only two outfalls exist at these locations: 026 and 048. However, the final permit does not reflect this new information and places both 009 and 048 at Hunters Point Avenue measuring 11' x 4' 6" and both 026 and 039 between 28th and 29th Streets measuring 9' x 4' 6".

In addition the location for outfall 049 into the Dutch Kills is not available from City reports or City staff. Although the permit listed it as discharging to Dutch Kills, the outfall location listed in the "Supplemental Memo" at 21st Avenue suggests that it may actually discharge to the East River.[45]

Newtown Creek and the adjacent Kills have some of the worst water quality in the District. An effort should be made to catalogue the outfalls

into these waterbodies correctly. The City's CSO abatement initiative for Newtown Creek will have to accomplish this in order to be successful. Its estimated construction cost is $100,000,000 and the work is scheduled to begin in 1993.

South of Newtown Creek to the Williamsburg Bridge

Between the East River south of Newtown Creek and the Williamsburg Bridge, there are approximately 28 outfalls, all of which are within the Newtown Creek drainage basin.

On the Manhattan side of the Newtown Creek drainage basin, 17 outfalls discharge into the East River, all of which have been inspected. Of the outfalls inspected, four have two outfall pipes: 045, 046, 049, and 052. Other large outfalls include 020, 053, 054, and 056. Outfalls 020 and 028 in this subsection are receiving SPDES numbers in this recent permit. This is in spite of information in the Summary Report that 020 receives only storm water and that regulator M-28, associated with outfall 028, has been removed from service.[46]

The Brooklyn side of the Newtown Creek drainage basin contains 11 outfalls in this area that discharge into the East River, all of which have been inspected for the Task 2.5.2. Two of these are double outfalls, the largest of which is 006 measuring 11'2" x 8' for each pipe. Other large outfalls include 004, 012, and 027. Outfall 027 measures 7'9" x 6'3". The inspection report remarks that outfall 004 had "heavy debris" as did 008, the other double-pipe outfall and that one of the outfall ends of 006 was deteriorating.[47]

Williamsburg Bridge to the Battery

South of the Williamsburg Bridge to the Battery there are approximately 28 CSOs into the East River from the Newtown Creek and Red Hook drainage basins. As was the case in earlier sections of this chapter, the

indefiniteness of the count results from a discrepancy among City reports and records. Nineteen of these were inspected by the City and six of those inspected received some sort of negative remarks in the inspection report.

On the Brooklyn side of the Newtown Creek drainage basin in this area, three outfalls discharge: 009, 013, and 014. Outfall 014 is listed as discharging into Wallabout Bay. Outfalls 014 and 013 are large (a double-barreled 17' x 11' and a single 10' x 8', respectively), but in "acceptable" condition.[48] The Summary Report, however, indicates that 014 has inadequate capacity at average dry weather flow.[49] Outfall 009, was also inspected and received no special comments.

The Manhattan side of the Newtown Creek contains fifteen outfalls that discharge into the East River. The outfalls characterized as being in poor condition or having an accumulation of debris were the outfalls SPDES numbers 042, 064, 066, 067, 069, and 078. Two of these (066 and 067) are described as "collapsed."[50] In addition, 064 and 065 are identified in the Summary Report as having dry weather bypassing due to inadequate sized equipment.[51] Outfalls 063 and 065 are among the largest in this segment of the River, each measuring 9' x 5'. Outfall 042, like outfall 028 immediately above it, received a SPDES number in the recent permit in spite of information in the Summary Report that it had been removed from service.[52]

The several outfalls on South Street between John Street and Catherine Slip are the source of some confusion in the available reports and records. Rather than attempt to summarize the discrepancies in narrative form, the following table will show the disagreements contained within the available City reports. According to the "Supplemental Memo", there are four outfalls in this area while Task 2.5.2 lists five. The size information available also shows significant disagreement.

Reg. No.	Supplemental Memo[53]	Task 2.5.2[54]
M-14	no information	no SPDES No., 48" dia.
M-15	no information	078, 4' x 4'
M-16	078, 12' x 6'	no SPDES No., 30" dia.
M-17	066, 48" dia.	066, 48" dia.
M-18	065, 9' x 5'	065, 9' x 5'
M-19	has been assigned 050 4' x 4' 6"	065, 4' x 4' 6"

Table 2-2 also shows that the locations of some of these outfalls have been listed at different streets in the current permit when compared to the previous permit. The information contained in the Task 2.5.2 suggests at least circumstantially that there may be additional outfalls not yet verified. These remaining discrepancies are all the more perplexing because television inspections were done on all six of these regulators in the Task 2.5.2 study. Based on the confusion evidenced in the documents available, definitive information is necessary.

Ten outfalls associated with the Red Hook POTW (permit NY0027073) drainage basin discharge into this segment. Only one outfall, that of SPDES numbers 004/005, was inspected for the Task 2.5.2. This outfall measures 168" in diameter and is the largest discharge point in the immediate area. Outfalls for 012 and 003, which were not inspected, are also large, measuring 6' x 6' and 4'6" x 7'3", respectively. According to the Task 2.5.2, 003 also has a 15" diameter companion pipe associated with it.[55] The Summary Report indicates that the 003 outfall bypasses in dry weather due to inadequate capacity.[56]

CONCLUSION

The East River is notable because it is essentially a strait that connects the Western Long Island Sound with the Upper New York Bay--two

waterbodies with relatively better water quality. Emphasis on improved water quality in the East River is necessary to assure that the wet weather pollutant inputs to the East River do not negatively affect these two adjacent waterbodies. Throughout this chapter, however, it is apparent that there are numerous places in the East River where clear information on the location and the size of outfalls is not available. Because of this, it is not possible to arrive at an accurate number of outfalls in this area, although the number of discharge points in the lower East River alone is staggering. Obtaining this information should be the first step in formulating a lasting solution to the CSO problem in this area of the District.

The next step should be to take advantage of the planned development in the area to mitigate and, wherever possible, eliminate CSOs. The shoreline of this area is valuable because of the extensive tourist and recreational resources planned for both sides of the River. This development has started in earnest with the South Street Seaport and related property on the Manhattan side and other projects such as marinas, fishing piers, and public waterfront promenades on the Brooklyn side. This development is planned for the entire length of the East River with major residential and commercial projects to be constructed in Manhattan, Queens, the Bronx, and Brooklyn. Development should be coordinated with CSO improvement and assuring adequate treatment for sewage.

FOOTNOTES

[1] New York State Department of Environmental Conservation. Division of Water. Use Attainability Analysis of the New York Harbor Complex. August 1985. p. 19.

[2] Ibid. p. 18.

[3] New York City, Department of Environmental Protection. Regulator Improvement Program, Task 1 - Drawings, Tallman Island. Prepared by Hazen & Sawyer. April 1985. Outfall Table. pp. T1-65, T1-66.

[4] "NYC Outfall Table." Tallman Island. October 6, 1988; New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 8.

[5] New York City, Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[6] New York City Department of Environmental Protection. Tallman Island Drainage Area, Comprehensive Maps. Prepared by URS Co. April 1986.

[7] Task 1 - Drawings, Hunts Point. Outfall Table.

[8] "Supplemental Memo." Table 3, n.2.

[9] "NYC Outfall Table." Tallman Island. October 6, 1988; "Supplemental Memo." Table 8.

[10] "Supplemental Memo." Table 8, n.3.

[11] New York City Department of Environmental Protection. Tallman Island Drainage Area, Comprehensive Maps. Prepared by URS Co. April 1986.

[12] Task 2.5.2 - Outfall Inspection. Table 3.

[13] "Supplemental Memo." Table 8.

[14] New York City Department of Environmental Protection. Summary Report, City-wide Regulator Improvement Program Inventory and Assessment. Prepared by Hazen and Sawyer. April 1985. p. 3-216.

[15] New York City Department of Environmental Protection. Tallman Island Drainage Area, Comprehensive Maps. Prepared by URS Co. April 1986.

[16] "NYC Outfall Table." Tallman Island. October 6, 1988; "Supplemental Memo." Table 8.

[17] New York City Department of Environmental Protection. Bowery Bay Drainage Area, Comprehensive Maps. Prepared by URS Co. April 1986.

[18] The sewer maps, however, indicate that the 008 outfall measures 12'6" x 3'9".

[19] Task 2.5.2 - Outfall Inspection. Table 3.

[20] Summary Report. pp. 3-59, 3-216.

[21] Task 2.5.2 - Outfall Inspection. Table 3.

[22] Summary Report. pp. 3-59, 3-215, 3-216.

[23] New York City Department of Environmental Protection. Bureau of Water Pollution Control. Flushing Bay Water Quality Facility Plan, Detailed Evaluation of Alternatives. Prepared by URS Co. January 1987. p. 2-2.

[24] Task 2.5.2 - Outfall Inspection. Table 3.

[25] Ibid.

[26] Ibid.

[27] Summary Report. pp. 3-59, 3-216.

[28] Task 2.5.2 - Outfall Inspection. Table 3.

[29] Summary Report. p. 3-216.

[30] Task 2.5.2 - Outfall Inspection. Table 3.

[31] Summary Report. pp. 3-59, 3-216.

[32] Task 2.5.2 - Outfall Inspection. Table 3.

[33] Ibid.

[34] Summary Report. p. 3-216.

[35] Task 2.5.2 - Outfall Inspection. Table 3.

[36] Ibid. Table 3.

[37] Task 2.5.2 - Outfall Inspection. Table 3.

[38] Summary Report. p. 3-164.

[39] Task 2.5.2 - Outfall Inspection. Table 3.

[40] Summary Report. pp. 3-59, 3-216.

[41] Task 2.5.2 - Outfall Inspection. Table 3.

[42] Ibid.

[43] Task 1 - Drawings, Bowery Bay. Outfall Table.

[44] DRAFT Bowery Bay permit, Part I, p. 9 of 29; "Supplemental Memo." Table 10.

[45] "Supplemental Memo." Table 10.

[46] Summary Report. p. 3-72.

[47] Task 2.5.2 - Outfall Inspection. Table 3.

[48] Ibid.

[49] Summary Report. p. 3-59.

[50] Task 2.5.2 - Outfall Inspection. Table 3.

[51] Summary Report. p. 3-216.

[52] Ibid. p. 3-72.

[53] "NYC Outfall Table." Newtown Creek. October 6, 1988; "Supplemental memo." Table 4.

[54] Task 2.5.2 - Outfall Inspection. Table 3.

[55] Ibid.

[56] Summary Report. pp. 3-59, 3-216.

CHAPTER 3

HARLEM RIVER

The Harlem River flows from its intersection with the Hudson River at Spuyten Duyvil to its convergence with the East River, which for this Report has been designated as occurring at the leg of the Triborough Bridge between Manhattan and the Bronx. The Bronx Kill, a small waterbody that separates the Bronx from the northern end of Randalls Island, has also been included in this chapter. The Harlem River, like the East River, is contained entirely within the State of New York. The Commission's classification of the Harlem River is "B-1." It was upgraded by the Commission from "B-2" to "B-1", with portions of the East River, in 1986.

Approximately 48 combined sewer outfalls discharge into the Harlem River and Bronx Kill. These CSOs are primarily in the Wards Island drainage basin, although 12 outfalls on the upper part of the River fall within the North River drainage basin (permit NY0026247). The outfalls in this area are shown on Map 3-1 and listed on Table 3-1.

Bronx Kill

Three outfalls from the Wards Island drainage basin discharge into the Bronx Kill: 068, 069, and 073. All three of these outfalls have been inspected for the Task 2.5.2. Outfall 068 is large measuring 12' x 9'10". The inspection report for outfall 073 at St. Anns Avenue in the Bronx and Bronx Kill noted that it contained "heavy silt" and "autoparts."[1] This outfall is a 12' diameter double outfall.

Harlem River Above Triborough Bridge to Highbridge Park

The segment of the Harlem River above the Triborough Bridge to the drainage area boundary of Wards Island and North River contains 25 CSOs, all of which are within the Wards Island drainage basin. Ten of these are on the

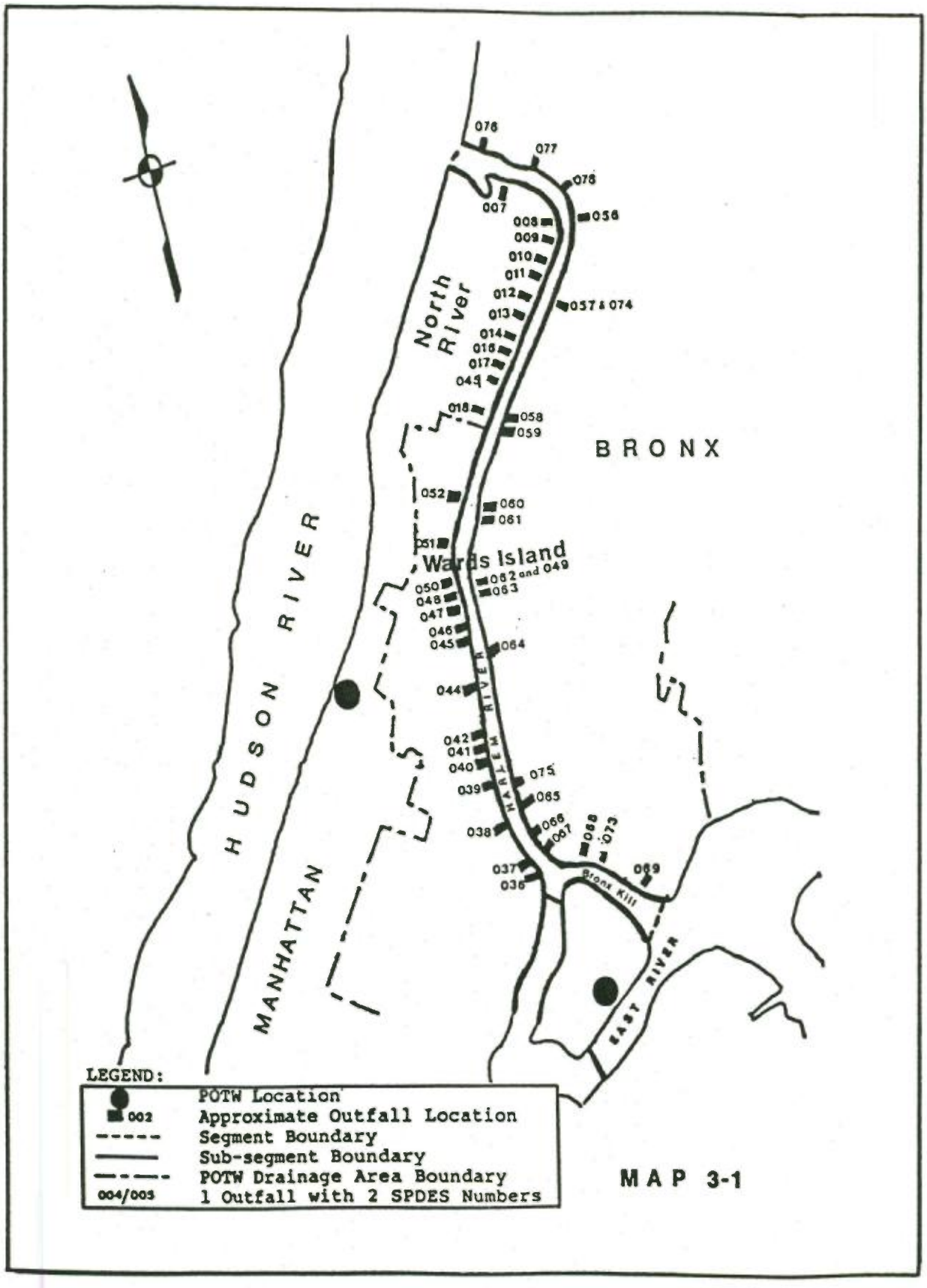

HUDSON RIVER
MANHATTAN
North River
BRONX
Wards Island
HARLEM RIVER
Bronx Kill
EAST RIVER
076
077
078
007
056
008
009
010
011
012
013
037 & 074
014
016
017
049
018
058
059
052
060
061
051
062 and 049
063
050
048
047
046
045
064
044
042
041
040
039
075
065
038
066
067
068
073
037
036
069
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/003 1 Outfall with 2 SPDES Numbers
MAP 3-1

TABLE 3-1

COMBINED SEWER OUTFALLS IN THE HARLEM RIVER
WATERWAY SEGMENT 3

Treatment Plant Drainage Basin: Wards Island, NY0026131[1]

MANHATTAN

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
036	R-36	E. 129th Street Harlem River	42" dia.	
037	R-37	E. 130th Street " "	2'8" x 4'	3
038	R-38	E. 135th Street " "	8'6" x 6'	3
039	R-39	E. 140th Street " "	2'8" x 4'	3
040	R-40	W. 141st Street " "	2'4" x 5'	3
041	R-41	W. 142nd Street " "	2'8" x 4'	3
042	R-42	W. 143rd Street " "	2'4" x 3'6"	3
044	R-44	W. 45th Street " "	5' x 6'	3
045	R-45	W. 149th Street " "	72" dia.	3
046	R-46	W. 151st Street " "	8'6" x 8'	3
047	R-47	W. 154th Street " "	2'8" x 4'	3
048	R-48	W. 155th Street " "	2'4" x 4'	3
050	R-50	W. 156th Street " "	2'8" x 4'	3
051	R-51	W. 167th Street " "	48" dia.	3
052	R-52	W. 176th Street " "	5' x 5'	3

[1] SPDES number assignment, street location, and size are taken from the Wards Island permit, Part I, pages 9 and 10 of 33.

[2] "NYC Outfall Table." Wards Island. October 6, 1988; See also, "Supplemental Memo." Outfall Table 2. June 1985.

[3] Inspected as part of Task 2.5.2.

TABLE 3-1 (continued)

Treatment Plant Drainage Basin: Wards Island, NY0026131 (continued)

BRONX

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
049	R-60A	Jerome Avenue & Macombs Dam Park	Harlem River	8'6"x7'8"*	3
056	R-67	W. 192nd Street	" "	Dbl. 15' x 9'2 1/8"^{2}	3
057	R-66	Landing Road	" "	66" dia.	3
058	R-65	W. 178th Street	" "	57" dia.	3
059	R-64	W. 176th Street	" "	45" dia.	
060	R-62	Webster Avenue	" "	14' x 11'	3
061	R-61	W. 167th Street	" "	42" dia.	3
062	R-60	Jerome Avenue	" "	10' x 8'6"	3
063	R-72	s/o Macombs Dam Br.	" "	48" dia.	3
064	R-59	E. 149th Street	" "	60" dia.	3
065	R-57	Park Avenue	" "	36" dia.	3
066	R-56	Third Avenue	" "	2'8" x 4'	3
067	R-55	Lincoln Avenue	" "	60" dia.	3
068	R-53,54	Brook Avenue	Bronx Kill	12' x 9'10"	3
069	R-71	Cypress Avenue	" "	2'2" x 3'	3
073	R-73	St. Anns Avenue	" "	Dbl.12' dia	

* This dimension is taken from DRAFT, Task 2.5.2, Table 3A.

TABLE 3-1 (continued)

Treatment Plant Drainage Basin: Wards Island, NY0026131 (continued)

BRONX

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
074	CSO	Landing Avenue Harlem River	72" dia.	
075	R-58	E. 138th Street " "	12' x 6'3"	3
076	MH-1	n/o Bradley Terrace " "	54" dia.	3
077	MH-2	Ewen Avenue " "	8'6" x 7'	3
078	MH-3	W. 225th Street " "	4'6" x 5'	3

TABLE 3-1 (continued)

Treatment Plant Drainage Basin: North River, NY0026247[4]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
007	N-15	W. 218th Street Harlem River	4' x 2'4"	
008	N-14	W. 216th Street " "	4' x 5'	
009	N-13	W. 215th Street " "	2'4" x 3'6"	
010	N-10, N-11, N-12	W. 211th Street " "	4'1" x 4'6"	3
011	N-9	W. 209th Street " "	48" dia.	
012	N-7, N-8	W. 207th Street " "	2'4" x 3'6"	Two Outfalls*
013	N-6	W. 206th Street " "	2'4" x 3'6"	
014	N-5	W. 205th Street " "	48" dia.	
016	N-4	W. 203rd Street " "	2'4" x 3'6"	
017	N-3	W. 201st Street " "	4' x 6'	3
018	N-1	Highbridge Park " "	48" dia.	
045	N-2	Academy Street " "	Dbl.7' x 6'	

[4] SPDES number assignment, street location, and size are taken from the North River permit, Part I, page 9 of 33.

* Information from Task 1-Drawings, North River. pp. NR-35, NR-40.

Bronx side of the River and fifteen are on the Manhattan side. Twenty-four of these were inspected either visually or by television for Task 2.5.2. The outfall not inspected was outfall 036, at 129th Street and the Harlem River, which, according to the Summary Report, bypasses in wet weather due to inadequate capacity in the R-36 regulator.[2]

Of the 24 outfalls inspected for the Task 2.5.2, the inspection reports on four of them noted some amount of debris accumulated in the outfall pipe. In addition, some structural problems were also noted. Outfall 051 was listed as being in "poor condition." Outfall 061 was specifically in need of repair with "severe cracks in the ceiling." Outfall 063 was characterized as "collapsed" with heavy silt.[3] Dry weather bypassing has been identified in two of the regulators in this segment due to inadequate equipment.[4] These regulators are associated with outfalls 060 and 075. Outfall 060 is the largest outfall in this subsegment, measuring 14' x 11'. Other large outfalls include 038, 045, 046, 049, 062, and 075. Their dimensions are contained in Table 3-1.

One apparent outfall discrepancy in this subsegment should be noted. The permit issued in 1983 placed 049 at 156th Street and the Harlem River and 050 at 159th Street and the Harlem River. In the Task 2.5.2, the street locations were reversed, so that 050 was located at 156th Street. Both outfalls, according to the Task 2.5.2, measure 2'8" x 4'.[5] In the "Supplemental Memo", the 049 outfall disappeared. According the the "Supplemental Memo", SPDES number 049 was assigned to a regulator or an outfall not in service.[6] Consequently, in the "Supplemental Memo" and the permit renewal, 049 was assigned to the outfall for R-60A,[7] which is apparently adjacent to the outfall for R-60. No dimensions are listed in the permit for this outfall, however. Moreover, reference to Task 1 leaves a question as to whether two outfalls actually exist or whether there is only one at that location.[8]

Uppermost Segment of the Harlem River

There are 20 outfalls into the remaining segment of the Harlem River to its confluence with the Hudson River. Eight of these, on the Bronx side of the Harlem River, are in the Wards Island drainage basin. The twelve on the Manhattan side of the River fall within the North River drainage basin. Eight of the 20 have been inspected for the Task 2.5.2. A number of outfalls within the Wards Island drainage basin are relatively large. Outfall 056 is comprised of two pipes each measuring 15' x 9'2 1/8". Outfalls 057 and 077 measure 66" in diameter and 8'6" x 7', respectively. The outfall for 078 measures 4'6" x 5'. One other relatively large discharge point in the Wards Island drainage basin is 074 at Landing Avenue. It measures 72" in diameter and is adjacent to 057.

The two North River drainage basin discharge points in this subsegment which have been inspected are outfalls 010 and 017. Outfall 017, at West 201st and the Harlem River, appears in the Task 2.5.2 as a 4' x 6' outfall "in poor shape."[9] Outfall 010, at approximately West 211th Street and the Harlem River, is a 4'1" x 4'6" outfall with "heavy debris."[10] Both 017 and 045 are identified in the Summary Report as having inadequate equipment in the regulators, leading to dry weather bypass.[11] Outfall 045 is a double 7' x 6' discharge point.

Of these ten uninspected outfalls contained within the North River drainage basin, there is a question on only one of these that should be resolved. It is unclear whether outfall 012 is one outfall pipe or two. Old sewer maps, information obtained from Commission records, and at least one City document indicate that two distinct outfalls exist, one for R-8 on the north side of West 207th Street and one for R-7 on the south side of West 207th Street.[12]

CONCLUSION

The Harlem River is a relatively short and narrow strait that provides a vital connection between the East River and the Hudson River. As evidenced by the recent upgrading of its classification, the water quality in the Harlem River has improved in recent years. However, as a river 8 miles long with 48 CSOs, some of which are quite large, it easily ranks as a highly stressed waterbody during wet weather overflows. This pollutant loading does not only effect the water quality of the Harlem River, but, because of its proximity to the Hudson River undoubtedly effects water quality in that waterbody as well. Degradation in the Harlem River may, in fact, be one reason that swimming is not yet possible along the upper Hudson River.

Because of the concentration of overflows in this area, these CSOs should receive some attention. Abatement, and where possible elimination, of any number should lead to an improvement in water quality. Coordination of efforts for the Harlem River may be somewhat simpler than for most waterbodies in the District because it falls entirely within the City of New York and involves only two drainage basins. Steps toward this goal would be one recommendation by the Commission.

FOOTNOTES

[1] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[2] New York City Department of Environmental Protection. Summary Report, City-Wide Regulator Improvement Program Inventory and Assessment. Prepared by Hazen and Sawyer. April 1985. p. 3-215.

[3] Task 2.5.2 - Outfall Inspection. Table 3.

[4] Summary Report. p. 3-216.

[5] Task 2.5.2 - Outfall Inspection. Table 3.

[6] New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 2, n.2.

[7] Ibid. Table 2.

[8] Task 1 - Drawings, Wards Island. pp. W1B-40, W1B-45.

[9] Task 2.5.2 - Outfall Inspection. Table 3.

[10] Ibid.

[11] Summary Report. p. 3-216.

[12] Task 1 - Drawings, North River. pp. NR-35, NR-40.

