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Paerdegat Basin CSO Facility and Improved Water Quality

URBAN RESILIENCE IN AN ERA OF CLIMATE CHANGE
KINGSBOROUGH COMMUNITY COLLEGE

October 17, 2013

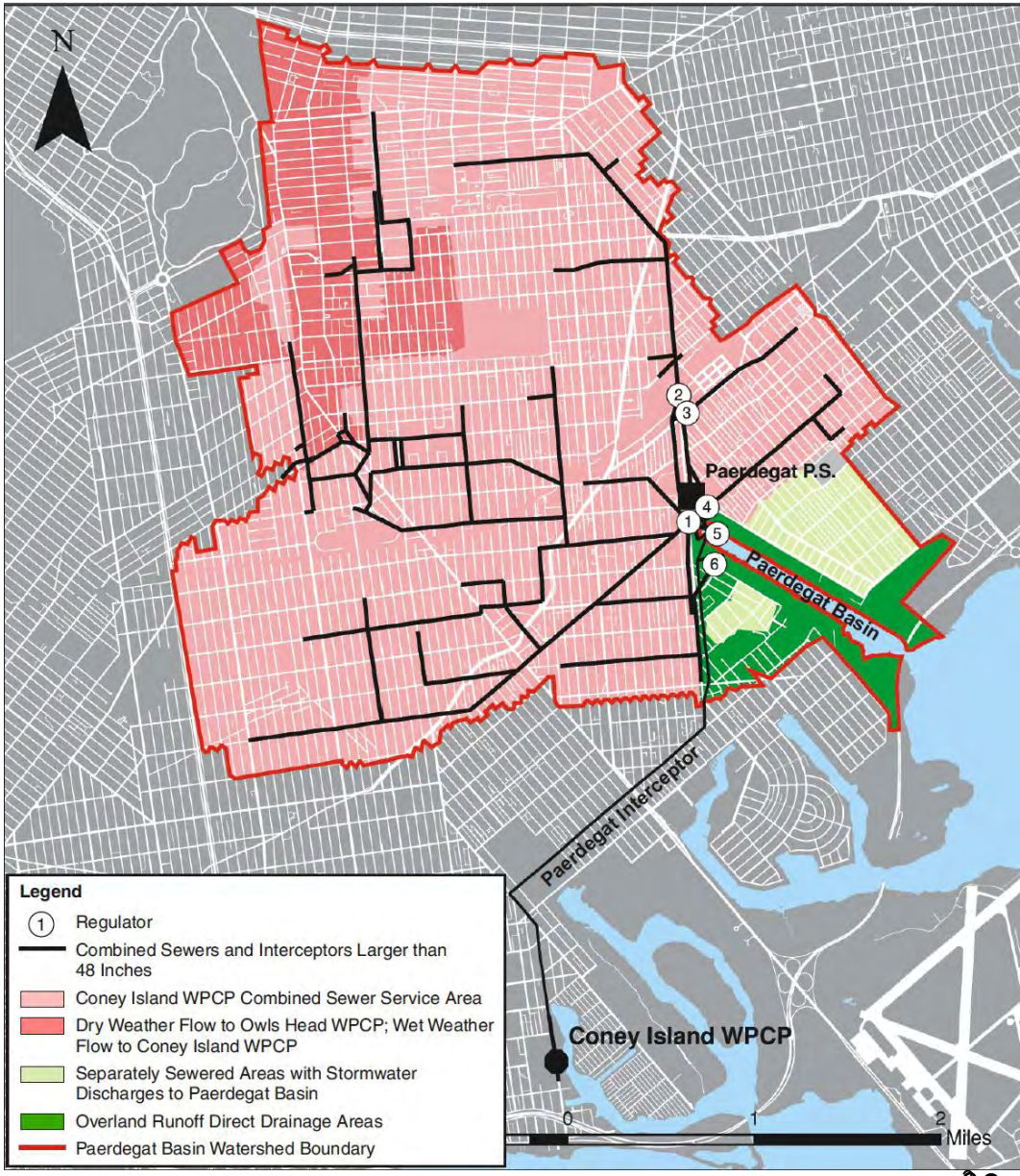
Presentation Overview

- Pre-CSO Retention Facility Conditions
- Proposed Facility Plan Projects and Goals
- Construction of Proposed CSO Projects
- Operation of the CSO Facility
- Post-CSO Retention Facility Conditions
- Overview of Upcoming Dredging Project

Paerdegat Basin Drainage Area

Description:

- Drainage area 6,825 Acres
- 90% of drainage area served by combined sewers
- Regulators 2, 3, and 4 connected to interceptor via Paerdegat PS
- Regulators 1 and 6 connected directly to interceptor
- 3 CSO Outfalls and 5 Stormwater Outfalls
- Estimated 2.7 billion gallons of CSO and 240 million gallons of stormwater discharged annually



