



Flushing Creek and Flushing Bay CSO Long Term Control Plan

Al Oerter Recreation Center
September 30, 2015

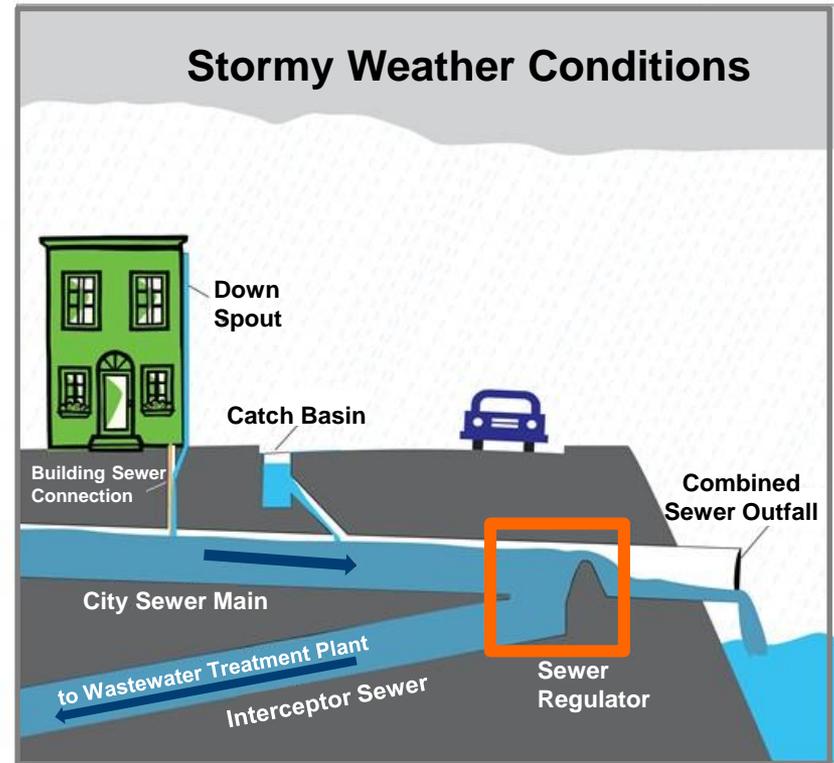
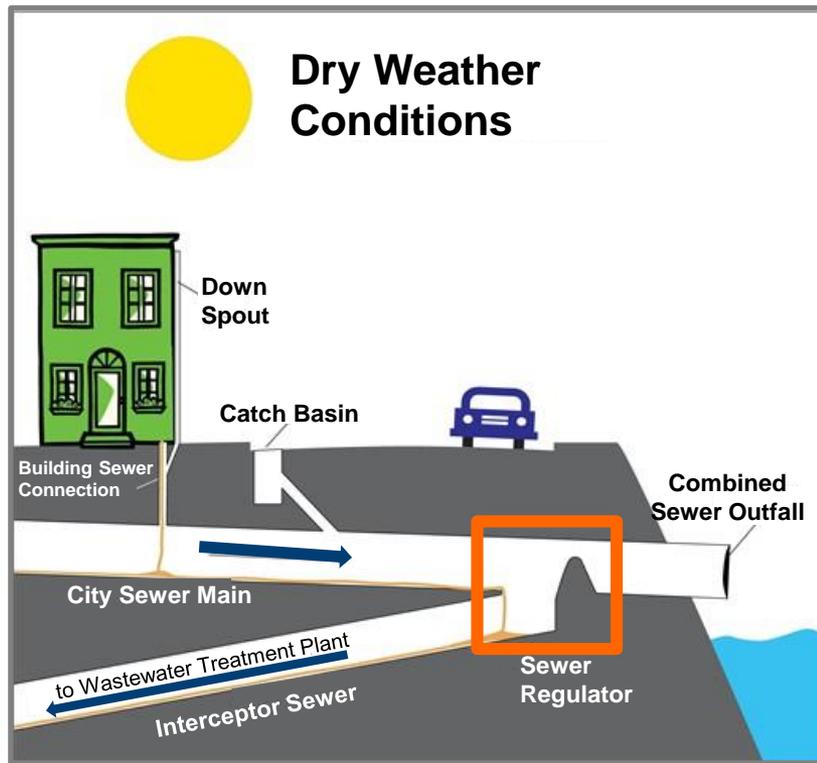
Welcome & Introductions

Eric Landau
Associate Commissioner
DEP

Topic	Speaker
1 Welcome & Introductions	Eric Landau
2 Flushing Creek LTCP <ul style="list-style-type: none">• Summary of Previous Public Meetings• LTCP Proposed Final Recommendations	Eric Landau Keith Beckmann
3 Flushing Bay LTCP <ul style="list-style-type: none">• Background• Waterbody / Watershed Characteristics• Water Quality Improvement Projects<ul style="list-style-type: none">○ Green Infrastructure○ Grey Infrastructure	Eric Landau Keith Beckmann Angela Licata Keith Beckmann
4 Next Steps	Eric Landau
5 Discussion and Q&A Session	All

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 may be released into local waterways. This is called a combined sewer overflow (CSO).
- 65% to 90% of **combined** sanitary & storm flow is captured at treatment plants.