CHAPTER 4

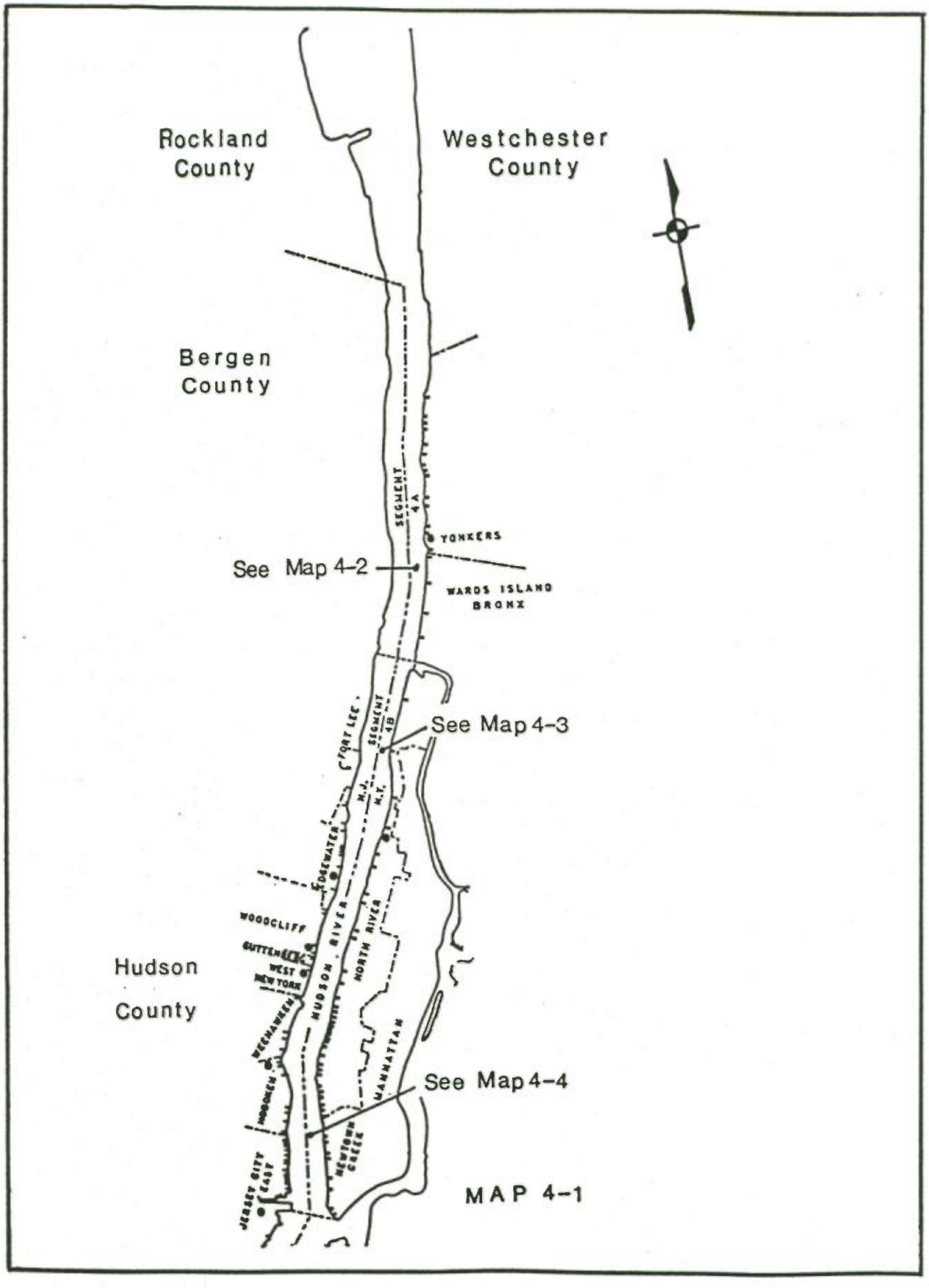
HUDSON RIVER

The next section of this Report encompasses that part of the Hudson River that is contained in the Commission's District. This area extends from the northern border of Rockland County and Westchester County to the southern tip of Manhattan at the Battery across to Pier 5 in Jersey City, New Jersey. The shoreline of this area, perhaps more than that of any other portion of the District, is the focus of many plans for development. While not opposed to development of the area, the Commission believes that such development must go forward in an environmentally sound manner, with attention to the issues of adequate sewage treatment capacity and efforts toward amelioration or elimination of CSOs, where possible.

The Hudson River is separated into sections A and B for discussion in this Report. Section 4A includes the northernmost area of the Hudson River down to a line from its confluence with the Harlem River across to Englewood Cliffs in New Jersey. Section 4B continues down from this point to the southern boundary of the Hudson at the Battery. The segment of the Hudson River discussed in this Report, including both sections A and B, is shown on Map 4-1.

SECTION 4A

The shoreline of this segment of the Hudson River is among the most scenic in the country. The Palisades on the western shore of the Hudson have provided a breathtaking view for travelers since the 1600s. Palisades Interstate Park lies along these shores and it is hoped that in the not too distant future, this and other recreational areas along the shore will once again be open for bathing and other primary contact recreation. This segment of the Hudson was upgraded by the Commission in 1986 from class "B-1" to class "A", which reflects the improvement in water quality to date and the expectations that improvement in sewage treatment facilities within and


Rockland County
Westchester County
Bergen County
Hudson County
SEGMENT 4A
YONKERS
See Map 4-2
WARDS ISLAND
BRONX
SEGMENT 4B
See Map 4-3
FORT LEE
N.J.
N.Y.
EDGEWATER
WOODCLIFF
GUTTENBERG
WEST NEW YORK
WEEHAWKEN
HUDSON RIVER
NORTH RIVER
MANHATTAN
See Map 4-4
HOBOKEN
NEWTOWN CREEK
JERSEY CITY EAST
MAP 4-1

adjacent to this segment will lead to further improvement. The States of New Jersey and New York have similarly upgraded this segment. Subsequent sampling of the Upper Hudson supports this reclassification and is encouraging.[1]

There are 18 CSOs in this upper segment of the Hudson River, all of which are in Westchester County and the Bronx. This area is shown on Map 4-2 and the outfalls are catalogued on Table 4-1.

Rockland County

Rockland County has separate storm and sanitary sewers according to NYS DEC[2] and Commission records. No combined sewer overflows from Rockland County outfall into the Hudson River.

Westchester County

Yonkers is the only area on the western shore of Westchester County that contains combined sewer outfalls. It is served by the Westchester County Department of Environmental Facilities' Yonkers Joint Treatment Plant (permit NY0026689). There are 14 CSO outfalls serving the Yonkers system. These outfalls contribute wet weather flow from approximately 2500 acres in lower Westchester County.[3] It is estimated that there is an annual total overflow of approximately 60 million gallons to the Hudson River from Yonkers.[4] It is also estimated that 90% of this amount comes from the overflows of only five regulators in the City of Yonkers: 003, 012, 017, 022, and 025.[5]

The northernmost of these outfalls is 017. The application of the Storm Water Management Model (SWMM) to Yonkers grouped 017 with outfalls 016, 015, and 014 into a subcatchment area of about 403 acres, which has an estimated four overflow events a year amounting to an average yearly overflow quantity of 1.6 million gallons.[6] The Yonkers Combined Sewer Overflow Study admits that this grouping has a tendency to underestimate the actual amount overflowing from 017, which is considered to be closer to 2 million gallons by itself on a yearly basis.[7]

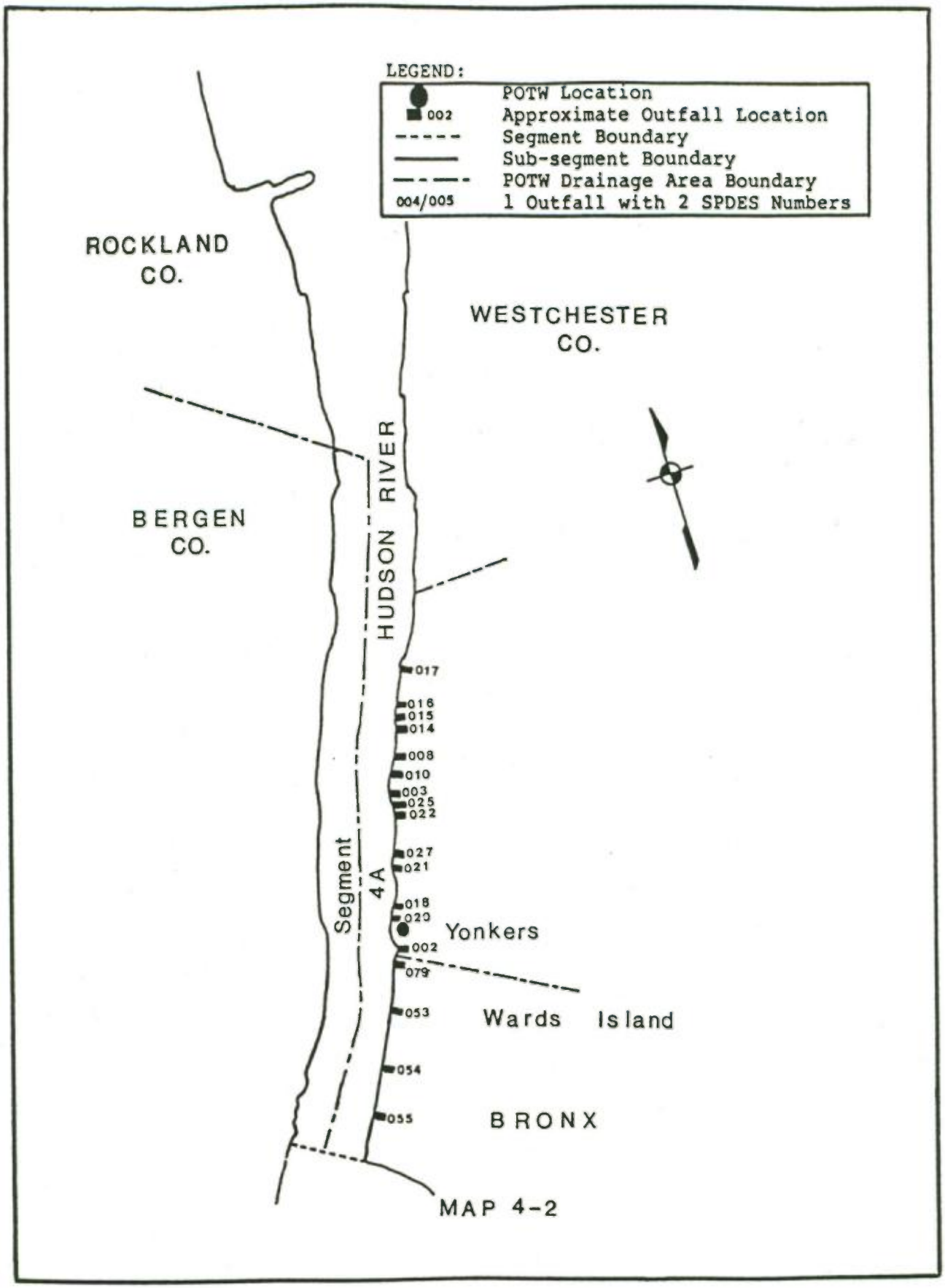

LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
ROCKLAND CO.
WESTCHESTER CO.
BERGEN CO.
HUDSON RIVER
Segment 4A
017
016
015
014
008
010
003
025
022
027
021
018
020
002
079
053
054
055
Yonkers
Wards Island
BRONX
MAP 4-2

TABLE 4-1

COMBINED SEWER OUTFALLS
IN THE UPPER HUDSON RIVER
WATERWAY SEGMENT 4A

Treatment Plant Drainage Basin: Yonkers, NY0026689

Outfall Number SPDES	Outfall Number Local	Location of Outfall[1]			Size[2]	Comments/ Notes
002		Yonkers	Hudson River		Dbl.48"dia*	
003	P/S	N. Yonkers Pump Sta.	"	"	Dbl.60"dia*	
008	R-1, R-2, R-6	Lamartine Avenue	"	"	48" dia.	same outfall for 009, 013
010	R-3, R-4 R-5	Ashburton Avenue	"	"	48" dia.	same outfall for 011, 012
014	R-7	Warburton Avenue	"	"	48" dia.	
015	R-8	Arthur Street	"	"	30" dia.	
016	R-9	Roberts Avenue	"	"	30" dia.	
017	R-10	Odell Avenue	"	"	4' x 4'	
018	R-11, R-12, R-16,	Pier Street	"	"	7' x 4'6"	same outfall for 019,023

[1] Location information from Westchester County, NY, Yonkers Combined Sewer Overflow Study Facilities Planning Report. Prepared by Greeley and Hansen. September 1986. Table 1.

[2] Size information from Westchester County, NY, Yonkers Combined Sewer Overflow Study Report On Initial Studies. Prepared by Greeley and Hansen. August 1985. Table 3.

* Information based on conversations with local officials.

TABLE 4-1 (continued)

Treatment Plant Drainage Basin: Yonkers, NY0026689 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall[1]		Size[2]	Comments/ Notes
020		Ashton Road	" "	48" dia.	
027		S. Yonkers Trunk Sewer	" "	36" dia.	
021	R-14	Herriot Street	" "	3'6" x 2'7"	
022	R-15, R-17	Main Street	Hudson River	5'11"x6'9"	same outfall for 024
025	R-18	Wells Avenue	" "	48" dia.	

TABLE 4-1 (continued)

Treatment Plant Drainage Basin: Wards Island, NY0026131[3]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
053	WI-R3	W. 256th Street Hudson River	7' x 4'	
054	WI-R2	W. 248th Street " "	8' x 6'	
055	WI-R1	W. 236th Street " "	6' x 4'6"	
079	WI-R4*	W. 261st Street " "	18" dia.	4

[3] SPDES number assignment, street address, and size are taken from the Wards Island permit, Part I, page 10 of 33.

[4] Inspected as part of Task 2.5.2.

* Regulator W1-R4, which should receive the SPDES assignment 079, directs dry weather flow from an area of the North Bronx to the Yonkers POTW, although the overflow is in the Bronx and discharges into the Hudson River just below the Westchester County border (see Map 4-2).

Of the five problem overflow points, the worst two are 003 and 025. Outfall 025 at Wells Avenue has an estimated tributary area of only 60.6 acres,[8] but has an estimated yearly average of 76 overflow events responsible for an average 7.7 million gallons in overflow quantity.[9] Outfall 003, the North Yonkers pump station, overflows an average of 21 times a year amounting to an estimated yearly discharge of 35.6 million gallons.[10]

The remaining two of the five problem overflow points are associated with multiple regulators. Outfall 010, at Ashburton Avenue, is associated with overflow 012 -- the Woodworth Avenue regulator -- as well as overflow 011. The estimated tributary area for this outfall is approximately 200 acres.[11] As with the 017 outfall discussed above, the SWMM analyses used by Yonkers, grouped overflows 012, 011, and 010 with 008, 009, and 013 into a single subcatchment area. These overflows grouped together have an estimated one overflow event a year resulting in 0.2 million gallons.[12] As with 017, however, the overflow from 012 is probably underestimated by using this method; actual overflow from 012 alone is estimated to be 9 million gallons.[13] Outfall 022, with its associated overflow 024, is the other structure identified in the City of Yonkers as a problem point. These structures have an estimated tributary area of 850 acres.[14] This outfall is subject to an estimated 16 overflow events a year resulting in an average 2 million gallons of overflow quantity a year.[15]

Two other outfalls in the Yonkers system are multiple regulator outfalls: 008 and 018. Outfall 008, the Lamartine Avenue overflow, is associated with overflows 008, 009, and 013. They have an estimated tributary area of 120 acres.[16] Outfall 018 at Pier Street is associated with overflows 019 and 023. These three structures have an estimated tributary area of approximately 660 acres.[17] They have an average of two overflow events a year resulting in an estimated yearly overflow quantity of 1.2 million gallons.[18]

According to the Yonkers Study, the degree of overflow is based on two structural problems within the Yonkers system. Infiltration into the system,

which is an estimated 7.1 MGD, causes additional flow resulting in an overloading of the sewer pipes with a greater possibility of overflow and discharge. The sewer pipes in several specific cases are already cited in the Yonkers report as having inadequate capacity to handle existing flows.

In 1987, Westchester County and NYS DEC signed an agreement that will lead to reduction of CSO discharges in the Yonkers drainage basin. The agreement outlines a five phase, $35 million program, with a completion date of 1997. Phase 1 of the project, which has received funding, will install swirl concentrators and disinfection capability at the North Yonkers pump station (003) to provide some treatment for the overflow discharging at this point. It is estimated that this first phase will reduce by 50% the volume of the CSO discharges.[19] The remaining four phases of the project include sewer and regulator improvement for both the North Yonkers and South Yonkers collection system, creation of additional pumping capacity at several pump stations, and installation of treatment facilities at the South Yonkers screen house similar to those being installed at the North Yonkers pump station. This project will specifically address the overflow problems at the five most frequent discharge points and effectively alleviate the pollution due to CSOs in Yonkers.

Bronx

Four outfalls discharge into section 4A from the Wards Island drainage basin in the Bronx. These outfalls are 053, 054, 055, and 079.

The northernmost of these outfalls is 079. This outfall is adjacent to the campus of Mount Saint Vincent College. Although 079 is a New York City regulator with overflows outfalling along the New York City shoreline, normal dry weather flow is fed into the Westchester County system for treatment at the Yonkers Joint Treatment Plant.

The three remaining outfalls are reasonably large, the smallest being 055, which measures 6' x 4'6". None of these three other outfalls was

inspected for the Task 2.5.2.[20]

Northern Bergen County

According to Commission records, there are no combined sewer outfalls in the area of Bergen County included in section 4A.

SECTION 4B

This section of the Hudson River extends from its confluence with the Harlem River to the tip of Manhattan at the Battery. Like the East River on the eastern side of Manhattan, this segment of the Hudson River is bordered by densely populated areas, although in this case, unlike the East River, the areas fall within both New Jersey and New York. Many recreational areas and parks exist along this segment of the River despite its "B-1" classification. The upgrading in the next few years of several primary treatment plants to secondary treatment capabilities, on both the New Jersey and New York side of the River, should result in improved water quality in the not too distant future. According to the 1985 NYS DEC Use Attainability Analysis, the water quality improvement resulting from the completion of the North River POTW and other upgrading construction in the area, "will promote the survival and reproduction of most, if not all, species of fish native to the Hudson."[21]

There are 97 CSOs in section 4B, as listed on Table 4-2. They fall within the North River and Newtown Creek drainage basins on the Manhattan side of the River and the drainage basins of numerous municipalities on the New Jersey side of the River.

Harlem River/Englewood Cliffs to West New York/West 60th Street, Manhattan

Thirty-three CSOs have been located in this subsection of the Hudson River, which is shown on Map 4-3. Of the 16 situated on the New York side of the River, only three have been inspected for the Task 2.5.2. All 33 of

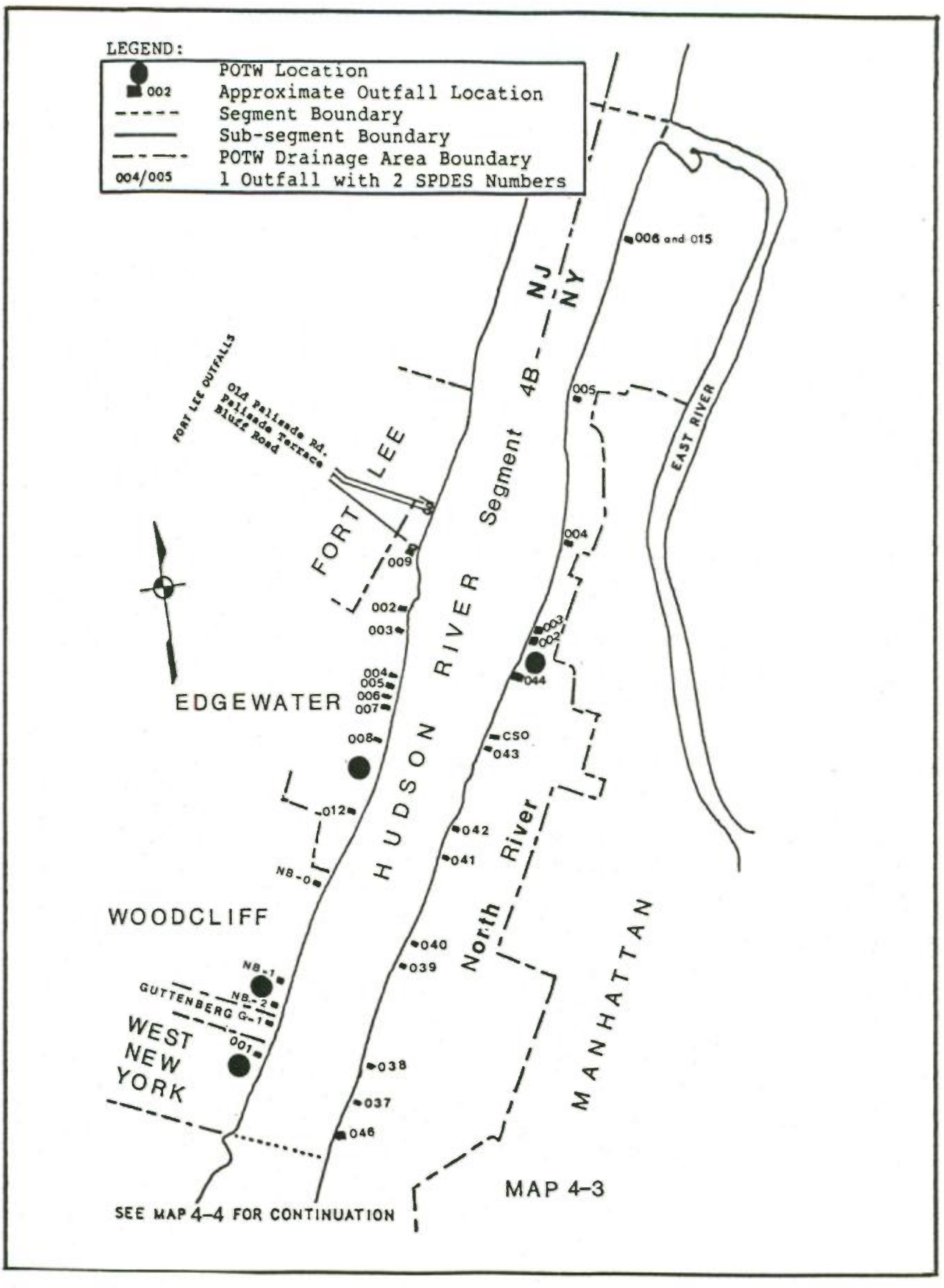

LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
006 and 015
NJ
NY
Segment 4B
005
EAST RIVER
FORT LEE OUTFALLS
Old Palisade Rd.
Palisade Terrace
Bluff Road
FORT LEE
004
009
002
003
003
002
004
005
006
007
044
EDGEWATER
008
CSO
043
012
042
041
NB-0
HUDSON RIVER
North River
WOODCLIFF
040
039
NB-1
NB-2
GUTTENBERG G-1
001
WEST NEW YORK
038
037
046
MANHATTAN
SEE MAP 4-4 FOR CONTINUATION
MAP 4-3

TABLE 4-2

COMBINED SEWER OUTFALLS IN THE HUDSON RIVER
IN MANHATTAN NORTH OF 60th STREET/
BETWEEN FORT LEE & WEST NEW YORK, NEW JERSEY
WATERWAY SEGMENT 4B

Treatment Plant Drainage Basin: North River, NY0026247[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
002	N-20 N-21 N-21A N-21B	W. 152nd Street Hudson River	60" dia.	2
003	N-19	W. 158th Street " "	48" dia.	
004	N-18	W. 171st Street " "	10'6" x 6'	
005	N-17	Chittenden Avenue " "	16" dia.	
006	N-16	Dyckman Street " "	Dbl.7' x 5'	2, 3
015	N-16A	Dyckman Street " "	36" dia.	
037	N-29	W. 72nd Street " "	Dbl.3' x 4'	
038	N-28	W. 80th Street " "	10'6" x 6'	3
039	N-27	W. 91st Street " "	5'5" x 4'	
040	N-26, N-26A	W. 96th Street " "	10' x 6'	

[1] SPDES number assignment, street address, and size are taken from the North River permit, Part I, pages 9 and 10 of 33.

[2] Location verified by Commission personnel.

[3] Inspected as part of Task 2.5.2

[4] Information from "Supplemental Memo." Outfall Table 14. June 1985.

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: North River, NY0026247 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
041	N-25	W. 108th Street " "	4' x 4'	
042	N-24	W. 115th Street " "	4'6" x 4'	
043	N-23	St. Clair Place " "	Dbl. 8'8" x 7'6"	3
044	N-22	W. 138th Street " "	42" dia.	
046	N-29A	W. 66th Street " "	5'6" x 5'	
	CSO	W. 130th Street " "	7' x 5'6"	4

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: Fort Lee, NJ0034517

Outfall Number SPDES	Outfall Number Local	Location of Outfall[5]		Size[6]	Comments/ Notes
001	Bluff Road Outlet	Hudson Terrace	Hudson River	48" dia.	
002	Palisade Terr. Outlet	Palisade Terrace/ Orchard Street	" "	66" dia.	
003	Lower Main Street Outlet	Main Street	" "	12" dia.	

[5] Information from U.S.G.S. Map provided by McClave and McClave, Inc., Civil and Consulting Engineers, April 1987.

[6] Information obtained during discussions with local officials.

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: Edgewater, NJ0020591

Outfall Number SPDES	Outfall Number Local	Location of Outfall[7]	Size[7]	Comments/ Notes
002	ER-2	Lasher Lane Hudson River	16" dia.	
003	ER-3	s/o Glenwood Avenue " "	12" dia.	
004	ER-4	Hudson Avenue " "	16" dia.	
005	ER-5	Dempsey Avenue " "	8" dia.	
006	ER-6	Hilliard Avenue " "	24" dia.	
007, 010, 011	ER-7	Between Hilliard & Gardin Place " "	60" dia.[6]	
008	ER-8	Archer Street " "	18" dia.	
009	ER-9	Between Orchard Street & Palisade Terrace " "	30" dia.	
012	Gorge Road Reg.	Gorge Road " "	30" dia.	

[7] Information from Borough of Edgewater, 201 Wastewater Facilities Plan, Volume I, Appendices. Prepared by Clinton Bogert Associates, July 1981. Appendix B.

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: North Bergen, NJ0029084[8]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[6]	Comments/ Notes
	NB-0	Hillcrest Pump Sta. Hudson River	Unknown	
	NB-1	73rd Street " "	60" dia.	*
	NB-2	74th Street " "	36" dia.	*

[8] The Woodcliff POTW permit lists two outfalls: 004 and 012. However, it was not possible to attach these numbers to specific outfalls by reference to the permit, nor was such information available from inquires to NJ DEP.

* According to information supplied by NJ DEP, NB-1 and NB-2 may both discharge through only one outfall. Commission records, however, indicate that both regulators have outfalls.

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: Guttenberg (Permit not available)[9]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
	G-1	70th Street	36" dia.*	

[9] Information from the Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume II, Table E-2, "Combined Sewer Overflow Facilities", and information contained in Commission files. According to communications with NJ DEP, the Guttenberg outfall is not included in any NJPDES permit.

* Figure V-2, "Existing Sewerage Facilities" in the 201 Wastewater Facilities Plan cited above shows the dimensions of this outfall to be 72" in diameter.

