

United States Department of the Interior
NATIONAL PARK SERVICE
Gateway National Recreation Area



WATER QUALITY SURVEY REPORT

1992

**DIVISION OF NATURAL RESOURCES
AND COMPLIANCE**

**COMPLIMENTS OF
NATIONAL PARK SERVICE
GATEWAY NATIONAL RECREATION AREA
DIVISION OF NATURAL RESOURCES
AND COMPLIANCE**

BREEZY POINT UNIT, N.Y.
JAMAICA BAY UNIT, N.Y.

STATEN ISLAND UNIT, N.Y.
SANDY HOOK UNIT, N.J.



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NATIONAL PARK SERVICE



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Recreation Area



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DIVISION OF NATURAL RESOURCES
AND COMPLIANCE

1992 WATER QUALITY SURVEY REPORT

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Gateway

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INTRODUCTION

The water quality monitoring program at Gateway National Recreation Area exists to provide data of public health and ecological significance that can be utilized to properly manage the recreational and natural resource. A major area of concern and focus for resource management personnel is the various environmental impacts that can effect the recreational and ecological quality of park waters. For instance, surrounding Jamaica Bay are four major sewage treatment plants, three landfills, J.F.K. Airport and numerous combined sewer overflows (CSOs). The wastes (e.g. sewage effluent, contaminant leachate and urban runoff) from these infrastructures can have an adverse effect on the aquatic environment and the biota living there(1-6). On the other hand, the presence of pathogenic microorganisms at contact-recreational beaches will force restrictions on bathing activities(7-9). Thus, the monitoring and assessment of Gateway waters must be performed to preserve and protect this valuable resource for the present and future.

The focus of this report will be two-fold; one, to document the levels of indicator bacteria at Gateway bathing beach sites, and, two, to ascertain the ecological quality of Jamaica Bay by certain water quality parameters. The determination of total and fecal coliform bacteria levels is used as the criteria for sanitary conditions at Gateway beaches. These microorganisms, which occur in fecal material, are used as indicators of the presence of human pathogens. The beaches of primary concern in the park

are those sites that are designated as bathing beaches. They are located at Sandy Hook (SH3,4,5), Staten Island (Great Kills Beach-GK6) and Breezy Point (ATL 1 - Riis Park). Both New York and New Jersey have coliform standards for beach sites which Gateway follows. The New Jersey standard for fecal coliform is 50 CFU/100 ml for ocean beaches. The New York standard for total coliform is 2400 CFU/100 ml and 200 CFU/100 ml for fecal. New Jersey has no total coliform standard for ocean beaches.

The second part of this report will discuss the significance of water quality data for Jamaica Bay that was statistically analyzed. The measured parameters that were used for statistical analysis were dissolved oxygen (DO), total and fecal coliform (TC;FC), chlorophyll a (chl a), and secchi depth. The focus of analysis was primarily on data obtained at a heavily impacted area (northern Jamaica Bay, sites 6-9; see map) and a relatively clean area just outside the bay - the inlet region (RI3 and MPB4; see map).

Analysis of DO was probably the most important parameter monitored. Its importance should be obvious - it is needed for the survival of most organisms in the bay. However, the amount of DO may be depleted due to several factors. Organic matter released into the bay will cause a decrease in DO levels when it is metabolized by bacteria. An indirect path to DO depletion occurs by the addition of above-normal levels of nutrients. The resultant excessive algal growth may initially produce higher amounts of DO, but eventually DO levels will decline when the algae die

and decompose. The effects of this scenario primarily occurs in the sediments when the dead algae (or any other form of organic matter) settles to the bottom. Insufficient/improper treatment or the bypass of untreated wastewater during precipitation events (due to limited plant capacity) are most likely the cause for high levels entering the bay.

Detection of coliform bacteria is another method that can also give an indication to the sufficiency of wastewater treatment. Their enumeration can also provide one with the effectiveness of treatment processes and the effect of wet weather events(10).

The two other parameters that were analyzed were secchi depth and chlorophyll a. Secchi depth is a measure of water clarity or transparency, and is performed by lowering a white circular disk into the water until it cannot be seen anymore. Presence of plankton as well as suspended sediments and water color will cause light extinction and lower the depth of visibility. Chlorophyll a is a measure of the photosynthetic pigment that occurs in phytoplankton and was used as an indicator of the algal biomass. Together these parameters were used to follow plankton and DO dynamics in Jamaica Bay.

METHODS

The water quality survey this year ran from the last week of May to the first week of September (15 weeks). Grab samples were collected from all the sites on a weekly basis. Repeat

sampling was done when an exceedance of a total or fecal coliform standard occurred at one of the bathing beach sites. Sampling for Jamaica Bay was performed by boat except for site JB-14, which was collected immediately offshore by hand. A bottom as well as a surface sample was collected at sites 3-13. For sites at Breezy Point, Staten Island, and Sandy Hook, collection was made at the waters edge by hand.

Precipitation values were gathered from data collected at the Floyd Bennett Field weather station. Readings generally cover a period of approximately 40-48 hours prior to the time of sampling. Air temperature was measured by hand held thermometers (either mercury or mineral spirits). Water temperature, salinity, and conductivity were measured on site by a calibrated Beckman RS-5 induction salinometer. pH was measured in the lab by an Orion model 230A pH meter. The membrane filter technique was used for total and fecal coliform determinations(11). All samples brought back to the lab for analysis were kept on ice. Dissolved oxygen was determined by the Winkler titration method using a DO kit manufactured by Ecologic Instrument Division, Bohemia, NY. An 8" diameter white disk was used for the secchi readings. For chlorophyll a, 100 ml from the surface grab sample was first filtered through a 0.45 um Millipore filter. The filter was then dissolved in 90% acetone. After storage by refrigeration, chlorophyll a was determined by the trichromatic method (12). Analysis of data was performed by analysis of variance (ANOVA) and student's t-test.

RESULTS AND DISCUSSION

I - Public Health Monitoring of Gateway Bathing Beaches

The results for Gateway bathing beaches at Sandy Hook (SH 3,4,5), Staten Island (GK6) and Breezy Point (Atl 1) all show total and fecal coliform levels at acceptable levels (see Appendix section). The fecal standard was exceeded only once for the whole season at Great Kills Beach (GK6), Riis Park (ATL-1) and Sandy Hook Beach SH-3. Table I lists the days that the criteria was exceeded this year (for all the sites sampled). While it appears that Jamaica Bay is too contaminated for a swimming beach placement, other sites in Staten Island could be considered as possible areas for contact-recreation. Table II as well as I shows Breezy Point to be the cleanest of the four units, with the seasonal average decreasing in each of the last three years. This was not the trend for the other units. Levels increased for Jamaica Bay as well as for the total coliform concentrations at Staten Island and Sandy Hook. But, the sites that had numerous exceedances and caused the overall increase in the seasonal average were areas that were non-bathing beach sites. The swimming beaches were relatively clean because the majority of them (Sandy Hook and Breezy Point) are situated on the ocean side. The high levels of coliform concentrations occur in the estuarine side, where most sewage effluent is released.

II - Ecological Monitoring of Jamaica Bay

In order to show the effects of sewage treatment plant and CSO effluents on the bay, a highly impacted area of Jamaica Bay

TABLE I
SAMPLE DAYS SURPASSING COLIFORM CRITERIA

SITE	TOTAL NO. OF SAMPLE DAYS	SAMPLE DAYS SURPASSING CRITERIA	%
ATL-1*	16	1	6
ATL-2*	15	0	0
BREEZY POINT AVERAGE	15.5 DAYS	0.5 DAYS	3
RI-3	15	0	0
MPB-4	15	1	7
JB-5	15	4	27
JB-6	15	5	33
JB-6A	15	5	33
JB-7	15	6	40
JB-8	15	5	33
JB-9	15	13	87
JB-10	15	7	47
JB-11	15	4	27
JB-12	15	3	20
JB-13	15	6	40
JB-14	15	5	33
JAMAICA BAY AVERAGE	15 DAYS	5 DAYS	33
SB-2	15	1	7
MB-3	15	2	13
NDB-4	15	2	13
OB-5	15	2	13
GK-6*	16	1	7
CP-7	15	2	13
GKM-8	15	0	0
STATEN ISLAND AVERAGE	15 DAYS	1.4 DAYS	9.6
SH-1	15	6	40
SH-2	15	3	20
SH-3*	16	0	0
SH-4*	15	1	7
SH-5*	15	0	0
SH-6	15	7	47
SANDY HOOK AVERAGE	15 DAYS	2.8 DAYS	19

* Bathing beach sites

NOTE: No beaches were closed during 1992 due to bacterial contamination even though standards may have been exceeded on initial count.

TABLE II
GATEWAY TOTAL AND FECAL COLIFORM SEASONAL AVERAGES
1982-1992

	<u>BREEZY POINT</u>		<u>JAMAICA BAY</u>		<u>STATEN ISLAND</u>		<u>SANDY HOOK</u>	
YEAR	T	F	T	F	T	F	T	F
1982	15	8	588	217	229	71		
1983	19	14	1631	1150	466	229		
1984	242	18	2955	500	1812	87		
1985	307	37	3513	429	3508	42		
1986	21	7	176	277	47	23		
1987	37	21	731	277	589	307		
1988	85	29	694	336	464	261	78	43
1989	401	77	3077	1324	40	77	2450	29
1990	38	27	932	301	408	105	56	20
1991	16	19	580	900	92	88	48	38
1992	12	14	1832	1098	344	56	135	31

(sites 6-9) was compared to a relatively clean area, the inlet region (sites 3-4). Table III illustrates the effect of wastewater discharge on this area by two major treatment plants - the Jamaica (Bergen Basin) and the 26th Ward (Hendrix Creek) plants. Except for surface DO, all the parameters analyzed show a significant difference at the 95% confidence level. Most likely, surface oxygen input by photosynthesis and atmospheric reaeration offsetted the O₂ depletion via respiration at JB6-9. The lower transparency and higher chlorophyll a values in this area also support this. However, these values also indicate that phytoplankton blooms are occurring in the surface waters and will lead to the degradative pathway discussed earlier. In fact the bottom DO in northern Jamaica Bay is significantly lower than the bottom DO in the inlet (though, the effects of temperature and salinity were not factored in). And, the significantly higher total and fecal coliform levels also further support the belief that the major source of impact are the treatment plants and associated overflow outlets.

It should be noted that there is a sewage effluent outlet located in the inlet area, yet the impact seems fairly minimal on the parameters measured. This could be attributed to the good flushing action that takes place at the ocean/bay interface. On the contrary, the flushing of Jamaica Bay is rather slow, taking 35 days for water to be flushed out of the estuary (13). This effect can be seen by the data presented in Table IV. At RI3 and MPB4, there is no significant difference between top and bottom

TABLE III
COMPARISON OF WATER QUALITY PARAMETERS
INLET AREA VS NORTH JAMAICA BAY SITES

<u>PARAMETER</u>	<u>MEAN OF INLET SITES (RI3 & MPB4)</u>		<u>MEAN OF No. J.B. SITES (JB6,6A,7,8,9)</u>		<u>SIGNIFICANTLY DIFFERENT ? *</u>
SURFACE DO	7.4	n=30	7.1	n=75	NO
BOTTOM DO	7.5	n=30	6.3	n=74	YES
TOTAL COLIFORM	464	n=30	2724	n=75	YES
FECAL COLIFORM	41	n=30	1663	n=75	YES
SECCHI DEPTH	7.22	n=21	4.65	n=70	YES
CHLOROPHYLL A	4.8238	n=8	10.5133	n=20	YES

TABLE IV
COMPARISON OF SURFACE AND BOTTOM DO's
INLET AREA AND NORTH JAMAICA BAY SITES

<u>SITE</u>	<u>MEAN OF SURFACE DO</u>	<u>MEAN OF BOTTOM DO</u>	<u>SIGNIFICANTLY DIFFERENT ? *</u>
INLET SITES (RI3 & MPB4)	7.4 n=30	7.5 n=30	NO
NORTH J.B. SITES (JB6,6A,7,8,9)	7.1 n=75	6.32 n=74	YES

* Significance at the 95% confidence level

n - number of samples

DO. Any organic matter that may sink to the bottom is probably carried away by the existing water currents. On the other hand, the bottom DO at JB6-9 is significantly lower than the surface DO. This could be attributed to the slower moving action of water in this area. Thus, degrading organic matter on the bottom will not be flushed away and the DO will decrease within the local vicinity. It appears that currents, as well as hydrologic input of man-made wastes, plays a major role in the transport of pollutants.