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable water quality standards

consistent with the Federal CSO Policy and Clean Water Act

CSO Consent Order

an agreement that settles past legal disputes without prolonged litigation

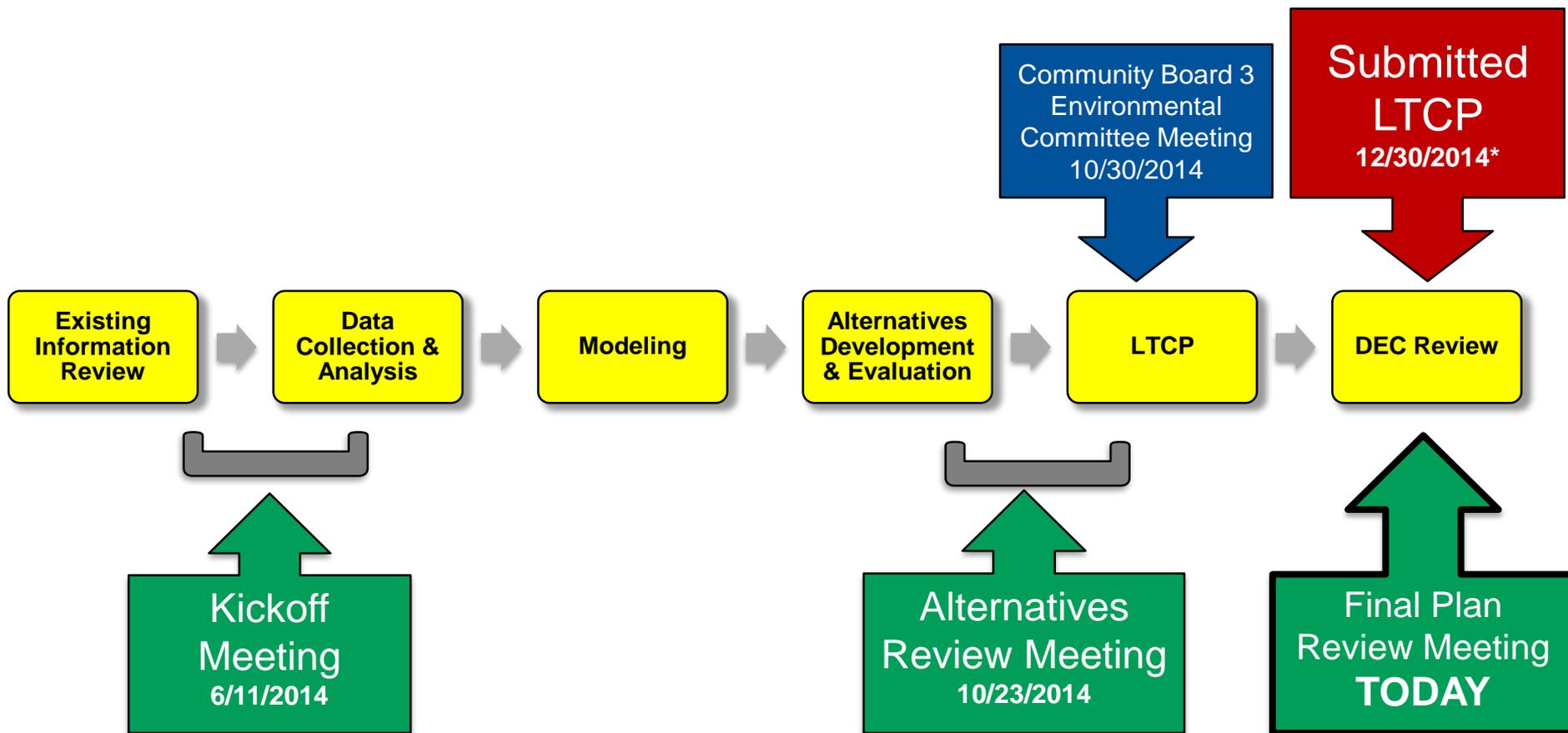
requires DEP to develop LTCPs and mitigate CSOs

Flushing Creek (FC) LTCP Proposed Final Recommendations



Summary of Previous Flushing Creek Public Meetings

Eric Landau
Associate Commissioner
DEP



ONGOING PUBLIC/STAKEHOLDER INPUT

*Supplemental Documentation was submitted to DEC on 5/22/2015 and 8/7/2015 in response to DEC review comments.

Date: June 11, 2014

Location: P.S. 020 John Bowne, Queens

Attendees: 20

Presented on:

- Waterbody/Watershed Characteristics
- Current Uses
- Preliminary Water Quality Sampling Results
- Grey Infrastructure Projects
 - CSO Retention Facility
 - Upgrades to increase flow conveyance to Tallman Island WWTP
- Green Infrastructure Projects
 - JHS 185Q, Edward Bleecker Jr. High
 - Flushing Town Hall
 - TI-011 and TI-022 Area-Wide Contracts with DDC



New Interceptor Route
Being Restored to Upland / Wetland



CSO Retention Facility

Date: October 23, 2014

Location: Al Oerter Recreational Center

Attendees: 15

Presented on:

- Brief Recap of Meeting #1
- Water Quality Attainment
 - Current Classification (Secondary Contact)
= High Level Attainment *(See following slides)*
 - Potential Future Classification (Primary Contact)
= Non-Attainment *(See following slides)*
- Modeling
 - 100% CSO Control in Flushing Creek results in minimal WQ improvement for Primary Contact Attainment
- Comparison of Key Alternatives