TABLE 4-2 (continued)

Treatment Plant Drainage Basin: West New York, NJ0025321

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[10]	Comments/ Notes
001	WNY-1	Hillside Road Hudson River	54" dia.	

[10] Information from the West New York permit, Part III-A, p. 1 of 4, effective June, 1986 and from Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area III, Facilities Report, Figure V-2, "Existing Sewerage Facilities."

these outfalls are listed on Table 4-2.

Beginning with the northernmost outfalls in this subsection, outfall 006 and 015 in the North River drainage basin are adjacent to each other. Outfall 006 is a double-barreled discharge point, measuring 7' x 5' for each pipe, that has been inspected in the Task 2.5.2. Commission personnel have verified the location of this structure. Outfall 015 is a much smaller discharge point, measuring 36" in diameter.

Of the next five outfalls south to the North River POTW (005, 004, 003, 002, and 044) none has been inspected, but two are of substantial enough size to merit mention here. Outfall 004, at West 171st Street and the Hudson River, has dimensions of 10' x 6'6". Outfall 002 at West 152nd Street is also large, measuring 60" in diameter. It is the outfall for regulators N-20, N-21, N-21A, and N-21B.[22] Outfall 044 is located at the North River POTW.

These four outfalls correspond with the northernmost outfalls on the New Jersey side of the Hudson, including three outfalls in the Fort Lee and four in the Edgewater drainage basin three discharge points in Fort Lee are the Bluff Road outfall, the Palisade Terrace outfall, and the Lower Main Street outfall.[23] These outfalls are listed on the Fort Lee permit as 001, 002, and 003. Based on recent inspection reports, the regulator mechanisms for 002 and 003 are inadequate or in poor condition. Some overflow was observed at 003. Reconstruction is scheduled for completion in mid 1989.[24]

Four outfalls in Edgewater (permit NJ0020591) discharging in this approximate area are 009, 002, 003, and 004. Outfall 009 is the 30" diameter Orchard Street-Palisade Terrace overflow. The outfalls for 002 and 004 are both 16" in diameter; 002 is located at Lasher Lane and 004 is located at Hudson Avenue. Outfall 003 is located south of Glenwood Avenue.

To the immediate south of the North River POTW, five discharge points outfall into the Hudson, with two on the Manhattan side and three on the Edgewater side. At 130th Street, a CSO with dimensions of 7' x 5'6"

discharges. Oddly, this outfall did not receive a SPDES number assignment in the permit reissuance. Immediately south of the CSO, outfall 043 at West 129th Street in Manhattan was inspected for the Task 2.5.2. and determined to be an 8'8" x 7'6" double-barreled outfall in "acceptable" condition.[25] The three outfalls on the Edgewater side are of a smaller size, but the information on their existence is much less clear. Outfall 005, located at Dempsey Avenue, has been measured to have an 8" diameter, but at present there is a question as to its existence because of landfilling at the Dempsey Avenue site. The outfalls 007, 010, and 011 have been merged and discharge through a 60" diameter outfall[26] located between Hilliard and Gardin Avenues. The Facilities Plan for this area indicates that the 24" diameter outfall for 006 was also merged with those of 007, 010, and 011.[27] However, discussions between Commission personnel and sewer system personnel in Edgewater revealed that the outfall, in fact, still exists at the foot of Hilliard Avenue.

The two remaining outfall locations in Edgewater mirror two outfalls in Manhattan but, again, on a smaller scale. The Archer Street outfall, 008, is 18" in diameter and the Gorge Road outfall, 012, is 30" in diameter. These two outfalls are associated with the two regulators in Edgewater that evidence the highest volume of overflows.[28] In fact, of the total pollutant load resulting from overflows, regulator 12 "discharges more than half" of it.[29] There is, however, no ongoing work for sewer separation or regulator improvement.[30] Opposite these, on the Manhattan side of the River, are outfalls 042 and 041 measuring 4'6" x 4' and 4' x 4', respectively.

The next five outfalls in the North River drainage basin, on the Manhattan side of the River, correspond geographically with five outfalls on the New Jersey side. All five of these outfalls in Manhattan (037, 038, 039, 040, and 046) are relatively large. Only one of them has been inspected. This outfall, 038, measures 10'6" x 6' and has "heavy deposition", according to the Task 2.5.2.[31] Outfall 040 is an uninspected 10' x 6' outfall. Outfall 037 at West 72nd Street is a double-barreled discharge point, with each pipe measuring 3' x 4'.[32] Outfall 046 measures 5'6" x 5'.

On the New Jersey side of the Hudson River, the five outfalls noted occur in the North Bergen, Guttenberg, and West New York drainage basins. The North Bergen sewer system was "constructed around the time of the First World War"[33] while the combined municipal sewer system in Guttenberg was built as a WPA project in the 1930s.[34] Most of the combined system in West New York was built before the turn of the century.[35]

According to the New Jersey Department of Environmental Protection (NJ DEP) the outfalls in North Bergen are included in the Woodcliff POTW permit (permit NJ029084).[36] Two outfalls are listed in this permit, with the corresponding latitude and longitude of the outfalls. Comparison of this type of description in the permit with the information available in the 201 Wastewater Facilities Plan, however, was not instructive. Consequently, the Commission staff was not able to determine to which outfalls these numbers were assigned.

In addition to the permit, other information supplied by the NJ DEP suggests that there are only two outfalls discharging from North Bergen, although Commission records indicate that there are three: NB-0, NB-1, and NB-2. The outfall for NB-1 and for NB-2 are the same, according to information provided by NJ DEP. The Commission was not able to verify the number of outfalls and it is still unclear, although three outfalls are placed in approximate locations on Map 4-3.

The uppermost of the outfalls in North Bergen is NB-0. It is the outfall for the Hillcrest pump station. The Commission has not been able to determine its dimensions from discussions with local officials. The other outfall or outfalls to the Hudson River in North Bergen are NB-1 and NB-2 in the vicinity of 73rd/74th Street. The inspection done on NB-2 for the 201 Wastewater Facilities Plan done in 1979 indicated that the mechanical equipment was not operational and most dry weather flow was bypassing to the River.[37]

Two other outfalls discharge in this area from New Jersey. Outfall G-1

at Hudson Boulevard and 70th Street in Guttenberg drains 108 acres.[38] Commission records show that it has a 3' diameter. This is supported by the 201 Wastewater Facilities Plan, although that document lists it as a 72" diameter elsewhere.[39] The Facilities Plan notes that this outfall bypasses during peak dry weather flow.[40] The one outfall in West New York (permit NJ0025321) is 001, which discharges at Hillside Road and drains about 792 acres with a service population of about 58,900 people, according to the Facilities Plan, based on data from the 1970s.[41] It has an outfall size of 54".

South in the Hudson River to the Battery and Liberty State Park

From this point south to the Battery in Manhattan and Liberty State Park in Jersey City, New Jersey, there are 64 outfalls into the Hudson River. These outfalls are shown on Map 4-4 and listed on Table 4-3.

The first five outfalls on the New Jersey side are all in Weehawken and have a combined drainage area of 691 acres.[42] The discharge points in Weehawken are the outfalls for W-6, W-5, and W-4 and the single outfall for W-3, W-2, and W-1.[43] The largest of these outfalls is the single outfall for the three regulators; it measures 66" x 126".[44] No outfall size information is available for two of the outfalls, although overflow size information is available for all but one.[45] In general, the inspection reports conducted for the 1979 Facilities Plan indicate that dry weather bypassing is a problem with all of the regulators in Weehawken to some degree.[46]

Of the fifteen outfalls between West 60th Street and West 25th Street in Manhattan, only three have been inspected by video camera: 034, 032, and 026. Outfall 034, at West 50th Street, was characterized in the Task 2.5.2 as having "heavy deposition/debris." The inspection of 026 noted the presence of some wood ceiling at the outfall location at West 26th Street.[47] For outfall 032, at West 46th Street, the report noted that the outfall was "deteriorated." The Task 2.5.2 lists the outfall measurements for 032 as 8'6" x 6'6" and 48", which is consistent with the "NYC Outfall Table" as it was

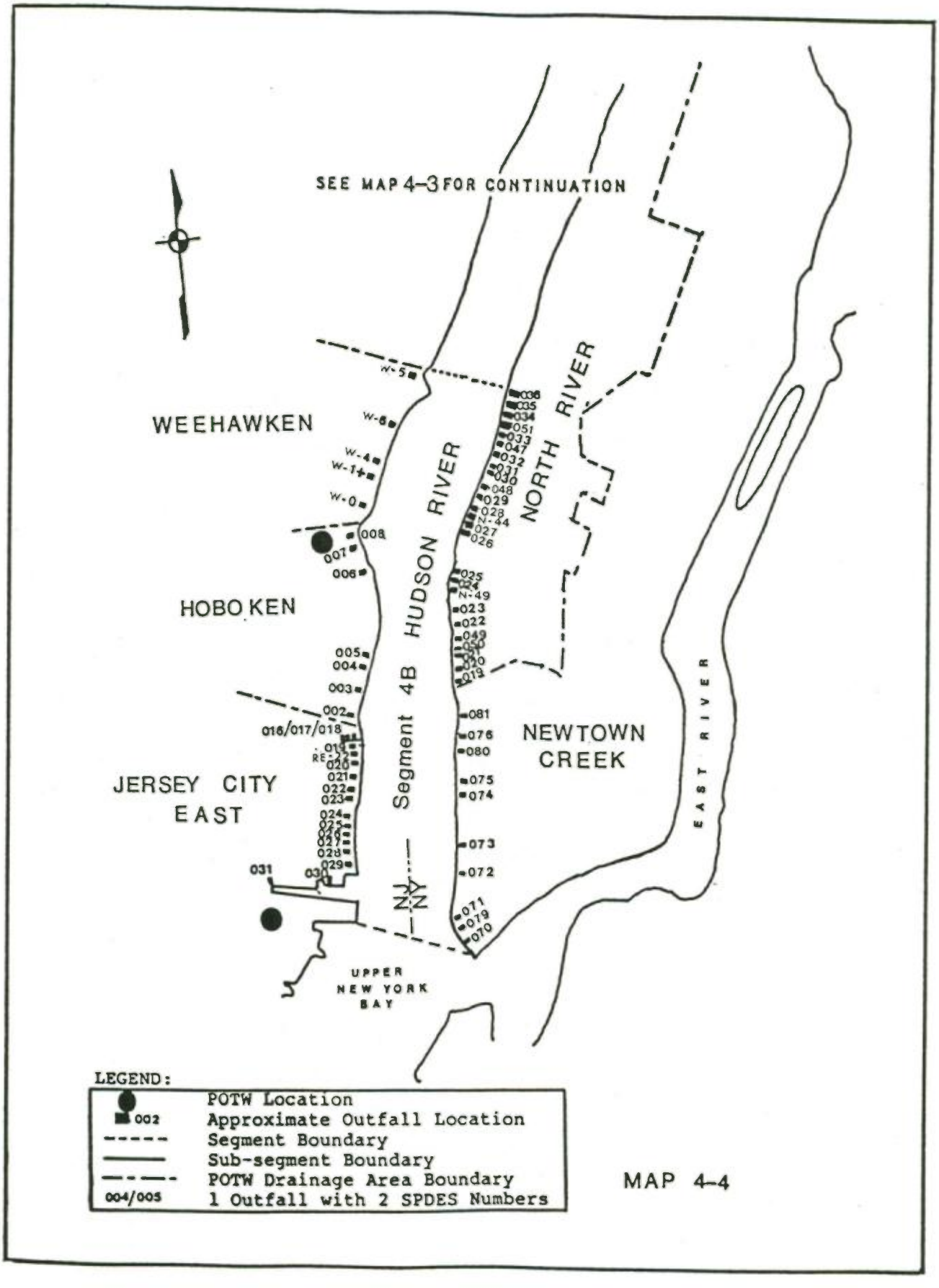

SEE MAP 4-3 FOR CONTINUATION
WEEHAWKEN
HOBOKEN
JERSEY CITY EAST
NEWTOWN CREEK
HUDSON RIVER
Segment 4B
NORTH RIVER
EAST RIVER
NJ
NY
UPPER NEW YORK BAY
W-5
W-6
W-4
W-14
W-0
N-44
N-49
008
007
006
005
004
003
002
016/017/018
031
030
081
076
080
075
074
073
072
071
079
070
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
MAP 4-4

TABLE 4-3

COMBINED SEWER OUTFALLS IN THE HUDSON RIVER
IN MANHATTAN SOUTH OF 60th STREET/
BETWEEN WEEHAWKEN & JERSEY CITY, NEW JERSEY
WATERWAY SEGMENT 4B

Treatment Plant Drainage Basin: North River, NY0026247[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
019	N-56	Bank Street Hudson River	3'8" x 4' To Bulkhead 48" dia. Along Pier	
020	N-55	Jane Street " "	3'10"x 4' To Bulkhead 48" dia. Along Pier	3
021	N-54	Gansevoort Street " "	2'8" x 4' To Bulkhead 48" dia. Along Pier	
022	N-51	s/o W.17th Street " "	54" dia.	
023	N-50	W. 18th Street " "	5' x 3'6" &5' x 4'6"	
024	N-48	W. 21st Street " "	6'4" x 4'6" To Bulkhead 48" dia. Along Pier	
025	N-47	W. 24th Street " "	6'6" x 5'6"	

[1] SPDES number assignment, street address, and size are taken from the North River permit, Part I, pages 9 and 10 of 33.

[2] Location verified by Commission personnel.

[3] Inspected as part of Task 2.5.2

[4] "NYC Outfall Table." North River. October 6, 1988; "Supplemental Memo." Outfall Table 14. June 1985.

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: North River, NY0026247 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall			Size[1]	Comments/ Notes
026	N-46	W. 26th Street	Hudson River		6'3" x 5'7" To Bulkhead Dbl. 3'x4' Along Pier	3
027	N-45	W. 30th Street	"	"	11' x 6' & 48" dia.	
028	N-43	W. 36th Street	"	"	48" dia.	
029	N-42	W. 40th Street	"	"	30" dia.	
030	N-39	W. 43rd Street	"	"	54" dia.	
031	N-38	W. 44th Street	"	"	54" dia.	
032	N-36, N-37	W. 46th Street	"	"	48" dia.	3; 8'6"x6' 6"&48"dia[4]
033	N-33,34	W. 48th Street	"	"	2'8" x 4'	2
034	N-32	W. 50th Street	"	"	4' x 4' To Bulkhead 48" dia. Along Pier	3
035	N-31	W. 56th Street	"	"	6' x 4'6" To Bulkhead 54" dia. Along Pier	
036	N-30	W. 59th Street	"	"	5'3"x5'3" To Bulkhead 48" dia. Along Pier	
047	N-35	W. 47th Street	"	"	2'8" x 4'	
048	N-40	W. 42nd Street	"	"	Dbl.8' x 2'	
049	N-52	W. 14th Street	"	"	6' x 4'6"	

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: North River, NY0026247 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[1]	Comments/ Notes
050	N-53	Bloomfield Street Hudson River	2'4" x 3'6"	
051	CSO	W. 49th Street " "	Dbl. 2'x6'	Dbl.[4] 12' x 6'
	N-44	W. 33rd Street " "	4'9" x 4'6"	4
	N-49	W. 21st Street " "	48" dia.	4

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: Newtown Creek, NY0026204[5]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
070	M-9	Battery Park Hudson River	84" dia.	3
071	M-6, M-7	s/o Rector Street " "	8' dia.	3
072	M-5	Vesey Street " "	48" dia.	3
073	M-4	Duane Street " "	5' x 4' To Bulkhead 54" dia. Along Pier	3
074	M-3	Vestry Street " "	60" dia.	3
075	M-2	Watts Street " "	Dbl. 6'9"x5'10" To Bulkhead 66" dia. Along Pier	3
076	M-1	Clarkson Street " "	12' x 6'3" To Bulkhead 48" dia. Along Pier	3
079	M-8	Morris Street " "	48" dia.	
080	TG-2	Van Dam Street " "	48" dia.	
081	TG-1	n/o Charles Street " "	4' x 5'	3

[5] SPDES number assignment, street location, and size are taken from the Newtown Creek permit, Part I, page 10 of 33.

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: Weehawken, NJ (Permit Not Available)[6]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
	W-0	18th Street Hudson River	36" dia.	
	W-1	Weehawken Rail Yard " "	66" x 126"	Also W-2, W-3
	W-4	n/o Baldwin Avenue " "	48" dia.	
	W-5	49th Street " "	Not Available*	
	W-6	Liberty Place/ Pershing Road	Not Available	

[6] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area III, Facilities Report, Figure V-2, "Existing Sewerage Facilities." According to communications with NJ DEP, the Weehawken outfalls are not included in any NJPDES permit.

* Size information available for W-5 relates to the overflow rather than the outfall.

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: Hoboken, NJ0026085

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[7]	Comments/ Notes
002	H-1	Observer Highway Hudson River	4' x 8'	
003	H-2	Newark Street " "	42" dia.	
004	H-3	3rd Street " "	5' dia.	
005	H-4	4th Street " "	7' x 4'9"	
006	H-5	11th Street " "	7' x 4'9"	
007	H-6	14th Street " "	30" x 42"	
008	H-7	15th Street " "	7' x 4'9"	

[7] Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume Two, Table F-1.

TABLE 4-3 (continued)

Treatment Plant Drainage Basin: Jersey City - East, NJ0027014

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size[8]	Comments/ Notes
016	RE-21	n/o Holland Tunnel	Hudson River	36" x 48"	
017	RE-20	" " " "	" "	66" dia.	
018	RE-19	" " " "	" "	60" dia.	
019	RE-18	" " " "	" "	60" dia.	
020	RE-17	8th Street	" "	48" dia.	
021	RE-16	6th Street	" "	48" dia.	
022	RE-15	2nd Street	" "	48" dia.	
023	RE-14	Bay Street	" "	42" x 36"	
024	RE-13	Pearl Street	" "	42" x 30"	
025	RE-12	Montgomery Street	" "	42" dia.	
026	RE-11	York Street	" "	136" x 87"	
027	RE-10	Grand Street	" "	84" dia.	
028	RE-9	Sussex Street	" "	30" x 20"	
029	RE-8	Essex Street	" "	36" dia.	
030	RE-7	Washington Street	Morris Canal	36" dia.	
031	RE-5, RE-6	Jersey Avenue	Tidewater Canal Basin	216" x 92"	
	RE-22	Ft. of 10th Street	Hudson River	120" dia.	Operated by the Jersey City DPW

[8] Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area I, Volume Three, Appendix A, Table A-1.

revised October 1988 and with the "Supplemental Memo",[48] but which is at variance with the measurements contained in the permit.

In addition to this discrepancy, there are others among the uninspected outfalls, some of which involve large discharge points. According to the permit, the three outfalls that have two pipes are 027, 048, and 051. Although the information in the October 1988 "NYC Outfall Table" for North River and the "Supplemental Memo" recognize 051 as having double pipes, the measurement in those documents is 12' x 6' for each pipe[49] rather than the 2' x 6' listed in the permit. All of these documents agree on the fact that outfalls 027 and 048 are the other large double outfalls in this subsegment, although as mentioned above, some also include 032. However, by referring to other City documents, the sizes and regulators associated with these outfalls are unclear. In the most recent documents, such as the October 1988 Outfall Table, some questions have been resolved. In several other cases, however, such as the question of the dimensions of 032 and the regulators associated with 048 and 030, the questions remain. Referring to the Task 2.5.2, there is even a question of whether 027 does, in fact, have two outfall pipes.[50]

The forty-four remaining CSOs outfalling into the Hudson to the Battery discharge from four different drainage basins -- North River and Newtown Creek in Manhattan and Hoboken and Jersey City-East in New Jersey. Of the twenty that discharge from the New York side of the Hudson, eight have been inspected as part of the Task 2.5.2. The twenty-four on the New Jersey side are composed of seven from Hoboken and seventeen from Jersey City.

Sewer system construction in Hoboken began prior to the Civil War. Approximately 1.9 miles of these wooden sewers are still in use, although they are badly deteriorated.[51] Because most of the sewer system was complete by the turn of the century, major repair has been and in some cases still is necessary on a number of lines.[52] Field inspections done for the Facilities Plan of 1979 noted that regulating equipment was not functioning correctly[53] and tidal surcharging was apparent in many areas of the system.[54] Since that

report was published, however, extensive rehabilitation has been completed on CSOs, although there are no current plans to eliminate any of them.[55]

Three outfalls (008, 007, and 006) in the Hoboken POTW drainage basin (permit NJ0026085) empty into the same short segment of the Hudson as do North River outfalls 022, 023, 024, 025, 049, 050 and N-49. The three Hoboken outfalls have a combined drainage area of 191 acres.[56] Outfalls 006 and 008 are relatively large, each measuring 7' x 4'9", while the 007 outfall's dimensions are 30" x 42". Of the seven North River outfalls, at least three are large, although none was inspected. Outfall 023 is a double outfall measuring 5' x 3'6" and 5' x 4'6". Outfall 049 is reported to measure 6' x 4'6". Outfall 025 is also large, measuring 6'6" x 5'6".

The N-49 outfall, which discharges into this segment of the Hudson River adjacent to 024, is a 48" diameter outfall. It is listed in the Task 1 and Task 2.5.2 documents, the "Supplemental Memo," and the October 1988 revised "NYC Outfall Table." Curiously, however, although N-49 is treated as a separate and acknowledged outfall in each of these documents, no SPDES number has been assigned to it in the new permit. Most outfalls that did not have number assignments in the previous permits, but which have been verified during the intervening years, are assigned numbers in the next permit. There are many such outfalls throughout the City's 14 drainage basins. In the North River drainage basin, however, three outfalls that have been identified have not received a SPDES number assignment, including the CSO at West 130th Street, N-44 at 33rd Street, as well as N-49.[57] Because the "non-assignment" is easy to notice on the regulator tables, it should not reasonably be considered an oversight, but to date no other explanation is available.

The next two Hoboken outfalls, 005 and 004 are roughly opposite the last three North River drainage basin outfalls in the Hudson River (021, 020, and 019). The Hoboken outfalls have a drainage basin of about 166 acres.[58] Outfall 005 is a large outfall measuring 7' x 4'9", while 004 measures 5' in diameter. Of the three Manhattan outfalls, 020 was inspected, measured to be 48" in diameter, and determined to have a wood pier ceiling.[59]

Outfalls 003 and 002 in Hoboken lie opposite the two uppermost Newtown Creek (permit NY0026204) outfalls into the Hudson River: 081 and 076. Both 081 and 076 were visually inspected.[60] The two Hoboken outfalls, which are associated with regulators H-2 and H-1, have a combined drainage area of 153 acres.[61]

The remaining outfalls on the New Jersey side of the Hudson River in section 4B are all in the Jersey City-East drainage basin (permit NJ0027014). The collection system in this drainage basin is almost entirely a combined system that is fifty or more years old.[62] They range in size from 216" x 92" to 30" x 20". Outfalls 016, 017, and 018 are north of the Holland Tunnel adjacent to the Conrail Yards. As indicated on Table 4-3, 017 is the largest of these outfalls, measuring 66" in diameter. Outfall 019 also discharges from the Conrail Yards, but at a point farther south. One other outfall into this area is the 120" diameter overflow from regulator RE-22 which enters the Hudson River at 10th Street. This structure is not under the jurisdiction of the Jersey City Sewerage Authority, but is operated by the Jersey City Department of Public Works.

Farther down the Jersey City shoreline, the Pavonia Avenue outfall, 020, discharges into Harsimus Cove and measures 48" in diameter, as does 021 which outfalls into the Hudson from the pier on the southern side of that same cove. The outfall for 022, which is also 48" in diameter, enters the Hudson at approximately Second Street. Outfall 023 enters the Hudson at the foot of Bay Street and 024 discharges at Pier D. The outfall at the foot of Montgomery Street and the Hudson River is 025. The York Street outfall is 026 and is one of the largest discharging in the Jersey City-East drainage basin; it measures 136" x 87". The Grand Street outfall, 027, is also large, measuring 84" in diameter. Outfalls 028 and 029 discharge into the Hudson River at the foot of Sussex Street and Essex Street, respectively. Outfall 030 enters the Morris Canal from a discharge point on Washington Street. Regulators RE-6 and RE-5 overflow to outfall 031, which empties into Tidewater Basin (Mill Creek), adjacent to Liberty State Park. The approximate size of

this outfall is 216" x 92", making it the largest in the Jersey City drainage basin. All of the overflows in Jersey City have been rehabilitated in recent years and a regular inspection schedule has been instituted.[63] However, in October 1988 Commission personnel observed dry weather flow into the Hudson River from a number of outfalls in the Jersey City drainage basin.

On the other side of the Hudson, there are eight CSOs in approximately the same segment of River as the Jersey City discharges. Six of these have been inspected. The two outfalls not inspected were 080 and 079, which services a regulator that does not appear to have an outfall according to Task 2.5.2. In the permit that was recently issued, however, it received a SPDES number. Outfall 075 at Watts Street and the Hudson River discharges from a 66" diameter pipe. Nearby outfall 074 was characterized in the Task 2.5.2 as having "heavy debris."[64] The remaining large outfalls are 070 and 071. Outfall 071 located South of Rector Street measures 96" in diameter, while 070 at Battery Park measures 84" in diameter.

Section 4B is an area of the District undergoing a great deal of development on both sides of the Hudson. With the development currently planned in this section of the District there is approximately an anticipated additional 10 MGD on each side of the Hudson River.[65] The Commission is working with the municipalities along the Hudson River to assure adequate sewage treatment for its current needs, as well as for those demands that will result from this additional development. Currently, the municipalities of Hoboken, West New York, and North Bergen are in the process of upgrading their primary treatment facilities to secondary treatment. The discharge from the Jersey City-East treatment plant will be eliminated when Jersey City's system connects with the Passaic Valley Sewerage Commissioners' (PVSC) facility. The systems from the municipalities of Guttenberg, Weehawken, and Union City will convey wastewater to one or more of these facilities, as they presently do. The construction along the shore will necessitate some rerouting of sewers and would provide a good opportunity to reduce the number of CSOs throughout this area, although none of these communities have included such plans in their projects at this time.[66]

CONCLUSION

The different segments of the Hudson River have distinctly different characters. Section 4A, recently reclassified as "A", has or will shortly attain good water quality and its bordering communities have plans that will further improve the waterbody. Development along this upper segment of the River has not progressed at the rate evident in Section 4B, but, nonetheless, some development is planned and, no doubt, more will be proposed in the near future. This new development should provide impetus and opportunity to plan for upgrading of sewer systems to handle projected waste flow and to reduce the effects of, and, where possible, eliminate existing CSO.

