



Gowanus Canal Combined Sewer Overflow Long Term Control Plan

Public Kickoff Meeting

Public School 32
November 19, 2014

Welcome & Introductions

Eric Landau
Associate Commissioner
DEP

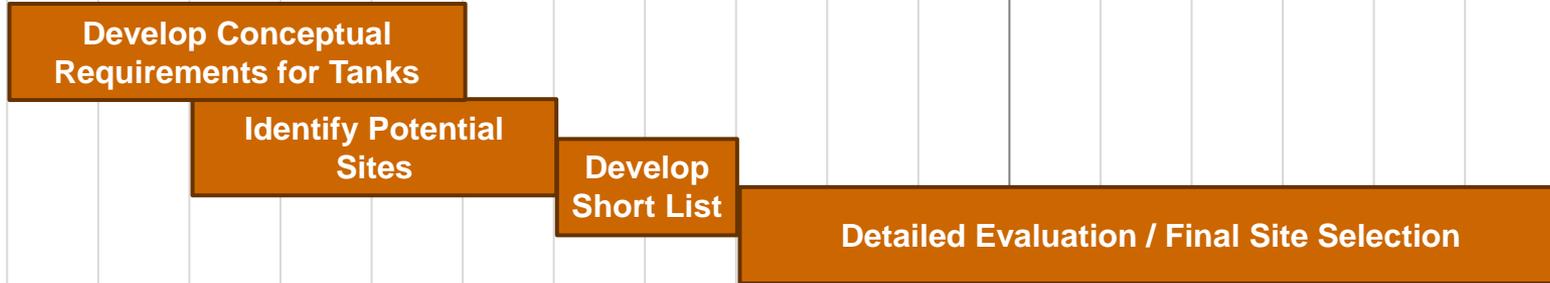
Concurrent DEP Initiatives

2014

2015

Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sept

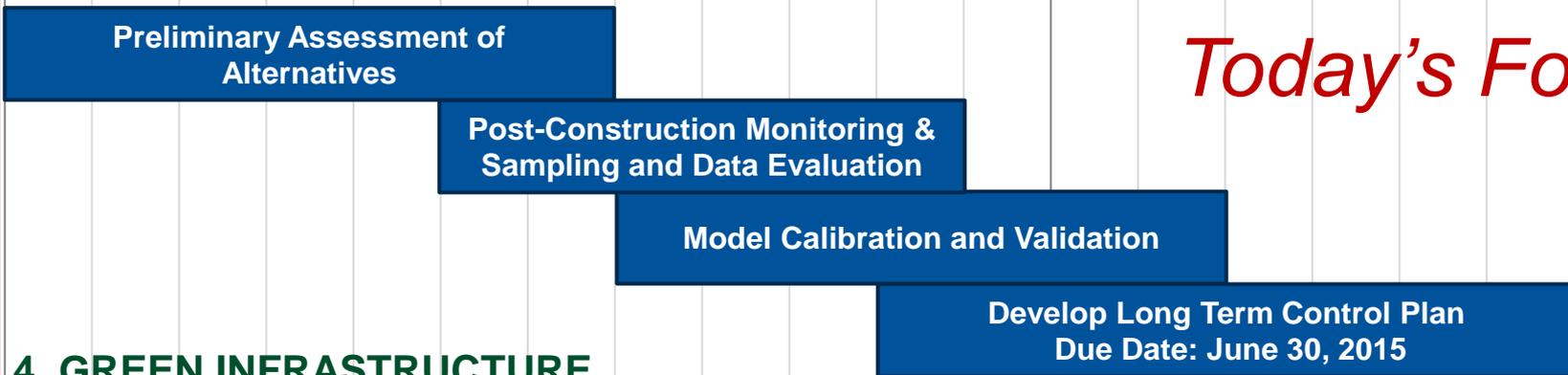
1. SUPERFUND WORK



2. HIGH LEVEL STORM SEWERS



3. LONG TERM CONTROL PLAN



Today's Focus

4. GREEN INFRASTRUCTURE



➤ **Goal:**