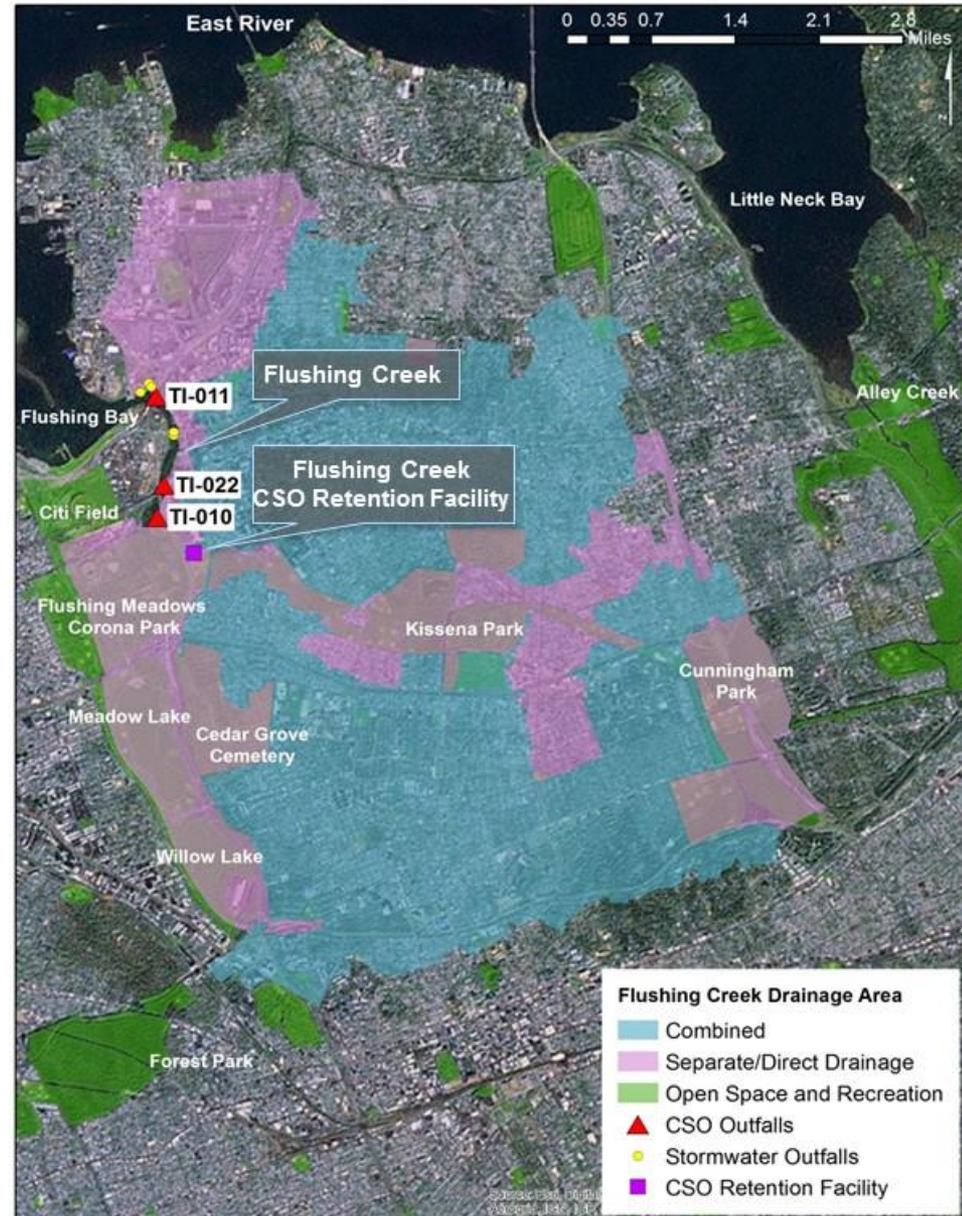
Flushing Creek LTCP Proposed Final Recommendations

Keith Beckmann, P.E.
LTCP Program Manager
DEP

Angela Licata
Deputy Commissioner
DEP

Flushing Creek Drainage Area

- Flushing Creek is located in north-central Queens and discharges into Flushing Bay
- Over 500 acres of the watershed tributary drain to fresh water Meadow and Willow Lakes