Such planning and expansion should already be underway in Section 4B. A great deal of development along the Hudson River has already taken place in this section and, unfortunately, in most cases the expansion of the facilities has not kept pace with it. The upgrading of several POTWs in this segment has been delayed many years, but by the early 1990s the discharges from the remaining primary treatment plants on both sides of the River should be upgraded to secondary treatment. In these drainage basins where the upgrading has been delayed, only limited reduction of CSO discharges has occurred so that wet weather water quality remains poor. Despite the pending completion of the North River POTW secondary upgrade, which is on schedule, the water quality in Section 4B will probably not be improved sufficiently to be eligible for consideration of an upgraded classification until the POTWs on the New Jersey side of the River are expanded to offer secondary treatment and the CSOs on both sides of the River are ameliorated. As part of the upgrading plan in New Jersey, substantial work has been undertaken on regulators to improve their function. Nonetheless, reduction of CSOs, and where possible elimination, is necessary for significant water quality improvement. Only after all of this is accomplished will the Hudson River adequately enhance the newly developed areas and the environmental quality of the metropolitan region.

FOOTNOTES

[1] Interstate Sanitation Commission. "Status Report on the Interstate Sanitation District Waters." An update for the State of New York's 305(b) Report. April 1988.

[2] "It was indicated by the NYS DEC Region III that there are no combined sewers in Rockland County." New York City Environmental Protection Administration. Task Report of New York, Section 208, Task 135, Current Sewer Service Areas. Prepared by Hazen and Sawyer. August 1977. p. A2-10.

[3] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Report on Initial Studies. Prepared by Greeley and Hansen. August 1985. p. 7.

[4] Ibid. p. 20.

[5] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Facilities Planning Report. Prepared by Greeley and Hansen. September 1986. p. 8.

[6] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Report on Initial Studies. Prepared by Greeley and Hansen. August 1985. Figure 9.

[7] Ibid. p. 22.

[8] Ibid. Table 3.

[9] Ibid. p. 22.

[10] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Facilities Planning Report. Prepared by Greeley and Hansen. September 1986. Figure 6.

[11] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Report on Initial Studies. Prepared by Greeley and Hansen. August 1985. Table 3.

[12] Ibid. Figure 9.

[13] Ibid. p. 22.

[14] Ibid. Table 3.

[15] Ibid. Figure 9.

[16] Ibid. Table 3.

[17] Ibid.

[18] Ibid. Figure 9.

[19] Westchester County, New York. Yonkers Combined Sewer Overflow Study, Facilities Planning Report. Prepared by Greeley and Hansen. September 1986. Table 5.

[20] New York City Department of Environmental Protection Regulator Improvement Program Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[21] New York State Department of Environmental Conservation. Use Attainability Analysis of New York Harbor Complex. August 1985. p. 8.

[22] New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 14.

[23] Letter and Map supplied by McClave and McClave, Inc., consulting engineers. Cliffside Park, New Jersey. April 6, 1987.

[24] Based on correspondence between the Commission and NJ DEP regarding these outfalls in Fort Lee.

[25] Task 2.5.2 - Outfall Inspection. Table 3.

[26] This information was obtained during conversations with local system personnel.

[27] Borough of Edgewater, New Jersey. 201 Wastewater Facilities Plan, Volume II, Appendices. Prepared by Clinton Bogert Associates. July 1981. Appendix F, Figure F-4.

[28] Ibid. Table F-3.

[29] Ibid. p. F-23.

[30] This information was obtained from communications with state officials.

[31] Task 2.5.2 - Outfall Inspection. Table 3.

[32] "Supplemental Memo." Table 14.

[33] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area II, Appendices, Volume Two. Prepared by Clinton Bogert Associates. January 1979. p. E-10.

[34] Ibid. p. E-9.

[35] Ibid.

[36] This information is based on correspondence between NJ DEP and the Commission.

[37] Ibid. p. F-7.

[38] Ibid. Table E-2.

[39] Ibid. Figure E-2.

[40] Ibid. p. F-6.

[41] Ibid. Table E-2.

[42] These regulator - outfall assignments were supplied in material from NJ DEP.

[43] Ibid.

[44] Ibid. Appendix F. Figure V-2.

[45] Ibid. Table E-2.

[46] Ibid. pp. F-5, F-6.

[47] Task 2.5.2 - Outfall Inspection. Table 3.

[48] Ibid. "NYC Outfall Table." North River. October 6, 1988; "Supplemental Memo." Table 14.

[49] "Supplemental Memo." Table 14.

[50] Compare Table 14 of the "Supplemental Memo" and page NR-250 of the Task 1 - Drawings, North River with Table 3 of Task 2.5.2. - Outfall Inspection. Table 3.

[51] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume Two. Prepared by Clinton Bogert Associates. January 1979. pp. E-7, E-16.

[52] Ibid. p. E-16.

[53] Ibid. pp. F-2 through F-4.

[54] Ibid. p. E-30.

[55] This information was obtained in communications with NJ DEP.

[56] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume Two. Prepared by Clinton Bogert Associates. January 1979. Table E-2.

[57] "Supplemental Memo." Table 14.

[58] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume Two. Prepared by Clinton Bogert Associates. January 1979. Table E-2.

[59] Task 2.5.2 - Outfall Inspection. Table 3.

[60] Ibid.

[61] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area III, Appendices, Volume Two. Prepared by Clinton Bogert Associates. January 1979. Table E-2.

[62] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area I, Volume I, Facility Report. Prepared by Havens and Emerson, Inc. in association with Hazen and Sawyer. January 1979. p. 5-4.

[63] This information was obtained in communications with NJ DEP.

[64] Task 2.5.2 - Outfall Inspection. Table 3.

[65] Hudson County Utilities Authority. Updated 201 Wastewater Facilities Plan, Planning Area III, Selected Plan Report. Prepared by Lawler, Matusky, & Skelly. January 1986. p. 1-10; Commission records.

[66] This information was conveyed in communications with NJ DEP.

CHAPTER 5

UPPER NEW YORK BAY

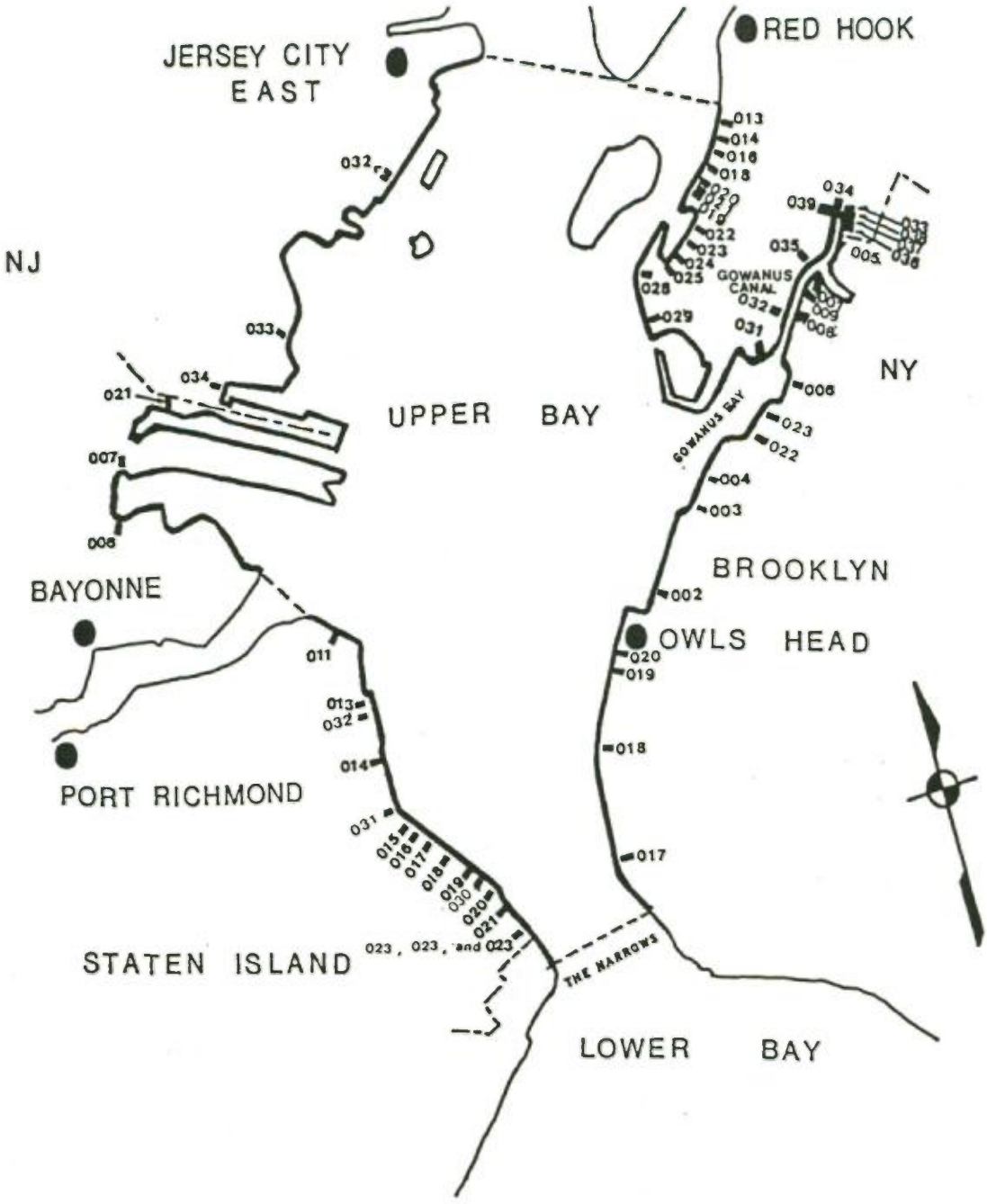
This section of the Report includes five different drainage basins in New York and New Jersey that contribute a total of about 59 CSOs. The area of the Upper Bay, for purposes of this Report, is considered the waterbody south of the Battery in Manhattan into the mouth of the Kill Van Kull, between the tip of Constable Hook in Bayonne to the foot of the B & O Railroad Pier in St. George, Staten Island, and the Verrazano Bridge. The Upper Bay receives CSO outfall discharges from Bayonne and Jersey City in New Jersey and from the Owls Head, Red Hook, and Port Richmond drainage basins in New York City.

This area, classified by the Commission as "B-1", contains some shoreline parks in Brooklyn and also borders Liberty State Park in New Jersey. The Statue of Liberty has greeted immigrants to this country from its position in the Upper Bay and still hosts multitudes of visitors each year, while Ellis Island lies adjacent to it. Hundreds of sails from small sailboats are a familiar sight dotting the Bay in fair weather. In addition to this recreational boating, the Bay also supports commercial boating and, of course, the Staten Island ferry.

Red Hook

Twenty-three of the outfalls listed in the SPDES permit issued to the City of New York for the Red Hook POTW (permit NY0027073) discharge to this designated section of the District. The outfalls in this section of the District are plotted on Map 5-1 and are listed in Table 5-1. Outfall 030 is included on the Table with an approximate outfall location, but because it could not be located, it is not shown on the Map.

A number of outfalls have been omitted from the recent SPDES permit that were listed in the previous SPDES permit. These include outfalls at Remsen Street and Congress Street into the Upper Bay, an outfall at Ferris



LEGEND:

	POTW Location
002	Approximate Outfall Location
-----	Segment Boundary
———	Sub-segment Boundary
—— ——	POTW Drainage Area Boundary
004/005	1 Outfall with 2 SPDES Numbers

MAP 5-1

TABLE 5-1

COMBINED SEWER OUTFALLS
IN THE UPPER BAY
WATERWAY SEGMENT 5

Treatment Plant Drainage Basin: Red Hook, NY0027073[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
013	R-14	Joralemon Street Upper NY Bay*	18" dia.	
014	R-13	Atlantic Avenue " " " *	36" dia. & 12" dia.	
016	R-12	Amity Street " " " *	8'6" x 8'6"	2
018	R-11	Kane Street " " " *	3'9" x 5'7"	
019	R-9	Hamilton St. Buttermilk Channel	8'6" x 6'	2
020	R-10	Degraw Street " "	18" dia.	2
021	R-9A	Sackett Street " "	48" dia.	
022	R-8	Bowne Street Atlantic Basin	24" dia.	
023	R-7	Commerce Street " "	24" dia.	
024	R-6	Verona Street " "	24" dia.	
025	R-5	Canover Street " "	2'4" x 2'6"	
028	R-2	Wolcott Street Buttermilk Channel	72" dia.	
029	R-1	Van Brunt Street Upper NY Bay	30" dia.	

[1] SPDES number assignment, street address, and size are taken from the Red Hook permit, Part I, page 9 of 28.

[2] Inspected as part of Task 2.5.2.

* The permit indicates that these outfalls discharge into the East River.

** This information is not contained in available City documents or inquiries to City officials.

TABLE 5-1 (continued)

Treatment Plant Drainage Basin: Red Hook, NY0027073 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
030	CSO	Hicks Street Gowanus Canal	42" dia.	
031	CSO	Creamer Street " "	72" dia.	
032	**	W. 9th Street " "	**	
033	R-25	Douglass Street " " (east side)	3'2"x3'8"	
034	CSO	Butler Street Gowanus Canal	216" dia.	
035	CSO	Bond Street " "	48" dia.	
036	R-22	President Street " "	18" dia.	
037	R-23	Sackett Street " "	18" dia.	
038	R-24	Degraw Street " "	12'x 5' 2 1/2"	
039	CSO	Douglass Street Gowanus Canal (west side)	3'2"x3'8"	

TABLE 5-1 (continued)

Treatment Plant Drainage Basin: Owls Head, NY0026166[3]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
002	R-6, R-6A, R-6B, R-6C	64th Street Upper NY Bay	3 Bl. 15' x 7'6"	2
003	R-7, R-7A, R-7B, R-7C	49th Street " "	11' x 8'	2
004	R-7D	43rd Street " "	6' x 4'	
005	CSO	Carroll Street Gowanus Canal	42" dia.	
006	CSO	19th Street " "	36" dia.	
007	CSO	2nd Avenue " "	6'6" dia.	
008	CSO	East 9th Street " "	*	
009	CSO	5th Street " "	6'6" dia.	
017	R-1	92nd Street Upper NY Bay	3Bl. 7'4" x 7'4"	2
018	R-2, R-3	79th Street " " "	7'6" dia.	2
019	R-4	71st Street " " "	48" dia.	2
020	R-5	Bay Ridge Avenue " " "	3' x 3'	2
022		Bush Terminal Complex (32nd Street) Gowanus Bay	*	
023		Bush Terminal (28th Street Slip) " "	*	

[3] SPDES number assignment, street address, and size are taken from the Owls Head permit, Part I, page 9 of 31.

* Dimensions for this outfall were not available from existing City documents or inquiries to City officials.

TABLE 5-1 (continued)

Treatment Plant Drainage Basin: Port Richmond, NY0026107[4]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
011	R-18	Hamilton Avenue Upper NY Bay	5' x 2'11" & 12" dia.	
013	R-17	Victory Boulevard " " "	72" dia.	2
014	R-15	Baltic Street " " "	Dbl. 6'2" x 3'6"	2
015	R-11	s/o Dock Street " " "	32" dia.	2
016	R-10	Marine Hospital " " "	20" dia.	2
017	R-9	Norwood Avenue " " "	48" dia.	2
018	R-8	n/o Camden Street " " "	36" dia.	2
019	R-7	s/o Lynhurst Ave. " " "	Dbl. 6'2" x 3'6"	2
020	R-5	n/o Sylva Lane " " "	15" dia.	2
021	R-4	Hylan Boulevard " " "	10" dia.	2
023	R-3	Nautilus Street " " "	6'6"x5'11"	2
023A	R-2	Nautilus Street " " "	20" dia.	
023B	R-1	Nautilus Street " " "	20" dia.	2
030	R-6	Sylvaton Terrace " " "	16" dia.	2
031	R-13	Canal Street " " "	Dbl. 3'10"x3'6"	2
032	R-16	s/o Victory Blvd.[5] " " "	24" dia.	2

[4] SPDES number assignment, street address, and size are taken from the Port Richmond permit, Part I, page 9 of 32.

[5] Taken from Task 1 - Drawings, Port Richmond. p. PR-72.

TABLE 5-1 (continued)

Treatment Plant Drainage Basin: Jersey City - East, NJ0027014

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[6]	Comments/ Notes
032	RE-3, RE-4	Liberty State Park Upper NY Bay	96" dia.& 60" x 72"	
033	RE-2	Ft. of Richard Street " " "	54" dia.	
034	RE-1	Harbor Drive " " "	60" dia.	

[6] Size information taken from the Hudson County Utilities Authority 201 Wastewater Facilities Plan, Planning Area I, Volume Three. January 1980. Appendix A. Table A-1 - "General Regulator Data."

TABLE 5-1 (continued)

Treatment Plant Drainage Basin: Bayonne, NJ0025836

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[7]	Comments/ Notes
006	R-3	N. Hook Road 33rd Streed Upper NY Bay	30" dia.	
007	R-4	Route 169/34th Street " " "	72" dia.	
021	R-18	n/o Marine Ocean Terminal " " "	48" dia.	

[7] Size information taken from Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area II, Volume One. January 1979. Table 5-1 - "Characteristics of Overflow Regulators in Bayonne."

Street and Atlantic Basin, and an outfall at Sullivan Street and Buttermilk Channel. Information on these outfalls in a variety of documents supports their deletion. The Commission's Combined Sewer Overflow Study for the Hudson River Conference indicated that regulators R-4 and R-3, which are associated with outfalls 026 and 027 in the SPDES permit, were to be constructed.[1] The Summary Report states that these same regulators have been removed from service.[2] More information on these outfalls is available in the "Supplemental Memo." This document indicates that outfalls at Remsen Street, Congress Street, and Ferris Street were assigned to what are now considered storm discharges.[3] The "Supplemental Memo" also indicates that 032 at West 9th Street is a storm outfall,[4] but due to an apparent disagreement between the City and State as to whether 032 is a storm outfall, 032 appears on the new permit.

The greatest discrepancy regarding the outfalls in the Red Hook drainage basin relates to 033 and 039, which both discharge at Douglass Street and the Gowanus Canal. Although 033 is not described in either the Task 1 or 2.5.2, the "Supplemental Memo" locates it at Douglass Street on the east side of the Gowanus Canal. There, according to this document, it is the outfall for R-25 and measures 3'2" x 3'8". This is precisely the way the Task 2.5.2 describes 039.[5] In the "Supplemental Memo", 039 discharges on the west side of the Gowanus Canal, is associated with no numbered regulator, and is listed without corresponding dimensions.[6] Also mystifying is the inclusion in the Task 2.5.2 of a 72" diameter outfall from R-25A at Nevins Street and Douglass Street in this vicinity. No information about this outfall is contained in the "Supplemental Memo," nor is a drawing shown in the Task 1. Although both 033 and 039 have been included in the most recent SPDES permit, no additional information is available on R-25A.

Three outfalls were inspected by video camera and evaluated in the Task 2.5.2: 016, 019, and 020. Outfall 016, located at Amity Street, is a 8'6" x 8'6" discharge point, characterized as "acceptable." Outfall 019's point of discharge is Hamilton Street and Buttermilk Channel. Its

inspection report notes that its 8'6" x 6' pipe has a "severe collapse at outfall end." Outfall 020, at Degraw Street and Buttermilk Channel, is a 18" diameter outfall with "heavy debris."[7]

Five additional large, but uninspected outfalls should be noted. These outfalls are 018 at Kane Street, 028 at Wolcott Street and Buttermilk Channel, 031 at Creamer Street and Gowanus Canal, 034 at Butler Street and the Gowanus Canal, and 038 at Degraw Street and Gowanus Canal. Outfall 034 is the largest of these measuring 216" in diameter. Outfall 038 is the next largest measuring 12' x 5'2 1/2". A small but double outfall is that of 014, which has two pipes measuring 36" in diameter and 12 inches in diameter. All of these are depicted on Map 5-1. Outfall 030 at Hicks Street and the Gowanus Canal is not, however, shown on Map 5-1, because its outfall could not be located with certainty.

The Gowanus Canal has been targeted as another waterbody in which the City will implement a CSO abatement strategy. The construction cost for this initiative will amount to $100,000,000 and the construction is currently scheduled to start in 1995.

Owls Head

The fourteen CSOs in the Owls Head POTW drainage basin that the Commission was able to identify from available documents are shown on Map 5-1.

Six of these outfalls have been inspected visually or by television for purposes of the Task 2.5.2. Outfall 002 is a three barrel outfall, each barrel of which measures 15' x 7'6". It is located at 64th Street and the Upper Bay. Task 2.5.2 notes that it is "deteriorating at outfall end."[8] According to the Summary Report, the regulator associated with this outfall is in disrepair and is the source of dry weather bypassing.[9] Outfall 003, at 49th Street and the Upper Bay, has an 11' x 8' discharge pipe with "severe damage last 600'." The Bay Ridge Avenue outfall, 020, is a 3' x 3' outfall with "heavy deposition/debris." Outfall 017 at 92nd Street and the Upper Bay

is a three barrel, 7'4" x 7'4" outfall, which was characterized by the inspection report as "acceptable."[10] Both outfall 018 and outfall 019, at 79th Street and 71st Street, respectively, were visually inspected for Task 2.5.2. The 018 outfall measures 7'6" in diameter and the 019 outfall measures 48" in diameter. All six of these outfalls are shown on Map 5-1.

Among the other outfalls shown on Table 5-1, three large and uninspected outfalls should be noted. Outfall 004 measures 6' x 4' and discharges at 43rd Street and Upper New York Bay. Two other large outfalls are 009 and 007, both of which measure 6'6" in diameter.

There are three outfalls for which no dimensions are available from City documents or officials. These are the East 9th Street outfall into the Gowanus Canal (008), the 32nd Street outfall into Gowanus Bay (022), and the 28th Street outfall into Gowanus Bay (023). The "Supplemental Memo" indicates that 008 is presently assigned to a storm outfall.[11] However, outfall 008 appears in the recently issued permit again, apparently because of a dispute between City DEP and NYS DEC about whether it is, in fact, a storm water outfall.

Port Richmond

The Commission has placed 16 outfalls in this section from the Port Richmond drainage basin by comparing the permit and available reports and maps for the area.

The Task 2.5.2 show that 14 of these outfalls were inspected either visually or by remote video. All of the largest discharge points in this section were inspected. Among these outfalls are 013, 014, 019, 023, and 031. Outfall 023 is the largest single outfall pipe measuring 6'6" x 5'11". Outfalls 014, 019, and 031 are all double barreled outfalls, with 014 and 019 being the largest of these. The 011 outfall, which was not inspected, is comprised of two pipes, a 5' x 2'11" and a 12" diameter pipe, discharging at Hamilton Avenue.

Only a few inspection reports made any mention of accumulated debris or damage to the outfall. These are the reports for 031 at Canal Street, for outfall 030 at Sylvaton Terrace, and for outfall 021 at Hylan Boulevard.[12]

Four of the outfalls inspected were termed "acceptable" in Task 2.5.2. Outfall 014, at Baltic Street, has a double-barreled discharge point measuring 6'2" x 3'6" which was "acceptable," as was outfall 017, a 48" diameter discharge at Norwood Avenue and the Upper Bay. The two other "acceptable" outfalls are 023 and 023B, which is adjacent to 023.[13] The pipe for 023 measures 6'6" x 5'11" and 023B measures 20" in diameter.

Jersey City - East

The Jersey City Eastside drainage basin has three SPDES-numbered outfalls in four discharge points overflowing into the Upper Bay. All of the outfalls are enumerated in the Jersey City-East permit (permit NJ0027014). Information on the individual regulators and associated outfalls is not contained in the available reports on the Jersey City system. In general, observations made in 1980 for the 201 Wastewater Facilities Plan indicate that surcharging was evident in the system and many regulators were inoperable and all required rehabilitation or modification.[14] Since the publication of that report, the regulators have been rehabilitated.[15]

Outfall 034, at Harbor Drive, is a 60" diameter pipe and is the overflow for regulator RE-1.[16] The overflow for RE-2 enters the Upper Bay at the foot of Richard Street through a 54" diameter pipe and has been assigned the SPDES number 033.

The two discharge points in Liberty State Park have been assigned to one number, 032, although they discharge through two distinct pipes from the overflows of RE-3 and RE-4. The outfall for RE-4, the northernmost in the Park, measures 60" x 72" and the outfall for RE-3 measures 96" in diameter. With the impending construction of facilities to transport wastewater from

Jersey City to PVSC, it is hoped that the next step in planning will be to alleviate some of the CSO problems in the system, including these identified here.

Bayonne

Three outfalls from the Bayonne drainage basin discharge into the Upper Bay. These are all listed on the Bayonne SPDES permit (permit NJ0025836). As was the case in Jersey City, specific descriptions of individual regulators are not contained in the reports available. The regulators, however, were built between 1949 and 1954 with an expected life of about 20 years; inspections in 1979 for the 201 Facilities Plan revealed that most of the regulator gates were not operating as designed.[17] Bayonne rebuilt or rehabilitated its tidegates and regulators in the early 1980s,[18] but no additional information on their operation has been published since the 1979 report.

The northernmost outfall, 021, is just north of the Military Ocean Terminal and measures 48" in diameter. Outfall 007 is the overflow for regulator R-4, which is a 72" diameter discharge point entering the Upper Bay at Route 169/34th Street. The overflow for regulator R-3, 006, is a 30" diameter outfall at North Hook Road/33rd Street. As is the case in Jersey City, Bayonne is in the process of planning for upgraded treatment of its sewage by conveying it to the PVSC treatment facility. Some work on regulators as an adjunct to this effort may reduce CSO flows.

Additional Bayonne outfalls will be discussed in the following chapter.

CONCLUSION

The Upper Bay is a large waterbody with relatively few CSOs, although the ones that exist fall under the control of two states and numerous municipal jurisdictions. Of the drainage basins bordering the Upper Bay,

almost all municipalities are in the process of upgrading POTWs. In New York City, the Red Hook POTW is currently providing primary treatment and disinfection to its wastewater and is on schedule in its construction of secondary treatment facilities. The Owls Head plant, also in New York City, is in the process of being rehabilitated as well. On the New Jersey side, Jersey City has a completion date of December 1989 for upgrading its existing primary treatment of wastewater by transporting its wastes to PVSC. Bayonne will be sharing the same pipeline with Jersey City to transport its wastes to PVSC as well. In New Jersey, much work is being done on the sewer system, as well as on the existing POTWs. Some of the work, especially on regulators, should result in some CSO abatement. On the New York side of the Bay repair and maintenance is equally important, but in addition, the City still, in many cases, does not have exact information on discharge locations and characteristics.