- Raise awareness, foster understanding, and encourage input on LTCP development

➤ **Activities:**

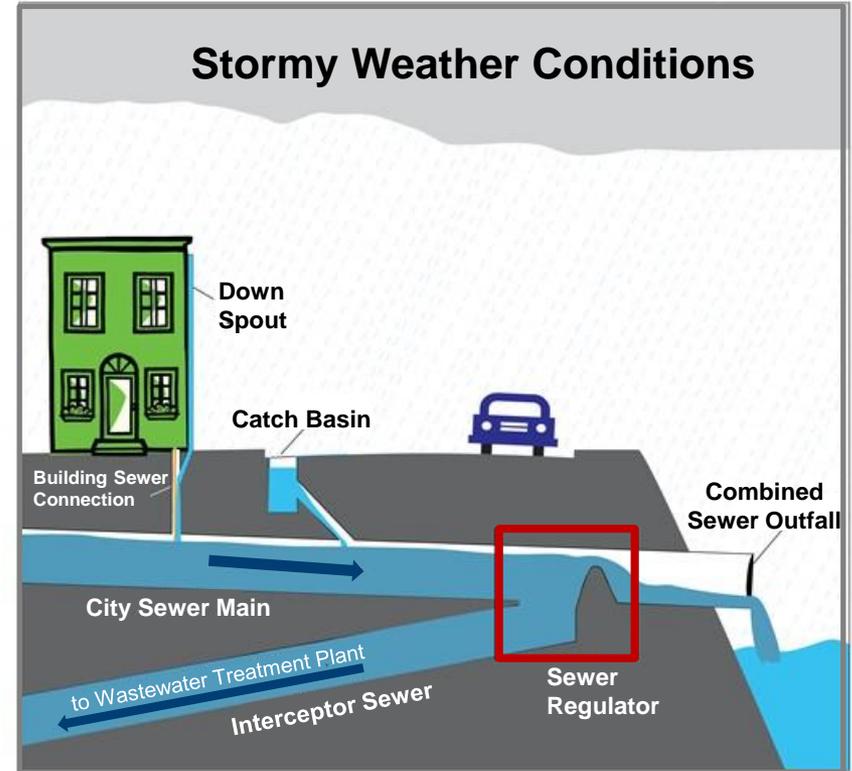
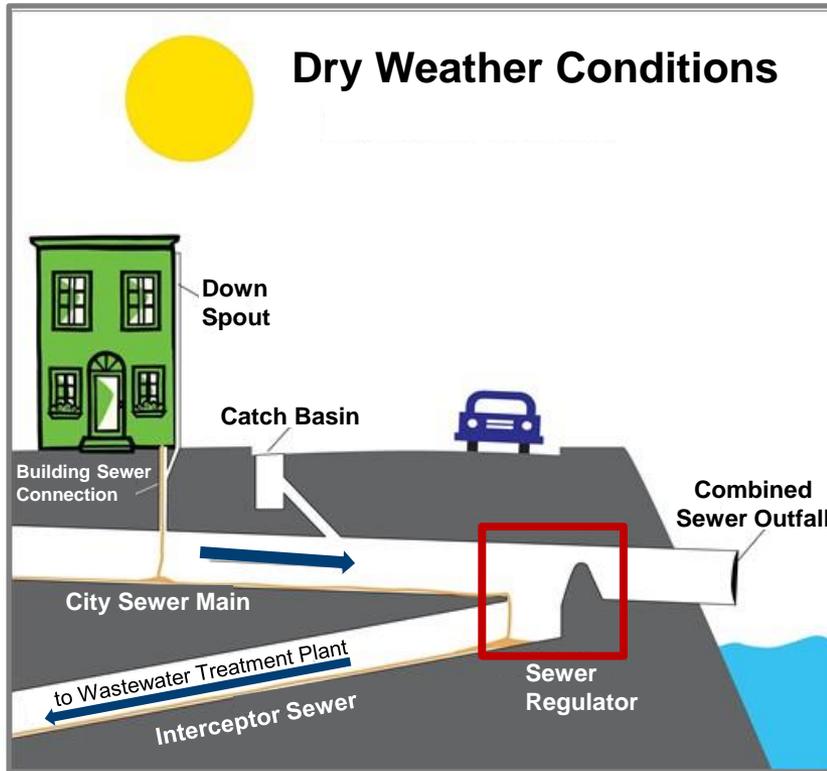
- Annual citywide public meetings rotating across boroughs
- Local public meetings in each watershed and existing forums
- Regular briefings for elected officials and their staff

➤ **Communication Tools:**

- Program Website
- Social Media
- Advisories and Notifications

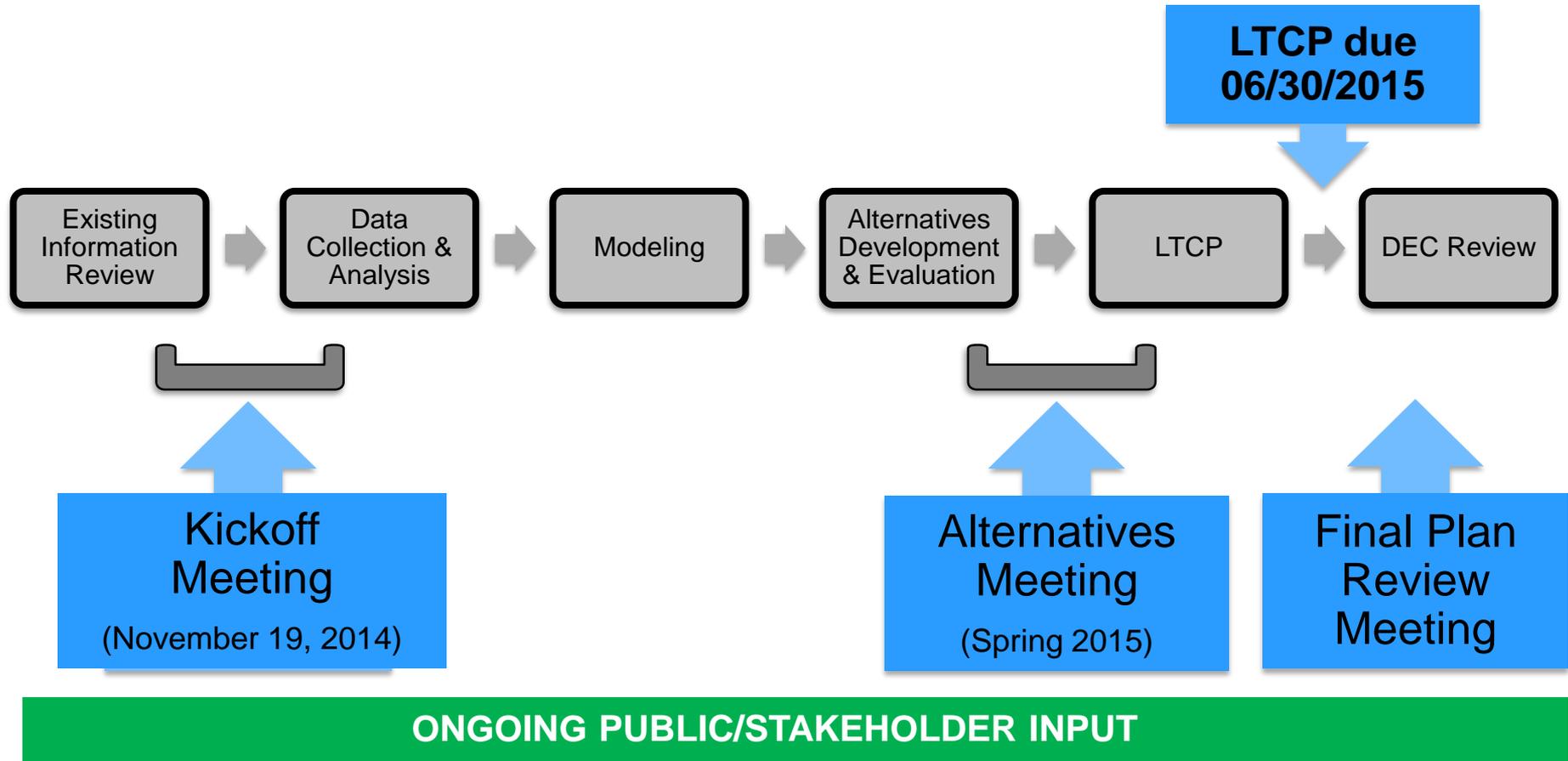
What is a Combined Sewer Overflow?