Paerdegat Basin Characteristics

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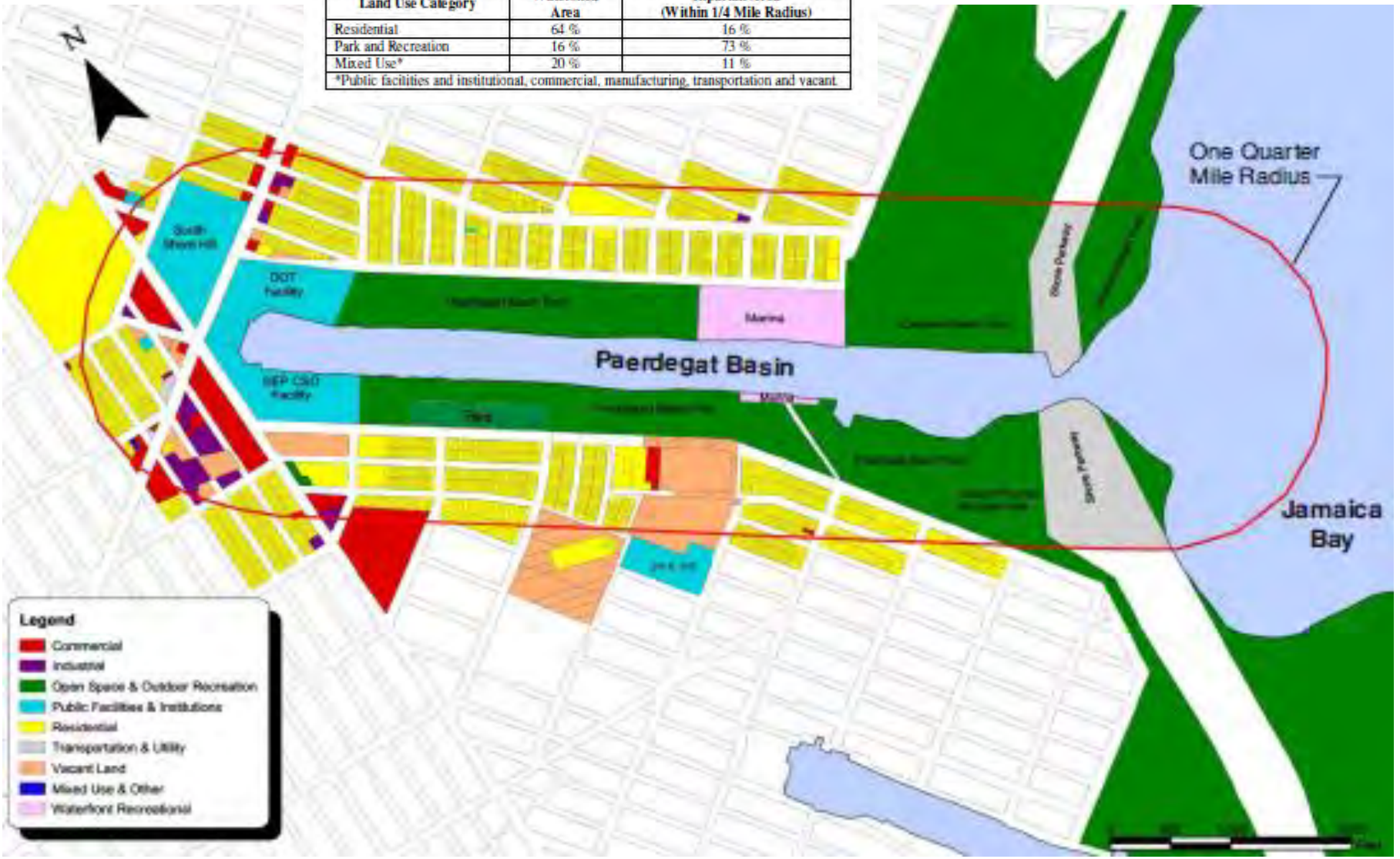
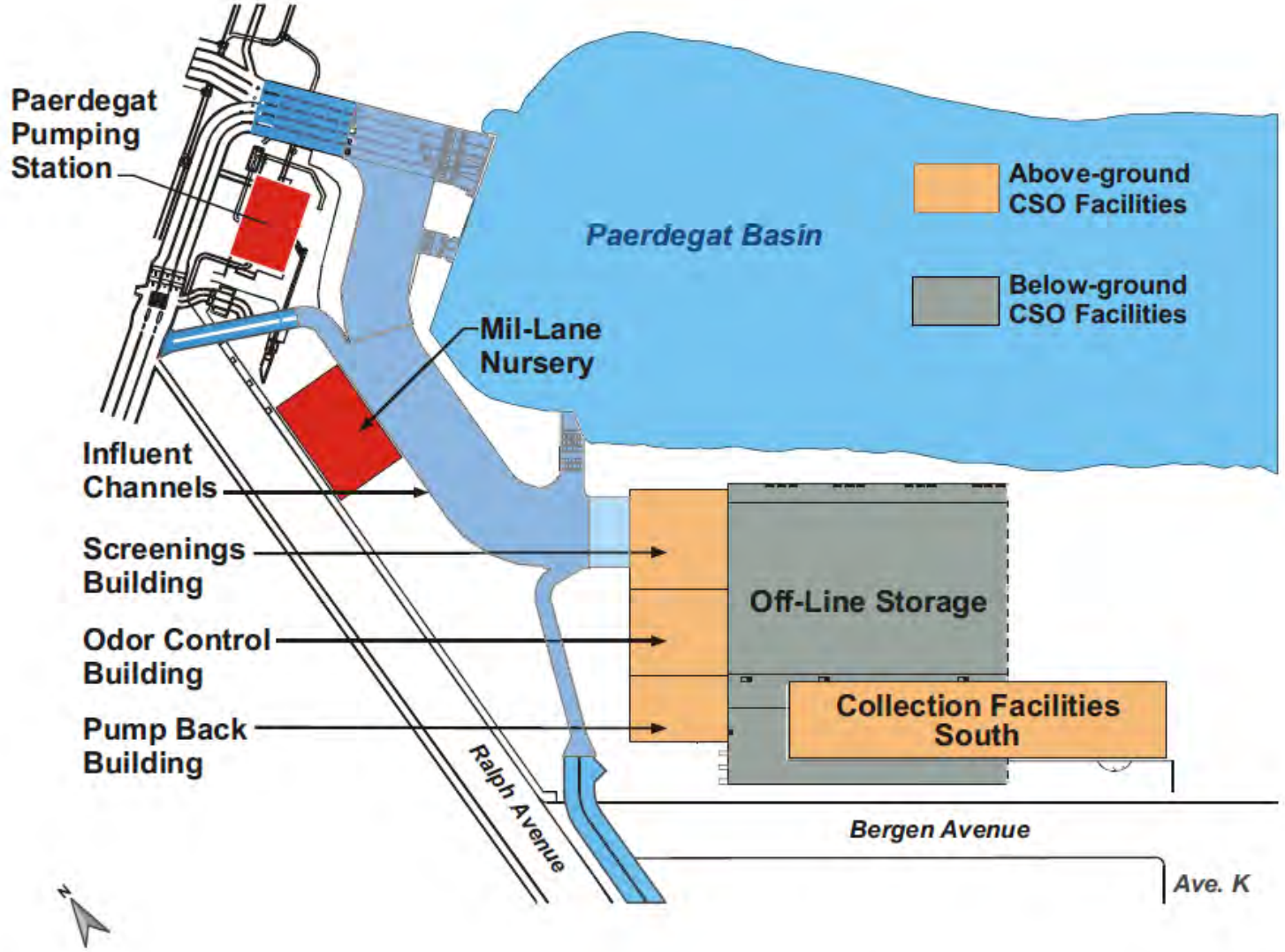
Table 2-1. Paerdegat Basin Land Use Summary by Category