According to recent Commission analysis of the waters of the Upper Bay for its 305(b) submittal, these waters do not yet support the use suggested by its classification,[17] which is for secondary contact recreation and fishing. Before any concrete answers can be found to abate the CSO pollution into the Bay and to improve the water quality sufficiently to support its designated use, definitive data must be gathered.

FOOTNOTES

[1] Interstate Sanitation Commission. Combined Sewer Overflow Study for the Hudson River Conference. August 1972. p. 203, Table 9.

[2] New York City Department of Environmental Protection. Summary Report, City-wide Regulator Improvement Program Inventory and Assessment. Prepared by Hazen and Sawyer. April 1985. p. 3-87.

[3] New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 15, n.2.

[4] Ibid.

[5] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[6] "Supplemental Memo." Table 15.

[7] Task 2.5.2 - Outfall Inspection. Table 3.

[8] Task 2.5.2 - Outfall Inspection. Table 3.

[9] Summary Report. p. 3-215.

[10] Task 2.5.2 - Outfall Inspection. Table 3.

[11] "Supplemental Memo." Table 7, n.3.

[12] Task 2.5.2 - Outfall Inspection. Table 3.

[13] Ibid.

[14] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area I, Volume Three, Combined Sewer Overflow Study. Prepared by Havens and Emerson, Inc. in association with Hazen and Sawyer. January 1980. p. 3-2.

[15] This information was conveyed in a communication to the Commission by NJ DEP.

[16] The permit described this discharge point as entering the Hudson River.

[17] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area II, Volume One, Regional Inventory. Prepared by Malcolm Pirnie, Inc. January 1979. p. 5-21.

[18] This information was transmitted in a letter from NJ DEP to the Commission.

[19] Interstate Sanitation Commission. "Status Report on the Interstate Sanitation District Waters." An update for the State of New York's 305(b) Report. April 1988.

CHAPTER 6

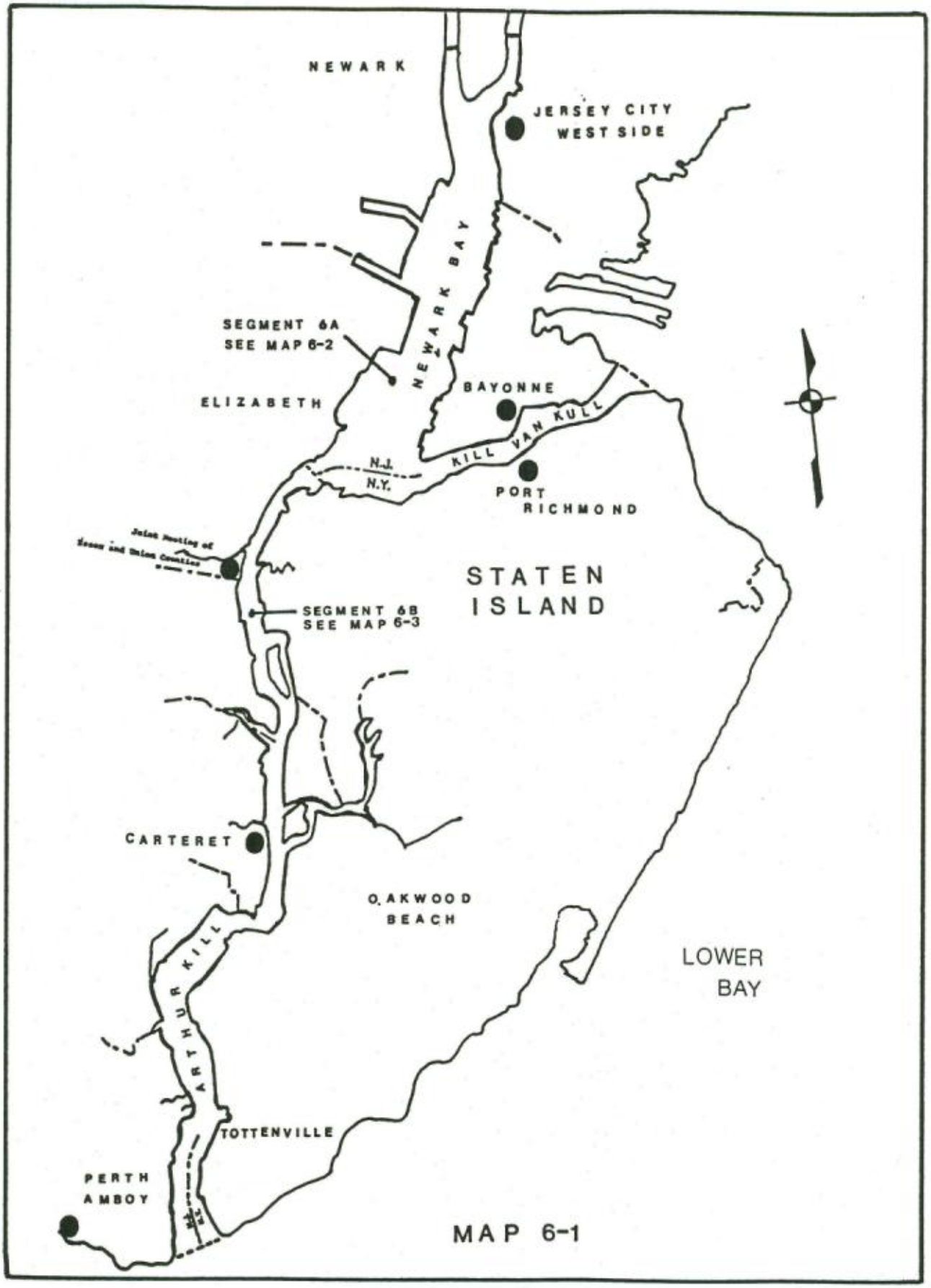
NEWARK BAY & THE KILLS

This section encompasses the Kill Van Kull from the tip of Constable Point in Bayonne to the foot of the B & O Railroad Pier in St. George, Staten Island, all of Newark Bay, and the Arthur Kill to the southernmost tip of Perth Amboy at the mouth of the Raritan River. This area is shown on Map 6-1.

This waterbody winds through the most industrial portion of the District. Petrochemical companies have located numerous refining and storage facilities on its banks. They rely on these waterbodies as a means of commerce. Ports in this section are among the busiest in the east. Pharmaceutical companies also lie adjacent to these waterbodies. In part as a result of the activities on its shoreline, the waterbodies discussed in this section have the Commission's lowest water quality classification and do not support their designated use.[1] In addition, the water quality in this area has a direct impact on both the Lower and Upper Bays. A New Jersey Department of Environmental Protection report indicates that CSOs from several of the communities in this section could have an impact on the Lower Bay Complex.[2]

The water quality in this section has not always been this degraded, however. Within this century the Arthur Kill was the site of fishing and oyster dredging, although such activities had ceased by 1916.[3] Even now, despite the degree of pollution, recreational areas exist along this segment of the District in the form of marinas and undeveloped beaches. The water quality has improved over the years and should continue to improve so that the available recreational resources can be eventually used to their fullest.

This section has been divided into two subsections: 6A, which includes the Kill Van Kull and Newark Bay, and 6B, which encompasses the Arthur Kill. Section 6A begins at the mouth of the Kill Van Kull and ends at a line from Elizabeth Avenue in Elizabeth to the foot of Western Avenue in Port Ivory on Staten Island. It encompasses sections of Bayonne, Jersey City, Kearny,


NEWARK
JERSEY CITY
WEST SIDE
NEWARK BAY
SEGMENT 6A
SEE MAP 6-2
ELIZABETH
BAYONNE
KILL VAN KULL
N.J.
N.Y.
PORT
RICHMOND
STATEN
ISLAND
SEGMENT 6B
SEE MAP 6-3
CARTERET
OAKWOOD
BEACH
LOWER
BAY
ARTHUR KILL
TOTTENVILLE
PERTH
AMBOY

MAP 6-1

Newark, and Elizabeth in New Jersey and part of the Port Richmond drainage basin in New York. This area is shown on Map 6-2. Section 6B begins at the Elizabeth Avenue-Western Avenue line and continues south to the southernmost tip of Perth Amboy at the mouth of the Raritan River. It includes CSOs from the Port Richmond and Oakwood Beach drainage basins in New York and from Elizabeth and Perth Amboy in New Jersey. This area is shown on Map 6-3.

SECTION 6A: KILL VAN KULL & NEWARK BAY

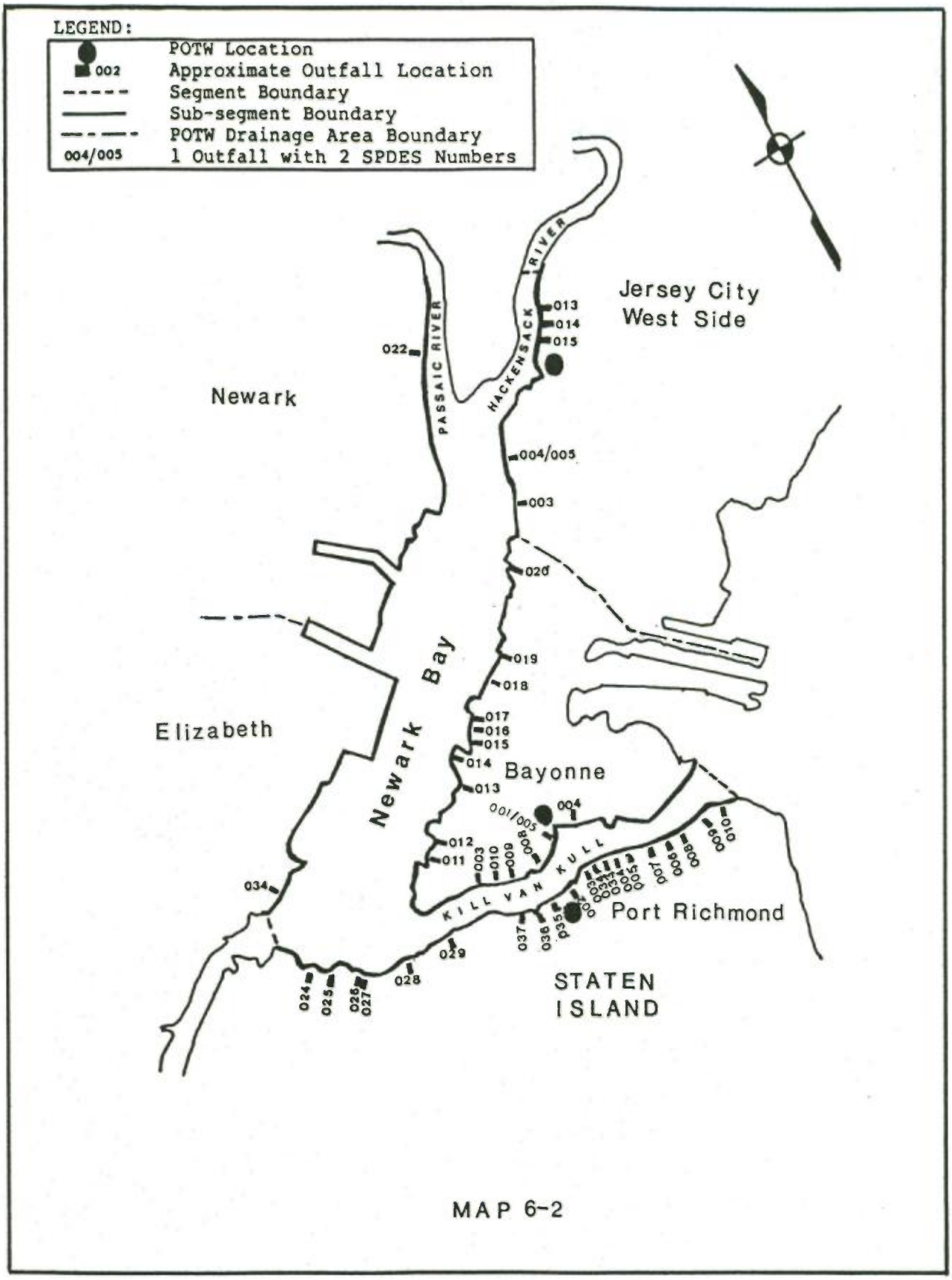
There are 46 CSOs in this section discharging into the Kill Van Kull, Newark Bay, and their tributaries. CSOs from the drainage basins in Bayonne, Jersey City-West, Newark, Elizabeth, and Port Richmond discharge into this area. Forty-three of these are shown on Map 6-2. Although Kearny falls within this geographic area, the part of Kearny in the District does not have any CSOs.[4] Table 6-1 lists all of the CSOs discharging into Section 6A.

Kill Van Kull

The Kill Van Kull contains six CSOs from the Bayonne system and 15 from the Port Richmond drainage basin, including one CSO into Bodine Creek.

The first six CSOs west of the mouth of the Kill Van Kull outfall from Staten Island. Two of these were inspected as part of the Task 2.5.2: 005 and 009. Outfall 009 at Jersey Street discharges through a 6'0" x 4'6" pipe. It was visually inspected. The inspection of 005 noted "heavy debris" in the 20" diameter outfall.[5] It discharges at Kissel Avenue.

The next segment of the Kill Van Kull contains six Bayonne outfalls and nine Port Richmond outfalls, beginning westward from outfall 004 in both drainage basins. Eight of the Port Richmond outfalls were inspected in the Task 2.5.2 either visually or by remote video; four (033, 002, 035, and 037) were found to contain debris.[6] Outfall 036, which discharges into Bodine Creek, is among the largest pipes in this section, measuring 9' x 4'. Outfall 029 is also a large discharge source with double-barreled 8'6" x 6' pipes. It


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
Jersey City
West Side
Newark
Elizabeth
Bayonne
Port Richmond
STATEN
ISLAND
Newark Bay
PASSAIC RIVER
HACKENSACK RIVER
KILL VAN KULL

MAP 6-2

TABLE 6-1

COMBINED SEWER OUTFALLS
IN THE KILL VAN KULL AND NEWARK BAY
WATERWAY SEGMENT 6A

Treatment Plant Drainage Basin: Port Richmond, NY0026107[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
002	R-34	e/o Taylor Street Kill Van Kull	16" dia.	2
003	R-33	Broadway " " "	18" dia.	2
004	R-29	Bard Avenue " " "	18" dia.	
005	R-28	w/o Kissel Avenue " " "	20" dia.	2
006	R-23	Clinton Avenue " " "	36" dia.	
007	R-27	Sailor's Snug Harbor " " "	15" dia.	
008	R-21	Franklin Avenue " " "	15" dia.	
009	R-20	Jersey Street " " "	6' x 4'6"	2
010	R-19	St. Peters Place " " "*	30" dia.	
024	W-R1	w/o Holland Avenue Newark Bay	16" dia.	2
025	W-R2	South Avenue " "	10" dia.	2
026	W-R3	Harbor Road " "	52" dia.	2
027	W-R4	Union Avenue " "	12" dia.	2
028	W-R5	Houseman Avenue " "	Dbl. 5'11 1/2" x 2'9"	2

[1] SPDES number assignment, street address, and size are taken from the Port Richmond permit, Part I, page 9 of 32.

[2] Inspected as part of Task 2.5.2.

* For purposes of this Report, this outfall has been included in the Kill Van Kull, although its permit places it in Upper NY Bay.

TABLE 6-1 (continued)

Treatment Plant Drainage Basin: Port Richmond, NY0026107 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
029	W-R6	Nicholas Avenue Kill Van Kull *	Dbl. 8'6" x 6'	2
033	R-31	Elizabeth Avenue " " "	3' x 3'6"	2
034	R-32	Bement Avenue " " "	12" dia.	2
035	R-35	Bodine Street " " "	18" dia.	2
036	R-36	Rector Street Bodine Creek	9' x 4'	2
037	R-37	Richmond Avenue Kill Van Kull	5' x 3'	2

* For this Report, this outfall has been included in the Kill Van Kull, although its permit locates it in Newark Bay.

TABLE 6-1 (continued)

Treatment Plant Drainage Basin: Bayonne, NJ0025836

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[3]	Comments/ Notes
004	R-1	19th Street Kill Van Kull	42" dia.	
001/ 005	R-2	Opposite 15th Street " " "	54" dia.	
003		First Street P/S " " "	12" dia.[4]	
008	R-5	Ingham Avenue " " "	60" dia.	
009	R-6	Broadway " " "	24" dia.	
010	R-7	Avenue C " " "	24" dia.	
011	R-8	W. 3rd Street Newark Bay	24" dia.	
012	R-9	W. 5th Street " "	24" dia.	
013	R-10	Edwards Court " "	12" dia.	
014	R-11	W. 16th Street Bayonne City Park " "	24" dia.	
015	R-12	W. 22nd Street " "	36" dia.	
016	R-13	W. 24th Street " "	16" dia.	
017	R-14	W. 25th Street " "	36" dia.	
018	R-15	W. 30th Street " "	18" dia.	
019	R-16	Lincoln Parkway " "	36" dia.	
020	R-17	59th Street " "	36" dia.	

[3] Size information from Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area II, Vol. I. January 1979. Table 5-1.

[4] Ibid. p. 5-8.

TABLE 6-1 (continued)

Treatment Plant Drainage Basin: Jersey City - West, NJ0027022

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[5]	Comments/ Notes
003	RW-13	Mina Drive Newark Bay	96" dia.	
004/ 005	RW-11, RW-12	Ft. of Danforth Avenue " "	96" dia. & 48" dia.	
015	RW-10	Fisk Street Hackensack River*	108" dia.	
014	RW-9	Claremont Avenue " "	48" dia.	
013	RW-8	Clendenny Avenue " "	60" dia.	

[5] Size information taken from the Hudson County Utilities Authority, 201 Wastewater Facilities Plan, Planning Area I, Volume Three, Appendix A. Table A-1.

* Six additional outfalls exist on the Hackensack River above the northern limits of this study.

TABLE 6-1 (continued)

Treatment Plant Drainage Basin: City of Newark, NJ0024724

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
022		Roanoke Avenue Passaic River*	5' dia.[6]	

[6] This information was obtained during conversations with NJ DEP officials.

* Eighteen outfalls exist on the Passaic River above Routes 1 & 9 to the Belleville - Newark line, above the northern limits of this study.

TABLE 6-1 (continued)

Treatment Plant Drainage Basin: City of Elizabeth, NJ0020648

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[7]	Comments/ Notes
001		Ft. of Alina St. Peripheral Ditch	48" dia.	
002		Dowd Avenue Great Ditch	48" dia.	
034		Trumbull Street Newark Bay	60" dia.	
039		Schiller Street Great Ditch	36" dia.	

[7] Information from permit NJ0020648, Table III-A.

was visually inspected. It has been included in the Kill Van Kull by the Commission, although its permit states that it discharges to Newark Bay.

After outfall 004, located at 19th Street in Bayonne, the next outfall is 001/005, which is the POTW outfall with its associated CSOs. It measures 54" in diameter. Outfall 008 is approximately opposite the Port Richmond POTW. It is located at Ingham Avenue and the Kill Van Kull and measures 60" in diameter. Outfalls 009 and 010 at Broadway and Avenue C, respectively, are both 24" diameter discharges. The First Street pump station is assigned 003 and is the westernmost Bayonne outfall into the Kill Van Kull.

Newark Bay

The 22 Newark Bay CSOs include five into the South Shooters Island Reach and 17 into Newark Bay and the lower Passaic and Hackensack Rivers below the Routes 1 & 9 traffic bridge have been included. Five are from the Port Richmond drainage basin, ten from Bayonne, five from Jersey City, one from Newark, and one from Elizabeth.

The ten Bayonne CSOs pepper the eastern side of the Bay. The southernmost overflow, 011, discharges at 3rd Street and the last one at the northern boundary of Bayonne, 020, enters the Bay at 59th Street. Outfall 014 discharges from the Bayonne City Park. The outfalls range in size from 12" in diameter (013 at Edwards Court) to 36" in diameter (015 at 22nd Street, 017 at 25th Street, 019 between 34th and 35th Streets, and 020 at 59th Street).

Five outfalls discharge into Newark Bay and the lower Hackensack River from the Jersey City-West drainage basin (permit NJ0027022). The southernmost outfall is 003 at Mina Drive. It measures 96" in diameter. Above that, at the foot of Danforth Avenue, are the double discharge pipes for 004/005, which measure 96" and 48" in diameter. Three outfalls discharge to the Hackensack River: 015, 014, and 013. Outfall 015, at Fisk Street, is the largest of the five, measuring 108" in diameter. Outfall 014, at Claremont Avenue, is 48" in

diameter, while 013 at Clendenny Avenue, the northernmost Jersey City-West outfall included here, measures 60" in diameter. Six outfalls from the Jersey City-West drainage basin enter the Hackensack River above the Routes 1 & 9 traffic bridge, but they are not shown on Map 6-2 and are not discussed here.

Kearny Point lies between the Hackensack and Passaic Rivers. The City of Kearny, according to the 201 Wastewater Facilities Plan, has a separate sanitary system and, thus, has no CSOs. However, the system does have two bypasses that divert high flows from the system into the Hackensack River.[7] One bypass is associated with the existing POTW while the other is at the site of the original POTW at Hackensack Avenue. They are not shown on Map 6-2.

One CSO from the City of Newark (permit NJ0024724) discharges into the lower Passaic River. This is the 5' diameter outfall 022 at Roanoke Avenue. There are 18 other outfalls within Newark above the traffic bridge up to the Newark-Belleville line. These are not shown on Map 6-2 and not discussed in this Report, but are mentioned here, as were the Jersey City overflows to the upper Hackensack River, to illustrate the number of other overflows that enter the River immediately outside of the area upon which this chapter has focused.

The City of Elizabeth (permit NJ0020648) has approximately 2900 acres serviced by combined sewers. Ninety percent of the length of the existing sewers are between 50 and 100 years old.[8] The one outfall from Elizabeth discharging into this section is 034. This is a 60" outfall located at Trumbull Street. Three other CSOs in Elizabeth are included on Table 6-1, but not on Map 6-2. These are the three that discharge into the Great Ditch or the Peripheral Ditch, both of which surround Newark International Airport.

Five Port Richmond outfalls discharge into South Shooters Island Reach. All five of them were inspected in the Task 2.5.2. Only one (026) was evaluated in depth by remote video and it received an "acceptable" rating. Outfall 026 is relatively large, having a 52" diameter. The largest of the outfalls is 028 at Houseman Avenue, which has double pipes, each measuring 5'11 1/2" x 2'9". The other three outfalls are all 15" in diameter or less.[9]

The sewer systems in Bayonne and Jersey City will be undergoing changes in order to connect them to the PVSC POTW in Newark. Because of this construction, those municipalities should take the opportunity to mitigate, and, where possible to eliminate, CSOs in the segment. As mentioned previously, however, no CSO elimination is planned by either community at this time. The Kill Van Kull provides an excellent good opportunity for interstate cooperation because it is a small waterbody into which a relatively large number of CSOs discharge; concentrated effort by the two states could reduce the CSOs in this area and lead to improvement in the degraded water quality.