- Flushing Creek is classified by New York State DEC for secondary contact recreation
 - **Class I – Boating and Fishing**
- DEP wet-weather discharges include:
 - ▲ 3 CSO Outfalls
 - 5 Stormwater Outfalls



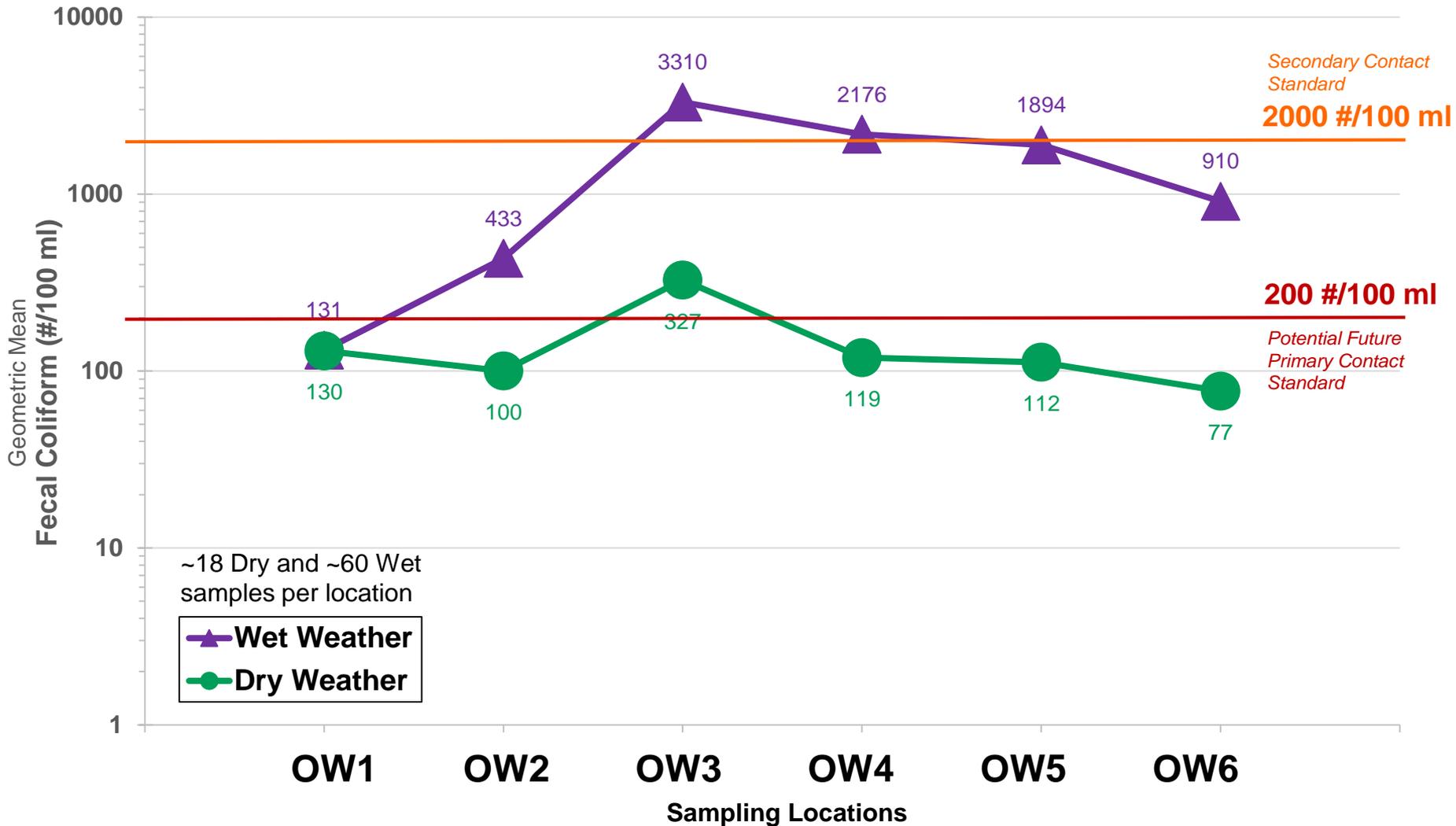
	Drainage Area
Acres	11,016
Served by combined sewers	57%