Another variable that effects the quality of estuarine water is precipitation. As mentioned earlier, treatment plants will direct untreated wastewater to the CSOs when the plant is at the maximum capacity. This will occur during precipitation events, when the added input of rain/snow leads to an excess of influent in a combined sewer and stormwater system. New York City has such a system, and so Jamaica Bay is the recipient of untreated wastewater during wet weather occurrences. Table V demonstrates the effects of rainfall events between JB6-9 and RI3-MPB4. For all parameters analyzed, the north Jamaica Bay area had significant differences between wet and dry weather periods. The difference in total and fecal coliform, and top and bottom DO illustrate the adverse impact precipitation has on the water quality of Jamaica Bay. On the other hand, chlorophyll a decreased and secchi depth increased significantly during wet weather periods. Apparently, there is some sort of adverse effect on the planktonic community following rainfall. The cause is unknown and should be further

TABLE V
COMPARISON OF WATER QUALITY PARAMETERS BETWEEN WET AND DRY PERIODS
INLET AREA AND NORTH JAMAICA BAY SITES

INLET SITES
(RI3 - MPB4)

<u>PARAMETER</u>	<u>MEAN - DRY PERIOD¹</u>		<u>MEAN - WET PERIOD²</u>		<u>SIGNIFICANTLY DIFFERENT ? *</u>
SURFACE DO	7.3	n=10	7.4	n=6	NO
BOTTOM DO	7.9	n=10	6.9	n=6	NO
TOTAL COLIFORM	110	n=10	991	n=6	YES
FECAL COLIFORM	6	n=10	68	n=6	YES
SECCHI DEPTH	6.64	n=7	7.5	n=3	NO
CHLOROPHYLL A ³	6.3338	n=2	1.8688	n=2	NO

1 - Used data from weeks 4, 6, 9, 11, 14 - 0.00"

2 - Used data from weeks 2, 10, 13 - Top three rainfalls (0.93", 0.74", 2.31")

3 - Used data from weeks 4 (0.00") and 13 (2.31")

* - Significance at the 95% confidence level

n - number of samples

CONTINUED ON NEXT PAGE

TABLE V - CONTINUED

NORTH JAMAICA BAY SITES
(JB6, 6A, 7, 8, 9)

<u>PARAMETER</u>	<u>MEAN - DRY PERIOD¹</u>	<u>MEAN - WET PERIOD²</u>	<u>SIGNIFICANTLY DIFFERENT ? *</u>
SURFACE DO	8.5 n=25	5.5 n=15	YES
BOTTOM DO	7.1 n=25	4.8 n=15	YES
TOTAL COLIFORM	1742 n=25	3986 n=15	YES
FECAL COLIFORM	204 n=25	2710 n=15	YES
SECCHI DEPTH	4.4 n=25	6.4 n=10	YES
CHLOROPHYLL A ³	20.5244 n=5	3.15376 n=5	YES

1 - Used data from weeks 4, 6, 9, 11, 14 - 0.00"

2 - Used data from weeks 2, 10, 13 - Top three rainfalls (0.93", 0.74", 2.31")

3 - Used data from weeks 4 (0.00") and 13 (2.31")

* - Significance at the 95% confidence level

n - number of samples

investigated, but one can still say that, overall, this area has excessive algal growth. By contrast, the inlet region is less impacted during precipitation events. All the parameters, except total and fecal coliform, have the same means. Yet, the difference between wet and dry weather events for total and fecal coliform show there is some effect during precipitation occurrences.

While the data presented in Tables III-V show significant differences between an impacted and relatively non-impacted area and between wet and dry weather events, does the decline in water quality actually adversely effect the biota in the bay? This question cannot really be answered in this report because associated biological data was not collected and correlated with the collected water quality data. The data presented can only be interpreted as showing a decline in environmental conditions and trends - adverse effects on the biota can only be made by inference. The water quality conditions in northern Jamaica Bay are certainly more degraded than the inlet sites, and even more so after rainfall. But, what is actually happening to the biota in this area due to the decline in environmental quality has yet to be determined.

However, a DO standard used as criteria for adequate fish O₂ concentrations reveals that the DO levels in the bay could use improvement, but are not at a level of critical concern. The DO means generated for Tables III-V, as well as the seasonal averages for all the sites sampled in Jamaica Bay, are all above the 3.0 mg/L fish survival standard. Yet, individual readings have on occasion

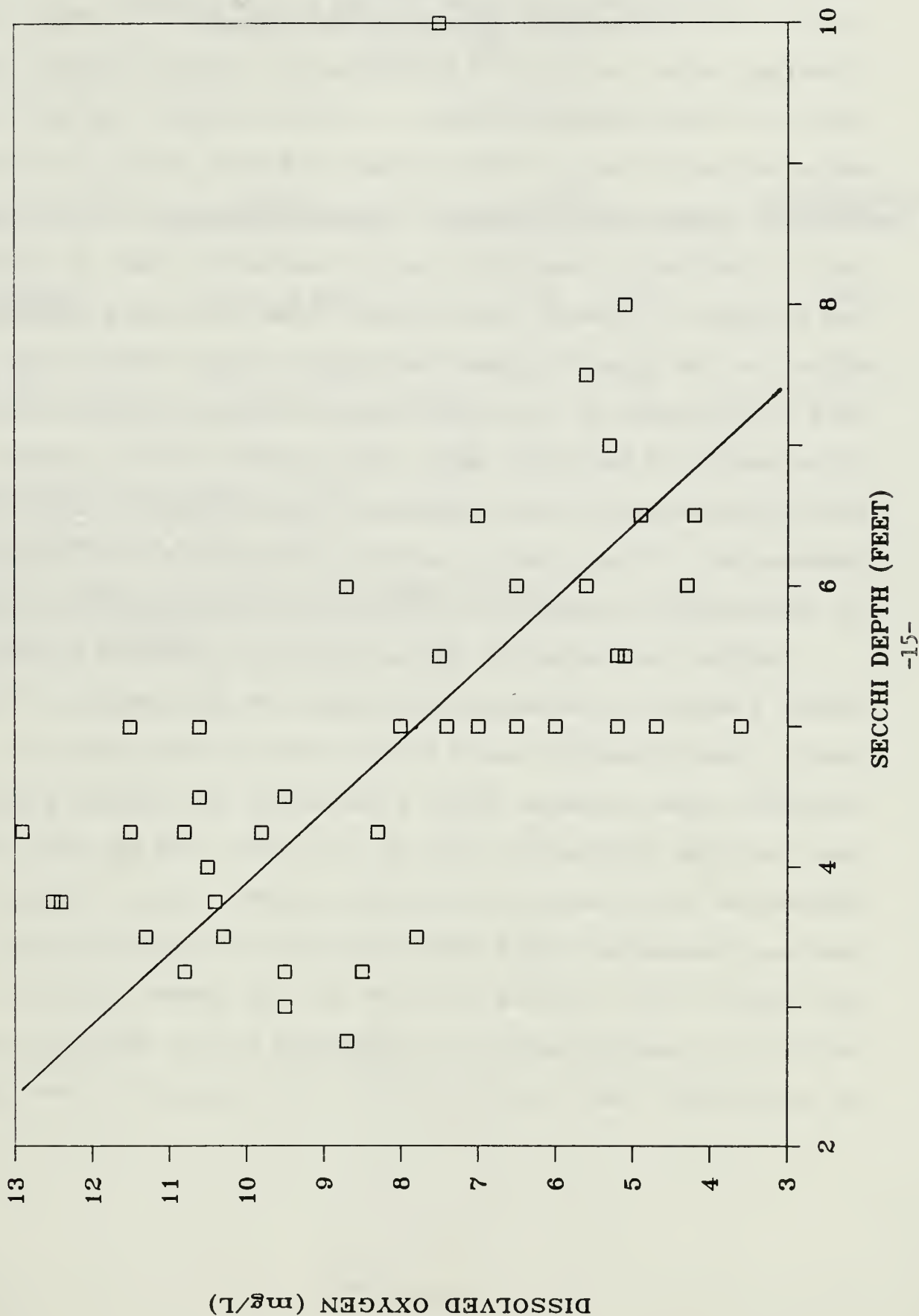
gone below the standard at various inner bay sites. And, there were also many samples from these sites that were relatively low (between 3.0-5.0 mg/L) but did not exceed the standard (see Appendix A).

Since dissolved oxygen in this survey was used as a major monitoring tool, analysis of the various relationships between it, chlorophyll a and secchi depth was performed to gain a better understanding of DO dynamics in Jamaica Bay. A comparison of chlorophyll a data (Appendix E) with corresponding secchi depth readings shows a strong inverse relationship between the two (chlorophyll a increases as secchi visibility decreases). From this correlation it appears that secchi depth measurements can give a legitimate account of phytoplankton biomass in the surface waters. A positive relationship exists between the chlorophyll a data and the corresponding dissolved oxygen values - more oxygen is produced as phytoplankton biomass increases. This trend reflects the photosynthetic O_2 input from phytoplankton in the surface waters. Graph I is a general summary of the two preceding comparisons. Secchi disc visibility, which is a function of water clarity and thus an indication of particulate matter in the surface waters (biotic and abiotic), is lower when dissolved oxygen is relatively higher. In other words, when a high number of plankton are present, the result is a decrease in light penetration (shown by secchi depth readings) and an increase in dissolved oxygen. While Graph I shows a lot of scatter - which may be due to other variables such as atmospheric reaeration, respiration and suspended sediments - the relationships just discussed serve to show that phytoplankton

GRAPH I

DISSOLVED OXYGEN VS SECCHI DEPTH

JAMAICA BAY



plays an important role in O_2 input and can generally be measured by secchi readings. Data presented in Table VI shows the dispersal effect of wind on phytoplankton (through secchi readings) and the resultant effects on the DO content. On non-windy days, phytoplankton is more abundant and thus more O_2 is released. On windy days, lower numbers of phytoplankton are present (possibly due to wind/wave dispersion), so DO decreases. What is interesting is that it appears that the wind does not have a compensating effect on the DO levels when the phytoplankton numbers are low. This is reflected by the significant difference between surface DO on windy and non-windy days. This suggests that O_2 import from phytoplankton may be more important than atmospheric reaeration in Jamaica Bay. It may also be another indication of the high levels of phytoplankton present in the bay due to anthropogenic input.

Further monitoring of the bay would be required to gain better insight on the ecological status of the estuary. A direct count of phytoplankton would be the most accurate method to determine algal biomass. Also, a survey of the species present would provide information such as available food for fish and indication of pollution. A nutrient analysis (e.g., nitrogen species, phosphate) would help determine the cause of algal blooms and identify the limiting nutrient for the system. Finally, the analysis of organic matter and suspended solids should be performed to document their levels and the role they play in the system.