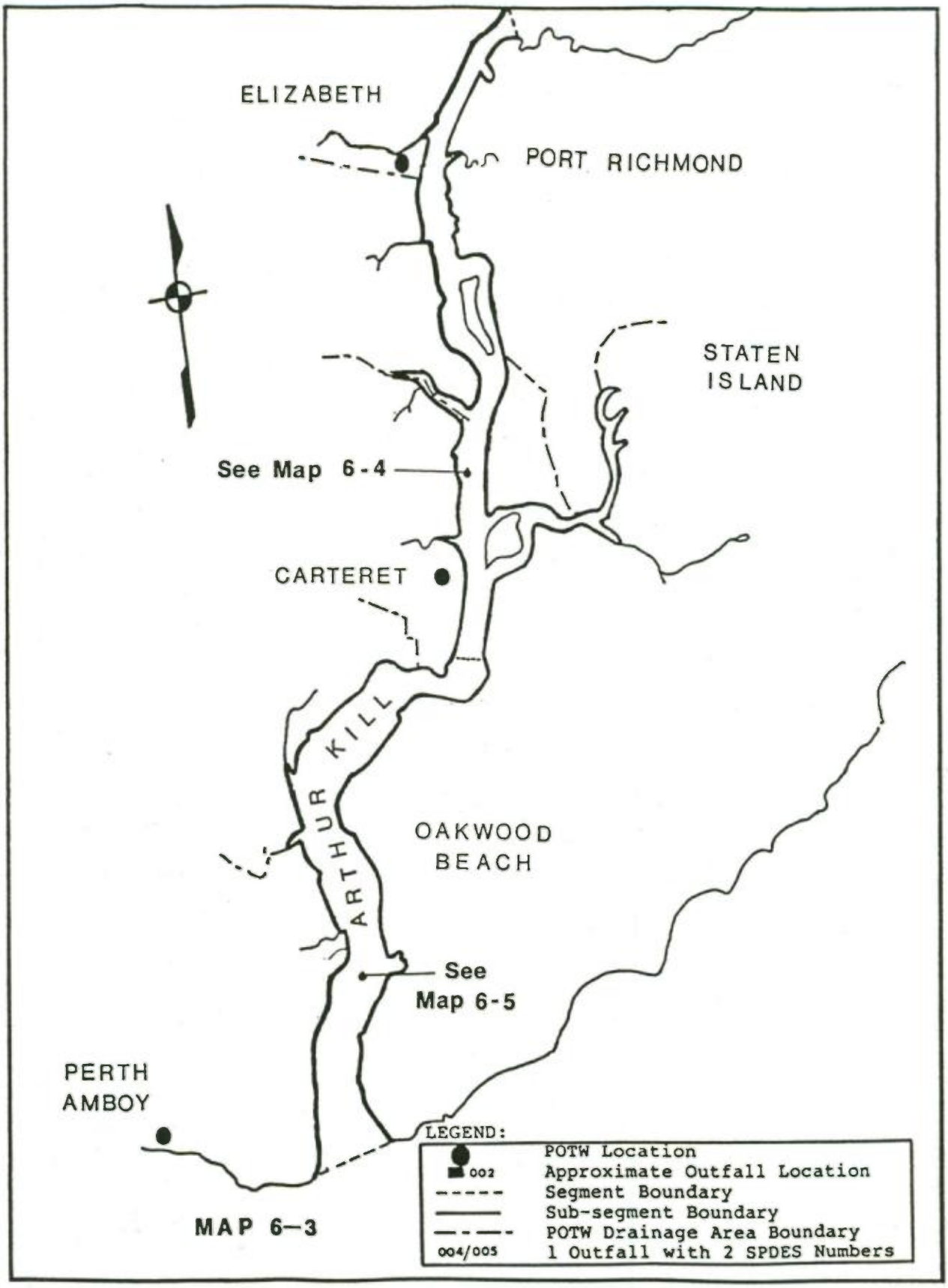
SECTION 6B: ARTHUR KILL

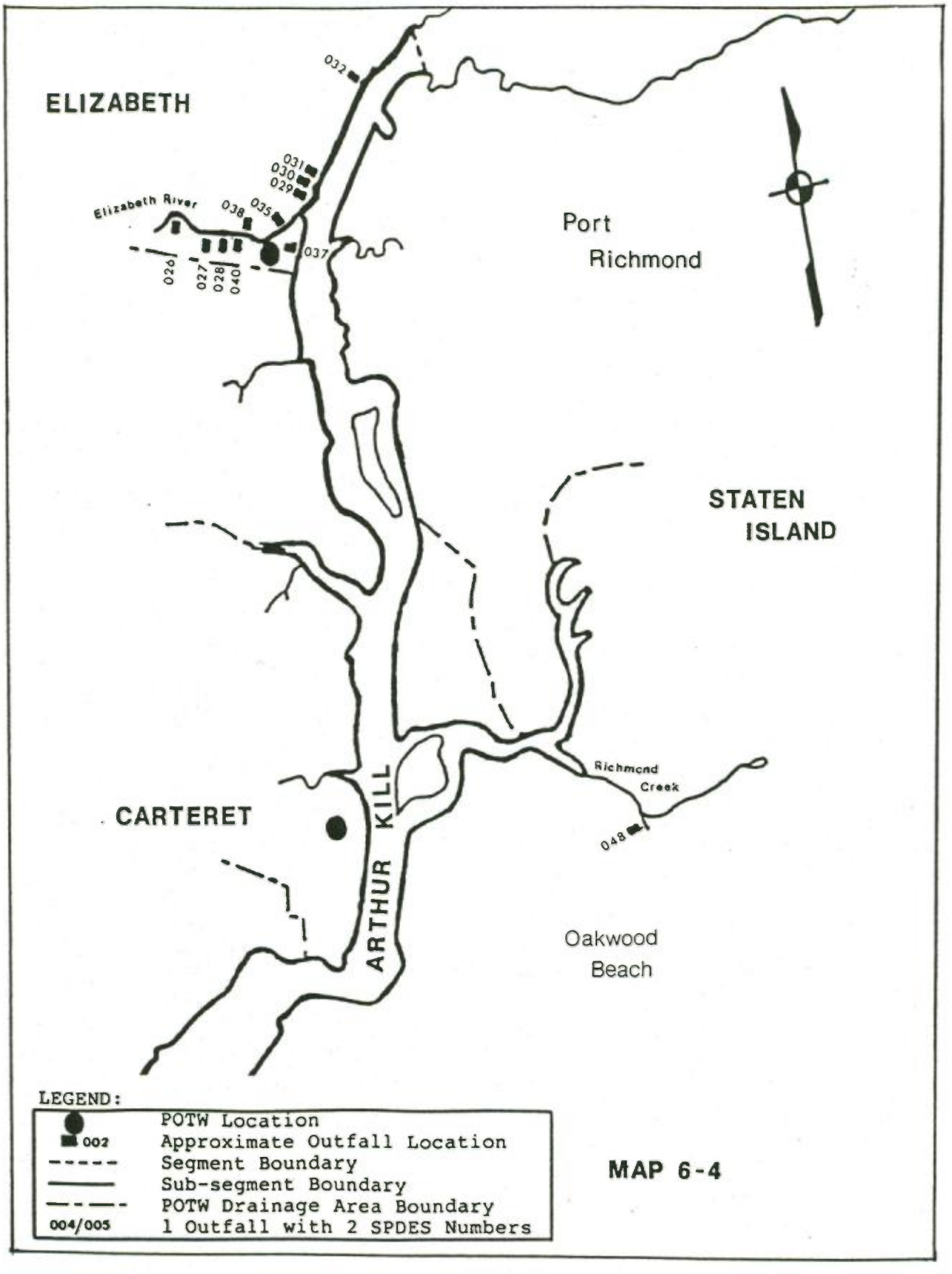
The Arthur Kill passes between Staten Island and numerous New Jersey municipalities. It is shown on Map 6-3. Separate sanitary sewer systems have been constructed in most municipalities along the Arthur Kill and if they are not entirely separate systems, they are separated along the shoreline. CSOs from several New Jersey communities, including Elizabeth and Perth Amboy, discharge into the Arthur Kill. Outfalls from the Oakwood Beach drainage basin on Staten Island are also included in this section. Tables 6-2 and 6-3 list the CSO outfalls in Section 6B and they are shown on Maps 6-4 and 6-5.

Elizabeth

The City of Elizabeth contributes eleven CSOs to this section of the District: five outfalls to the Arthur Kill and six to the Elizabeth River. The outfalls to the Arthur Kill, shown on Map 6-4, range in size from 36" in diameter to 3' x 5'3". Although the discharge pipes in Elizabeth are generally constructed of cast iron or reinforced concrete, 029 at Elizabeth Avenue is wood. Outfall 032 at Magnolia Avenue is a 3' x 4'6" brick outfall.

Six CSOs from Elizabeth into the Elizabeth River are included here. They range in size from 4' x 3'3" to 60" in diameter. Outfall 040 is a 54" pipe at Pulaski Street and the Elizabeth River. Twenty-four other overflows


ELIZABETH
PORT RICHMOND
STATEN ISLAND
See Map 6-4
CARTERET
ARTHUR KILL
OAKWOOD BEACH
See Map 6-5
PERTH AMBOY
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
MAP 6-3


ELIZABETH
032
031
030
029
Elizabeth River
038
035
037
026
027
028
040
Port
Richmond
STATEN
ISLAND
ARTHUR KILL
CARTERET
Richmond
Creek
048
Oakwood
Beach
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers

MAP 6-4

from Elizabeth enter the Elizabeth River above outfall 026, but are not shown on Map 6-4. Approximately half of these outfall to saline waters according to the discharge permit. The estimated flow from these CSOs is 1.82 MGD.[10]

The City of Elizabeth is initiating several projects to gain better control over these flows. First, flow meters are being installed at a number of outfalls to monitor flow. Second, the City is constructing a "storage module" at outfall 042, which is above 026 on the Elizabeth River, in an effort to reduce discharges caused by wet weather overflows.[11]

Carteret

Carteret's $9.5 million sewer separation program is approximately 99% complete. Work continues on the remaining regulator interconnections and the cosmetic work of paving the areas that are complete. As part of this work, the Dorothy Street pump station, which discharged to the Rahway River, was renovated and outfall structures and tide gates were replaced or repaired. Construction of the pump station necessary to convey wastewater from Carteret to the Middlesex County Utilities Authority (MCUA) POTW has begun.[12] According to a NJ DEP report, the CSOs from Elizabeth and Carteret "cause severe local water quality problems in the Arthur Kill."[13] With the abatement of CSOs in Carteret, an estimated flow of 1.15 MGD has been eliminated.[14]

Oakwood Beach

The lower section of Staten Island is largely unsewered; reliance is placed on septic systems for individual homes or small package treatment plants for housing developments. Although discharges occur from Staten Island into the Kill, the location or size of outfalls is not always available. The information available from the City lists 33 outfalls from the Oakwood Beach drainage basin into the Arthur Kill including six into Mill Creek and one into Richmond Creek. With the exception of the Richmond Creek outfall (048), which is shown on Map 6-4 and listed on Table 6-2, all of the other outfalls are shown on Map 6-5 and catalogued on Table 6-3. The largest of these outfalls

TABLE 6-2

COMBINED SEWER OUTFALLS
IN THE UPPER ARTHUR KILL
WATERWAY SEGMENT 6B

Treatment Plant Drainage Basin: City of Elizabeth, NJ0020648

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[1]	Comments/ Notes
026*	No.26	John Street Elizabeth River	4' x 3'3"	
027	No.27	n/o Summer Street " "	58" dia.	
028	No.28	s/o Summer Street " "	48" dia.	
029	No.29	Elizabeth Avenue Arthur Kill	3' x 5'3"	
030	No.30	E. Jersey Street " "	48" dia.	
031	No.31	Livingston Street " "	36" dia.	
032	No.32	Magnolia Avenue " "	3' x 4'6"	
035	No.35	3rd Avenue Elizabeth River	60" dia.	
037	No.37	Bay Way Arthur Kill	36" dia.	
038	No.38	Trenton Avenue Elizabeth River	48" dia.	
040	No.40	Pulaski Street " "	54" dia.	

[1] All information was obtained from permit NJ0020648, Table III-A.

* There are 24 outfalls discharging to the Elizabeth River in Elizabeth above outfall 026.

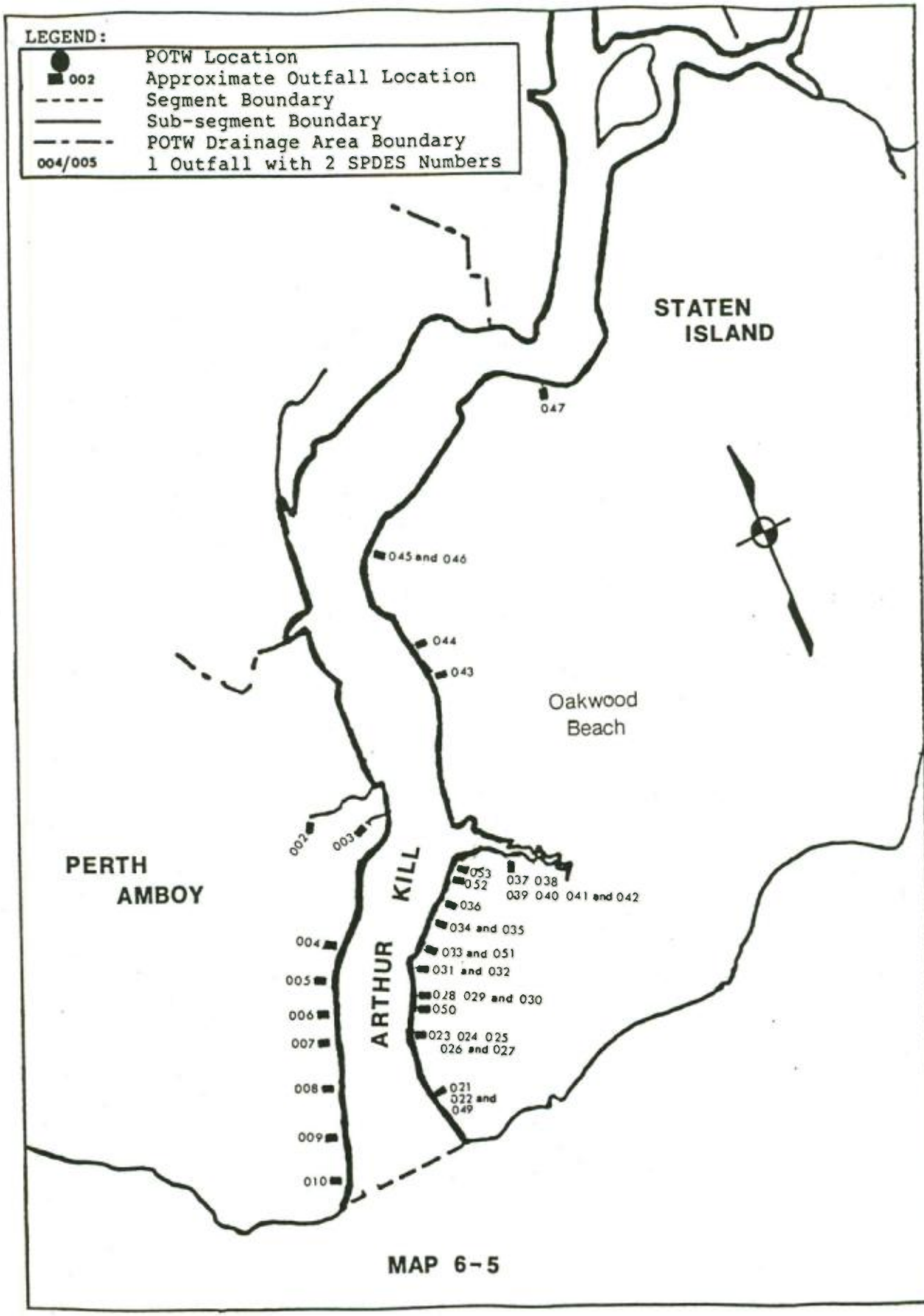
TABLE 6-2 (continued)

Treatment Plant Drainage Basin: Oakwood Beach, NY0026174[2]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
048		Woodrow Road Richmond Creek	*	

[2] SPDES number assignment and street address are taken from the Oakwood Beach permit, Part I, page 10 of 33.

* No size information could be obtained from available documents or inquiries to City officials.


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
STATEN ISLAND
047
045 and 046
044
043
Oakwood Beach
002
003
PERTH AMBOY
ARTHUR KILL
053
052
037 038
039 040 041 and 042
036
034 and 035
033 and 051
031 and 032
028 029 and 030
050
023 024 025
026 and 027
021
022 and
049
004
005
006
007
008
009
010

MAP 6-5

TABLE 6-3

COMBINED SEWER OUTFALLS
IN THE LOWER ARTHUR KILL
WATERWAY SEGMENT 6B

Treatment Plant Drainage Basin: Oakwood Beach, NY0026174[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
021		Amboy Road Arthur Kill*	18" dia.	
022		" " " " *	18" dia.	
023		Between Amboy Road and Bentley Street " " *	10" dia.	
024		" " " " *	6" dia.	
025		" " " " *	6" dia.	
026		" " " " *	30" dia.	
027		" " " " *	30" dia.	
028		Bentley Street " " *	**	
029		" " " " *	**	
030		" " " " *	12" dia.	
031		Between Bentley Street and Main Street " " *	12" dia.	
032		" " " " *	6" dia.	
033		Main Street " " *	**	

[1] SPDES number assignment, street address, and size are taken from the Oakwood Beach permit, Part I, pages 9 and 10 of 33.

* The SPDES permit indicates that these outfalls discharge into the Raritan Bay.

** No size information could be obtained from available documents or inquiries to City officials.

TABLE 6-3 (continued)

Treatment Plant Drainage Basin: Oakwood Beach, NY0026174 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
034		Between Main Street and Tracy Avenue	" " *	**	
035		" "	" " *	**	
036		Tracy Avenue	Arthur Kill*	3' x 3'	
037		Between Arthur Kill Road and Page Avenue	Mill Creek	8" dia.	
038		" "	" "	8" dia.	
039		" "	" "	36" dia.	
040		" "	" "	36" dia.	
041		" "	" "	**	
042		" "	" "	30" dia.	
043		Androvette Street	Arthur Kill	**	
044		Between Androvette Street and Winant Road	" "	**	
045		Ellis Road	" "	**	
046		" "	" "	**	
047		Chemical Lane	" "	**	
049		Amboy Road	" "	10" dia.	
050		Bentley Street	" "	10" dia.	
051		Main Street	" "	30" dia.	
052		Fisher Avenue	" "	16" dia.	
053		Nassau Place	" "	36" dia.	

TABLE 6-3 (continued)

Treatment Plant Drainage Basin: Perth Amboy, NJ0023213

Outfall Number SPDES	Outfall Number Local	Location of Outfall[2]	Size[3]	Comments/ Notes
002		Garretson Avenue Crane Creek	3' x 4'	
003		Rudyk Park Arthur Kill	84" dia.	
004		Buckingham Street " "	33" dia.	
005		Washington Street " "	33" dia.	
006		Commerce Street " "	33" dia.	
007		Fayette Street " "	48" dia.	
008		Smith Street " "	33" dia.	
009		Gordon Street " "	36" dia.	
010		Lewis Street " "	18" dia.	

[2] Information from permit NJ0023213.

3 Size information was obtained through conversations with local officials.

measures approximately 36" in diameter and there are a number of these. For eleven of these 33 outfalls, the City has no diameter information.

The Commission has documented several outfalls in the lower Arthur Kill evidencing a sanitary discharge in dry weather. Samples taken at an outfall on Amboy Road show levels of coliforms in excess of 24000 mpn/100 ml, which verifies the visual observations of sanitary wastes. In addition, Commission outfall size information does not always correspond with the measurements contained in City documents. This suggests that additional outfalls may be present that have not yet been catalogued.

The NYS DEC reimposed a building moratorium on Staten Island in order to prevent increases of untreated sewage before the proposed interceptor to connect with the Oakwood Beach POTW is completed.[15] The date for its completion is currently identified by City officials as 1994.[16]

Perth Amboy

Nine outfalls from the Perth Amboy (permit NJ0023213) drainage basin outfall to the lower Arthur Kill. They are listed on Table 6-3 and shown on Map 6-5. The uppermost outfall within Perth Amboy is 002, a 3' x 4' discharge that outfalls to Crane Creek, which is a marshy area adjacent to the Arthur Kill. The other outfalls range in size from 18" in diameter (010) to 84" in diameter (003).[17] Perth Amboy has a Marine CSO program to address CSOs in its jurisdiction. There is a program of ongoing sewer separation in part of Perth Amboy and plans for a rehabilitation program, which has not yet begun.[18]

The shoreline of the Arthur Kill is an area undergoing change. Several communities are regionalizing their waste treatment in order to upgrade from the primary treatment they currently give their wastewater. As previously mentioned, on the Staten Island side of the Kill a sewer system is being constructed to service that part of the Island for the first time. Although CSOs in the Arthur Kill are not the only cause of its poor water quality, they are a major contributing factor. The fact that other sources of pollution,

whether identifiable or not, degrade the Arthur Kill should not prevent the communities along its shores from abating existing CSOs when possible. The proposed changes to the existing sewer systems provide such an opportunity.

CONCLUSION

This area of the District does suffer from poor water quality. This is not, however, a valid justification for inaction. Concerted efforts toward improving the water quality could lead to rewarding results in the long term.

The amount of sewer system work being done by the municipalities in this section provides an opportunity to eliminate or to lessen the effects of CSOs. On the Kill Van Kull, Bayonne will be working on its system to send its wastewater to PVSC. On Newark Bay, Jersey City-West and Bayonne will be doing sewer system work and constructing a joint interceptor to transport wastewater to PVSC. Many of the Arthur Kill communities and specifically Carteret and Perth Amboy, will be tying into the MCUA POTW. The work necessary on the systems for these transitions should incorporate abatement of existing CSOs, where possible. In several cases, it already has.

Regarding the outfalls from the Oakwood Beach drainage basin, it is clear that baseline information is still being obtained. The Commission, NYS DEC, and the City are all working toward this goal and even so the information is being gathered slowly. This data gathering can and should go forward at the same time as the planning for the interceptor. Only by this parallel program will the raw discharges from lower Staten Island cease as quickly as possible, to the benefit of both the Kills and the adjacent Bays.

Because this is perhaps the most degraded area of the District, its improvement must realistically be viewed within a long time frame. However, timely evaluation in the short term should be made by jurisdictions along the shore to determine what mechanisms within their control can lead to improved water quality. Only with such effort by all communities in this area, will any significant improvement in the water quality be possible.

FOOTNOTES

[1] Interstate Sanitation Commission. "Status of the Interstate Sanitation District Waters." An update for New York's 305(b) Report. April 1988; Interstate Sanitation Commission. "Status of the Interstate Saniation District Waters." An update for New Jersey's 305(b) Report. April 1988.

[2] New Jersey Department of Environmental Protection, Bureau of Systems Analysis and Wasteload Allocation. Water Quality Management Assessment Due to Marine CSO Abatement Along the New Jersey Shore. 1984. p. 48

[3] New York State Department of Health, Water Pollution Control Board. New York City Waters Survey Series Report No. 3, Arthur Kill and Kill Van Kull. June 1960. p. 2.

[4] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area I, Volume Three, Combined Sewer Overflow Study. Prepared by Havens and Emerson, Inc. in association with Hazen and Sawyer. January 1980. p. 1-1.

[5] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[6] Task 2.5.2 - Outfall Inspection. Table 3.

[7] Hudson County Utilities Authority. 201 Wastewater Facilities Plan, Planning Area I, Volume Two, Infiltration/Inflow Analysis. Prepared by Havens and Emerson, Inc. in association with Hazen and Sawyer. January 1979. p. 3-6.

[8] City of Elizabeth. Combined Sewer Overflow Study Pollution Abatement Program, Volume I. Prepared by Clinton, Bogert Associates. August 1981. p. S-8.

[9] Task 2.5.2 - Outfall Inspection. Table 3.

[10] New Jersey Department of Environmental Protection. Water Quality Management Assessment Due to Marine CSO Abatement Along the New Jersey Shore. 1984. Table 5.

[11] This information was transmitted in a letter to Commission staff by NJ DEP.

[12] This information is based on conversations with local officials.

[13] Ibid. p. 48.

[14] Ibid.

[15] New York State Department of Environmental Conservation. Environmental Notice Bulletin, Issue No. 49. December 3, 1986. p. 5.

[16] Letter from Harvey W. Schultz, Commissioner of the New York City Department of Environmental Protection, printed in the Staten Island Advance. October 17, 1987. p. 48.

[17] The Lewis Street outfall (010) has been included in the Arthur Kill section of this Report, although the SPDES permit characterizes it as discharging to Raritan Bay.

[18] This information was obtained in a communication with NJ DEP.

CHAPTER 7

LOWER BAY

The Lower Bay, consisting of New York Bay, Raritan Bay, and Sandy Hook Bay, has a Commission water classification of "A". Although this area is a large body of water, it has relatively few CSOs. Nonetheless, those that do exist deserve attention because of the Lower Bay's commercial and recreational importance. Valuable shellfishing resources are found in this waterbody[1] and numerous beaches line its shores. In Staten Island alone there are 7 1/2 miles[2] of beach potentially available, including 2 1/2 miles of the City-owned South Beach.[3] These beaches, however, cannot be made available for bathing until the water quality in the Lower Bay is substantially improved.

Because of its valuable resources, a high priority has been placed on environmental integrity in the Bay. For example, discharge permits granted for the Lower Bay in both New York and New Jersey prior to 1984 required disinfection of effluents. This requirement was formalized to apply consistently throughout the area in the Commission's year-round disinfection regulation. Even with this requirement, recent Commission data indicate that the Lower Bay only partially supports use for its "A" classification.[4] Remaining water quality problems suggest that more policy coordination would be beneficial to both states and would enable the Bay's greater use as a recreational and commercial resource. The entire area is shown on Map 7-1.

Owls Head

On the New York side of the Bay, the Owls Head and Oakwood Beach drainage basins of New York City contribute about 26 discharge points. Of the two drainage basins, the discharges from the Oakwood Beach drainage basin pose the more serious environmental and health threat, as will be discussed below.

The SPDES permit for the Owls Head POTW (permit NY0026166) lists two outfalls that discharge to the area designated here as the Lower Bay. Both


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
BROOKLYN
OWLS HEAD
CONEY ISLAND
015
021
STATEN ISLAND
Lower Bay
OAKWOOD BEACH
Segment 7
SEE MAP 7-3
SEE MAP 7-2
PERTH AMBOY
Sandy Hook Bay
Raritan Bay
Monmouth Co.
Middlesex Co.

MAP 7-1

are large, multiple outfalls. They were both inspected. Outfall 015 was found to be "acceptable" while "partial collapse" was noted for 021.[5] This is the Avenue V pump station overflow. According to the Task 1, CSOs are associated with this overflow, which is fed by a separate system.[6] Outfall 015, located at 17th Avenue and Gravesend Bay, has four barrels, each pipe of which measures 14'6" x 10'. The outfall servicing this combined and separate system is a three barrel discharge point, with each barrel measuring 15' x 10'. It discharges between Cropsey and Stillwell Avenues into Coney Island Creek. Both outfalls are shown on Map 7-1 and they are listed on Table 7-1.

The Owls Head POTW, which has a capacity of 160 MGD,[7] is being rehabilitated to improve to secondary levels the treatment it affords to the wastewater it receives. Completion of this construction should occur by 1995.

Perth Amboy

Nine outfalls from Perth Amboy (permit NJ0023213) discharge into the Raritan River and Raritan Bay. Seven of these are clustered near the mouth of the River, to the immediate east of the New York and Long Branch Railroad Bridge, with only 011 discharging into Raritan Bay. Six of these are 33" in diameter, reinforced concrete pipes. Outfalls 017, 018, and 019, however, are much larger. Outfall 017, the Second Street overflow, enters the River through an 84" diameter pipe, while the two remaining upriver outfalls, 018 at Sheridan Street and 019 at Victory Bridge, measure 72" in diameter. All of these Perth Amboy outfalls are shown on Map 7-2 and listed on Table 7-2.

The remaining shore of Middlesex County and Monmouth County bordering Raritan Bay contains no CSOs. This information was verified by conversations with local officials, reference to previous studies done in the District,[8] and review of Commission records. It was also verified in inspections done by Commission personnel. Discussions during these inspections revealed, however, that officials are currently investigating infiltration problems along some areas of the shoreline. It is not clear at this point what, if any, impact this may have on water quality.