- NYC's sewer system is approximately 60% **combined**, which means it is used to **convey both sanitary and storm flows**.



- When the sewer system is at full capacity, a diluted mixture of rain water and sewage are released into local waterways. This is called a combined sewer overflow (CSO).

Public Involvement and LTCP Process



Current Water Quality Improvement Projects

Jim Mueller, P.E.
Assistant Commissioner
DEP

➤ Grey Infrastructure

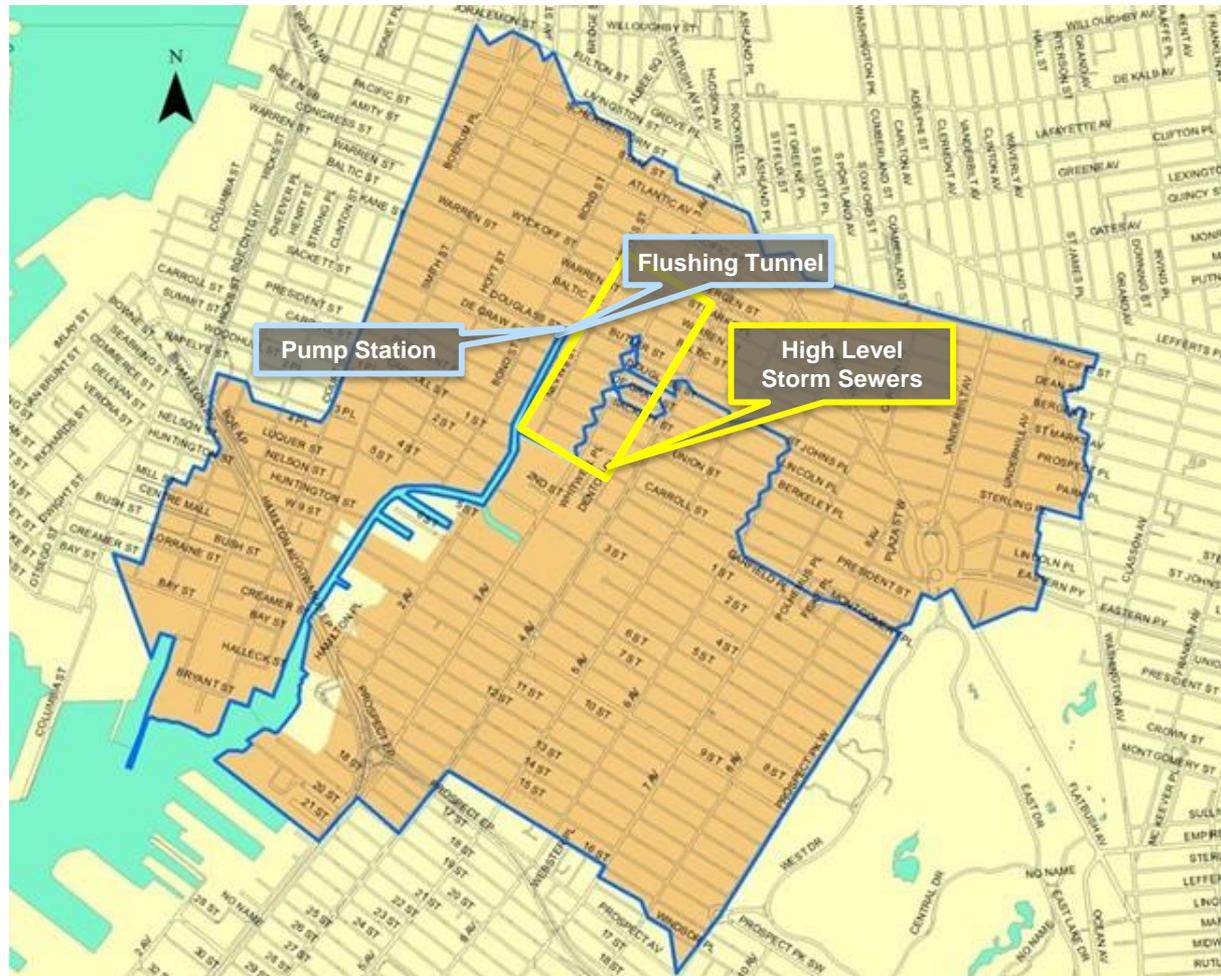
- Flushing Tunnel and Pump Station (\$190 M)
- Environmental Dredging (deferred due to ongoing Superfund remediation under consideration)

➤ HLSS Project

- High Level Storm Sewers (\$20 M)

➤ Green Infrastructure

- Bioswales
- Stormwater Green Streets



* The Grey Infrastructure projects are from the approved Gowanus Canal Waterbody Watershed Facility Plan (WWFP) and are listed in the CSO Consent Order.