Flushing Creek Sampling Locations



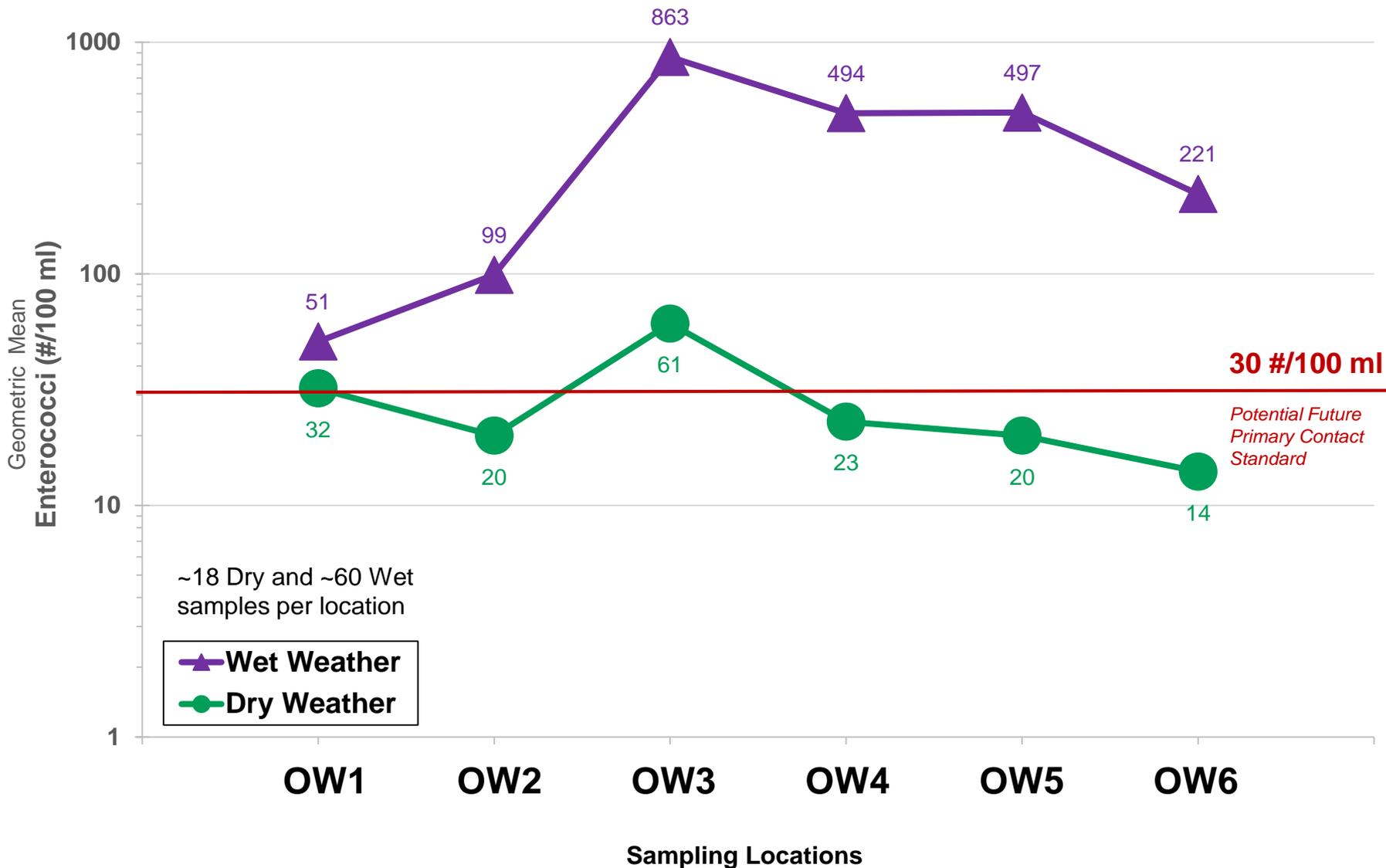
Flushing Creek Fecal Coliform Results

November 2013 to May 2014



Flushing Creek Enterococci Results

November 2013 to May 2014



Flushing Creek CSO Mitigation Options

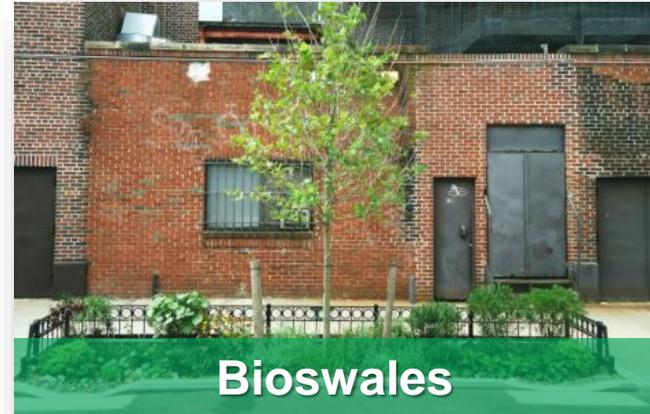
INCREASING COMPLEXITY 

INCREASING COST 

System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Inflatable Dams Bending Weirs Control Gates	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping	
Water Quality / Ecological Enhancement	Floatables Control	Dredging	Wetlands Restoration	Flushing Tunnel
Treatment Satellite:	Outfall Disinfection	Tank Disinfection		High Rate Clarification (HRC)
Centralized:	WWTP Expansion			
Storage	In-System	Shaft	Tank	Tunnel

Flushing Creek Preferred Alternative
= Disinfection of Outfalls TI-011 and TI-010

- **Green Infrastructure (GI)** collects stormwater runoff from impervious surfaces, such as streets and roofs, reducing flow to sewers
- 2012 Consent Order requires GI investments over 20 years
- **\$1.5 billion** budgeted for GI Citywide to manage 1" of stormwater runoff from 10% of impervious combined sewer areas by 2030
- DEP will meet this goal through:
 - Area-Wide Contracts (right of way green infrastructure)
 - Public Property Retrofits
 - Grant Program for Private Property Owners
 - Stringent Detention Rule for New Development



➤ **Green Infrastructure Grant Program:**

DEP provides funding for the design and construction costs of green infrastructure on private property in combined sewer areas of the City.

➤ **Green Roof Tax Abatement:**

The City provides a one-year property tax abatement for private properties that install green roofs. The abatement value is \$5.23 per square foot (up to the lesser of \$200,000 or the building's tax liability) and is available through March 15, 2018.

➤ **2012 Stormwater Rule:**

In 2012, DEP amended the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may include green infrastructure technologies to meet the new allowable rate.

➤ Area-Wide GI Contracts:

- TI-022 – Geotechnical investigations are complete
- TI-011 – Geotechnical investigations are underway
- TI-010 – Design will begin this fall/winter

➤ PS 185Q:

- Construction began September 2015
- Rain garden and synthetic turf field for “Schoolyards to Playgrounds” project with TPL/SCA/DOE

➤ Flushing Town Hall:

- In construction
- Rain garden and swales with the Department of Cultural Affairs



Flushing Creek Preferred Alternative

Recreational Season Disinfection (May 1st – Oct. 31st)

*TI-010 – Disinfect at Influent Screens and DC5

*TI-011 – Disinfect at Regulator 9



	TI-010	TI-011
Benefits	<ul style="list-style-type: none"> Provides disinfection of tank bypass flows Minimizes footprint as disinfection equipment can be installed at existing site 	<ul style="list-style-type: none"> Utilizes gravity, no effluent pumping Maximizes use of existing infrastructure Cost effective; no retention tank needed
Challenges	<ul style="list-style-type: none"> May require control structure at end of outfall Potential residual chlorine issues Potential impacts due to street work 	<ul style="list-style-type: none"> May require control structure at end of outfall Potential residual chlorine issues May require site acquisition
Construction	\$2 Million	\$5 Million
O&M Cost	\$350,000 per Year	\$300,000 per Year