TABLE VI
COMPARISON OF SECCHI DEPTH AND SURFACE DO
BETWEEN WINDY AND NON-WINDY DAYS
JAMAICA BAY

<u>PARAMETER</u>	<u>MEAN CLOUDY/NON-WINDY¹</u>		<u>MEAN CLOUDY/WINDY-VERYW²</u>		<u>SIGNIFICANTLY DIFFERENT? *</u>
SECCHI DEPTH	4.91	n=23	7.15	n=21	YES
SURFACE DO	6.5	n=23	5.1	n=21	YES

1 - Used data from weeks 7 & 12

2 - Used data from weeks 5 & 8

* - Significance at the 95% confidence level

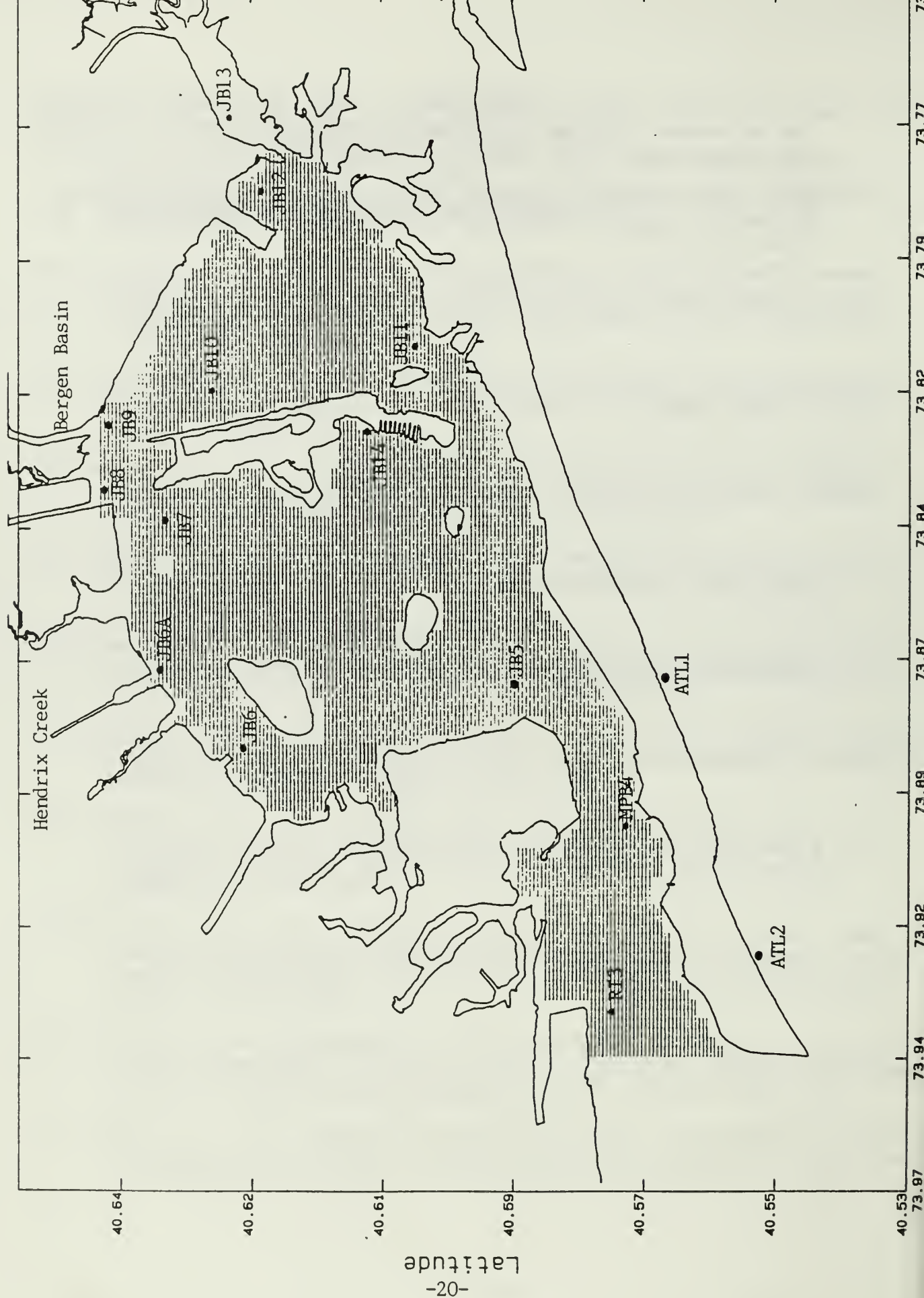
n - number of samples

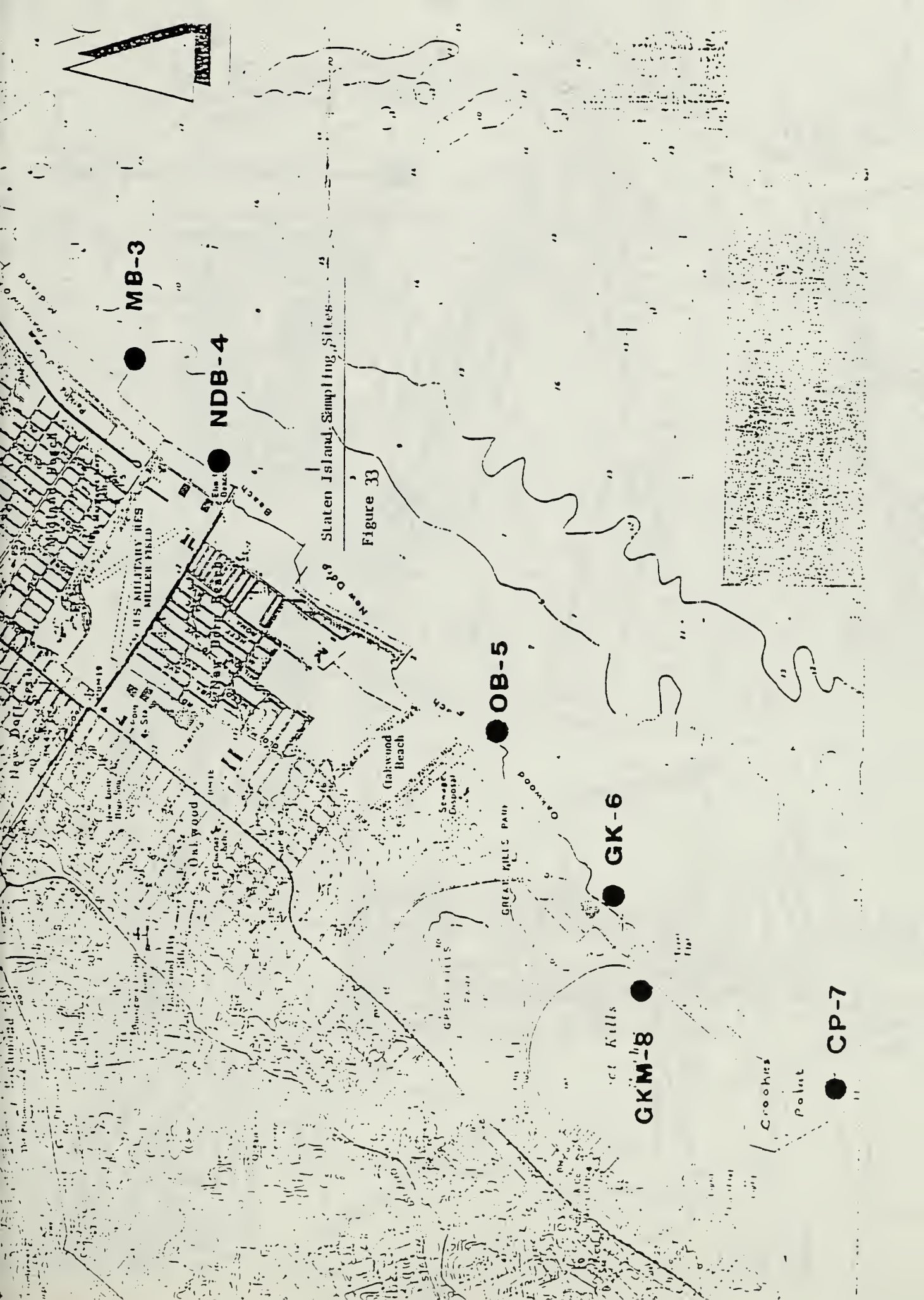
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JAMAICA BAY





MB-3

NDB-4

Staten Island Sampling Sites

Figure 33

OB-5

GK-6

GK-M-8

CP-7

ABBREVIATIONS

KEY TO WATER QUALITY PARAMETERS

COND	-	ATMOSPHERIC CONDITIONS
PRECIP	-	PRECIPITATION
AT	-	AIR TEMPERATURE
ST	-	SURFACE TEMPERATURE
BT	-	BOTTOM TEMPERATURE
SS	-	SURFACE SALINITY
BS	-	BOTTOM SALINITY
SpH	-	SURFACE pH
BpH	-	BOTTOM pH
SDO	-	SURFACE DISSOLVED OXYGEN
BDO	-	BOTTOM DISSOLVED OXYGEN
Se	-	SECCHI DEPTH
TOT	-	TOTAL COLIFORM
FEC	-	FECAL COLIFORM

KEY TO ATMOSPHERIC CONDITIONS

Cl	-	CLEAR (FEW OR NO CLOUDS)
Cd	-	CLOUDY
PC	-	PARTLY CLOUDY
H	-	HAZY
B	-	BREEZY
W	-	WINDY
VW	-	VERY WINDY
F	-	FOG
R	-	RAIN
LR	-	LIGHT RAIN

KEY TO UNITS

TEMPERATURE (T)	-	CENTIGRADE (°C)
SALINITY (S)	-	PARTS PER THOUSAND (PPT)
DISSOLVED OXYGEN (DO)	-	MILLIGRAMS/LITER (mg/L)
SECCHI DEPTH (Se)	-	FEET (ft)
TOTAL COLIFORM (TOT)	-	COLONY FORMING UNITS/100 ml (CFU/100ml)
FECAL COLIFORM (FEC)	-	COLONY FORMING UNITS/100 ml (CFU/100ml)
CONDUCTIVITY	-	MILLIMHOS/CM
CHLOROPHYLL a	-	MILLIGRAMS/CUBIC METERS (mg/m ³)

KEY TO TIDAL READINGS

SAMPLE SITES

REFERENCE POINT

RI3, MPB4, JB5

Rockaway Inlet*

JB6, JB6A, JB7, JB8
JB9, JB10, JB14

Canarsie, Jamaica Bay*

JB11, JB12, JB13

Norton Point, Jamaica Bay*

Staten Island Sites

Sandy Hook, New Jersey

Breezy Point Sites

Rockaway Inlet*

* Reference point for these sites is Sandy Hook, New Jersey

Example: For RI-3, Wk 4, 6/15/92, Time of Sample 9:42AM -

H8:38 - High Tide at 8:38AM

Ref. pt. Rockaway Inlet

L14:40 - Low Tide at 2:40PM

APPENDIX A

WATER QUALITY DATA FOR JAMAICA BAY

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE RI-3 ROCKAWAY INLET

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	BT	SS	BS	SPH	BpH	SDO	BDO	Se	TOT	FEC
1	5/28	9:48	Cl,B	0.10"	H5:25	17.5	14.6	14.3	28.3	27.9	8.1	8.4	11.5	10.8	5	0	0
				5/26-28	L11:24												
2	6/1	9:43	Cd,B	0.93"	H8:39	18.0	14.3	13.9	28.7	29.1	8.3	8.6	10.3	10.0	*	1450	116
				5/30-6/1	L14:36												
3	6/9	9:42	PC,B	0.04"	H3:21	22.0	18.3	18.2	27.4	27.0	8.2	8.3	7.6	8.0	5.25	58	0
				6/7-9	L9:44												
4	6/15	9:42	H,W	0.00"	H8:38	26.0	17.4	16.5	28.2	29.3	8.35	8.30	8.7	8.5	6	319	29
				6/13-15	L14:40												
5	6/22	11:18	Cd,VW	Trace	L7:14	14.0	14.8	14.8	28.4	28.5	8.06	8.05	7.0	7.2	11.5	145	0
				6/20-22	H13:34												
6	6/30	10:01	H	0.00"	H8:22	26.0	15.5	15.0	30.2	30.3	8.05	8.16	7.1	8.6	*	0	0
				6/28-30	L14:18												
7	7/6	10:08	Cd	0.22"	L7:19	21.0	18.3	18.2	29.8	29.6	7.92	7.97	6.6	6.8	8.5	145	0
				7/4-6	H13:44												
8	7/13	9:35	Cd,W	0.05"	H7:38	24.0	20.7	18.6	28.5	30.9	8.05	8.08	7.0	7.5	10	116	0
				7/11-13	L13:34												
9	7/20	9:09	H	0.00"	L5:49	25.0	22.3	22.4	28.6	28.6	7.92	7.99	6.1	6.7	8	203	0
				7/18-20	H12:09												
10	7/28	9:30	Cl,B	0.74"	H7:13	21.0	22.0	22.0	30.1	29.9	8.14	8.18	6.8	7.1	8	1972	29
				7/26-28	L13:05												
11	8/3	9:14	H	0.00"	L5:57	24.0	21.4	21.5	29.0	28.3	7.97	8.04	6.2	6.8	8	116	0
				8/1-3	H12:22												
12	8/10	9:40	Cd	0.36"	H6:31	23.5	21.9	21.4	29.0	27.3	8.10	8.20	7.5	8.2	6.5	1566	58
				8/8-10	L12:23												
13	8/19	9:18	F	2.31"	L5:42	23.3	21.5	21.6	27.9	27.6	7.91	7.92	5.6	5.1	7.5	870	58
				8/17-19	H12:11												
14	8/24	9:14	Cl	0.00"	H4:51	25.0	21.9	21.7	28.5	28.4	8.41	8.24	8.5	7.9	6	0	0
				8/22-24	L10:52												
15	9/3	9:45	Cd,W	0.25"	L7:09	20.0	18.0	18.0	30.2	30.0	8.04	7.85	6.6	3.3	10	29	0
				9/1-3	H13:36												
Seasonal Avg																	
Total																	
						22.0	18.8	18.5	28.8	28.8	8.09	8.14	7.5	7.5	7.7'	466	19