➤ Pumping Station Upgrades

- Increased pumping capacity from 20 to 30 MGD
- Screening Device
- Operational since June 2014

➤ Benefits

- Reduce CSO discharges by 34%
- Reduce floatables discharges at head end



**Post-Upgrade Rendering of
the Gowanus Facilities**

➤ Flushing Tunnel Upgrades

- 3 pumps
- New automated screens
- Operational since May 2014

➤ Benefits

- Increase flow through tunnel
- Improve dissolved oxygen
- Minimize shutdowns

➤ Estimated Flows

- Average Daily Flow of 215 MGD (40% increase)
- No shut down at low tide

➤ Objective:

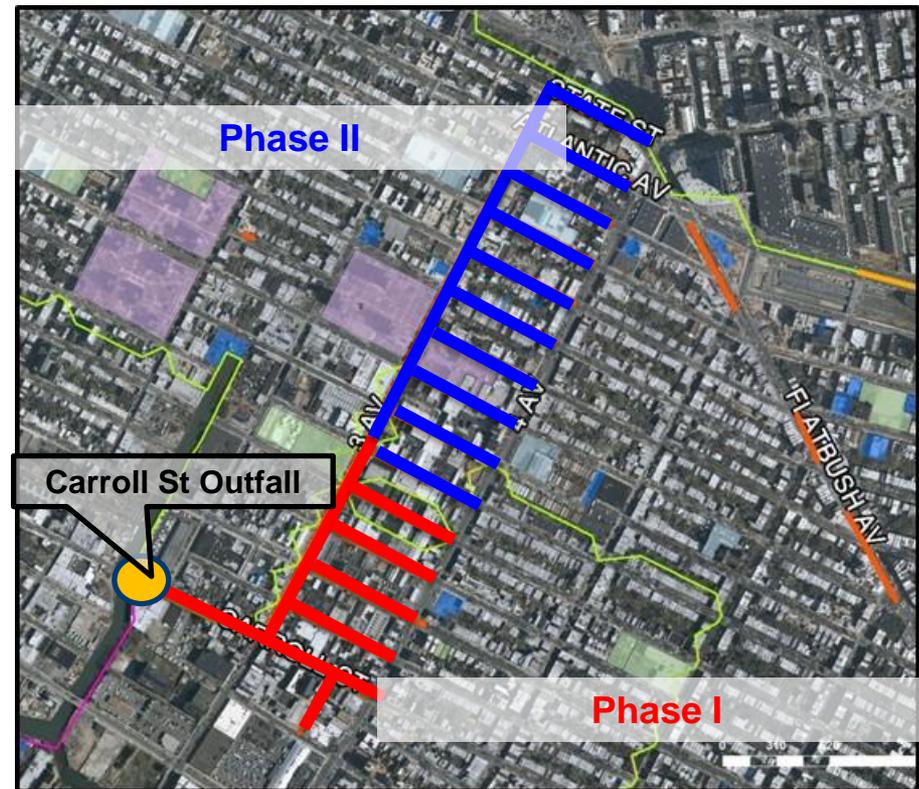
- Redirect existing catch basin flow from combined sewer to new HLSS

➤ Benefit:

- Reduced street flooding

➤ Amended Drainage Plan

- HLSS to capture 50% of drainage area runoff
- 96-acre area bounded by 1st Pl, 4th Ave, State St, 3rd Ave
- **Phase I**
 - FY2014 – Design
 - FY2015 – Construction
- **Phase II**
 - FY2018 – Design
 - FY2019 – Construction



Green Infrastructure

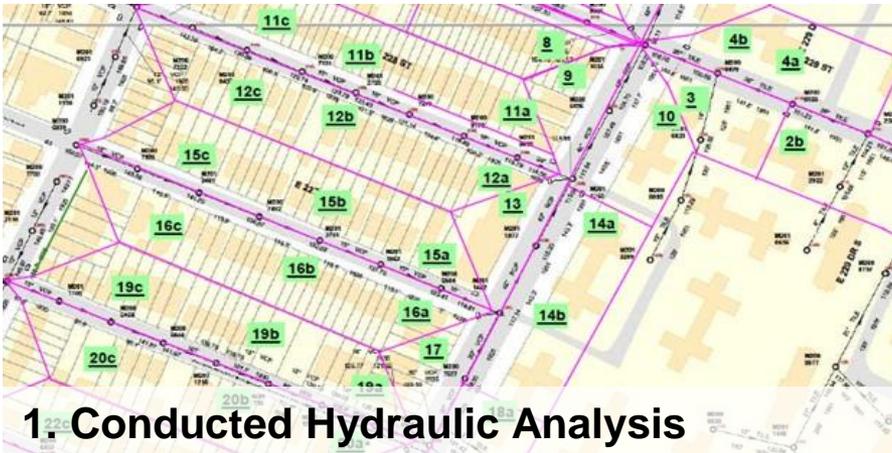
Angela Licata
Deputy Commissioner
DEP



Bioswale

- **Green Infrastructure (GI)** collects stormwater runoff from impervious surfaces
- 2012 Amended Consent Order: GI investments over 20 years
- Budget **\$1.5 billion** for GI Citywide to manage 1” of stormwater runoff from 10% of impervious combined sewer areas by 2030
- Meet this goal through:
 - ROW Bioswale Area-Wide Projects
 - Public Property Retrofits
 - Grant Program for Private Property Owners
 - Stringent detention rule

- Design for GI in City streets and sidewalks as well as City owned properties such as schools and parks began in early 2013