TABLE 7-1

COMBINED SEWER OUTFALLS IN THE LOWER BAY
FROM OWLS HEAD DRAINAGE BASIN

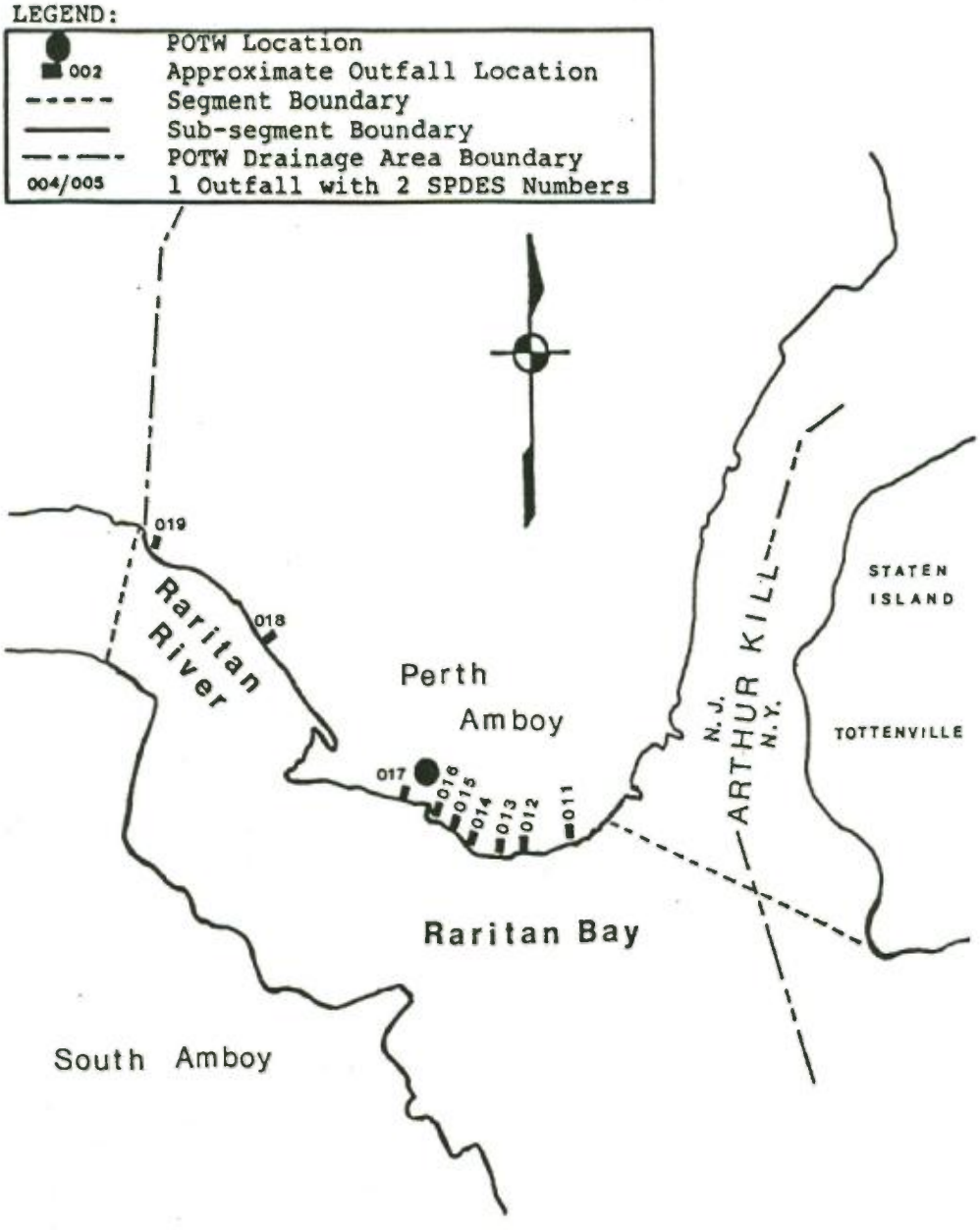
Treatment Plant Drainage Basin: Owls Head, NY0026166[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
015	R-9,9A 9B,9C	17th Avenue Gravesend Bay	4 Bl. 14'6" x 10'	2
021	R-1 & ten over-flows	Between Cropsey & Stillwell Avenues Coney Island Creek*	3 Bl. 15' x 10'	2

[1] SPDES number assignment, street address, and size are taken from the Owls Head permit, Part I, page 9 of 31.

[2] Inspected as part of Task 2.5.2.

* The receiving waterbody was contained in Task 2.5.2. Table 3.


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
019
018
017
016
015
014
013
012
011
Raritan River
Perth Amboy
South Amboy
Raritan Bay
ARTHUR KILL
N.J.
N.Y.
STATEN ISLAND
TOTTENVILLE

MAP 7-2

TABLE 7-2

COMBINED SEWER OUTFALLS IN LOWER NEW YORK BAY
FROM PERTH AMBOY, NEW JERSEY
WATERWAY SEGMENT 7

Treatment Plant Drainage Basin: Perth Amboy, NJ0023213

Outfall Number SPDES	Outfall Number Local	Location of Outfall[1]		Size[2]	Comments/ Notes
011		High Street	Raritan Bay	33" dia.	
012		State Street	Raritan River	33" dia.	
013		Catalpa Avenue	" "	33" dia.	
014		Brighton Avenue	" "	33" dia.	
015		Madison Avenue	" "	33" dia.	
016		1st Street	" "	33" dia.	
017		2nd Street	" "	84" dia.	
018		Sheridan Street	" "	72" dia.	
019		Outer Smith Street	" "	72" dia.	

[1] Information from permit NJ0023213.

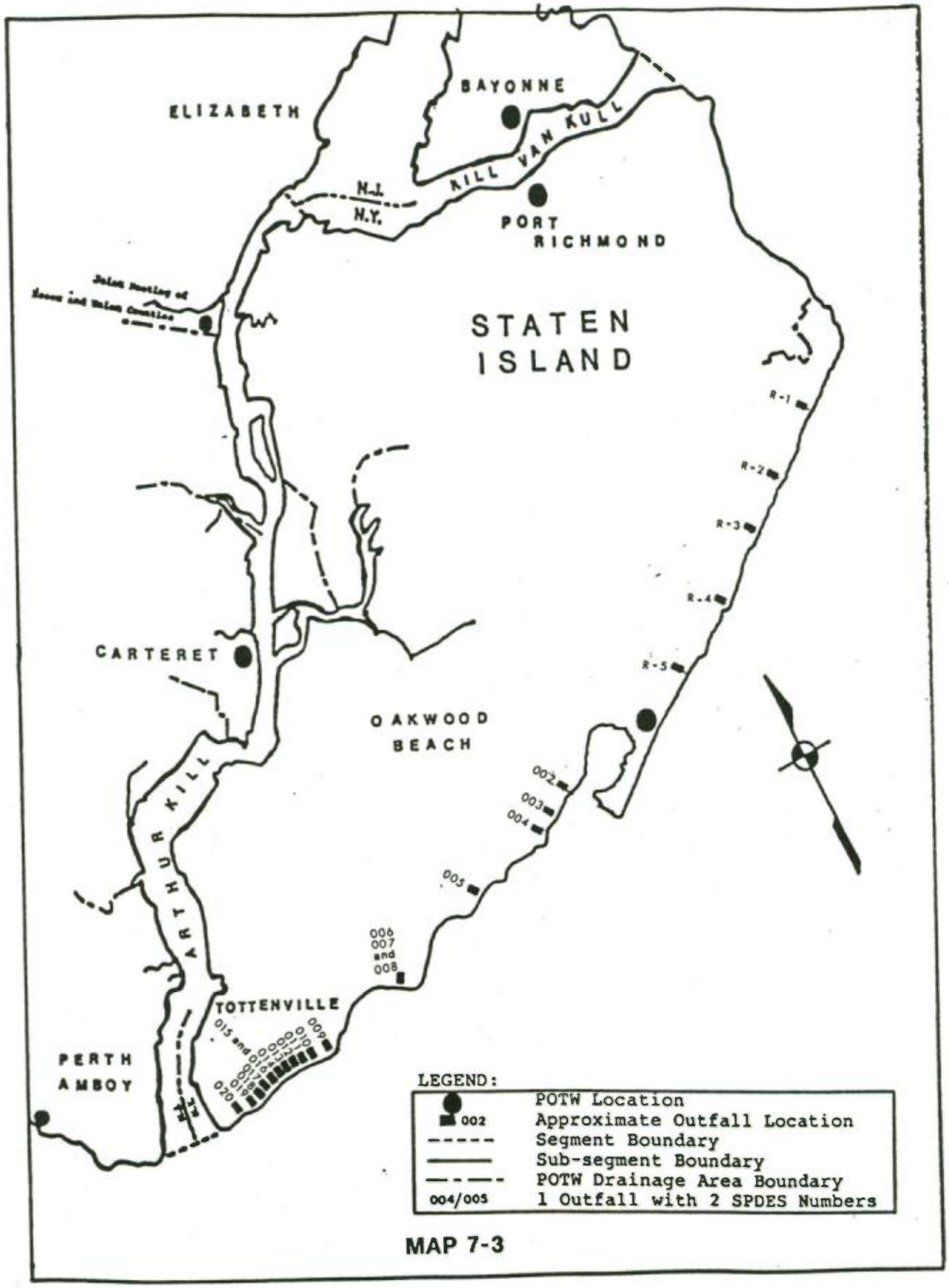
[2] Size information obtained through conversations with local officials.

Oakwood Beach

As mentioned previously, accurate information on discharges in the Oakwood Beach drainage basin is difficult to obtain. The City of New York is in the process of extending sewer lines to areas on Staten Island that are presently unsewered. Until now, individual homes have relied on septic tanks, but increased upland development has resulted in flooding in the low-lying areas and caused, quite literally, sewage running in or adjacent to the streets. Because this area contains no sewer system, these discharges are not technically CSOs. However, like the discharge problems in Westchester County, the discharges from eastern Staten Island are serious and must be addressed.

Sampling done by Commission personnel of street runoff at various locations on the lower portion of Staten Island revealed elevated coliform counts evidencing sanitary waste. Among these, dry weather samples from an outfall on Sprague Avenue has had coliform levels of 24000 mpn/100 ml each time samples were taken. Dry weather measurements from outfalls at Joline Avenue and at Loretto Street have shown elevated coliform levels as well. In addition, size discrepancies on this side of the Island have appeared during Commission field investigations much as they have on the Arthur Kill side. Unfortunately, this large and entirely unsewered portion of Staten Island borders the Lower Bay, as shown on Map 7-3. Consequently, raw sewage entering the Bay is a constant and serious problem during both dry and wet weather. The Commission has conducted and will continue to conduct discussions with the City on this issue.

The Oakwood Beach permit (permit NY0026174) lists 24 outfalls into the Lower Bay section of this Report. Five of these are large outfalls associated with regulators. The remainder of the outfalls, where sizes are known, are all less than 24". In many cases, however, size information is not available from the City. Similarly, information on the sources of these outfalls is not available. Table 7-3 contains the information that the Commission has been able to gather on these outfalls.


ELIZABETH
BAYONNE
KILL VAN KULL
N.J.
N.Y.
PORT RICHMOND
STATEN ISLAND
R-1
R-2
R-3
R-4
R-5
CARTERET
OAKWOOD BEACH
002
003
004
005
006 007 and 008
ARTHUR KILL
TOTTENVILLE
009
010
011
012
013
014
015 and 016
017
018
019
020
PERTH AMBOY
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers

MAP 7-3

TABLE 7-3
COMBINED SEWER OUTFALLS IN THE LOWER BAY
FROM THE OAKWOOD BEACH DRAINAGE BASIN
WATERWAY SEGMENT 7

Treatment Plant Drainage Basin: Oakwood Beach, NY0026174[5]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size[1]	Comments/ Notes
002		Cindra Ave. Great Kills Harbor	*	
003		Richmond Avenue Raritan Bay	*	
004		Arden Avenue " "	*	
005		Arbutus Avenue " "	*	
006		Seguine Avenue " "	24" dia.	
007		" " " "	16" dia.	
008		" " " "	8" dia.	
009		Mt. Loretto " "	*	
010		Page Avenue " "	12" dia.	
011		Low Street " "	6" dia.	
012		Giegerich Avenue " "	12" dia.	
013		Between Giegerich Ave. & Bedell Avenue " "	8" dia.	
014		Between Bedell Avenue & Ketchum Avenue " "	6" dia.	
015		Between Ketchum Avenue & Joline Avenue " "	10" dia.	
016		Between Joline Avenue & Gladstone Avenue " "	6" dia.	

[1] SPDES number assignment and street address are taken from the Oakwood Beach permit, Part I, pages 9 and 10 of 33.

* Dimensions not available from existing documents or inquiries to local officials.

TABLE 7-3 (continued)

Treatment Plant Drainage Basin: Oakwood Beach, NY0026174 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
017		Between Gladstone Avenue and Galveston Avnue Raritan Bay	6" dia.	
018		Galveston Avenue " "	6" dia.	
019		Between Loretto Street & Sprague Avenue " "		
020		Manhattan Street " "	6" dia.	
054	R-1	Sand Lane Lower New York Bay	10' x 6'	
055	R-2	Quintard Avenue " " "	Dbl.9'x5'6"	
056	R-3	Atlantic Avenue " " "	Dbl. 10' x 6'9"	
057	R-4	Naughton Avenue " " "	Dbl. 10' x 6'6"	
058	R-5	Midland Avenue " " "	8' x 4'	

NYS DEC has also taken several actions designed to ameliorate the situation. Currently, NYS DEC requires construction of package treatment plants to serve development in areas not connected to an existing sewer system.[9] This initiative guarantees adequate treatment for wastewater generated by these new projects. The completion of the planned interceptor sewer and especially the construction of the laterals to the low-lying shoreline will eliminate this flow of raw sewage. This Oakwood Beach interceptor is expected to cost $129 million and, unless expedited, will be completed in 1994. However, the completion of the entire system, including the lateral branches, is not expected before the turn of the century.[10] Consequently, for the foreseeable future, this untreated sewage will continue to foul the waters and to blight the beaches on the southern shore of Staten Island. Until the abatement of these CSOs, these beaches, which are perhaps one of the greatest potential recreational resources in the area, will remain, and because of the health threat should remain, underutilized.

CONCLUSION

In regard to the Lower Bay as a whole, the unsewered areas of Staten Island are the most serious problem. However, the existing CSOs in Owls Head and Perth Amboy also deserve attention. The Commission would like to see continued pressure kept on the interceptor project to expedite the completion schedule to the greatest extent possible. In addition, as mentioned in the previous chapter, the Perth Amboy sewage system will be undergoing changes in order to tie into the MCUA POTW, amelioration and, where possible, elimination of CSOs in the Perth Amboy system would be opportune at this point and would be beneficial to the water quality in the Lower Bay.

Because the waterbodies receiving the greatest impact from these CSOs are among those most used for recreation in the metropolitan region, an emphasis should be placed on addressing the outfalls to improve water quality. This action would not only make additional recreational areas available but improve the existing ones.

FOOTNOTES

[1] New York State Department of Environmental Conservation. Use Attainability Analysis of the New York Harbor Complex. August 1985. p. 20.

[2] U.S. Department of the Interior, National Parks Service. General Management Plan, Gateway National Recreation Area. August 1979. p. 96.

[3] Ibid. p. 18.

[4] Interstate Sanitation Commission. "Status of the Interstate Sanitation District Waters." An update for the State of New York's 305(b) Report. April 1988; Interstate Sanitation Commission. "Status of the Interstate Sanitation District Waters." An update for the State of New Jersey's 305(b) Report. April 1988.

[5] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen and Sawyer. April 1985. Table 3.

[6] New York City Department of Environmental Protection. Regulator Improvement Program, Task 1 - Drawings, Owls Head. Prepared by Hazen and Sawyer. April 1985. Outfall Table.

[7] Interstate Sanitation Commission. 1987 Annual Report. Appendix A. p. A-2.

[8] New York City Environmental Protection Administration. City of New York, Section 208, Task 135, Current Sewer Service Areas. Prepared by Hazen & Sawyer. August 1977. pp. A2-5, A2-6.

[9] This foregoing information was obtained during conversations with NYS DEC officials.

[10] This information was obtained in conversations with officials in the NYC Department of Environmental Protection.

CHAPTER 8

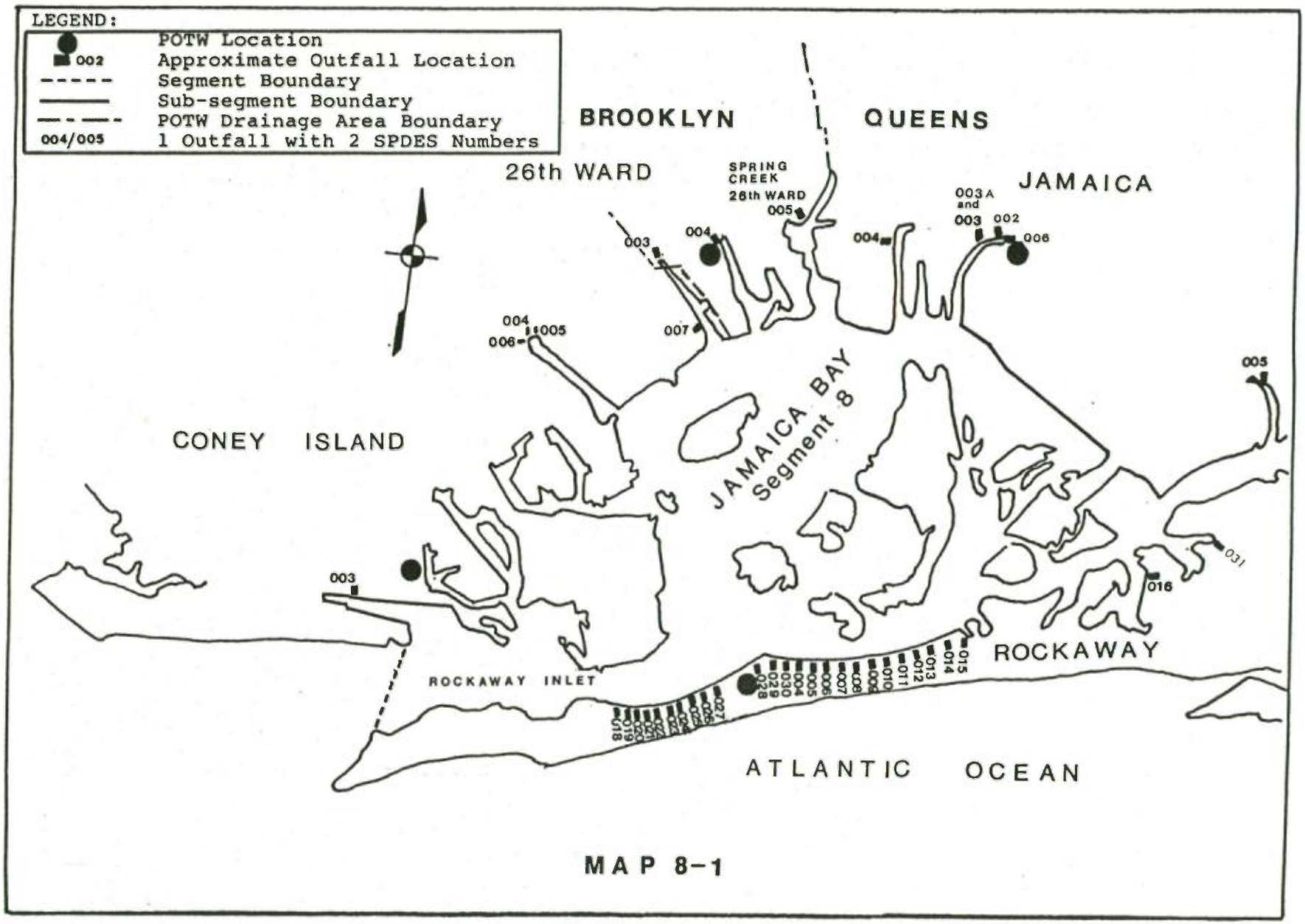
JAMAICA BAY & ROCKAWAY INLET

This section of the District's waters is composed of the bays and inlets in Brooklyn and portions of Queens. It encompasses all or part of four drainage basins within the City of New York: Coney Island, 26th Ward, Rockaway, and Jamaica. It is classified by the Commission as "A", indicating a goal for this section of water a quality that will allow primary contact recreation. Recent data analysis by the Commission indicates that it only partially supports the uses for this designation.[1] There are approximately 40 outfalls into this area, which are shown on Map 8-1 and listed on Table 8-1.

This area is a significant natural resource of the metropolitan region. Jamaica Bay, a tidal marsh, is the location of a portion of the Gateway National Recreation Area, which is part of the National Park System. The Jamaica unit of this project is comprised of over 4,000 acres of land and marshland.[2] Jamaica Bay also contains approximately 1500 acres of potentially harvestable shellfish.[3] Existence of this shellfish resource, as well as its valuable recreational area, justifies increased attention to the water quality in this area.

Paerdegat Basin, Sheepshead Bay

Within the drainage basin for the Coney Island POTW (permit NY0026182), there are five outfalls that discharge into waterbodies that are contiguous with Jamaica Bay. Outfall 003 discharges into Sheepshead Bay while three outfalls (004, 005, and 006) discharge to Paerdegat Basin and the remaining outfall discharges to Fresh Creek Basin. All of these outfalls are fairly large and 004, 005, and 006 were inspected as part of the Task 2.5.2. Outfall 003 measures approximately 138" in diameter. Outfalls 004 and 005 are multiple outfalls next to each other on Flatlands Avenue. Outfall 004 is a double outfall, each pipe of which measures 12' x 9'; outfall 005 has five discharge pipes measuring 12' x 9' each. Nearby, outfall 006 at Ralph Avenue


LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers
BROOKLYN
QUEENS
26th WARD
SPRING CREEK
26th WARD
JAMAICA
003A and 003
002
006
004
005
003
007
CONEY ISLAND
JAMAICA BAY
Segment 8
031
016
ROCKAWAY
ROCKAWAY INLET
ATLANTIC OCEAN

MAP 8-1

TABLE 8-1

COMBINED SEWER OUTFALLS
JAMAICA BAY/ROCKAWAY INLET
WATERWAY SEGMENT 8

Treatment Plant Drainage Basin: Coney Island, NY0026182[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
003	CSO	Ocean Avenue Sheepshead Bay	138" dia.	
004	R-1, R-5	Flatlands Avenue Paerdegat Basin	Dbl. 12' x 9'	2
005	R-2,3, 4	Flatlands Avenue " "	5 Bl. 12' x 9'	2
006	R-6	Ralph Avenue " "	Dbl. 20' x 9'	2
007	CSO	Avenue M Pump Station Fresh Creek Basin	72" dia.	

[1] SPDES number assignment, street address, and size are taken from the Coney Island permit, Part I, page 9 of 31.

[2] Inspected as part of Task 2.5.2.

TABLE 8-1 (continued)

Treatment Plant Drainage Basin: 26th Ward, NY0026212[3]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
003	R-2, 2A	Williams Avenue Fresh Creek Basin	4 Bl. 15'3"x9'	2
004	R-1	Hendrix Street " "*	4 Bl. 11' x 7'6"	2
005	R-3	Spring Creek Auxiliary Water Pollution Control Plant Spring Creek	72 Bl. 7'6"x2'5"[4]	**

[3] SPDES number assignment, street address, and size are taken from the 26th Ward permit, Part I, page 9 of 31.

[4] Information from "Supplemental Memo." Outfall Table 5. June 1985.

* Other City documents ("NYC Outfall Table", revised 10/6/88 and the "Supplemental Memo", Table 5) indicate that this outfall discharges to Hendrix Street Canal.

** R-2 in the Jamaica Bay drainage basin discharges to the Spring Creek Auxiliary WPCP during wet weather.

TABLE 8-1 (Continued)

Treatment Plant Drainage Basin: Jamaica, NY0026115[5]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
002	R-4 R-5	130th Place Bergen Basin	*	
003	R-3	123rd Street " "	Dbl. 8' x 9'	2
003A	R-14	123rd Street " "	Dbl. 13'6" x 9'	
004	R-11, R-11A	Cross Bay Blvd. Shell Bank Basin	42" dia.	2
005	R-6,7 8,9	225th Street Thurston Basin	4 Bl. 16' x 8'	2
006	R-1	JFK Airport Bergen Basin	3 Bl. 19' x 9'	2

[5] SPDES number assignment, street address, and size are taken from the Jamaica permit, Part I, page 9 of 32.

* Size information is not available from existing City documents or inquiries to City officials.

TABLE 8-1 (continued)

Treatment Plant Drainage Basin: Rockaway, NY0026221[6]

Outfall Number SPDES	Outfall Number Local	Location of Outfall		Size	Comments/ Notes
004	D-11	Seaside Avenue	Jamaica Bay	12" dia.	2
005	D-10	Beach 102nd Street	" "	12" dia.	2
006	D-9	Beach 101st Street	" "	8" dia.	2
007	D-8	Beach 100th Street	" "	10" dia.	2
008	D-7	Beach 99th Street	" "	12" dia.	2
009	D-6	Beach 98th Street	" "	12" dia.	2
010	D-5	Beach 97th Street	" "	12" dia.	2
011	D-4	Beach 96th Street	" "	12" dia.	2
012	D-3	Beach 94th Street	" "	10" dia.	2
013	CSO	Beach 93rd Street	" "	*	
014	D-2	Beach 91st Street	" "	12" dia.	2
015	TG-1	Beach 88th Street	" "	60" dia.	
016	CSO	Bayswater Avenue	Norton Basin	60" dia.	
018	D-25	Beach 140th Street	Jamaica Bay	20" dia.	
019	D-24	Beach 139th Street	" "	48" dia.	2
020	D-23	Beach 136th Street	" "	60" dia.	2
021	D-22	Beach 135th Street	" "	20" dia.	2
022	D-21	Beach 132nd Street	" "	54" dia.	2
023	D-20	Beach 128th Street	" "	18" dia.	2

[6] SPDES number assignment, street address, and size are taken from the Rockaway permit, Part I, page 9 of 31.

* Size not available from existing City documents or inquiries to City staff.

TABLE 8-1 (continued)

Treatment Plant Drainage Basin: Rockaway, NY0026221 (continued)

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
024	CSO	Beach 124th Street Jamaica Bay	*	
025	D-18	Beach 122nd Street " "	18" dia.	2
026	D-17	Beach 117th Street " "	18" dia.	
027	CSO	Beach 116th Street " "	*	
028	D-14	Beach 108th Street " "	4' x 6'	2
029	R-1, R-2	Beach 106th Street " "	72" dia.	2
030	D-12	Beach 104th Street " "	12" dia.	2
031	P/S	Redfern Avenue (Nameoke P/S) Mott Basin	*	

* Size information was not available from existing City documents or inquiries to City officials.

and Paerdegat Basin is a double discharge point measuring 20' x 9'.[4] The outfall for the Avenue M pump station (007) discharges into Fresh Creek Basin through a 72" diameter discharge pipe.

As part of the City of New York's CSO abatement program that targets Paerdegat Basin, the discharge from the three Paerdegat Basin outfalls will be diverted and stored in a 30 million gallon facility. The planning for this facility is 90% complete looking toward beginning construction in 1991. The project will cost an estimated $150,000,000.[5]

Spring Creek, Hendrix Creek, Fresh Creek

The adjacent drainage basin, 26th Ward (permit NY0026212), also contains large outfalls into tributaries of Jamaica Bay. Two of these were inspected for the Task 2.5.2. Fresh Creek receives the discharge from outfall 003. This outfall enters the Creek at Williams Avenue and has four 15'3" x 9' pipes. Outfall 004 discharges into Hendrix Creek from Hendrix Street. It is also a four-barreled outfall with pipes measuring 11' x 7'6". The outfall discharging into Spring Creek is 005, which is the outfall for regulator R-3. Wastes from this overflow receive some basic treatment at the Spring Creek Auxiliary Water Pollution Control Plant. This plant provides sedimentation and chlorination[6] before releasing the wastewater into Spring Creek through seventy-two 7'6" x 2'5" tide gates.[7] Spring Creek flows into Old Mill Creek, which enters Jamaica Bay. Regulator R-2, in the Jamaica Bay drainage basin, discharges into the Spring Creek Auxiliary Water Pollution Control Plant during wet weather.