***Note:** Provisions for floatables control to be evaluated and included in the design for both TI-010 and TI-011.

Projected Attainment with Implementation of LTCP Recommended Plan

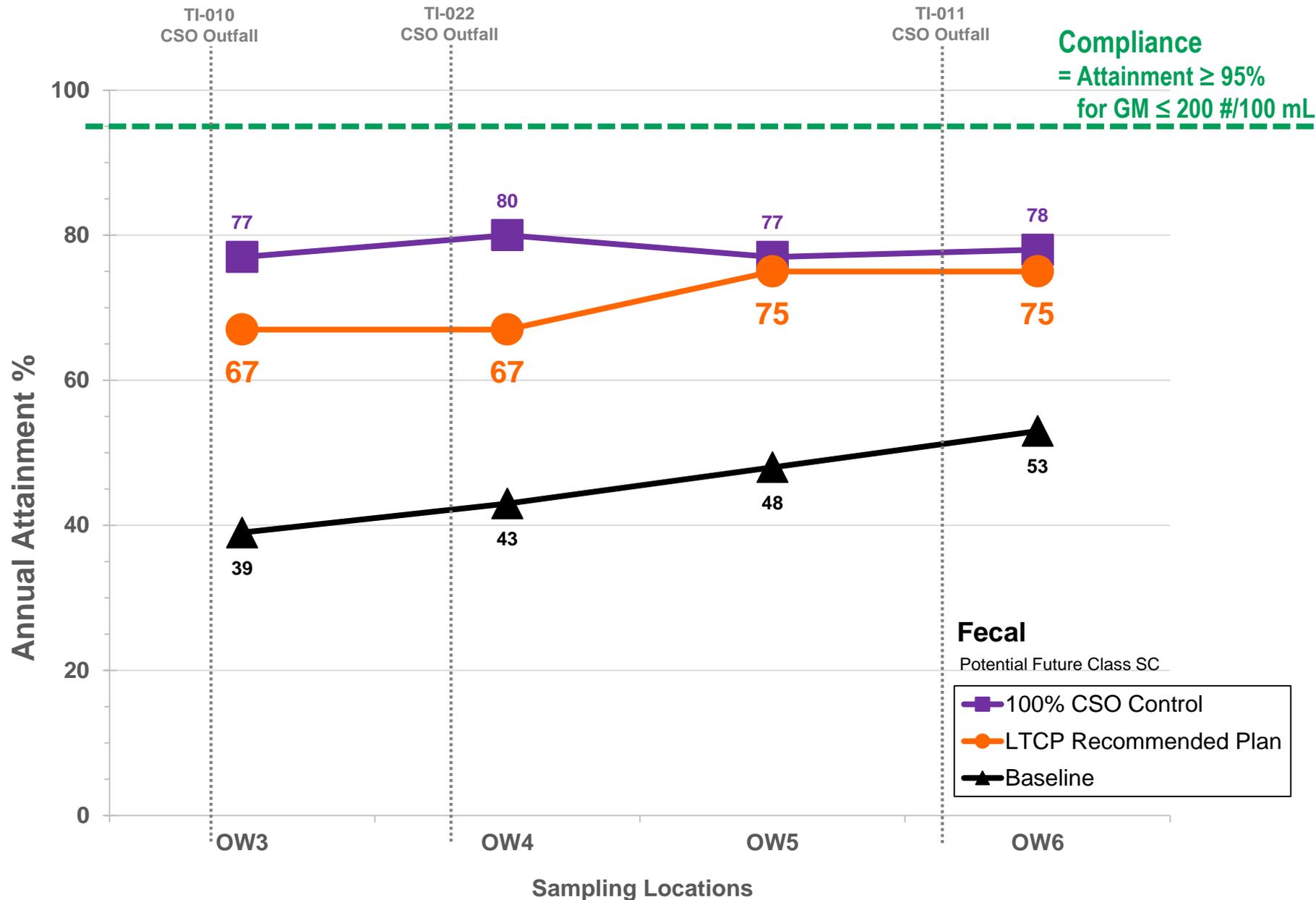
Current Classification

- **Class I** – Secondary Contact (Fecal GM \leq 2000 #/100mL)
 - **100% Annual Attainment**

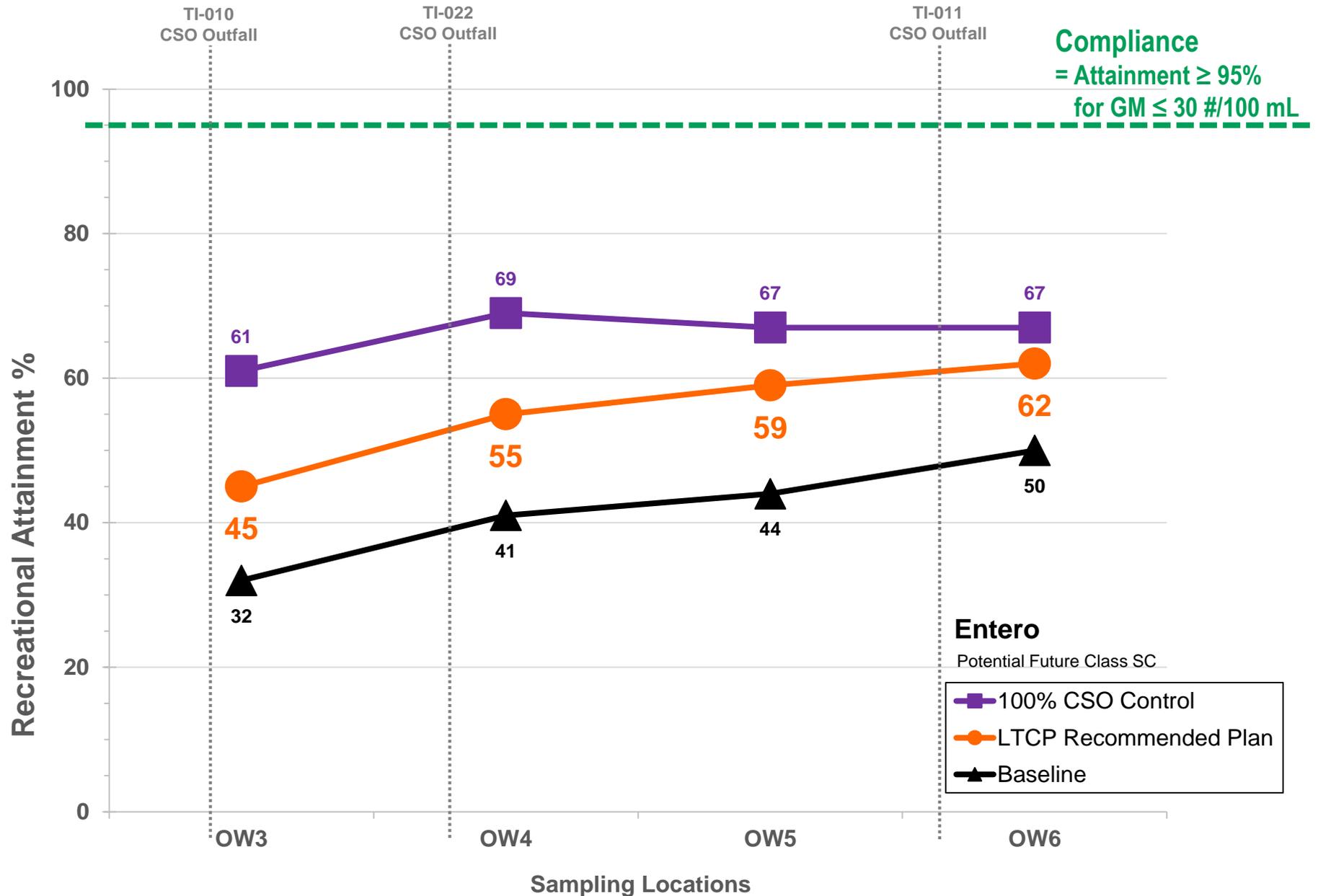
Potential Future Classification)

- **Class SC** – Primary Contact (Fecal GM \leq 200 #/100mL and Entero GM \leq 30 #/100mL)
 - Fecal: 67% to 75% Annual Attainment
 - Entero: 45% to 62% Annual Attainment