Current GI in the Gowanus Watershed

 RH-034 CSO Outfall

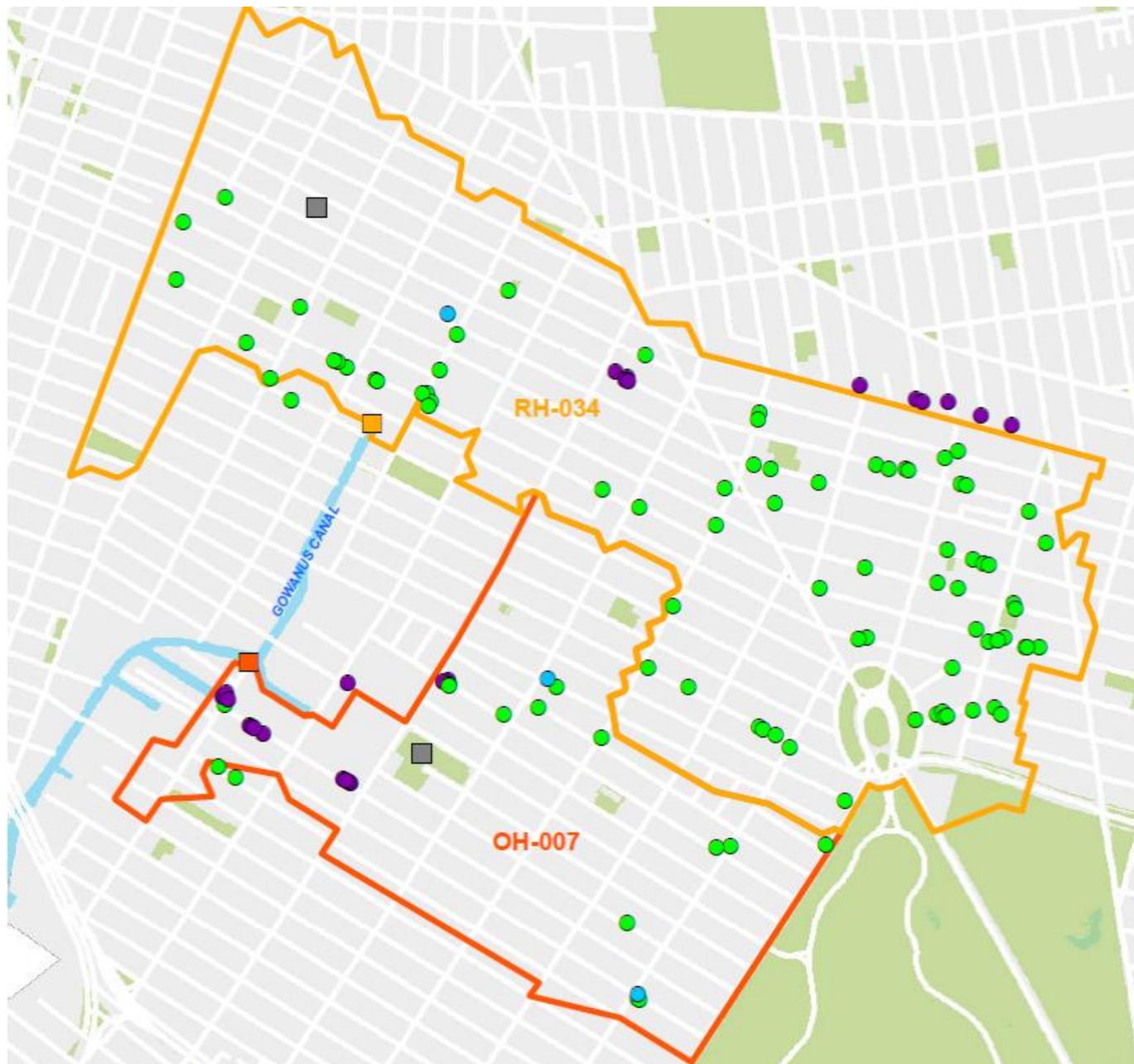
 OH-007 CSO Outfall

 19 Bioswales
Constructed

 92 Bioswales
under
Construction

 3 Stormwater
Greenstreets
(SGS) under
Construction

 Onsite Project



➤ Partnerships:

- NYC Parks Department
- NYC Housing Authority
- NYC Dept. of Education and School Construction Authority

➤ GI Types:

- Rain Gardens
- Permeable Pavements
- Subsurface Detention with Infiltration

➤ 10 sites are under consideration or in planning

Sample Case Study: Public School (P.S. 261)



➤ **GI Grant Program**

- DEP provides up to 100% reimbursement for design and construction of GI on private property in combined sewer areas

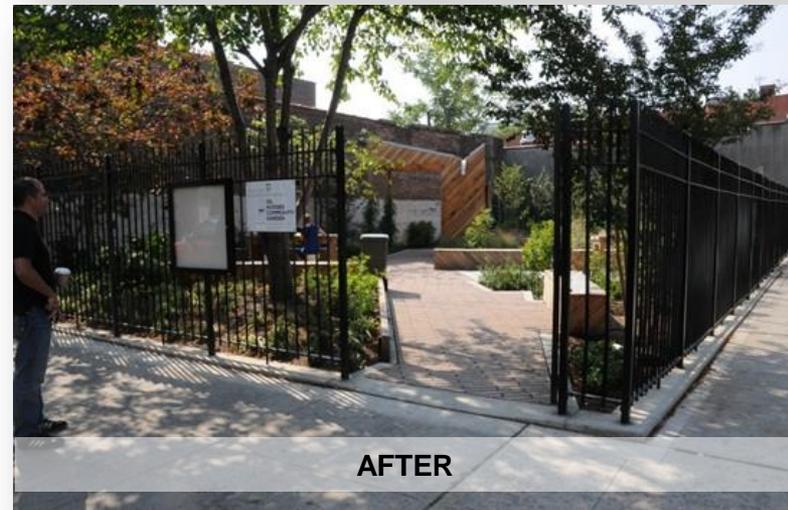
➤ **Green Roof Tax Abatement**

- City provides a 1 year property tax abatement for private properties that install a green roof