Fresh Creek, Hendrix Creek, and Spring Creek are all waterbodies included in the City's 26th Ward Tributary Group for purposes of CSO abatement. The City proposes to spend $100,000,000 to ameliorate CSO discharges to these waterbodies in an effort to improve their water quality. Construction is scheduled to start on this project in 1993.[8]

Bergen Basin

The Jamaica POTW (permit NY0026115) has six CSOs within this area affiliated with it. Of these six outfalls, four are large outfalls with multiple pipes. Outfall 003 is a double-barreled 8' x 9' outfall. The outfall for R-14 was listed as an additional outfall for 003 in both the Task 2.5.2 and the "Supplemental Memo"; however, in the newly issued permit this large, double-barreled outfall was assigned the number 003A.[9] Outfall 005 is a four barrel 16' x 8' discharge point that outfalls into Thurston Basin on the eastern most side of John F. Kennedy Airport. The other large outfall, 006, discharges from Kennedy Airport to the head of Bergen Basin and is a three barrel outfall, each barrel of which measures 19' x 9'. The remaining Jamaica outfall is the 42" diameter outfall numbered 004 at Cross Bay Boulevard and Shell Bank Basin. Outfalls 003, 004, and 005 were inspected by television and found to be "acceptable." The approximate location for 002 is shown on Map 8-1; the size of this outfall is not available from City documents and could not be ascertained.

Waterbodies including Bergen Basin and Thurston Basin in this area have been included in the City's Jamaica Tributary Group. As with other such projects in the area of Jamaica Bay and other tributaries in the City, these relatively smaller waterbodies are the focus of efforts to eliminate CSOs, which have a direct and significant impact on water quality. The project in the Jamaica drainage basin is expected to cost $200,000,000 and construction is scheduled to begin in 1994.

Jamaica Bay

The Rockaway POTW drainage basin (permit NY0026221) has, by far, the greatest number of outfalls to Jamaica Bay with 27. Nineteen of these have been inspected as part of the Task 2.5.2 either visually or by television. Although most of these outfalls are less than 24" in diameter, several outfalls in this drainage basin do deserve comment.

Seven large outfalls exist among the mostly small discharge points in the Rockaway drainage basin. The largest of these outfalls are next to each other at Beach 106th Street and Beach 108th Street. Outfall 029 is a 72" diameter outfall, while the dimensions of outfall 028 are 4' x 6'. The inspection report for 028 notes "tide gates missing."[11] The three 60" diameter outfalls include 016, at Bayswater Avenue, as well as 015 at Beach 88th Street and 020 at Beach 136th Street.[12] Task 2.5.2 notes a slight displacement of outfall segments at 020.[13] Outfall 016, the easternmost outfall in this drainage basin, discharges into Norton Basin at Bayswater Avenue. This outfall and 031, which is the outfall for the Nameoke pump station, are the only ones of the 27 outfalls in the Rockaway drainage basin that do not overflow directly into Jamaica Bay. The 54" diameter discharge for 022 enters Jamaica Bay at Beach 132nd Street. The smallest of these larger outfalls is 019 at Beach 139th Street and it measures 48" in diameter. No size information is available for outfalls 013, 024, 027, and 031. Due to a lack of specific outfall location information, only an approximate site for 031 is shown on Map 8-1.

CONCLUSION

Jamaica Bay and its inlets and tributaries is perhaps the most desirable waterbody on which to begin to coordinate elimination of CSOs. Not only is Jamaica Bay a great recreational resource that cannot be fully realized because of the pollutant levels, but in addition, the entire Bay is confined within the jurisdiction of the City of New York, making coordination somewhat easier than if numerous municipalities were involved. The City has already begun this effort with its CSO abatement strategy in Paerdegat Basin and its participation in the Jamaica Bay Task Force. Although these projects focusing on Jamaica Bay will no doubt improve its water quality, the Commission would urge that other initiatives also be reviewed so that a comprehensive CSO abatement plan can be tailored to Jamaica Bay to make it available fully for its designated use.

FOOTNOTES

[1] Interstate Sanitation Commission. "Status of the Interstate Sanitation District Waters." An update for the State of New York's 305(b) Report. April 1988.

[2] U.S. Department of the Interior. National Park Service. General Management Plan, Gateway National Recreation Area. August 1979. p 24.

[3] New York State Department of Environmental Conservation. Use Attainability Analysis of the New York Harbor Complex. August 1985. p. 20.

[4] New York City Department of Environmental Protection. Regulator Improvement Program, Task 2.5.2 - Outfall Inspection. Prepared by Hazen & Sawyer. April 1985. Table 3.

[5] This information has been supplied by City officials in conversations and other communications with Commission staff.

[6] New York City Environmental Protection Administration. Department of Water Resources, Bureau of Water Pollution Control. "26th Ward Water Pollution Control Project." November 14, 1973. Prepared by Jerry Lastihenos, Associate, Hazen and Sawyer for the Met Section NYWPCA Luncheon and Field Trip.

[7] New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 5, n.1.

[8] This information has been supplied by City officials in communications with Commission staff.

[9] "Supplemental Memo." Table 9.

[10] This information has been supplied by City officials in communications with Commission staff.

[11] Task 2.5.2 - Outfall Inspection.

[12] Ibid.

[13] Ibid.

CHAPTER 9

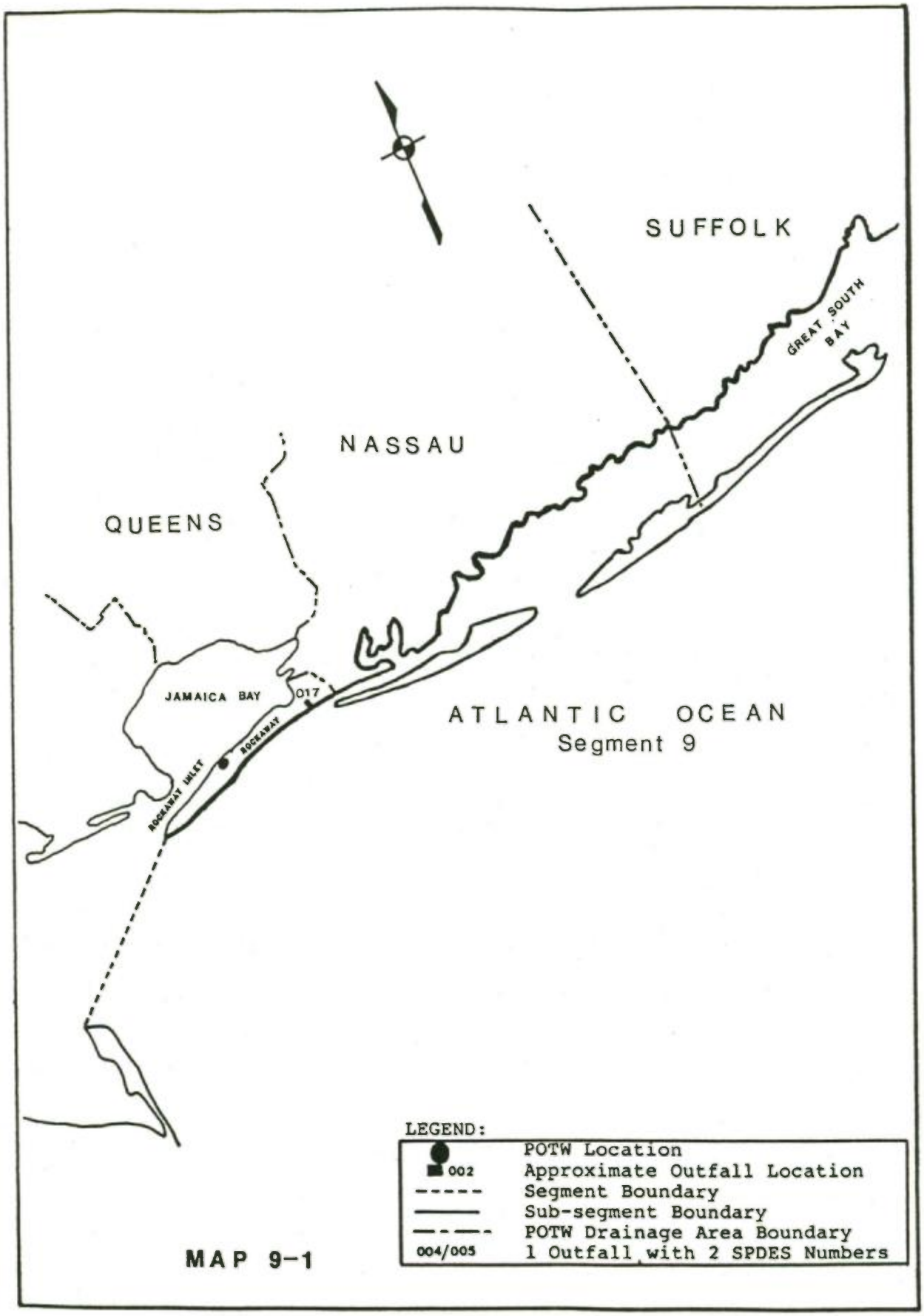
ATLANTIC OCEAN

One of the most important natural resources in the Tri-State metropolitan area is the Atlantic Ocean. This is true in part because of its recreational and commercial value to residents of and visitors to the area. It provides excellent water-based recreational opportunities and holds abundant food and game fish. In addition, it is important as a global resource, valuable as a component of the Earth's ecology.

For the purpose of this Report, only that area of the Atlantic Ocean and its associated bays that is within the Commission's District will be addressed. This section is shown on Map 9-1. It extends shoreward from the Sandy Hook, New Jersey transect to Breezy Point in Rockaway, Queens and eastward along the Long Island shoreline to the easterly side of Fire Island Inlet. Miles of sandy beaches stretch along the shores of this area hosting bathers, surfers, and sunworshipers. Shoreside parks provide excellent picnicking, fishing, and camping locations and bayside marinas are home to numerous fishing and pleasure craft of all kinds. Among the principal recreation facilities within this section are Gateway National Recreation Area, Jones Beach, Captree State Park, and the 7 1/2 miles of New York City-operated beaches in the Rockaways.[1]

Rockaway

With one possible exception, there are no known CSO outfalls into the area of the Atlantic Ocean or its bays and channels discussed in this section. The only CSO that may possibly exist in this segment is outfall 017 of the Rockaway POTW. The SPDES permit for the Rockaway POTW (permit NY0026221) identifies the location for outfall 017, which is the outfall for the Seagrit Avenue pump station, as Beach 9th Street and Banister Creek. The "Supplemental Memo" also places this outfall at Beach 9th Street and Banister


SUFFOLK
GREAT SOUTH BAY
NASSAU
QUEENS
JAMAICA BAY
017
ROCKAWAY
ROCKAWAY INLET
ATLANTIC OCEAN
Segment 9
LEGEND:
POTW Location
002 Approximate Outfall Location
Segment Boundary
Sub-segment Boundary
POTW Drainage Area Boundary
004/005 1 Outfall with 2 SPDES Numbers

MAP 9-1

TABLE 9-1

COMBINED SEWER OUTFALLS
IN THE ATLANTIC OCEAN
WATERWAY SEGMENT 9

Treatment Plant Drainage Basin: Rockaway, NY0026221[1]

Outfall Number SPDES	Outfall Number Local	Location of Outfall	Size	Comments/ Notes
017		Beach 9th Street Banister Creek	24" dia.	*

[1] Information taken from the Rockaway permit, Part I, page 9 of 31.

* City street maps show Beach 9th Street intersecting with Reynolds Channel not Banister Creek.

Creek and describes the outfall as being 24" in diameter.[2] In a review of City street maps of Far Rockaway, it appears that Beach 9th Street does not intersect Banister Creek at all, while it does intersect Reynolds Channel, which flows into the Atlantic Ocean. Because of this confusion, outfall 017 is listed on Table 9-1, but only an approximate location has been plotted on Map 9-1 into Reynolds Channel.

CONCLUSION

The Atlantic Ocean is the major receiver of flows from the Hudson-Raritan Estuary and the Jamaica Bay complex, whether discharges are direct or indirect. To some degree, all of the CSO outfalls mentioned in this Report have an impact on the Ocean. Both tidal and surface currents can transport pollutants inputs from the northerly areas of the District through the Sandy Hook - Breezy Point transect and into the Ocean. The effects of CSO discharges are not instantaneous and depending upon seasonal variances, the state of tide and current, and storm intensity all have various effects upon the Ocean's water quality. In periods of wet weather, the discharges from CSOs can be carried significant distances toward the Ocean. In general, these inputs, with their component of both organic and toxic pollutants, can place a strain on the ecological balance of those waters. In addition, specific concern about these pollutant loadings relate to the direct harvesting of shellfish occurring in the Rockaways and their impact on the fragile estuarine ecology in other parts of the metropolitan region.

It is important to the District as a whole that water quality that has been given an "A" classification be maintained or improved. This is the case with the waters of the Atlantic Ocean -- they should be maintained at a level of quality that will keep them "swimmable and fishable." Although the Commission has conducted sampling in the Atlantic Ocean off of the Rockaways, insufficient sampling has been completed to draw definitive conclusions about improvement in water quality. Preliminary results are encouraging, however.[3]

Because these initial results seem promising, every effort should be made to eliminate CSO discharges into those waters that do affect its quality, so that any improvement can be sustained.

FOOTNOTES

[1] U. S. Department of the Interior. National Park Service. General Management Plan, Gateway National Recreation Area - New York/New Jersey. August 1979. p. 69.

[2] New York City Department of Environmental Protection. "New York City Regulator Improvement Program, Supplemental Memo, State Pollutant Discharge Elimination System (SPDES) Permit Discrepancies." Prepared by Hazen and Sawyer. April 1985. Table 11.

[3] Interstate Sanitation Commission. "Status of the Interstate Sanitation District Waters." An update for the State of New York's 305(b) Report. April 1988.

CONCLUSION

This Report documents the extent to which information is available on CSOs in the District and notes the necessary information required before an overall regional policy on this significant environmental problem can be implemented. In reviewing each waterbody not only do specific recommendations become clear, but the same general recommendations apply to waterbody after waterbody. Rather than simply summarizing the recommendations contained in the previous chapters, this conclusion emphasizes these generally applicable observations in an effort to provide a more beneficial overview of the problem in the District. For recommendations regarding specific waterbodies, individual chapters can be reviewed. This last chapter focuses on the steps that can be taken in every section, regardless of a waterbody's individual characteristics. In addition, as part of this conclusion chapter, criteria useful in prioritizing waterbodies for remediation have been outlined.

As has been suggested throughout this Report, the information assembled here is valuable as a point of departure for interstate cooperation in the abatement of CSO impacts in the District. The Commission intends to send this Report and an invitation to participate in a coordinating conference to every municipality and each governmental and regulatory entity in the District which has control over CSOs. This conference should provide a mechanism to open communications among these entities, as well as a forum for technical information-sharing within the District.

The general observations applicable to all waterbodies in the District can be divided into two broad categories: obtaining definite information and coordinating action among jurisdictions. Within these two categories, six specific recommendations apply to all of the waterbodies discussed in this Report and will be discussed at the Commission's CSO conference:

1. Require a comprehensive outfall inventory of each permit-holding municipality or agency;

2. Identify each outfall in addition to each regulator overflow;

3. Reconcile all contradictory outfall and regulator information;

4. Obtain statistically valid sampling data on volume and constituents being discharged from outfalls;

5. Coordinate among jurisdictions to develop a plan and priorities for action; and

6. Initiate action to abate and, where possible, to eliminate CSOs.

All of these recommendations must be pursued. They are necessary first, to determine precisely the parameters of the CSO problem in a given waterbody and, second, to implement an efficient and thorough response to the water quality degradation resulting from this form of pollution.

1. Require a comprehensive inventory of each permit-holding municipality or agency

Although a listing of all combined sewer outfalls is attached to every state pollution discharge elimination permit granted to a POTW in the District and each outfall listed is assigned an outfall number, it is clear from this study that the information contained in the permit is not always correct. As is evident in numerous sections of this Report, the existence of outfalls that appear in the permit is not always verified by reference to other available reports. Similarly, outfalls acknowledged in inspection reports have not always been included in the permit or assigned an outfall number. In an attempt to compile an accurate catalogue of all outfalls in the District, each permittee should be required to do a study to identify all outfalls in its jurisdiction and to submit a complete listing as part of its permit application.

To some degree this has already been required, but remaining discrepancies indicate that the task has not been done thoroughly enough. The emphasis must be on field investigation and shoreline surveys rather than a report that simply relists previously compiled and often erroneous

information. Although identifying an outfall by latitude and longitude is often required by state agencies, listing its location by its nearest cross streets is more accessible to a broader range of interested parties. In some municipalities where few outfalls exist such an inventory will be easy to complete and to verify. In others, of course, it will be quite difficult. In New York City where this type of compilation would be monumental, such a compilation is already underway and the areas where there is poor or scant knowledge are known and can, thus, be targeted. An inventory of outfalls, on a region-wide basis, is an essential ingredient in any policy for remediation.

2. Identify each outfall in addition to each overflow

In order to best assess the impact of CSOs on a waterbody, it is necessary to tally the inputs to that waterbody. The most relevant part of the sewer system for this assessment is the mouth of the outfall pipe that discharges to a waterbody. To the extent that location and dimensions are provided for overflows or regulators, any estimates of inputs will be inaccurate. This information on overflows is not always descriptive of the outfalls. Only very rarely will the location and dimensions of an overflow be the same as the outfall for that overflow. In addition, a count of overflows may not correspond with the total number of outfalls. Although an overflow is usually associated with a single outfall, sometimes one outfall will empty a series of overflows or multiple outfalls will service one overflow.

Different municipalities have evaluated their sewer systems differently, with some focusing on overflows and some focusing on outfalls. Obviously, if a District-wide effort to abate CSOs is undertaken, there is value to having all of the recorded information documented consistently. Although data should be gathered for both outfalls and overflows, the structure referenced for measuring inputs throughout the District should be the outfall. Available information on overflows and outfalls can be verified and refined in the comprehensive outfall assessment performed in 1 above.

3. Reconcile all contradictory information

Some of the municipalities in the District have already begun to gather information on location, dimensions, and total number of outfalls within their jurisdictions. Unfortunately, information compiled for separate reports or even separate sections of the same report show discrepancies. A portion of these discrepancies may be attributable to printers' errors and could be clarified immediately. To the extent that the corrections are not apparent from backup material or where genuine questions exist, field inspections should be conducted to provide the answer. The Commission could act as a repository for all corrections, publishing as an Addendum to this Report all corrections and clarifying information.

4. Obtain statiscally valid sampling data on volume and constituents being discharged from outfalls

More desirable even than simply knowing where outfalls are discharging into a waterbody is knowledge of how much of what substances they are emptying into the waterbody. At a time when there is not definite information on the numbers and locations of outfalls, volumetric and analytic data might reasonably be considered to be substantially "down the road." Yet this information has been gathered for some outfalls, which could be the beginning of a data base. As part of this task, existing data should be gathered, evaluated, and incorporated in a data base if it can be validated. Additional information necessary to fill in data gaps should be gathered in a manner that is statistically valid from a regional perspective and that will present a picture of the inputs for the region as a whole.

In addition to providing valuable information for the purpose of assessing the impact of CSOs on water quality, data on the composition of effluents would have corollary importance in discovering previously unidentified sources of toxic pollution. Indeed this data gathering could

provide some evidence of possible pretreatment violations occurring in the sewer systems. As long as these outfalls will be point sources, intermittently at least, for some time in the future, the constituents of their discharges should be known.

5. Coordinate among jurisdictions to develop a plan and priorities for action

When information has been gathered on CSOs within a municipality's jurisdiction, the next logical step is for that municipality to decide, on the basis of that information, the action that it will take to alleviate the discharges. In order to get the most out of the investment, construction would generally be targeted for those outfalls or sections of the system where the work could provide the greatest benefit. As mentioned earlier, the greatest benefit is likely to be obtained when work is coordinated among jurisdictions bordering a waterbody because few waterbodies are entirely contained within one municipality. Consequently, it is necessary to open a dialogue with these other municipalities and apprise them of plans being formulated. The Commission, as stated before, is willing to act as facilitator in setting up the conference in which this dialogue can take place.

This strategy is especially important on a region-wide basis. Because the expense of the necessary sewer system separation in the District makes it unlikely that all of the work would be done at the same time, if ever, priorities must be assigned regarding where work will be done first. Coordination in resource allocation will lead to receipt of the greatest benefit from the money expended and may lead to an appreciable improvement in water quality in certain waterbodies within a relatively short time frame.

In terms of the criteria for prioritizing the waterbodies in which CSO abatement work will be undertaken once the parties involved begin allocating funds, at least four different approaches to funding projects could be

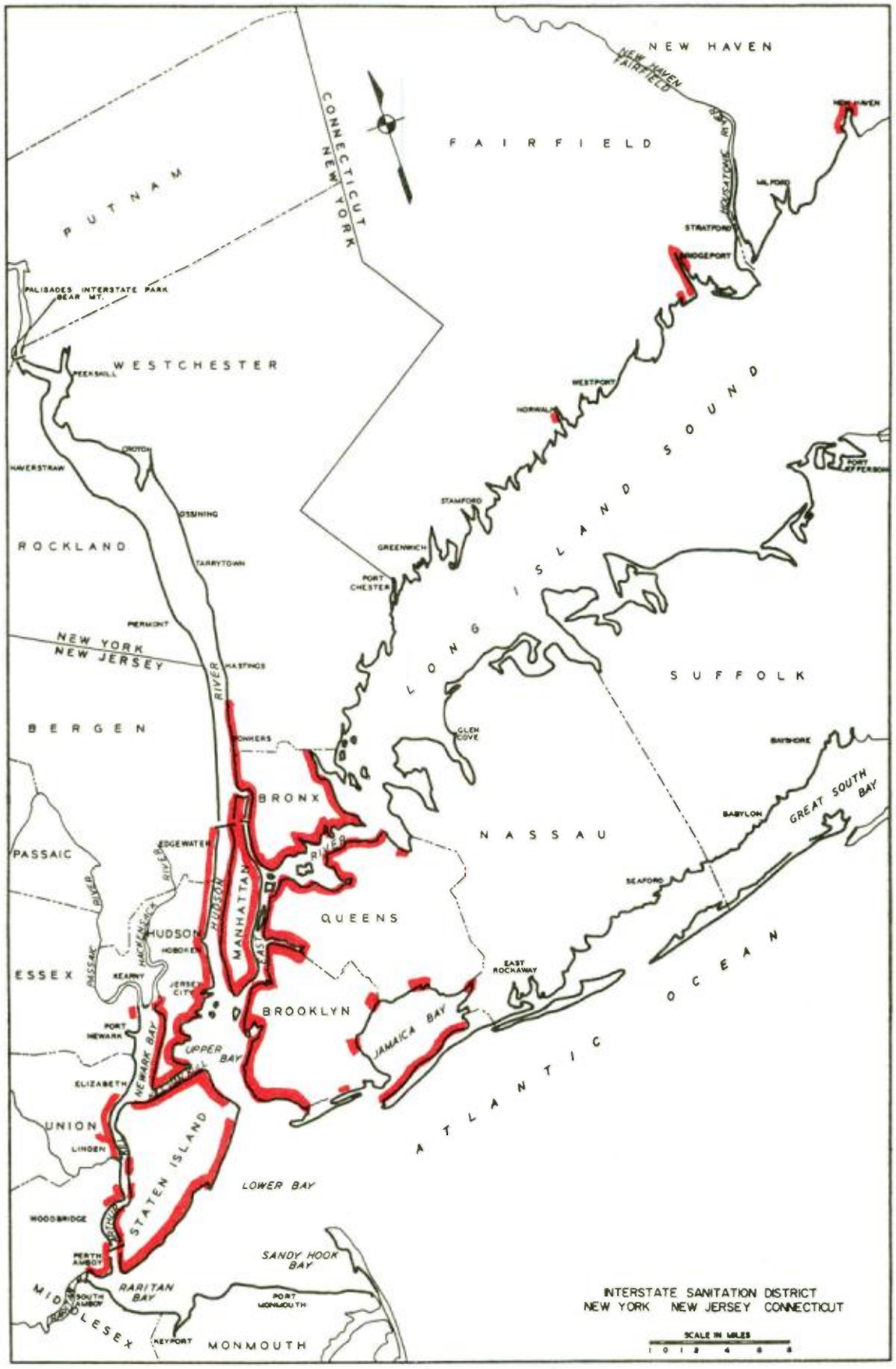
followed -- allocation based on: 1) the present water quality classification of the waterbody, 2) the number of CSOs in the waterbody, 3) the concentration of CSOs in a particular area of the waterbody, and 4) the potential of the waterbody for an upgraded water quality classification. Clearly, other criteria exist and can be used, but these four approaches listed above are put forward here and will be discussed during the Commission's CSO conference.

6. Initiate action to abate and, where possible, to eliminate CSOs

Although a plan to separate all sewer systems within the District would cost prohibitive amounts, sewer separation is clearly the most desirable resolution to the problem of CSOs. Realistically, a remediation plan that eliminates CSOs, where possible, and reconfigures or expands sewer lines to accommodate flows is reasonable if it, in fact, decreases the volume or number of discharge events. Part of any action to fulfill this sixth step should include review of existing CSO control technologies and evaluation of their applicability at certain locations in a project area. It also includes assessment of existing municipal procedures that could minimize the impacts of the CSO discharges, such as regular street cleaning. The emphasis in this sixth step is to take the action mapped out in step five and to reduce CSOs and their impacts to the maximum extent possible.

Although the goal of this Report has been to assemble a summary of available information regarding CSOs in one document, perhaps the most important role the Commission and this Report can perform is to spotlight the problem and to provide a focus and forum for solving the problem--a problem which is now only beginning to get the attention required. Studies are being conducted and additional data are being gathered. However, it is important to insure that the momentum gained to date is not lost. Creation of a regional policy and a plan on CSOs would guarantee that progress continues as more parties in the three states acknowledge the problems resulting from CSOs and the benefits to be gained from abating them. The Commission will continue in

phase two of its Report to gather and to disseminate information on CSOs, to arrange interjurisdictional conferences, to identify the participants for each waterbody, to facilitate a discussion of priorities and methods necessary to accommplish this, and to make recommendations regarding coordinated action to alleviate CSOs.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