Land Use Category	Watershed Area	Riparian Area (Within 1/4 Mile Radius)
Residential	64 %	16 %
Park and Recreation	16 %	73 %
Mixed Use*	20 %	11 %

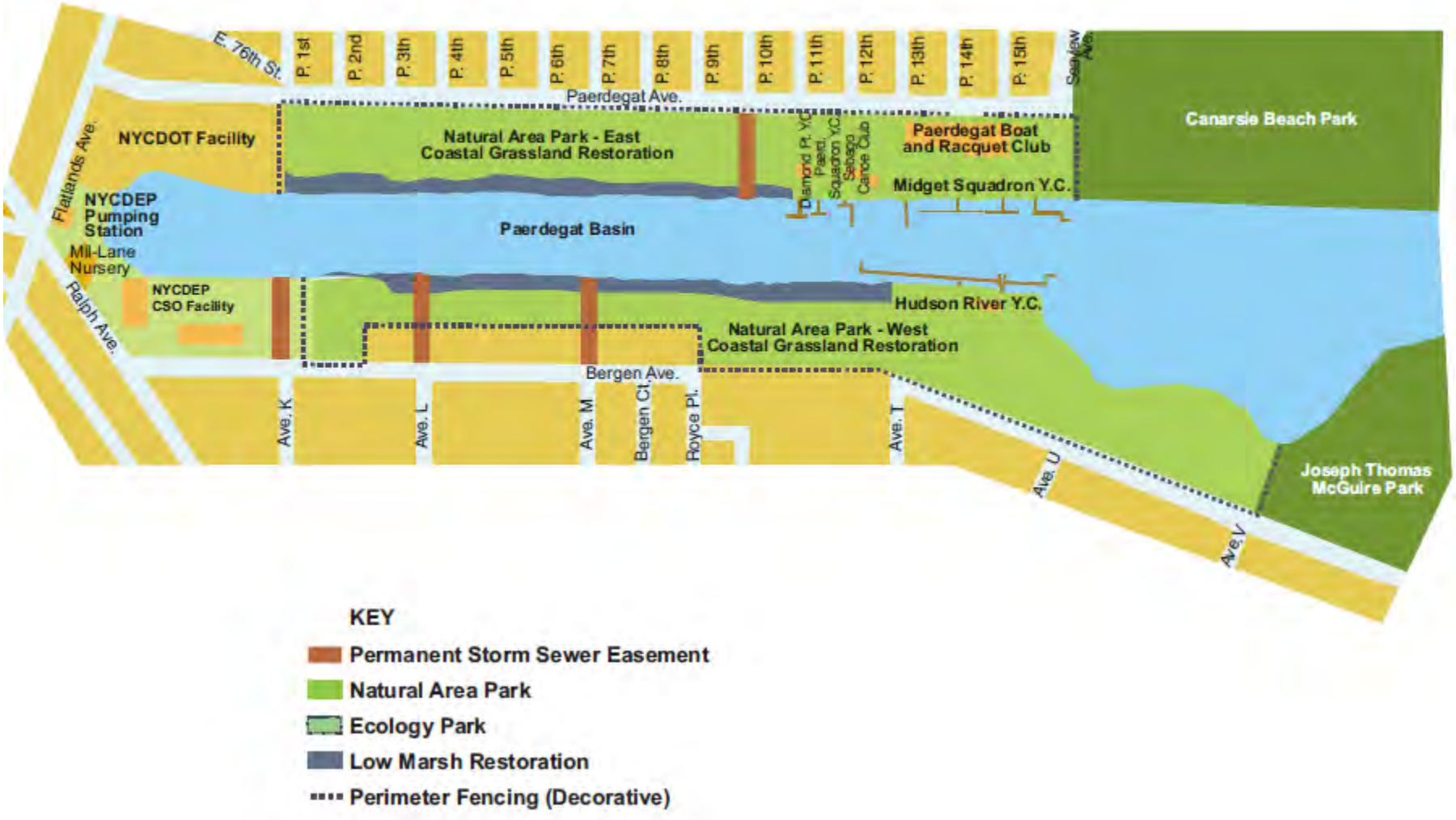
*Public facilities and institutional, commercial, manufacturing, transportation and vacant.