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE MPB-4 MARINE PARK BRIDGE

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>BT</u>	<u>SS</u>	<u>BS</u>	<u>SpH</u>	<u>BpH</u>	<u>SDO</u>	<u>BDO</u>	<u>Se</u>	<u>TOT</u>	<u>FEC</u>
1	5/28	10:09	Cl,B	0.10"	H5:25 L11:24	18.0	15.7	15.3	27.4	27.2	8.5	8.7	10.6	11.5	5	0	0
2	6/1	9:58	Cd,B	0.93"	H8:39 L14:36	17.0	14.6	14.0	28.8	28.6	8.7	8.6	10.0	10.7	*	551	58
3	6/9	10:00	PC,B	5/30-6/1 0.04"	L9:44 H16:04	21.0	19.3	19.0	26.9	25.9	8.6	8.3	7.2	7.6	4.5	4002	696
4	6/15	9:57	H,W	0.00"	H8:38 L14:40	24.5	18.8	15.8	28.1	30.5	8.48	8.41	7.5	8.9	5.5	29	0
5	6/22	11:35	Cd,VW	6/13-15 Trace	L7:14 H13:34	11.0	15.5	15.3	28.3	28.7	8.08	8.10	6.8	7.6	11	58	0
6	6/30	10:17	H	6/20-22 0.00"	H8:22 L14:18	21.0	16.3	16.1	29.5	29.7	8.17	8.18	8.0	8.6	7	0	29
7	7/6	10:21	Cd	0.22"	L7:19 H13:44	20.5	18.8	19.2	29.5	29.1	8.02	8.04	6.5	7.2	*	232	0
8	7/13	9:47	Cd,W	7/4-6 0.05"	H7:38 L13:34	24.0	20.9	19.1	28.6	30.6	8.08	8.12	6.6	7.5	*	87	0
9	7/20	9:21	H	7/11-13 0.00"	L5:49 H12:09	25.0	22.8	22.9	29.2	29.1	7.91	7.95	5.9	7.2	*	0	0
10	7/28	9:45	Cl,B	7/18-20 0.74"	H7:13 L13:05	22.0	22.3	22.4	28.7	28.8	8.00	8.02	5.9	6.3	7	261	0
11	8/3	9:26	H	7/26-28 0.00"	L5:57 H12:22	25.0	21.3	21.4	29.2	27.7	8.00	8.14	6.5	7.3	*	406	0
12	8/10	9:53	Cd	8/1-3 0.36"	H6:31 L12:23	25.0	22.6	22.1	28.6	25.8	8.06	8.26	7.2	8.5	5.5	377	0
13	8/19	9:31	F	8/8-10 2.31"	L5:42 H12:11	23.9	21.5	21.3	27.9	28.6	7.91	7.97	5.6	2.3	*	841	145
14	8/24	9:27	Cl	8/17-19 0.00"	H4:51 L10:52	25.5	22.7	22.3	27.2	26.9	8.51	8.28	8.8	8.1	6	29	0
15	9/3	9:55	Cd,B	8/22-24 0.25"	L7:09 H13:36	20.5	18.6	18.5	29.6	29.3	8.24	8.05	7.5	4.5	*	58	0
Seasonal Avg																	
Total 5.00"																	
0.33"																	
						21.6	19.4	19.0	28.5	28.4	8.21	8.20	7.4	7.6	6.4	462	62

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

Seasonal Avg	Total
0.33"	5.00"

A-3

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-6 CANARSIE PIER

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>BT</u>	<u>SS</u>	<u>BS</u>	<u>SpH</u>	<u>BpH</u>	<u>SDO</u>	<u>BDO</u>	<u>Se</u>	<u>TOT</u>	<u>FEC</u>
1	5/28	10:49	Cl,B	0.10"	H5:53	18.5	16.6	16.2	25.7	26.0	8.7	8.4	12.9	9.5	4.25	58	29
2	6/1	10:31	Cd,B	5/26-28 0.93"	L11:36 H9:07	17.0	16.4	15.8	26.4	27.4	8.7	8.6	7.2	9.2	*	1885	3335
3	6/9	10:30	PC,B	5/30-6/1 0.04"	L14:48 L9:56	24.5	20.0	19.5	25.9	26.6	8.7	8.3	9.3	8.2	4.25	1624	319
4	6/15	10:28	H,W	6/7-9 0.00"	H16:32 H9:06	24.5	21.3	20.2	26.9	27.4	8.76	8.64	8.7	8.5	2.75	0	0
5	6/22	12:06	Cd,W	6/13-15 Trace	L14:52 L7:26	12.0	18.8	18.8	27.4	27.7	8.22	8.06	4.8	5.4	8	406	58
6	6/30	10:44	H	6/20-22 0.00"	H14:02 H8:50	22.0	21.3	19.8	27.0	27.9	8.58	8.29	8.3	7.7	3.75	87	29
7	7/6	10:47	Cd	6/28-30 0.22"	L14:30 L7:31	21.5	20.7	19.8	27.3	28.5	8.14	8.06	6.4	6.8	4.75	5104	2320
8	7/13	10:20	Cd,VW	7/4-6 0.05"	H14:12 H8:06	27.0	23.3	22.7	27.1	28.2	8.12	7.93	6.5	6.2	5	58	58
9	7/20	9:46	H	7/11-13 0.00"	L13:46 L6:01	27.0	24.0	23.6	27.6	27.4	8.02	7.84	7.1	5.5	4	145	0
10	7/28	10:14	Cl,B	7/18-20 0.74"	H12:37 H7:41	22.0	23.0	22.8	27.1	27.4	7.81	7.78	4.8	5.4	6.25	609	174
11	8/3	9:54	H	7/26-28 0.00"	L13:17 L6:09	24.0	23.0	22.9	28.0	26.9	8.00	8.02	7.0	6.5	5.25	667	29
12	8/10	10:21	Cd	8/1-3 0.36"	H12:50 H6:59	25.0	23.8	23.4	25.5	27.5	8.01	8.09	6.3	7.0	5	6583	7424
13	8/19	10:00	H	8/8-10 2.31"	L12:35 L5:54	25.5	21.8	21.1	25.3	27.0	7.77	7.72	5.6	4.7	6	4930	6815
14	8/24	9:54	Cl	8/17-19 0.00"	H12:39 H5:19	25.5	23.1	23.1	24.9	26.4	8.36	8.24	10.3	7.9	4	174	0
15	9/3	10:15	Cd,B	8/22-24 0.25"	L11:04 L7:21	21.1	21.5	20.7	27.2	28.5	8.39	8.27	9.5	3.3	4.5	87	0
				9/1-3 H14:04													
Seasonal Avg			Total 5.00"	0.33"		22.5	21.2	20.7	26.6	27.4	8.27	8.14	7.6	6.8	4.8	1494	1373

Reference: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-6A FRESH CREEK

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>BT</u>	<u>SS</u>	<u>BS</u>	<u>SpH</u>	<u>BpH</u>	<u>SDO</u>	<u>BDO</u>	<u>Se</u>	<u>TOT</u>	<u>FEC</u>
1	5/28	11:06	Cl,B	0.10"	H5:53	20.0	17.5	16.6	24.1	26.4	8.3	8.4	10.3	6.1	3.5	232	29
				5/26-28	L11:36												
2	6/1	10:43	Cd,B	0.93"	H9:07	18.0	16.9	16.2	24.7	27.3	8.3	8.7	8.1	8.6	*	5771	2233
				5/30-6/1	L14:48												
3	6/9	10:42	PC,B	0.04"	L9:56	21.5	20.0	19.8	25.7	26.2	7.9	8.5	7.5	7.1	4	1160	580
				6/7-9	H16:32												
4	6/15	10:37	H,W	0.00"	H9:06	26.0	22.1	21.0	25.4	27.2	8.68	8.54	8.5	8.5	3.25	203	58
				6/13-15	L14:52												
5	6/22	12:18	Cd,W	Trace	L7:26	14.0	19.2	19.2	26.6	26.5	8.02	8.10	3.6	5.5	8.25	1537	58
				6/20-22	H14:02												
6	6/30	10:54	H	0.00"	H8:50	23.0	21.7	20.3	26.4	27.8	8.54	8.27	10.9	7.6	3.25	58	0
				6/28-30	L14:30												
7	7/6	10:55	Cd	0.22"	L7:31	24.0	20.9	20.9	26.8	25.9	7.94	8.02	6.5	6.8	4.5	6351	3451
				7/4-6	H14:12												
8	7/13	10:31	Cd,VW	0.05"	H8:06	27.5	23.5	23.3	24.2	27.6	7.91	8.06	5.1	5.5	5.5	145	0
				7/11-13	L13:46												
9	7/20	9:57	H	0.00"	L6:01	29.0	24.1	23.8	27.4	27.3	7.91	7.67	6.1	5.1	4.5	406	0
				7/18-20	H12:37												
10	7/28	10:24	Cl,W	0.74"	H7:41	21.5	23.1	23.0	27.1	25.5	7.79	7.74	4.2	5.0	6.5	928	116
				7/26-28	L13:17												
11	8/3	10:03	H	0.00"	L6:09	24.0	23.3	23.2	27.4	26.6	7.89	7.92	5.8	6.7	5.25	986	29
				8/1-3	H12:50												
12	8/10	10:31	Cd	0.36"	H6:59	25.0	24.0	23.3	24.9	27.2	7.95	8.13	6.0	7.0	4.5	13021	7134
				8/8-10	L12:35												
13	8/19	10:10	H	2.31"	L5:54	27.2	21.8	21.3	24.6	25.8	7.55	7.60	7.0	3.3	6.5	4930	4785
				8/17-19	H12:39												
14	8/24	10:04	Cl	0.00"	H5:19	23.9	23.4	23.0	25.1	25.4	8.14	8.25	10.0	8.2	4	174	29
				8/22-24	L11:04												
15	9/3	10:22	Cd,B	0.25"	L7:21	21.1	21.7	21.5	27.1	24.4	8.32	8.27	9.1	*	4.5	203	0
				9/1-3	H14:04												

Seasonal Avg Total 5.00"
0.33"

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-7 PUMPKIN PATCH CHANNEL

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>BT</u>	<u>SS</u>	<u>BS</u>	<u>SpH</u>	<u>BpH</u>	<u>SDO</u>	<u>BDO</u>	<u>Se</u>	<u>TOT</u>	<u>FEC</u>
1	5/28	11:23	C1,B	0.10"	H5:53	20.0	17.6	17.8	26.0	25.7	8.7	8.6	12.5	11.9	3.75	87	0
				5/26-28	L11:36												
2	6/1	10:56	Cd,B	0.93"	H9:07	17.5	16.8	16.8	25.6	24.6	8.7	8.7	7.9	6.2	*	6090	3248
				5/30-6/11	L14:48												
3	6/9	10:55	PC,B	0.04"	L9:56	24.0	20.1	19.8	25.7	25.7	8.5	8.3	10.0	8.1	3.75	4118	899
				6/7-9	H16:32												
4	6/15	10:49	H,W	0.00"	H9:06	25.0	22.3	22.2	26.2	25.7	8.77	8.82	9.5	9.5	3	29	0
				6/13-15	L14:52												
5	6/22	12:28	Cd,VW	Trace	L7:26	14.5	19.9	20.0	26.5	26.4	8.16	8.14	3.5	5.3	8	1015	29
				6/20-22	H14:02												
6	6/30	11:05	H	0.00"	H8:50	23.0	21.5	22.0	26.4	26.8	8.39	8.38	8.2	8.5	4	87	58
				6/28-30	L14:30												
7	7/6	11:06	Cd	0.22"	L7:31	24.0	21.2	21.0	26.6	25.1	8.08	8.10	5.7	6.9	5.25	3567	1943
				7/4-6	H14:12												
8	7/13	10:43	Cd,VW	0.05"	H8:06	27.0	23.6	23.5	26.3	26.4	8.06	8.12	6.0	6.9	5	87	29
				7/11-13	L13:46												
9	7/20	10:07	H	0.00"	L6:01	28.0	24.5	24.2	26.7	26.2	7.91	7.85	6.3	6.1	4.5	377	0
				7/18-20	H12:37												
10	7/28	10:38	C1,W	0.74"	H7:41	21.5	23.5	23.3	26.4	23.5	7.61	7.66	2.6	4.0	6.5	1914	754
				7/26-28	L13:17												
11	8/3	10:14	H,B	0.00"	L6:09	24.0	23.3	23.5	26.8	26.7	7.86	7.86	5.6	6.6	4.5	1363	87
				8/1-3	H12:50												
12	8/10	10:42	Cd	0.36"	H6:59	26.5	23.9	24.1	26.2	26.2	7.76	7.80	4.0	5.3	5.5	5713	9309
				8/8-10	L12:35												
13	8/19	10:22	H	2.31"	L5:54	25.5	22.0	21.5	25.1	26.6	7.60	7.58	4.9	3.9	6.5	4582	3219
				8/17-19	H12:39												
14	8/24	10:16	C1	0.00"	H5:19	26.1	23.3	23.0	25.1	25.3	8.14	8.14	8.0	8.0	4.5	290	0
				8/22-24	L11:04												
15	9/3	10:32	Cd,W	0.25"	L7:21	21.1	22.1	21.8	25.9	27.4	8.25	8.27	8.0	8.5	5	87	58
				9/1-3	H14:04												