➤ **2012 Stormwater Rule**

- Site Connection Proposals may use GI technologies to meet the new allowable flow rate

Sample Case Study: Gil Hodges Community Garden, Brooklyn



Overview of LTCP Process

Jim Mueller, P.E.
Assistant Commissioner
DEP

1. Build off existing infrastructure investments
2. Assess current waterbody and watershed characteristics
3. Identify and analyze **Grey-Green*** infrastructure balance for different watersheds to meet applicable water quality standards
4. Includes a public engagement process

**Definitions:*

Grey = traditional practices such as pipes and sewers

Green = sustainable pollution reducing practices that also provide other ecosystem services

- Required by state pollution control permits in accordance with the Clean Water Act (CWA) and Federal CSO Control Policy; an agreement between the State and City of New York establishes the time frame for submittal of 11 LTCPs.
- Comprehensive evaluation of alternatives to improve water quality in NYC's waterbodies through CSO mitigation measures.

➤ 1994 Guidance for CSO LTCPs includes **nine** elements:

- 1 Characterization, Monitoring, Modeling
- 2 Public Participation
- 3 Sensitive Areas
- 4 Evaluation of Alternatives
- 5 Cost Performance Considerations
- 6 Operational Plan
- 7 Maximization of Treatment at Existing Publicly Owned Treatment Plants
- 8 Implementation Schedule
- 9 Post-Construction Monitoring Plan

Gowanus Canal LTCP Development

Jim Mueller, P.E.
Assistant Commissioner
DEP

Current Water Quality Standards



Waterbody Classifications

SA – Shellfish

SB – Bathing

SC – Bathing / Fishing

I – Bathing / Fishing

SD – Fish Survival

Gowanus Canal

- Best Use Designations
- Saline Surface Water Quality Standards
- **Gowanus Canal**
 - **Class SD**
 - Dissolved Oxygen (DO) ≥ 3 mg/L

New York State Saline Surface Water Quality Standards				
Class	Bacteria <i>(when disinfection is practiced)</i>			Dissolved Oxygen <i>(acute, never less than)</i>
	Total Coliform	Fecal Coliform	Enterococci	
SA	Median ≤ 70 MPN 100 ml	-	-	≥ 4.8 mg/l (daily avg) ≥ 3.0 mg/l
SB	Monthly Median $\leq 2,400/100$ ml 80% $\leq 5,000/100$ ml	Monthly GM $\leq 200/100$ ml	*Geometric Mean $\leq 35/100$ ml	≥ 4.8 mg/l (daily avg) ≥ 3.0 mg/l
SC	Monthly Median $\leq 2,400/100$ ml 80% $\leq 5,000/100$ ml	Monthly GM $\leq 200/100$ ml	*Geometric Mean $\leq 35/100$ ml	≥ 4.8 mg/l (daily avg) ≥ 3.0 mg/l
I	Monthly GM $\leq 10,00/100$ ml	Monthly GM $\leq 2,000/100$ ml	-	≥ 4.0 mg/l
SD	-	-	-	≥ 3.0 mg/l

*Applicable to coastal waters. Does not apply to tributaries.