Proposed CSO Retention Facility



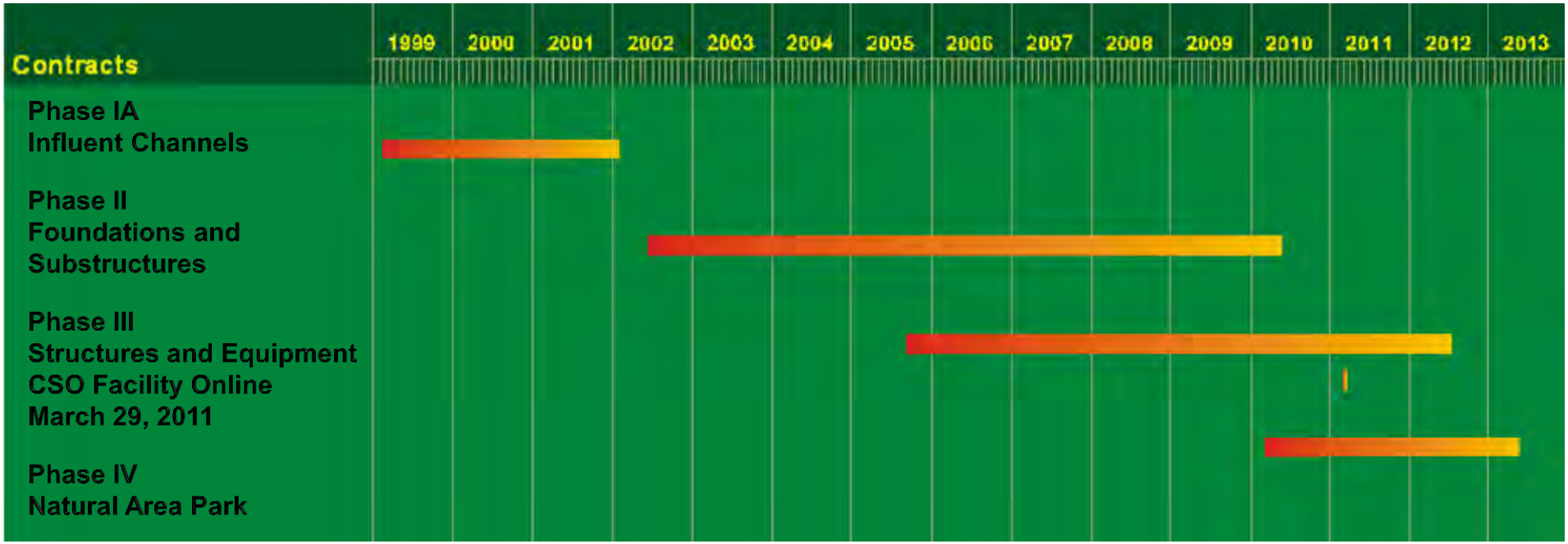
Proposed Riparian Improvements



Project Goals & Elements of the Plan

Project Goals	Elements of the Plan
• Improve Water Quality through Cost-Effective CSO Abatement • Compliance with NYSDEC Water Quality Standards for D.O. and Coliform Bacteria • CSO Capture 60% • BOD Reduction 70% • TSS Reduction 80% • Maximize Use of Existing Facilities	• Off-line 30 MG CSO Retention Facility • In-line Sewer Storage of up to 20 MG • Optimize Regulator Settings • Dredge Accumulated Sediments from the Basin • Restore Paerdegat Basin Wetland Areas