Seasonal Avg Total 5.00" 0.33"

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

Seasonal Avg	0.33"
Total	5.00"

Denotes exceedance of dissolved oxygen fish survival std. of 3.0 mg/L

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-9 BERGEN BASIN

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	BT	SS	BS	SpH	BpH	SDO	BDO	Se	TOT	FEC
1	5/28	11:53	PC,W	0.10"	L11:36 H18:19	16.0	17.6	16.8	25.7	23.6	8.6	8.1	10.8	5.1	3.25	5394	783
2	6/1	11:18	Cd,B	0.93"	H9:07	18.0	17.2	17.0	25.1	23.0	8.5	8.8	7.5	4.5	*	5220	5075
3	6/9	11:15	PC,B	5/30-6/1L14:48	L9:56 H16:32	25.5	20.1	18.7	25.8	24.8	7.7	8.3	3.8	7.1	2.25	957	20097
4	6/15	11:07	H,B	0.00"	H9:06 L14:52	25.5	22.3	20.0	25.7	24.0	8.61	8.29	7.8	5.5	3.5	4727	1131
5	6/22	12:52	Cd,W	Trace	L7:26 H14:02	14.5	20.4	20.3	25.6	26.2	8.08	8.08	2.1	4.5	4.5	10324	5104
6	6/30	11:24	H,B	0.00"	H8:50 L14:30	22.0	22.4	21.7	25.3	25.9	8.51	8.26	10.9	7.0	2.5	377	0
7	7/6	11:24	Cd	6/28-30 0.22"	L7:31 H14:12	25.0	21.5	21.4	25.8	23.5	7.64	7.97	4.1	6.3	3	580	17806
8	7/13	11:04	Cd,W	7/4-6 0.05"	H8:06 L13:46	27.0	23.7	23.3	25.5	25.1	7.92	7.95	4.7	4.9	5	2494	0
9	7/20	10:25	H	7/11-13 0.00"	L6:01 H12:37	28.5	25.0	24.4	25.8	26.5	7.84	7.78	6.4	6.0	3.25	7511	1247
10	7/28	10:57	Cl,B	7/18-20 0.74"	H7:41 L13:17	22.0	23.6	23.1	26.3	26.9	7.65	7.62	3.2	3.8	6.5	6496	1015
11	8/3	10:31	H,B	7/26-28 0.00"	L6:09 H12:50	23.5	23.5	23.7	26.2	24.1	7.85	7.79	5.9	6.2	4.5	1015	0
12	8/10	11:00	Cd	8/1-3 0.36"	H6:59 L12:35	25.5	24.2	23.9	25.8	25.2	7.61	7.65	4.2	3.9	5	11194	638
13	8/19	10:41	H	8/8-10 2.31"	L5:54 H12:39	26.1	22.4	21.9	24.4	25.8	7.58	7.62	4.3	4.6	6	5100	2900
14	8/24	10:37	Cl	8/17-19 0.00"	H5:19 L11:04	27.2	23.7	22.6	24.7	25.4	8.71	7.94	18.4	6.3	2.75	21600	2088
15	9/3	10:50	Cd,W	8/22-24 0.25"	L7:21 H14:04	21.6	22.4	22.2	25.0	26.1	8.23	8.12	8.7	7.5	4.5	4234	87
				9/1-3													
Seasonal Avg			Total	5.00"		23.2	22.0	21.4	25.5	25.0	8.05	8.01	6.8	5.5	4.0	5815	3865
				0.33"													

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-10 WINHOLE CHANNEL

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	BT	SS	BS	SpH	BpH	SDO	BDO	Se	TOT	FEC
1	5/28	12:06	PC,W	0.10"	L11:36	20.0	17.2	16.7	25.7	25.7	8.6	8.6	11.3	8.7	3.5	812	58
2	6/1	11:30	Cd,B	5/26-28	H18:19	18.0	17.1	16.5	25.2	24.8	8.7	8.7	8.5	7.4	*	6293	2755
3	6/9	11:29	PC,B	5/30-6/1	L14:48	25.0	20.5	19.0	25.3	27.1	8.7	8.1	11.4	6.5	3.25	4031	957
4	6/15	11:18	H,W	0.04"	L9:56	25.5	22.3	21.0	25.5	26.7	8.72	8.52	8.5	7.5	3.25	754	29
5	6/22	13:03	Cd,W	6/7-9	H16:32	14.5	20.3	20.3	25.3	25.5	8.31	8.30	4.2	5.3	6	1073	29
6	6/30	11:34	H,B	0.00"	H9:06	22.0	22.0	20.6	26.0	25.0	8.69	7.77	11.7	4.2	3	232	87
7	7/6	11:34	Cd	6/13-15	L14:52	25.0	21.7	20.8	25.6	24.5	8.25	8.21	8.5	6.1	3.5	4901	2204
8	7/13	11:14	Cd,W	Trace	L7:26	28.0	24.0	23.6	25.6	26.5	7.92	8.10	5.2	5.7	*	1015	29
9	7/20	10:35	H	7/4-6	H14:12	27.0	25.0	23.9	25.7	24.3	8.32	7.57	10.3	3.4	3.25	5394	261
10	7/28	11:07	Cl,W	0.05"	H8:06	22.0	23.4	23.4	26.2	25.7	7.74	7.67	4.7	4.6	5.75	4350	928
11	8/3	10:41	H,B	7/11-13	L13:46	23.5	23.5	23.4	26.3	26.5	8.01	7.83	7.3	6.2	4.5	493	0
12	8/10	11:09	Cd	0.00"	L6:09	25.5	24.1	23.8	25.7	27.2	8.02	7.97	6.3	6.5	5	11745	6467
13	8/19	10:51	H	8/1-3	H12:50	26.6	22.2	21.9	24.3	26.3	7.96	7.60	8.0	3.1	5	3033	522
14	8/24	10:48	Cl	0.36"	H6:59	26.6	23.4	22.3	24.8	25.5	8.75	7.60	13.2	2.0	4	145	0
15	9/3	11:00	Cd,W	8/8-10	L12:35	21.6	22.3	21.9	26.4	26.4	8.22	7.99	7.3	5.7	4.75	87	0
				2.31"	L5:54												
				8/17-19	H12:39												
				0.00"	H5:19												
				8/22-24	L11:04												
				0.25"	L7:21												
				9/1-3	H14:04												

Seasonal Avg Total 5.00" 0.33"

23.3 21.9 21.2 25.5 25.8 8.32 8.02 8.4 5.5 4.2 2957 955

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml
Denotes exceedance of dissolved oxygen fish survival std. of 3.0 mg/L

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-11 SUBWAY TRESSEL

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>BT</u>	<u>SS</u>	<u>BS</u>	<u>SpH</u>	<u>BpH</u>	<u>SDO</u>	<u>BDO</u>	<u>Se</u>	<u>TOT</u>	<u>FEC</u>
1	5/28	12:23	PC,W	0.10"	L12:13 H18:30	19.0	17.3	16.9	26.3	26.5	8.7	8.7	12.4	9.5	3.75	0	0
2	6/1	11:44	Cd,B	0.93"	H9:18	18.0	16.6	16.3	26.7	26.7	8.8	8.7	8.7	4.7	*	5017	2581
3	6/9	11:43	PC,B	0.04"	5/30-6/1L15:25 L10:33	20.5	20.2	20.3	26.3	25.6	8.7	8.1	10.3	9.4	3.5	754	116
4	6/15	11:31	H,W	0.00"	H16:43 H9:17	26.5	21.5	21.3	26.9	26.9	8.70	8.60	8.3	8.5	4.25	29	0
5	6/22	13:16	Cd,W	Trace	6/13-15 L15:29 L8:03	15.0	19.3	19.5	26.4	26.9	8.33	8.26	6.1	7.1	6	87	58
6	6/30	11:46	H,B	0.00"	6/20-22 H14:13 H9:01	21.0	21.6	20.6	26.9	26.7	8.34	8.26	9.0	8.4	4.5	116	29
7	7/6	11:46	Cd	0.22"	6/28-30 L15:07 L8:08	25.5	20.5	20.6	28.3	27.1	8.02	8.08	6.2	6.9	5.75	145	29
8	7/13	11:29	PC,VW	7/4-6 0.05"	H14:23 H8:17	27.5	23.9	23.5	26.6	27.7	8.08	8.14	5.3	6.2	7	145	29
9	7/20	10:48	H	0.00"	7/11-13 L14:23 L6:38	26.0	25.1	24.1	27.7	28.3	8.06	7.89	7.2	6.3	4.25	58	0
10	7/28	11:19	Cl,W	0.74"	7/18-20 H12:48 H7:52	23.0	23.4	23.7	27.0	27.0	7.80	7.79	5.0	5.5	7	493	232
11	8/3	10:55	Cl,B	0.00	7/26-28 L13:54 L6:46	24.0	23.0	22.8	28.0	27.4	8.05	7.96	6.5	6.7	6	406	0
12	8/10	11:21	Cd	0.36"	8/1-3 H13:01 H7:10	25.0	23.9	23.8	26.9	27.8	7.96	8.10	6.2	6.7	5	8642	5713
13	8/19	11:10	H	0.31"	8/8-10 L13:12 L6:31	26.1	21.7	21.6	26.0	26.3	7.77	7.80	5.3	2.9	7	2581	493
14	8/24	11:02	Cl	0.00"	8/17-19 H12:50 H5:30	24.4	23.4	23.0	24.8	25.1	8.44	8.34	10.0	8.0	4.5	29	29
15	9/3	11:11	Cd,B	0.25"	8/22-24 L11:41 L7:58	21.6	21.0	20.8	27.9	27.0	8.44	8.35	9.5	6.2	4.75	87	0
				9/1-3 H14:15													
Total 5.00"																	
Seasonal Avg 0.33"																	
22.8 21.5 21.2 26.8 26.8 8.27 8.19 7.7 6.8 5.2 1239 621																	

Seasonal Avg Total 5.00"
0.33"