The Gowanus Canal Watershed

➤ Watershed Drainage Area

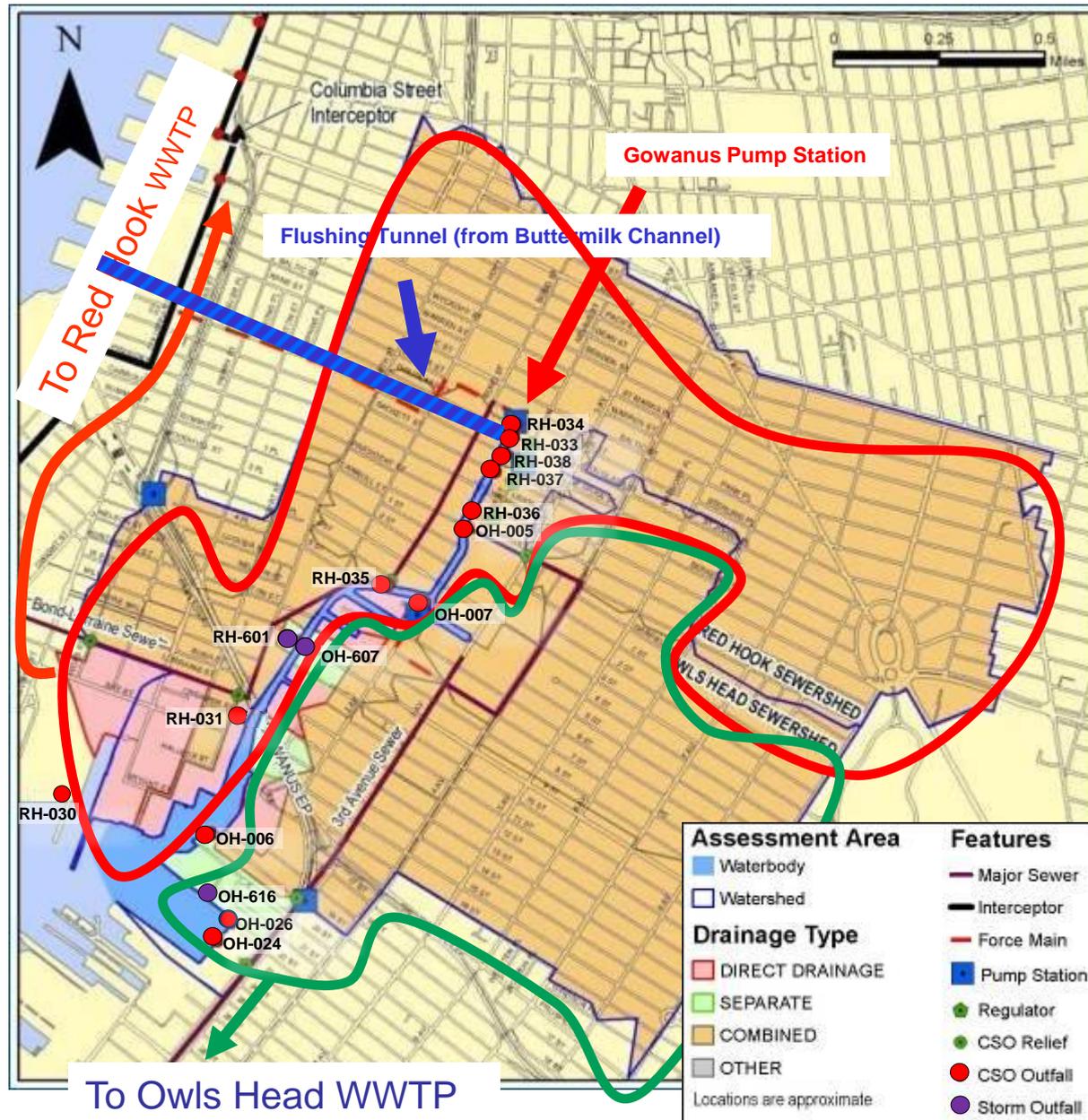
- 1,581 Acres

➤ Combined Sewer System

- Red Hook and Owls Head WWTP Service Areas
- Gowanus Pump Station
- 13 CSO and 3 Storm Sewer Outfalls

➤ Annual Wet-Weather Discharge Volume:

- ≈ 300 MGal (typical year)



Gowanus Canal Sampling Stations



- ▲ Sampled CSO Outfall
- LTCP Receiving Water Sampling
- ◆ Sediment Oxygen Demand (SOD)
- ⬢ Data Sonde (DO-Temp-Salinity-Algae)
- ▲ Harbor Survey (HS)
- Sentinel Monitoring (SM)

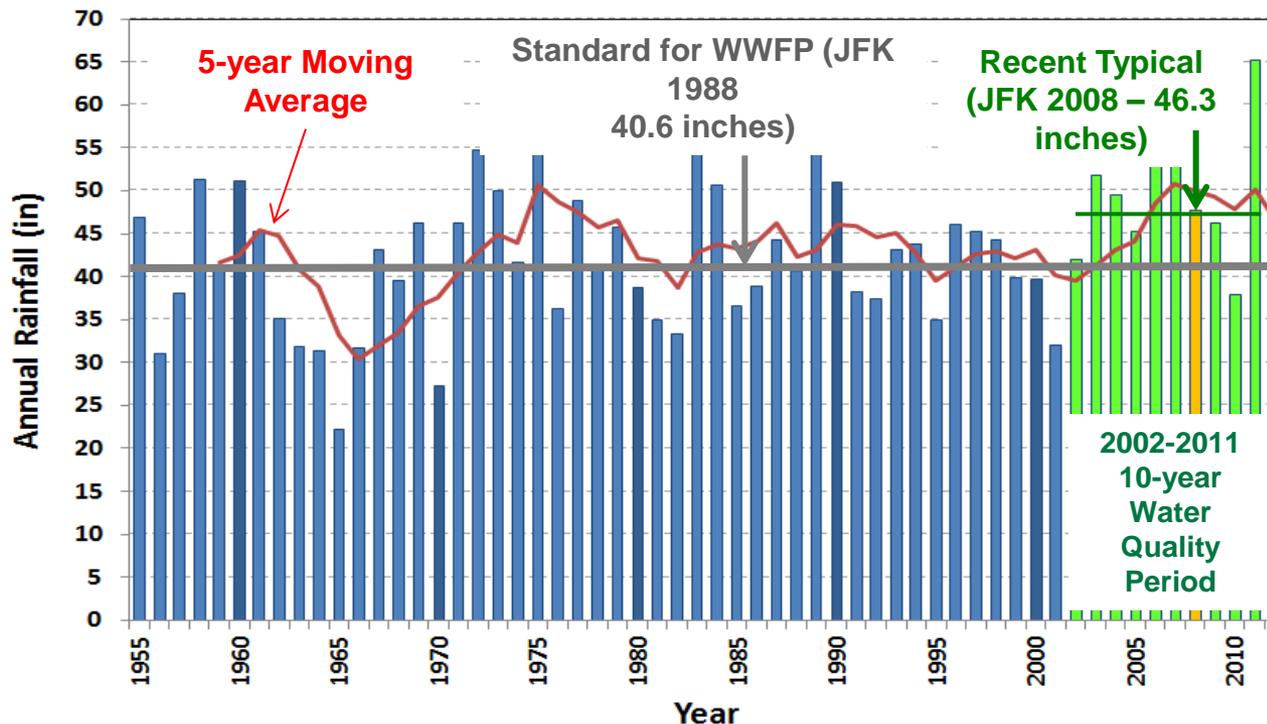
Note:

Locations GC3, GC4, GC5, GC6 and GC8 are consistent HSM locations.