Construction Schedule



Slurry Wall and Tank Construction

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Influent CSO Channels

Above Ground Facilities

Completed CSO Facility

Wetland Restoration Work

Sustainable Facility Design

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New Public Esplanade

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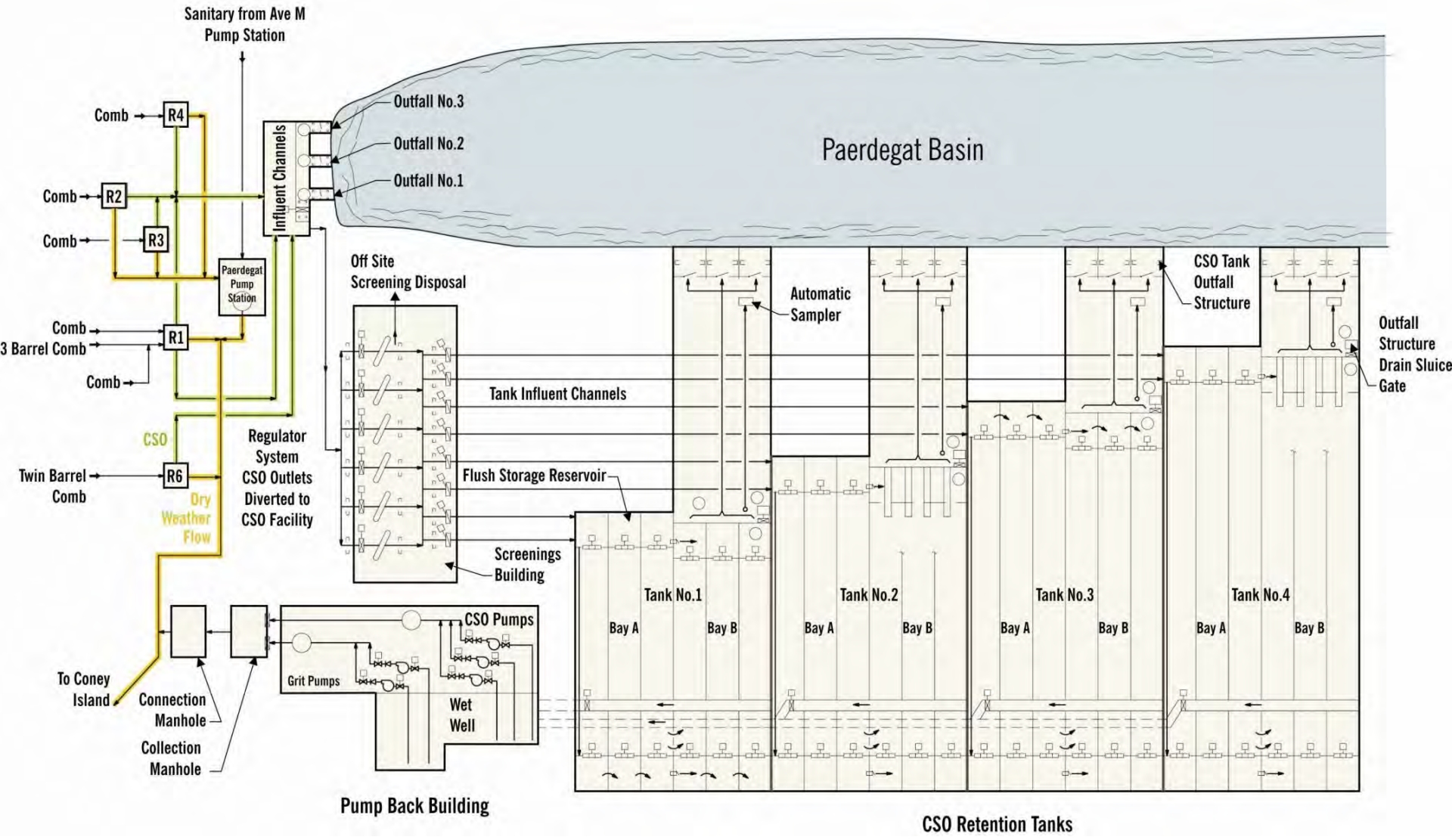
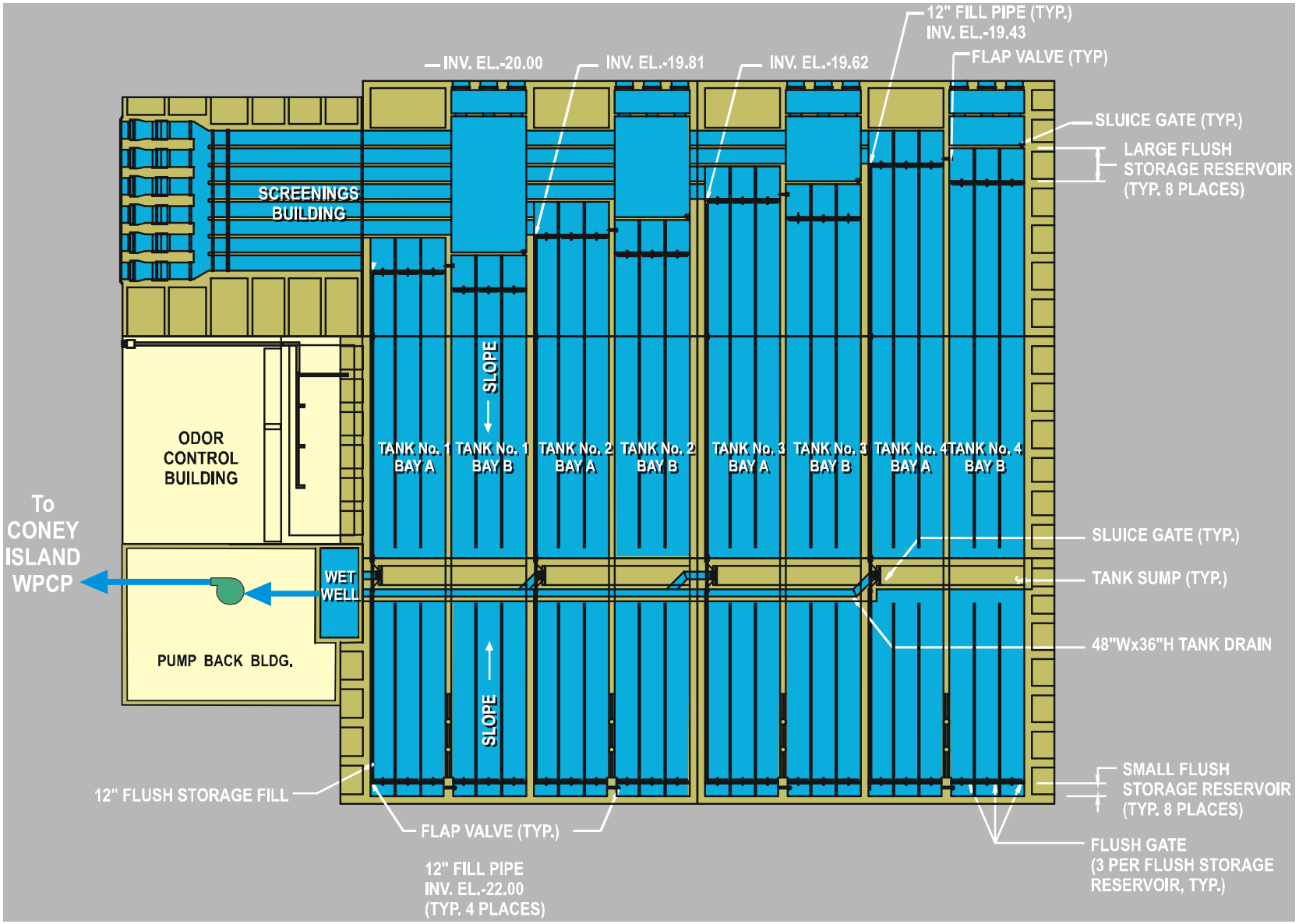
CSO Facility Operation and Major Components