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-12 JO CO MARSH

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	BT	SS	BS	SpH	BpH	SDO	BDO	Se	TOT	FEC
1	5/28	12:39	PC,B	0.10"	L12:13	20.0	17.6	17.1	26.7	27.0	8.8	8.7	10.6	7.3	4.5	29	0
				5/26-28	H18:30												
2	6/1	11:58	Cd,B	0.93"	H9:18	17.0	17.1	16.6	26.6	27.1	8.7	8.7	8.6	8.5	*	1450	232
				5/30-6/1L15:25													
3	6/9	11:56	PC,B	0.04"	L10:33	24.0	20.7	18.1	26.4	26.6	8.9	8.1	12.1	6.4	3.5	58	0
				6/7-9	H16:43												
4	6/15	11:44	H,W	0.00"	H9:17	26.5	22.0	20.9	26.7	27.2	8.74	8.49	9.8	7.7	4.25	0	58
				6/13-15	L15:29												
5	6/22	13:29	Cd,W	Trace	L8:03	15.0	20.7	20.8	26.6	29.5	8.14	8.14	3.5	5.0	9.5	87	0
				6/20-22	H14:13												
6	6/30	11:58	H,B	0.00"	H9:01	22.0	22.2	19.8	26.6	27.0	8.56	8.05	10.3	6.8	3.5	0	0
				6/28-30	L15:07												
7	7/6	11:57	Cd	0.22"	L8:08	26.0	21.4	20.0	27.2	27.9	8.17	7.84	7.8	5.1	4.25	116	116
				7/4-6	H14:23												
8	7/13	11:44	PC,VW	0.05"	H8:17	28.5	24.1	24.0	26.7	27.2	8.18	8.24	6.5	6.7	6	87	0
				7/11-13	L14:23												
9	7/20	11:01	H	0.00"	L6:38	27.0	25.4	23.4	26.8	24.0	8.39	7.55	10.7	3.5	3	87	0
				7/18-20	H12:48												
10	7/28	11:31	Cl,W	0.74"	H7:52	21.5	23.7	22.7	27.2	26.3	7.93	7.57	5.8	3.7	6.25	261	116
				7/26-28	L13:54												
11	8/3	11:07	Cl,B	0.00"	L6:46	25.0	23.7	23.1	27.0	24.0	8.00	7.74	6.6	5.7	6.5	116	0
				8/1-3	H13:01												
12	8/10	11:34	Cd	0.36"	H7:10	26.0	24.2	23.5	26.9	27.8	8.37	7.84	9.7	6.0	3.75	5075	1363
				8/8-10	L13:12												
13	8/19	11:22	H	2.31"	L6:31	26.1	23.0	22.1	23.0	26.9	8.05	7.62	8.3	3.6	5	3712	1392
				8/17-19	H12:50												
14	8/24	11:16	Cl	0.00"	H5:30	23.9	23.6	22.1	24.5	26.5	8.87	7.61	13.8	3.6	3.5	0	0
				8/22-24	L11:41												
15	9/3	11:21	Cd,W	0.25"	L7:58	22.2	22.4	21.8	26.5	27.4	8.54	8.06	10.3	4.8	4	58	0
				9/1-3	H14:15												

Seasonal Avg Total 5.00"
0.33"

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-13 HEAD OF THE BAY

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	BT	SS	BS	SPH	BpH	SDO	BDO	Se	TOT	FEC
1	5/28	12:56	Cl,W	0.10"	L12:13	21.0	18.3	17.4	26.1	25.2	8.7	8.7	11.5	8.7	4.25	87	29
2	6/1	12:09	Cd,B	5/26-28	H18:30	18.0	17.3	17.0	26.0	26.5	8.7	8.7	8.6	3.2	*	3915	1914
				0.93"	H9:18												
3	6/9	12:07	PC,B	5/30-6/1	L15:25	21.0	21.0	19.3	25.7	25.6	8.8	8.7	13.5	8.3	3.5	4640	667
4	6/15	11:54	H,W	0.04"	L10:33	21.0	22.3	21.5	26.1	26.6	8.71	8.51	10.4	8.2	3.75	1943	203
5	6/22	13:40	Cd,W	6/7-9	H16:43	26.0	22.3	20.8	26.2	26.4	8.18	8.14	4.1	5.2	8.25	377	0
				0.00"	H9:17												
6	6/30	12:08	H,B	6/13-15	L15:29	15.0	20.8	21.6	25.7	25.6	8.56	8.14	11.7	7.5	3	58	58
7	7/6	12:07	Cd	Trace	L8:03	22.5	23.0	21.6	25.7	27.2	7.58	7.83	6.5	5.8	3.5	2059	7511
8	7/13	11:55	PC,W	6/20-22	H14:13	23.5	21.9	21.0	25.8	26.5	8.12	8.08	5.2	5.4	5.5	87	0
				0.00"	H9:01												
9	7/20	11:10	H,B	6/28-30	L15:07	28.0	24.0	23.3	26.7	26.5	8.12	8.08	11.4	5.5	2.5	87	0
10	7/28	11:42	Cl,W	7/4-6	H14:23	26.0	25.2	24.9	25.8	25.9	8.51	8.00	11.4	5.5	2.5	87	0
				0.05"	H8:17												
11	8/3	11:17	Cl,B	7/11-13	L14:23	22.5	23.8	23.7	26.7	26.1	7.88	7.62	6.0	4.9	5.75	348	58
12	8/10	11:44	Cd	7/18-20	12:48	24.0	23.8	23.5	26.2	26.6	8.02	7.84	7.8	6.7	6	145	0
				0.74"	H7:52												
13	8/19	11:34	H	7/26-28	L13:54	26.0	24.8	24.2	25.8	26.3	8.22	8.18	9.1	8.2	3.5	3973	9976
14	8/24	11:27	Cl	8/1-3	H13:01	27.2	23.1	22.4	22.7	26.5	7.88	7.60	7.4	2.6	5	7946	2755
				0.36"	H7:10												
15	9/3	11:31	Cd,W	8/8-10	L13:12	23.9	24.3	22.9	24.3	24.9	8.44	8.25	11.9	7.5	5	0	0
				2.31"	L6:31	22.2	22.6	22.3	26.3	25.7	8.58	8.40	11.0	9.8	3.75	29	0
				8/17-19	H12:50												
				0.00"	H5:30	22.2	22.6	22.3	26.3	25.7	8.58	8.40	11.0	9.8	3.75	29	0
				8/22-24	L11:41	22.2	22.6	22.3	26.3	25.7	8.58	8.40	11.0	9.8	3.75	29	0
				0.25"	L7:58	22.2	22.6	22.3	26.3	25.7	8.58	8.40	11.0	9.8	3.75	29	0
				9/1-3	H14:15	22.2	22.6	22.3	26.3	25.7	8.58	8.40	11.0	9.8	3.75	29	0

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR JAMAICA BAY
MAY TO SEPTEMBER 1992
SITE JB-14 BROAD CHANNEL

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	SS	SpH	SDO	TOT	FEC
1	5/27	14:46	Cd,B	0.12"	L10:48 H17:28	19.0	18.0	26.1	8.9	11.8	87	0
2	6/3	10:21	H	0.00"	L4:29 H10:48	24.0	19.0	26.1	8.8	9.0	7018	203
3	6/10	12:41	Cl	0.00"	L10:48 H17:32	29.0	25.6	26.4	8.9	16.3	406	87
4	6/16	12:34	PC	0.00"	H9:47 L15:34	25.5	24.6	24.4	9.01	10.6	29	29
5	6/23	14:21	Cl,B	Trace	L8:14 H14:50	24.0	20.3	25.5	8.53	9.5	116	0
6	7/1	11:05	H	0.00"	H9:40 L15:25	28.0	23.6	26.9	8.42	7.7	638	232
7	7/8	11:30	Cl,B	0.21"	L9:27 H16:05	28.0	25.2	26.4	8.73	13.6	29	0
8	7/14	14:44	H,B	0.30"	L14:31 H20:22	33.0	27.7	27.1	8.80	13.4	377	0
9	7/21	16:28	PC,H	0.00"	H13:19 L19:08	*	29.3	27.1	8.50	10.8	5075	26564
10	7/29	11:28	Cl,B	0.10"	H8:32 L14:15	28.0	24.6	26.3	7.90	6.6	1334	377
11	8/5	12:01	PC,B	0.02"	L7:55 H14:38	26.0	25.5	27.2	8.40	9.4	493	29
12	8/12	12:36	PC,B	0.44"	H8:25 L14:11	28.5	27.2	27.1	8.04	7.3	1160	0
13	8/18	11:30	Cd	2.65"	L5:22 H11:58	22.8	21.4	21.4	7.49	4.8	2291	6061
14	8/26	12:56	H	0.00"	H7:22 L13:03	31.6	26.4	26.3	8.49	9.5	232	58
15	9/2	13:00	PC,B	0.00"	L6:27 H13:13	24.4	22.7	27.5	8.91	12.5	1624	58
Seasonal Avg				Total								
				3.84"								
				0.26"								
						26.5	24.0	26.1	8.51	10.2	1394	2246

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform std. of 200 CFU/100 ml

APPENDIX B

WATER QUALITY DATA FOR STATEN ISLAND

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE SB-2 SOUTH BEACH

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	11:38	Cd,B	0.10"	L10:42 H17:00	13.0	17.0	23.0	116	0
2	6/4	11:41	Cl,W	0.00"	H11:16 L17:15	17.0	19.0	21.8	29	0
3	6/8	13:12	H	0.90"	L8:52 H15:05	23.5	21.5	19.9	464	116
4	6/16	11:22	PC,W	0.00"	H9:19 L15:28	21.0	21.5	23.4	116	0
5	6/23	11:26	PC,B	Trace	L8:08 H14:22	14.0	17.0	24.5	29	0
6	6/29	14:42	H,W	0.00"	L13:28 H19:49	17.5	19.0	25.9	0	0
7	7/7	12:31	Cl,B	0.43"	L8:23 H14:40	19.0	21.0	24.9	116	0
8	7/14	11:18	Cl,B	0.30"	H8:20 L14:25	23.0	22.0	26.5	0	29
9	7/21	11:41	PC,H	0.00"	L6:27 H12:51	22.5	23.0	24.9	58	0
10	7/27	12:30	PC	0.64"	L12:14 H18:39	23.0	24.0	25.5	841	261
11	8/4	11:21	PC,H	0.01"	L6:54 H13:15	22.5	24.0	25.0	174	29
12	8/13	10:25	PC,B	0.44"	H8:34 L14:46	*	21.7	25.1	377	0
13	8/17	12:11	F,R	1.35"	H10:51 L17:08	20.5	21.3	24.2	522	29
14	8/26	11:30	H	0.00"	H6:54 L12:57	27.8	24.4	26.3	29	0
15	8/31	13:42	PC,B	0.03"	H11:00 L17:17	28.9	23.2	27.8	29	0
Seasonal Avg										
			Total	4.2"						
				0.28"		20.9	21.3	24.6	193	31

Boldface: Denotes exceedance of fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE MB-3 MIDLAND BEACH

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	11:27	Cd, B	0.10"	L10:42 H17:00	12.5	17.0	22.6	29	29
2	6/4	11:31	Cl, B	0.00"	H11:16 L17:15	19.0	20.0	22.7	29	29
3	6/8	13:00	H	0.90"	L8:52 H15:05	20.0	21.0	20.1	1624	290
4	6/16	11:10	PC, W	0.00"	H9:19 L15:28	20.0	22.0	23.7	58	0
5	6/23	11:16	PC, B	Trace	L8:08 H14:22	14.0	18.0	24.1	0	0
6	6/29	14:29	H, W	0.00"	L13:28 H19:49	18.0	20.5	26.1	0	29
7	7/7	12:18	Cl, B	0.43"	L8:23 H14:40	19.0	21.0	25.3	58	0
8	7/14	11:04	Cl, B	0.30"	H8:20 L14:25	22.5	22.5	25.5	0	0
9	7/21	11:29	PC, H	0.00"	L6:27 H12:51	22.5	24.5	26.3	1479	0
10	7/27	12:19	PC	0.64"	L12:14 H18:39	23.0	23.0	25.0	232	29
11	8/4	11:09	PC, H	0.01"	L6:54 H13:15	22.0	24.0	26.2	319	145
12	8/13	10:15	PC, B	8/2-4 0.44"	H8:34 L14:46	*	21.8	25.8	464	0
13	8/17	11:59	F, R	8/11-13 1.35"	H10:51 L17:08	20.5	21.0	25.0	2146	435
14	8/26	11:18	H	8/15-17 0.00"	H6:54 L12:57	28.3	25.4	26.1	0	0
15	8/31	13:31	PC, B	8/24-26 0.03"	H11:00 L17:17	30.5	23.0	27.9	29	29
Seasonal Avg				Total		20.8	21.6	24.8	431	68

Boldface: Denotes exceedance of fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE NDB-4 NEW DORP BEACH