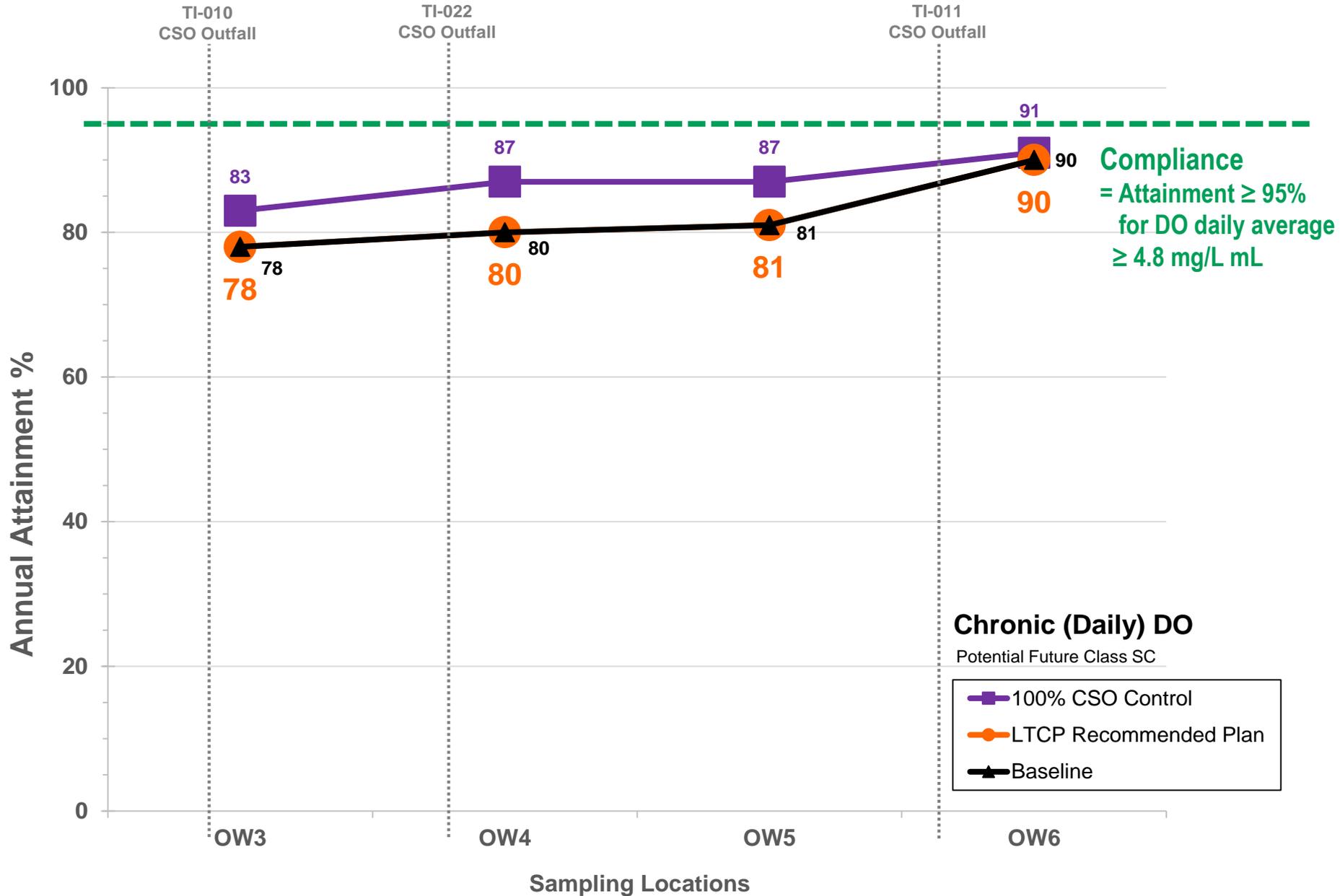
Projected Fecal Annual Attainment



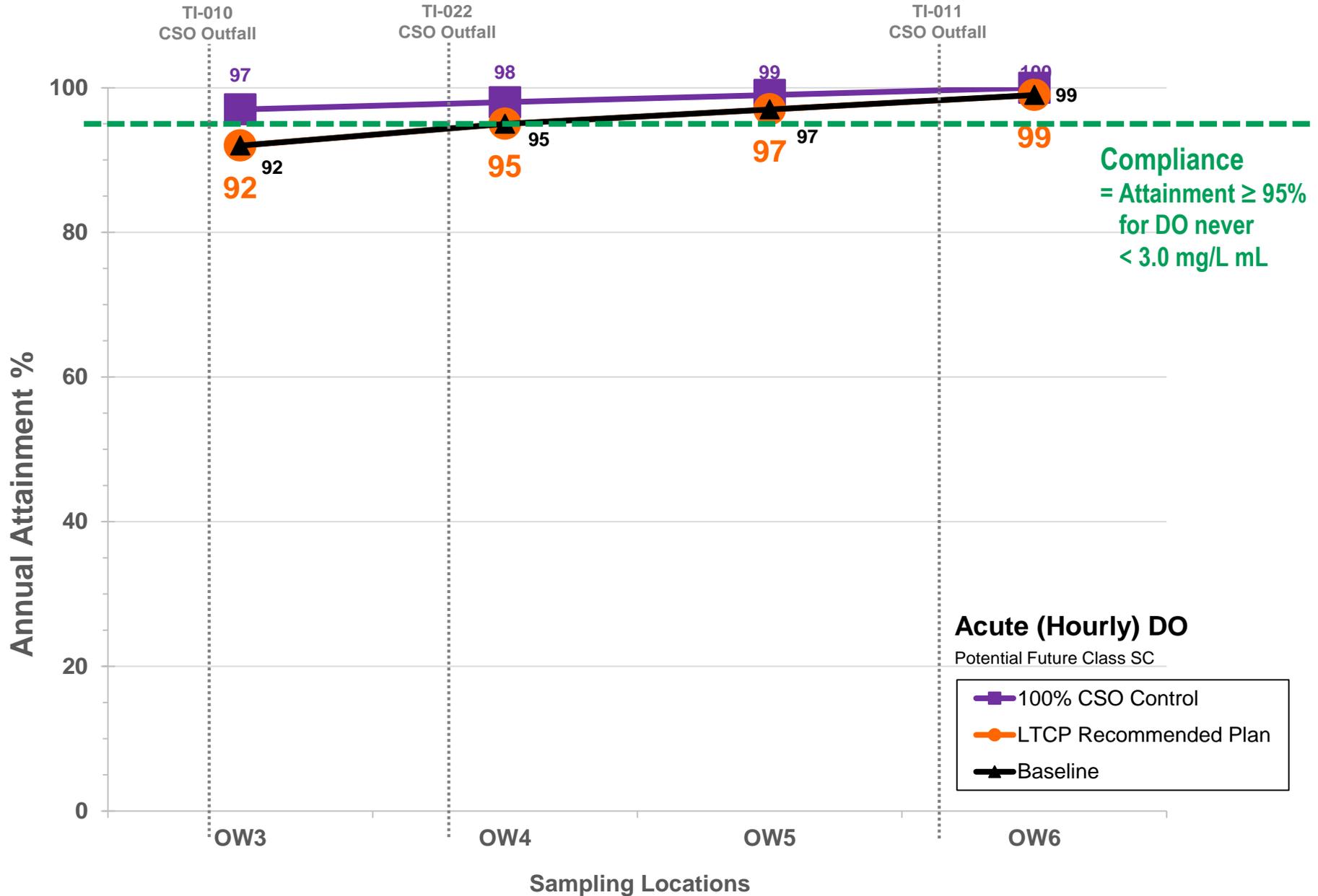
Projected Entero Attainment