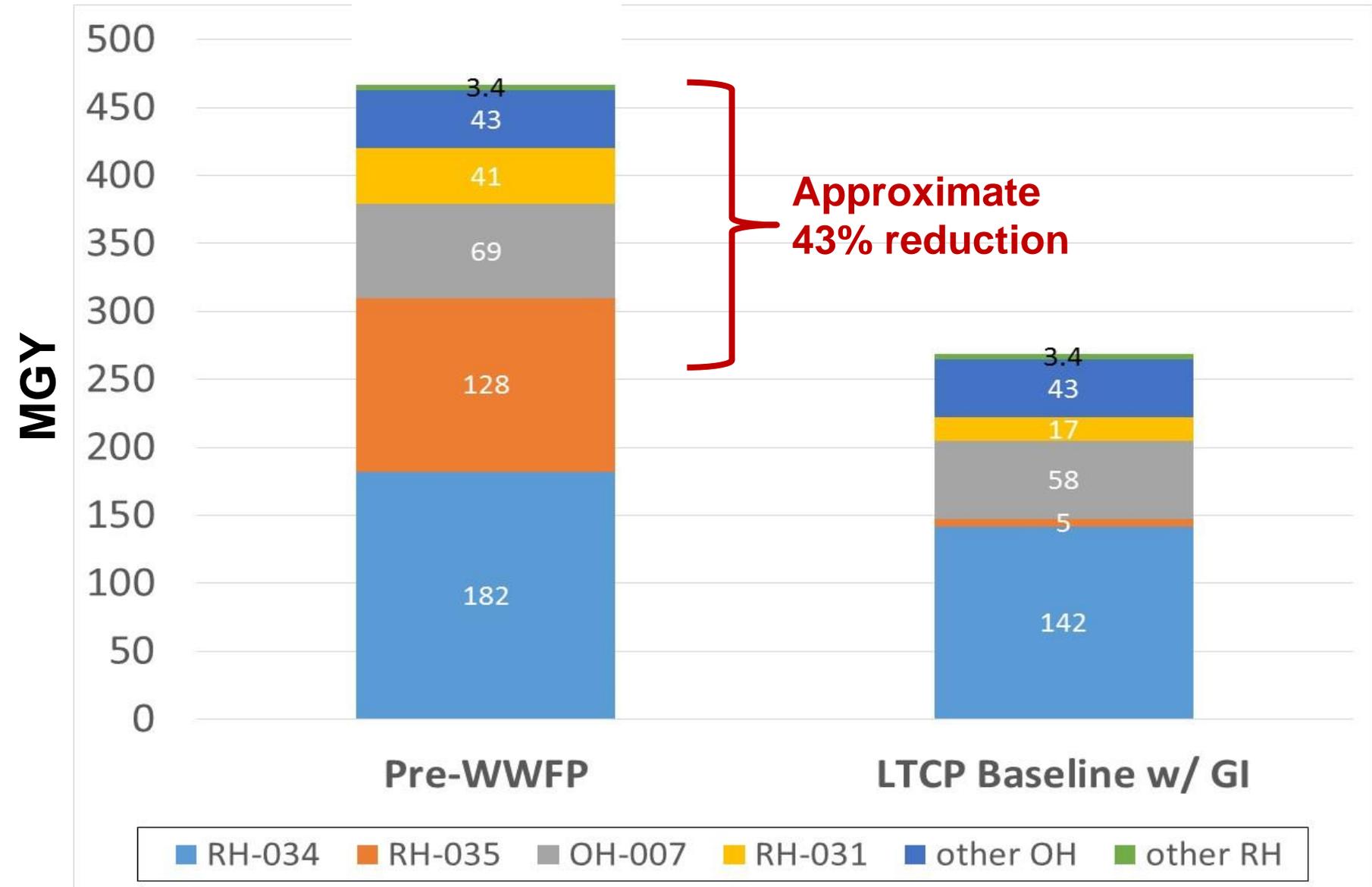
Sampling locations selected to assess tidal phases.

Model Updates & Baseline Assumptions

- Model runs are based on 10 years of data (2002 – 2011) for pathogens; 1 year of data used for DO (2008, “typical year rainfall”)
- 2040 population projections
- Model is calibrated with Harbor Survey data plus LTCP sampling data
- 2012 InfoWorks recalibration based on revised impervious areas



Modeled Gowanus Canal CSO Volumes*



* Subject to revision based on additional calibration and flow monitoring currently underway

Traditional CSO Mitigation Toolbox

INCREASING COMPLEXITY



INCREASING COST



System Optimization	Regulator Modifications	Parallel Interceptor	Inflatable Dams Bending Weirs Control Gates	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other WWTPs	Flushing Tunnel Reversal	Flow Tipping with Conduit/Tunnel and Pumping	
Treatment	Sewer Cleaning Maximize Flow to the WWTP	Outfall Disinfection	Retention Treatment Basin (RTB) with Disinfection	High Rate Clarification (HRC)
Storage	In-System	Shaft	Tank	Tunnel

1. Bacteria Source Component Analysis

- CSO, stormwater and direct drainage

2. Gap Analysis for Water Quality Standard Attainment

- Calculate Bacteria and DO for Baseline conditions
- Calculate Bacteria and DO for 100% control conditions

3. Matching CSO Scenarios to CSO Engineering Control Alternatives



100% Storage

75% Treatment

50% System Optimization

25% Source Control

- Gowanus Canal LTCP Public Meeting #2, Spring 2015
 - Objective: Review proposed alternatives and related waterbody uses and revisiting water quality attainments

- Comments can always be submitted to:
 - New York City DEP at: ltcp@dep.nyc.gov

- Visit the informational tables tonight for handouts and poster boards with detailed information

- Go to www.nyc.gov/dep/ltcp to access:
 - LTCP Public Participation Plan
 - Presentation, handouts and poster boards from this meeting
 - Links to Waterbody/Watershed Facility Plans
 - CSO Order including LTCP Goal Statement
 - NYC's Green Infrastructure Plan
 - Green Infrastructure Pilots 2011 and 2012 Monitoring Results
 - NYC Waterbody Advisory Program
 - Upcoming meeting announcements
 - Other LTCP updates

Open Discussion