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	11:12	Cd, B	0.10"	L10:42	17.0	18.0	21.7	0	0
2	6/4	11:13	Cl, B	5/25-27 0.00"	H17:00 L5:11	19.5	20.0	22.3	116	0
3	6/8	12:42	H	6/2-4 0.90"	H11:16 L8:52	23.5	23.0	20.1	1189	290
4	6/16	10:52	PC, B	6/5-8 0.00"	H15:05 H9:19	20.0	22.0	23.3	116	0
5	6/23	11:00	PC, B	6/14-16 Trace	L15:28 L8:08	14.5	18.0	25.0	58	0
6	6/29	14:12	H, W	6/21-23 0.00"	H14:22 L13:28	18.0	21.0	24.1	58	29
7	7/7	12:00	Cl, B	6/27-29 0.43"	H19:49 L8:23	18.5	22.0	26.3	1740	1189
8	7/14	10:46	Cl, B	7/5-7 0.30"	H14:40 H8:20	22.5	22.5	26.6	0	0
9	7/21	11:13	PC, H, B	7/12-14 0.00"	L14:25 L6:27	23.0	25.0	26.3	145	29
10	7/27	12:03	PC	7/19-21 0.64"	H12:51 H6:16	23.5	24.5	22.9	406	29
11	8/4	10:53	PC, H	7/25-27 0.01"	L12:14 L6:54	22.5	24.0	25.7	29	0
12	8/13	10:00	Cd, W	8/2-4 0.44"	H13:15 H8:34	*	21.3	26.3	174	0
13	8/17	11:26	F, R	8/11-13 1.35"	L14:46 H10:51	21.1	20.6	25.1	551	0
14	8/26	11:03	H	8/15-17 0.00"	L17:08 H6:54	28.3	26.1	26.4	0	0
15	8/31	13:14	PC, B	8/24-26 0.03"	L12:57 H11:00	30.8	23.2	28.1	0	0
				8/29-31	L17:17					
Seasonal Avg			Total	4.2"		21.6	22.1	24.7	305	104
				0.28"						

Boldface: Denotes exceedance of fecal coliform std. of 200 CFU/100 ml

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE OB-5 OAKWOOD BEACH

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	11:00	Cd,B	0.10"	L10:42 H17:00	15.0	17.5	21.9	29	0
2	6/4	10:59	H	0.00"	L5:11 H11:16	18.0	20.5	23.8	29	29
3	6/8	12:26	H	0.90"	L8:52 H15:05	22.5	22.5	21.0	551	29
4	6/16	10:38	PC,B	0.00"	H9:19 L15:28	21.0	22.0	23.0	174	0
5	6/23	10:47	PC,B	6/14-16 Trace	L8:08 H14:22	13.5	17.5	25.3	0	0
6	6/29	13:57	H,W	0.00"	L13:28 H19:49	19.0	22.0	25.2	58	0
7	7/7	11:48	Cl,B	0.43"	L8:23 H14:40	19.0	22.0	26.7	29	145
8	7/14	10:22	Cl,B	0.30"	H8:20 L14:25	22.0	23.0	25.9	0	0
9	7/21	11:01	PC,H	0.00"	L6:27 H12:51	24.0	25.0	26.7	638	29
10	7/27	11:49	PC	0.64"	H6:16 L12:14	23.0	23.0	23.4	29	0
11	8/4	10:40	PC,H	0.01"	L6:54 H13:15	22.0	24.5	26.2	261	87
12	8/13	9:48	Cd,W	8/2-4 0.44"	H8:34 L14:46	20.7	21.4	26.3	174	0
13	8/17	11:13	F,LR	8/11-13 1.35"	H10:51 L17:08	20.5	20.5	25.6	6264	290
14	8/26	10:49	H	0.00"	H6:54 L12:57	27.8	26.2	25.9	203	58
15	8/31	13:02	PC,W	8/24-26 0.03"	H11:00 L17:17	29.4	22.7	28.0	435	232
Seasonal Avg			Total	4.2" 0.28"		21.2	22.0	25.0	592	60

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform

✓
WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE GK-6 GREAT KILLS BEACH

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	10:42	Cd,B	0.10"	L10:42	14.5	17.0	21.9	0	29
2	6/4	10:41	H	5/25-27 0.00"	L5:11 H11:16	18.5	21.0	24.5	0	29
3	6/8	12:07	H	6/2-4 0.90"	L8:52 H15:05	22.0	23.5	20.6	1595	377
4	6/9	14:09		6/5-8 0.00"	L9:50 H16:04				116	116
5	6/16	10:20	PC,B	6/8-9 0.00"	H9:19 L15:28	21.5	22.5	23.2	58	87
6	6/23	10:29	PC,B	6/14-16 Trace	L8:08 H14:22	15.0	17.5	24.3	0	0
7	6/29	13:35	H,W	6/21-23 0.00"	L13:28 H19:49	20.0	25.0	24.8	116	29
8	7/7	11:30	Cl,B	6/27-29 0.43"	L8:23 H14:40	19.0	22.5	26.6	145	116
9	7/14	10:05	Cl,B	7/5-7 0.30"	H8:20 L14:25	22.0	23.5	25.4	0	0
10	7/21	10:43	PC,H	7/12-14 0.00"	L6:27 H12:51	23.0	25.5	26.6	1189	0
11	7/27	11:26	PC	7/19-21 0.64"	H6:16 L12:14	24.0	24.0	24.3	116	145
12	8/4	10:22	PC,H	7/25-27 0.01"	L6:54 H13:15	23.0	24.0	26.2	58	145
13	8/13	9:31	Cd,W	8/2-4 0.44"	H8:34 L14:46	20.5	21.5	26.0	609	0
14	8/17	10:58	F,R	8/11-13 1.35"	H10:51 L17:08	19.9	20.3	25.5	1421	174
15	8/26	10:32	H	8/15-17 0.00"	H6:54 L12:57	28.3	26.1	25.4	87	58
16	8/31	12:46	PC,W	8/24-26 0.03"	H11:00 L17:17	28.3	22.8	26.2	58	0
Seasonal Avg				Total		21.3	22.4	24.7	348	82
				4.2"						
				0.28"						

Boldface: Denotes exceedance of fecal coliform std. of 200 CFU/100 ml. GK6 is a bathing beach

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE CP-7 CROOKES POINT

<u>WK</u>	<u>DATE</u>	<u>TIME</u>	<u>COND</u>	<u>PRECIP</u>	<u>TIDE</u>	<u>AT</u>	<u>ST</u>	<u>SS</u>	<u>TOT</u>	<u>FEC</u>
1	5/27	10:30	Cd, B	0.10"	H4:27	15.0	17.5	22.2	0	0
2	6/4	10:30	H	5/25-27	L10:42					
				0.00"	L5:11	18.0	20.5	23.9	58	0
3	6/8	11:56	H	6/2-4	H11:16					
				0.90"	L8:52	23.0	23.0	21.0	1711	232
4	6/16	10:10	PC, B	6/5-8	H15:05					
				0.00"	H9:19	21.0	22.0	22.8	0	0
5	6/23	10:17	PC, B	6/14-16	L15:28					
				Trace	L8:08	15.0	18.5	24.0	29	0
6	6/29	13:22	H, W	6/21-23	H14:22					
				0.00"	H7:32	20.0	24.0	25.0	0	0
7	7/7	11:20	Cl, B	6/27-29	L13:28					
				0.43"	L8:23	19.0	22.0	26.8	58	29
8	7/14	9:54	Cl, B	7/5-7	H14:40					
				0.30"	H8:20	22.0	23.0	26.4	0	0
9	7/21	10:33	PC, H	7/12-14	L14:25					
				0.00"	L6:27	23.5	25.0	26.5	2465	29
10	7/27	11:16	PC	7/19-21	H12:51					
				0.64"	H6:16	25.0	24.0	24.5	58	0
11	8/4	10:12	PC, H	7/25-27	L12:14					
				0.01"	L6:54	22.5	24.0	25.9	29	29
12	8/13	9:20	Cd, W	8/2-4	H13:15					
				0.44"	H8:34	20.5	21.5	26.0	58	0
13	8/17	10:48	F, R	8/11-13	L14:46					
				1.35"	L4:49	20.5	20.1	25.2	2001	58
14	8/26	10:19	H	8/15-17	H10:51					
				0.00"	H6:54	29.4	25.9	25.4	0	0
15	8/31	12:37	PC, W	8/24-26	L12:57					
				0.03"	11:00	29.4	23.4	26.3	0	0
				8/29-31	17:17					
Seasonal Avg			Total	4.2"		21.5	22.3	24.8	431	25
				0.28"						

Boldface: Denotes exceedance of total coliform std. of 2400 CFU/100 ml or fecal coliform

WATER QUALITY DATA FOR STATEN ISLAND
MAY THROUGH AUGUST 1992
SITE GKM-8 GREAT KILLS MARINA

WK	DATE	TIME	COND	PRECIP	TIDE	AT	ST	SS	TOT	FEC
1	5/27	10:17	Cd,B	0.10"	H4:27	17.0	17.5	21.4	29	0
2	6/4	10:20	H	5/25-27	L10:42					
				0.00"	L5:11	20.0	21.2	22.9	0	58
3	6/8	11:46	H	6/2-4	H11:16					
				0.90"	L8:52	23.5	22.8	20.9	0	0
4	6/16	10:01	PC,B	6/5-8	H15:05					
				0.00"	H9:19	22.5	22.3	20.9	0	29
5	6/23	10:07	PC,B	6/14-16	L15:28					
				Trace	L8:08	22.0	18.5	22.5	58	87
6	6/29	13:12	H,W	6/21-23	H14:22					
				0.00"	H7:32	26.0	23.3	24.7	87	0
7	7/7	11:10	Cl,B	6/27-29	L13:28					
				0.43"	L8:23	24.0	21.7	25.7	0	0
8	7/14	9:40	Cl,B	7/5-7	H14:40					
				0.30"	H8:20	26.0	25.1	25.5	232	0
9	7/21	10:23	PC,H	7/12-14	L14:25					
				0.00"	L6:27	33.5	25.8	25.4	0	58
10	7/28	11:06	PC	7/19-21	H12:51					
				0.64"	H6:16	29.5	24.3	24.1	348	29
11	8/4	10:02	PC,H	7/25-27	L12:14					
				0.01"	L6:54	26.0	24.8	25.0	0	0
12	8/13	9:10	Cd,W	8/2-4	H13:15					
				0.44"	H8:34	21.5	24.4	25.3	58	0
13	8/17	10:37	F,LR	8/11-13	L14:46					
				1.35"	L4:49	22.2	21.1	25.5	87	0
14	8/26	10:07	H	8/15-17	H10:51					
				0.00"	H6:54	27.8	25.7	24.6	0	0
15	8/31	12:25	PC,W	8/24-26	L12:57					
				0.03"	H11:00	29.4	24.5	25.7	696	29
				8/29-31	L17:17					
Seasonal Avg			Total	4.2"		24.7	22.8	24.0	106	19
				0.28"						

APPENDIX C

WATER QUALITY DATA FOR SANDY HOOK

TOTAL AND FECAL COLIFORM CONCENTRATIONS
FOR SANDY HOOK
MAY TO SEPTEMBER 1992

WK	DATE	SH-1			SH-2			SH-3			SH-4			SH-5			SH-6		
		TOT	FEC		TOT	FEC		TOT	FEC		TOT	FEC		TOT	FEC		TOT	FEC	
1	5/27	29	0		0	0		0	0		0	0		0	0		29	145	
2	6/3	261	116		0	0		0	0		29	0		0	0		0	0	
3	6/10	145	87		0	0		29	0		0	58		58	0		29	29	
4	6/17	0	0		0	29		0	0		0	29		0	0		29	0	
5	6/24	87	29		58	0		0	0		0	0		0	0		87	87	
6	7/1	29	58		58	0		0	0		0	0		0	0		0	0	
7	7/8	0	0		29	0		0	29		0	29		0	0		58	87	
8	7/15	87	203		232	145		0	0		29	0		29	0		0	0	
9	7/22	58	29		0	29		29	0		0	0		58	0		203	58	
10	7/29 7/30	232	0		261	29		3480 174	0		87	29		29	0		2001	522	
11	8/5	29	0		29	29		174	29		0	29		0	0		261	87	
12	8/12	1392	0		203	0		116	0		58	0		58	0		87	0	
13	8/19	1015	145		87	29		0	0		58	0		33	29		58	319	
14	8/26	174	58		174	58		0	0		0	0		0	0		0	0	
15	9/2	29	0		58	87		0	0		0	0		0	0		203	29	
Seasonal Avg		238	48		79	29		250	4		17	12		18	2		203	91	