Facility Operations	Major Components
• Operate During Wet Weather Only • Screen All Incoming Flow • Hold Flow for Subsequent Treatment at Coney Island WPCP • Pump CSO to the Interceptor for Gravity Flow to Coney Island • Flush Tanks Clean After Each Storm Event • Odor Control (Carbon Vessels) 24/7	• Influent Channels • CSO Retention Tanks: 4 Tanks • Screenings Building: 6 Screens • Pump Back Building: 3 CSO, 2 Grit Pumps • Odor Control Building: 5 Carbon Vessels • Crew Facility with Add-On Space for Community Board #18

Process Flow Diagram



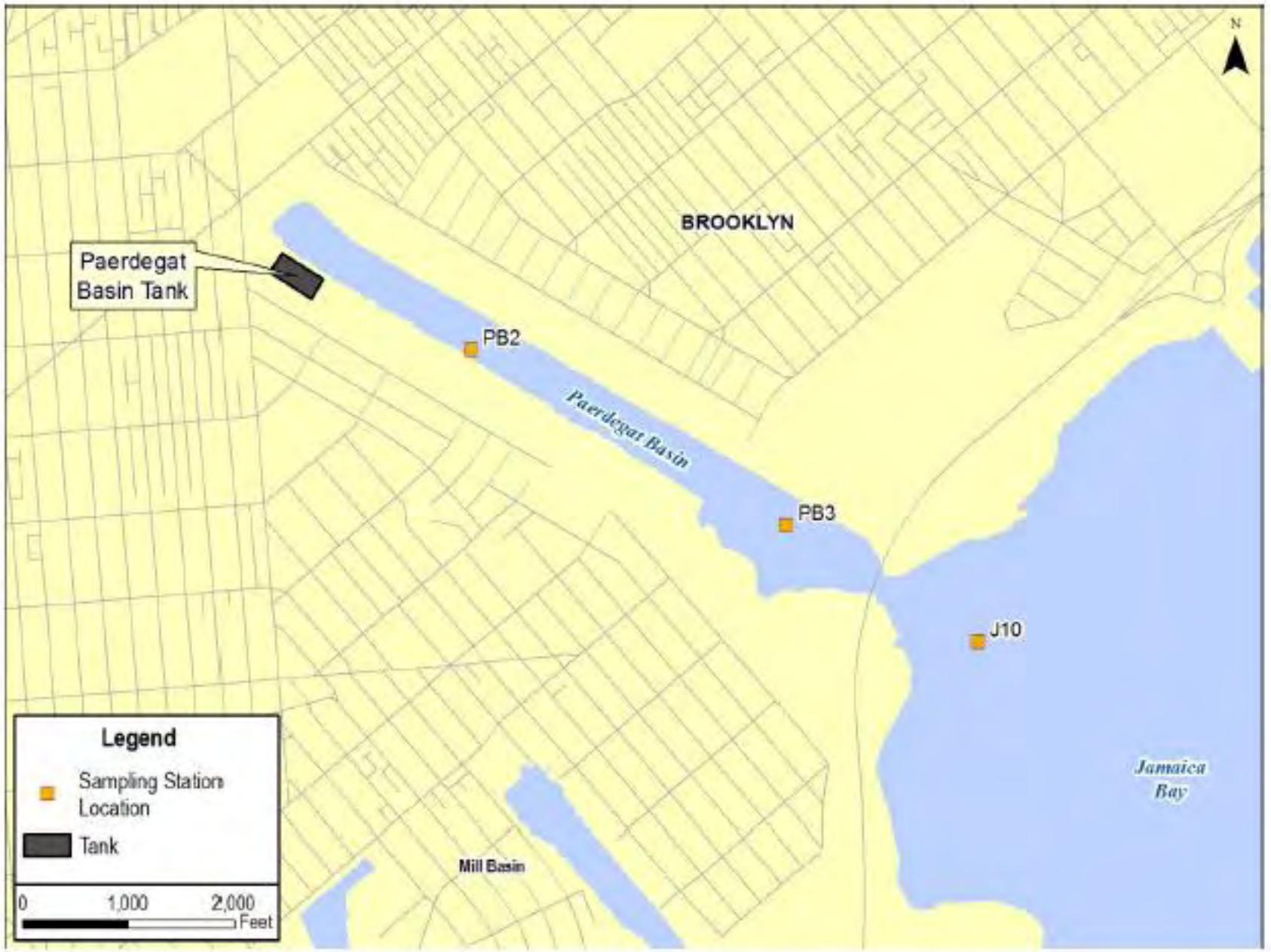
CSO Storage Tanks



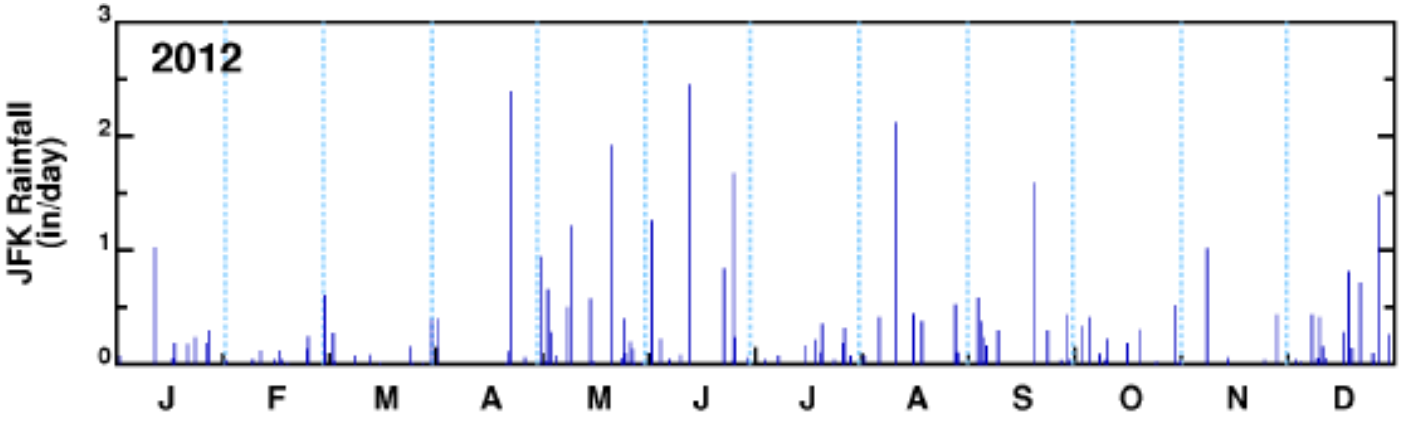
Tank Flushing - Components

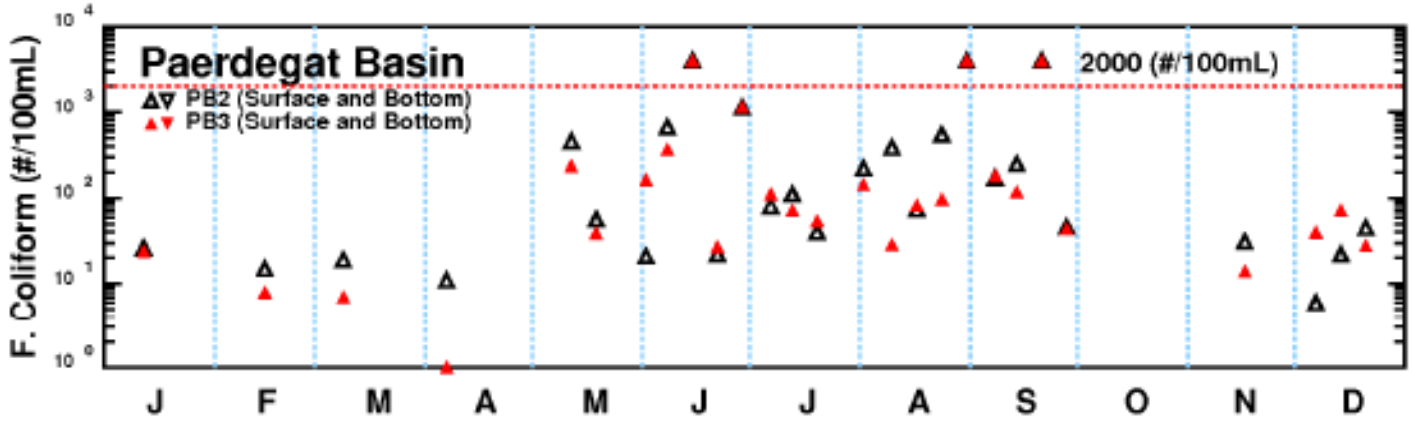
- One flushing system per tank
- Flushing System :
  - 12 Flush Storage Reservoirs
  - 12 Gates with latches
  - Hydraulic cylinder to unlatch gate
  - Hydraulic lines to cylinders
  - A hydraulic power pack and fluid reservoir controlled by LCP