Boldface: Denotes exceedance of fecal coliform std. of 50 CFU/100 ml (SE1 NJ std.)
Sites SH-3, SH-4, SH-5 are bathing beaches

APPENDIX D

WATER QUALITY DATA FOR BREEZY POINT

TOTAL AND FECAL COLIFORM CONCENTRATIONS
FOR BREEZY POINT
MAY THROUGH AUGUST 1992



ATL-1

ATL-2

<u>WEEK</u>	<u>DATE</u>	<u>PRECIP</u>	<u>TIME</u>	<u>TIDE</u>	<u>TOT</u>	<u>FEC</u>	<u>TIME</u>	<u>TIDE</u>	<u>TOT</u>	<u>FEC</u>
1	5/26	0.12"	12:50	L9:51	174	203	13:15	L9:51	0	0
		5/26-27		H16:06				H16:06		
	5/27	0.12"	13:35	L10:36	0	0				
		5/26-27		H17:00						
2	6/3	0.00"	10:44	H10:20	0	0	11:07	H10:20	0	0
		6/1-3		L16:17				L16:17		
3	6/10	0.00"	13:06	L10:36	0	29	13:32	L10:36	29	0
		6/8-10		H17:04				H17:04		
4	6/16	0.00"	13:04	H9:19	0	0	13:30	H9:19	0	0
		6/14-16		L15:22				L15:22		
5	6/23	Trace	14:41	H14:22	0	0	15:00	H14:22	0	0
		6/21-23		L20:51				L20:51		
6	7/1	0.00"	11:27	H9:12	0	0	11:58	H9:12	0	0
		6/29-7/1		L15:13				L15:13		
7	7/8	0.21"	11:10	L9:15	0	0	10:50	L9:15	29	0
		7/6-8		H15:37				H15:37		
8	7/14	0.30"	15:05	L14:19	29	0	15:29	L14:19	0	0
		7/12-14		H20:33				H20:33		
9	7/21	0.00"	13:38	H12:51	0	58	14:17	H12:51	0	29
		7/19-21		L18:56				L18:56		
10	7/29	0.10"	11:09	H8:04	0	0	10:49	H8:04	0	0
		7/27-29		L14:03				L14:03		
11	8/5	0.02"	11:38	L7:43	0	0	11:19	L7:43	0	0
		8/3-5		H14:10				H14:10		
12	8/10	0.36"	*		0	0	*		0	0
		8/8-10								
13	8/18	2.65"	9:34	L5:10	29	0	9:11	L5:10	29	0
		8/16-18		H11:30				H11:30		
14	8/25	0.00"	9:27	H5:57	29	0	9:05	H5:57	0	0
		8/23-25		L11:53				L11:53		
15	8/31	0.03"	14:03	H11:00	29	116	13:43	H11:00	0	0
		8/29-31		L17:11				L17:11		

Total: 3.79"

Ssnl. Avg: 0.25" 18 25 6 2

Boldface: Denotes exceedance of fecal coliform std. of 200 CFU/100 ml

ATL 1 & ATL 2 are bathing beaches

APPENDIX E

CHLOROPHYLL A DATA FOR JAMAICA BAY & STATEN ISLAND

CHLOROPHYLL A FOR JAMAICA BAY
MAY TO AUGUST 1992



WEEK 1 - 5/28/92

RI-3	5.8396
MPB-4	9.382
JB-5	10.804
JB-6	11.2408
JB-6A	7.0916
JB-7	8.3154
JB-8	12.5554
JB-9	15.5748
JB-10	13.5974
JB-11	14.0896
JB-12	10.3102
JB-13	13.268
JB-14	13.4632 (5/27)

WEEK 4 - 6/15/92

RI-3	3.3054
MPB-4	9.3622
JB-5	13.1336
JB-6	22.3806
JB-6A	20.5368
JB-7	20.6094
JB-8	20.3416
JB-9	18.7536
JB-10	18.5474
JB-11	15.5116
JB-12	32.1922
JB-13	15.6252
JB-14	11.9612 (6/16)

WEEK 8 - 7/13/92

RI-3	0.1626
MPB-4	6.804
JB-5	5.601
JB-6	9.0944
JB-6A	3.2342
JB-7	6.7876
JB-8	10.9422
JB-9	7.0404
JB-10	7.5192
JB-11	7.6354
JB-12	7.7792
JB-13	7.3002
JB-14	20.4636 (7/14)

WEEK 13 - 8/19/92

RI-3	1.8526
MPB-4	1.885
JB-5	1.3382
JB-6	4.116
JB-6A	4.1886
JB-7	4.1886
JB-8	2.2574
JB-9	1.0182
JB-10	3.2618
JB-11	2.1108
JB-12	3.2958
JB-13	4.447
JB-14	0.3072 (8/18)

UNITS: mg/m³

CHLOROPHYLL A FOR STATEN ISLAND
MAY TO AUGUST 1992

WEEK 1 - 5/27/92

SB-2	18.3592
MB-3	2.0974
NDB-4	8.9096
OB-5	9.1466
GK-6	11.4162
CP-7	9.8252
GKM-8	7.0428

WEEK 4 - 6/16/92

SB-2	4.255
MB-3	7.3146
NDB-4	8.4476
OB-5	9.0944
GK-6	10.6154
CP-7	11.2582
GKM-8	4.9466

WEEK 9 - 7/21/92

SB-2	2.0074
MB-3	8.3968
NDB-4	9.2832
OB-5	6.9874
GK-6	8.757
CP-7	11.4406
GKM-8	8.385

WEEK 13 - 8/17/92

SB-2	0.4368
MB-3	0.4336
NDB-4	2.2648
OB-5	3.2586
GK-6	6.5166
CP-7	6.7844
GKM-8	8.432

UNITS: mg/m³

APPENDIX F

CONDUCTIVITY DATA FOR JAMAICA BAY AND STATEN ISLAND

**CONDUCTIVITY FOR JAMAICA BAY
MAY TO SEPTEMBER 1992**

WK	DATE	RI3	MPB4	JB5	JB6	JB6A	JB7	JB8	JB9	JB10	JB11	JB12	JB13	JB14
1	5/28	SUR: 34.4	34.3	33.8	32.8	31.6	34.1	33.8	33.6	33.5	34.3	34.9	34.8	34.3
		BOT: 34.1	33.9	34.1	33.2	33.7	34.0	28.9	30.4	33.3	34.2	34.9	32.9	
2	6/1	SUR: 34.7	34.9	35.1	33.7	31.9	33.1	32.8	32.6	32.6	34.0	34.3	33.6	35.1
		BOT: 34.9	34.7	34.9	34.4	34.4	32.2	31.9	29.5	31.7	33.8	34.5	34.0	
3	6/9	SUR: 36.4	36.5	36.3	35.6	35.4	35.4	35.3	35.4	35.1	36.3	36.7	36.0	39.8
		BOT: 35.8	35.2	36.2	36.1	36.0	35.4	33.7	33.4	36.0	35.4	35.3	35.1	
4	6/15	SUR: 36.6	37.3	37.7	37.8	36.2	37.5	36.9	36.8	36.6	37.7	37.8	37.2	36.7
		BOT: 37.1	37.6	36.6	37.7	37.8	36.3	36.1	33.8	37.1	37.4	36.8	37.4	
5	6/22	SUR: 34.9	35.7	36.6	36.6	36.0	36.2	36.0	35.4	35.1	35.8	36.8	36.4	35.1
		BOT: 34.9	35.7	35.8	36.9	35.7	36.2	35.9	36.0	35.4	36.6	37.0	36.8	
6	6/30	SUR: 37.1	37.2	37.7	37.7	37.4	37.3	36.7	35.9	36.9	37.7	37.8	37.1	39.7
		BOT: 36.7	37.1	37.4	37.5	37.8	37.2	30.1	36.4	34.9	37.2	36.9	36.2	
7	7/6	SUR: 39.1	39.1	39.3	37.9	37.3	37.4	37.2	36.5	36.4	39.0	38.3	36.8	40.7
		BOT: 38.8	39.1	39.3	38.9	36.3	35.6	37.4	33.4	34.3	37.7	38.2	38.2	
8	7/13	SUR: 39.2	39.7	40.1	39.4	35.8	38.6	38.6	37.6	37.9	39.1	39.5	39.3	42.7
		BOT: 40.4	40.5	38.2	40.5	39.9	38.5	39.2	36.6	38.5	40.1	39.5	38.6	
9	7/20	SUR: 40.8	41.8	42.0	40.7	40.4	39.8	39.3	38.9	38.8	41.5	40.7	39.0	43.7
		BOT: 40.6	42.0	41.2	40.0	40.3	38.6	39.8	39.1	36.4	41.3	35.4	38.8	
10	7/28	SUR: 42.4	41.1	40.2	39.3	39.3	38.8	38.7	38.6	38.4	39.5	39.9	39.4	39.4
		BOT: 42.4	41.0	39.7	39.6	38.6	34.9	39.0	38.8	37.6	39.4	37.8	38.0	
11	8/3	SUR: 40.6	40.7	41.3	40.3	39.8	39.1	38.3	38.4	38.4	40.4	39.6	38.6	41.3
		BOT: 39.7	38.6	41.1	38.8	38.8	39.1	38.4	35.2	38.8	39.5	35.4	38.7	
12	8/10	SUR: 40.7	40.8	40.5	37.7	36.6	38.8	38.5	38.3	38.1	39.6	39.9	38.7	41.8
		BOT: 38.4	36.6	38.8	40.1	39.7	38.9	39.5	37.1	39.8	40.6	40.4	38.9	
13	8/19	SUR: 38.7	38.8	38.9	36.1	35.3	35.6	35.2	35.5	35.1	37.3	33.7	33.6	30.5
		BOT: 38.7	39.5	38.9	38.1	36.3	37.3	36.7	36.9	37.8	37.5	38.1	37.7	
14	8/24	SUR: 40.4	39.1	38.7	36.3	36.7	36.7	36.6	36.3	36.5	36.7	36.3	36.3	40.5
		BOT: 40.3	38.7	39.2	38.3	37.2	36.7	36.9	36.7	36.7	36.5	37.9	36.2	
15	9/3	SUR: 39.3	39.4	39.4	38.2	38.2	37.0	36.3	35.9	37.6	38.7	37.9	37.7	39.2
		BOT: 38.9	38.6	39.1	39.4	34.9	38.9	37.8	37.3	37.6	37.5	38.7	36.9	

UNITS: millimhos/cm

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CONDUCTIVITY FOR STATEN ISLAND
MAY THROUGH AUGUST 1992

<u>WK</u>	<u>DATE</u>		<u>SB2</u>	<u>MB3</u>	<u>NDB4</u>	<u>OB5</u>	<u>GK6</u>	<u>CP7</u>	<u>GKM8</u>
1	5/27	SUR:	29.4	28.9	28.2	28.2	28.3	28.6	27.9
2	6/4	SUR:	29.6	31.0	31.0	33.3	34.3	33.5	32.4
3	6/8	SUR:	29.2	29.3	29.3	31.3	31.2	31.4	30.7
4	6/16	SUR:	33.2	33.6	33.3	32.9	33.2	33.3	30.8
5	6/23	SUR:	33.1	32.4	33.9	33.8	32.4	32.8	30.9
6	6/29	SUR:	35.9	37.2	34.7	37.0	37.6	37.2	36.3
7	7/7	SUR:	35.9	36.2	37.8	38.4	38.6	38.5	37.0
8	7/14	SUR:	38.7	39.5	40.1	39.4	38.0	39.2	38.9
9	7/21	SUR:	37.0	39.7	40.1	41.2	41.0	40.4	39.0
10	7/27	SUR:	38.4	37.7	35.7	35.2	36.7	36.6	36.1
11	8/4	SUR:	37.5	39.5	38.8	39.5	39.7	39.0	37.6
12	8/13	SUR:	35.7	36.6	37.0	37.1	36.7	36.7	37.9
13	8/17	SUR:	34.2	35.1	34.9	35.4	35.1	34.8	35.9
14	8/24 ²⁶	SUR:	38.9	39.5	40.4	39.5	39.0	38.8	37.5
15	8/31	SUR:	40.0	40.1	40.5	40.0	37.7	38.1	38.1

UNITS: millimhos/cm