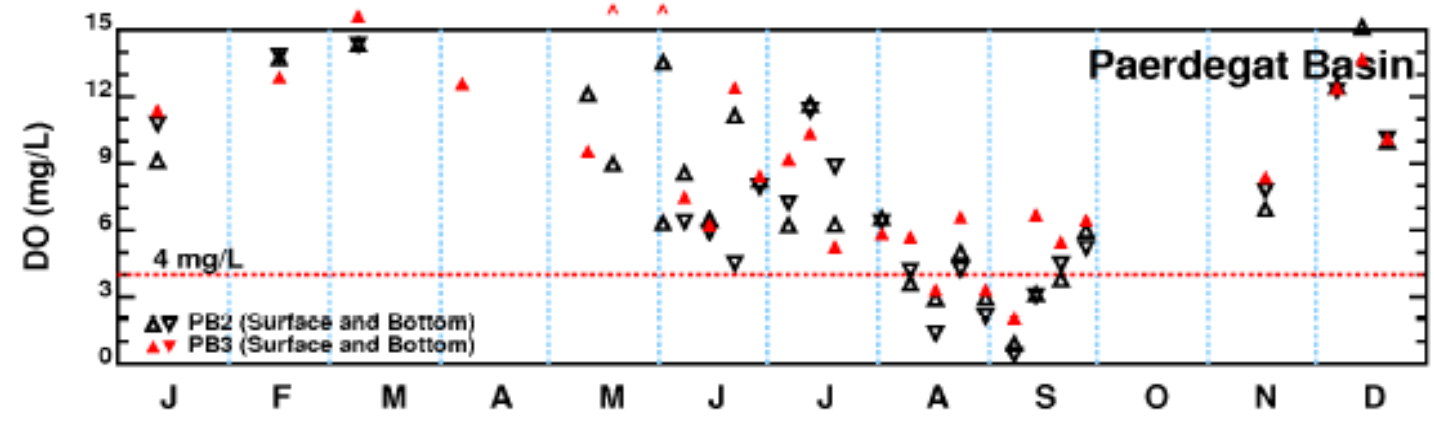
Harbor Survey Sample Locations



Harbor Survey Sample Results (2012)







CY2012 Fecal Reductions

Month	Model-Calculated Fecal Coliform (MGM, cells/100 mL) Station PB2			Model-Calculated Fecal Coliform (MGM, cells/100 mL) Station PB3			Model-Calculated Fecal Coliform (MGM, cells/100 mL) Station J10		
	With Tank	With-out Tank	Percent Reduction[1]	With Tank	With-out Tank	Percent Reduction[1]	With Tank	With-out Tank	Percent Reduction[1]
Jan	45	251	82	21	75	72	13	37	65
Feb	24	99	76	10	26	62	6	11	45
Mar	18	55	67	9	22	59	6	12	50
Apr	16	96	83	11	34	68	8	18	56
May	188	1,067	82	88	395	78	47	167	72
Jun	114	280	59	49	98	50	27	49	45
Jul	11	41	73	5	14	64	3	7	57
Aug	16	79	80	10	31	68	7	16	56
Sep	30	266	89	15	62	76	9	27	67
Oct	29	131	78	14	38	63	8	18	56
Nov	14	123	89	7	33	79	5	16	69
Dec	168	965	83	71	322	78	39	146	73

[1] Percent reduction in concentrations based on change from "without-tank" to "with-tank" condition.

Overview of CY 2012 Performance

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Paerdegat Basin CSO Retention Facility on Discharges to Paerdegat Basin, 2012

Parameter	Discharges to Paerdegat Basin[1]		
	Without Tank	With Tank	Percent Reduction With Tank
Overflow Events (count)[2]	93	12	87
Volume (MG)	1,326	610	54
BOD_5 (lb)[3]	331,269	142,762	57
TSS (lb)[3]	318,045	137,451	57
Fecal Coliform (cells)[3]	25.5E+15	10.4E+15	59

(1) Includes discharges from CI-004, CI-005, CI-006, and tank overflow.

(2) Event counts reflect number of storms during which an overflow occurs from the tank or, in the without-tank condition, from tributary regulators.

(3) Based on application of InfoWorks-calculated sanitary/stormwater fractions of discharges, with sanitary –sewage concentrations of 140 mg/L BOD5, 130 mg/L TSS, and 4.0E+06 cells/100mL Fecal Coliform, and stormwater concentrations of 15 mg/L BOD5, 15 mg/L TSS, and 3.5E+05 cells/100mL Fecal Coliform.

CY2012 Floatables Capture

Month	Collected Screenings (cubic yards)
January	108
February	90
March	54
April	32
May	126
June	154
July	34
August	168
September	82
October	80
November	32
December	26
Annual Total	**986**
Average per Month	**82**

Upcoming Environmental Dredging Project

- Long Term Control Plan
- Consent Order Project

- DEP is required to conduct environmental dredging in several waterbodies around NYC to abate odor and improve aesthetics

Dredge Area Extended, Head End