Projected Dissolved Oxygen Annual Attainment

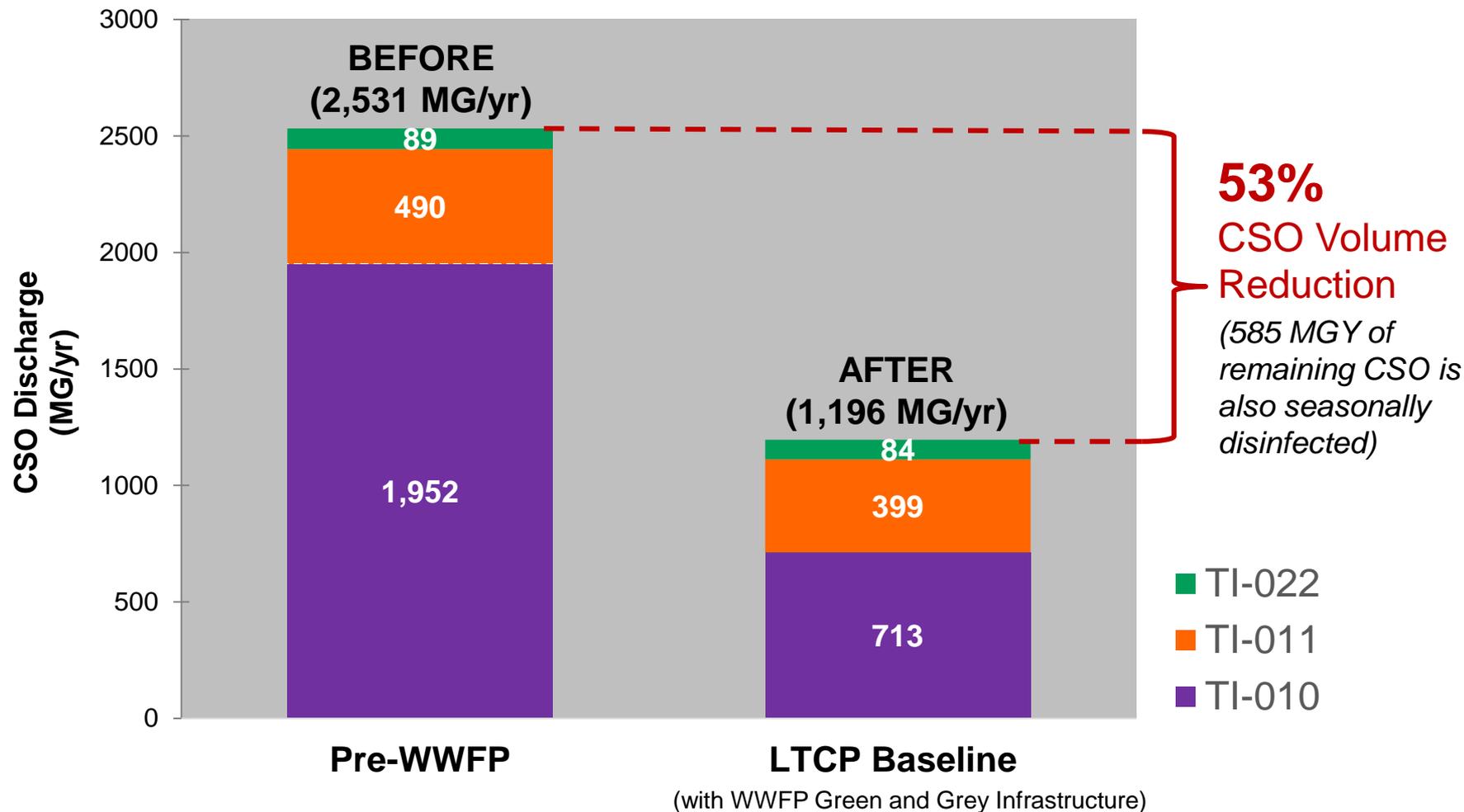


Projected Dissolved Oxygen Annual Attainment



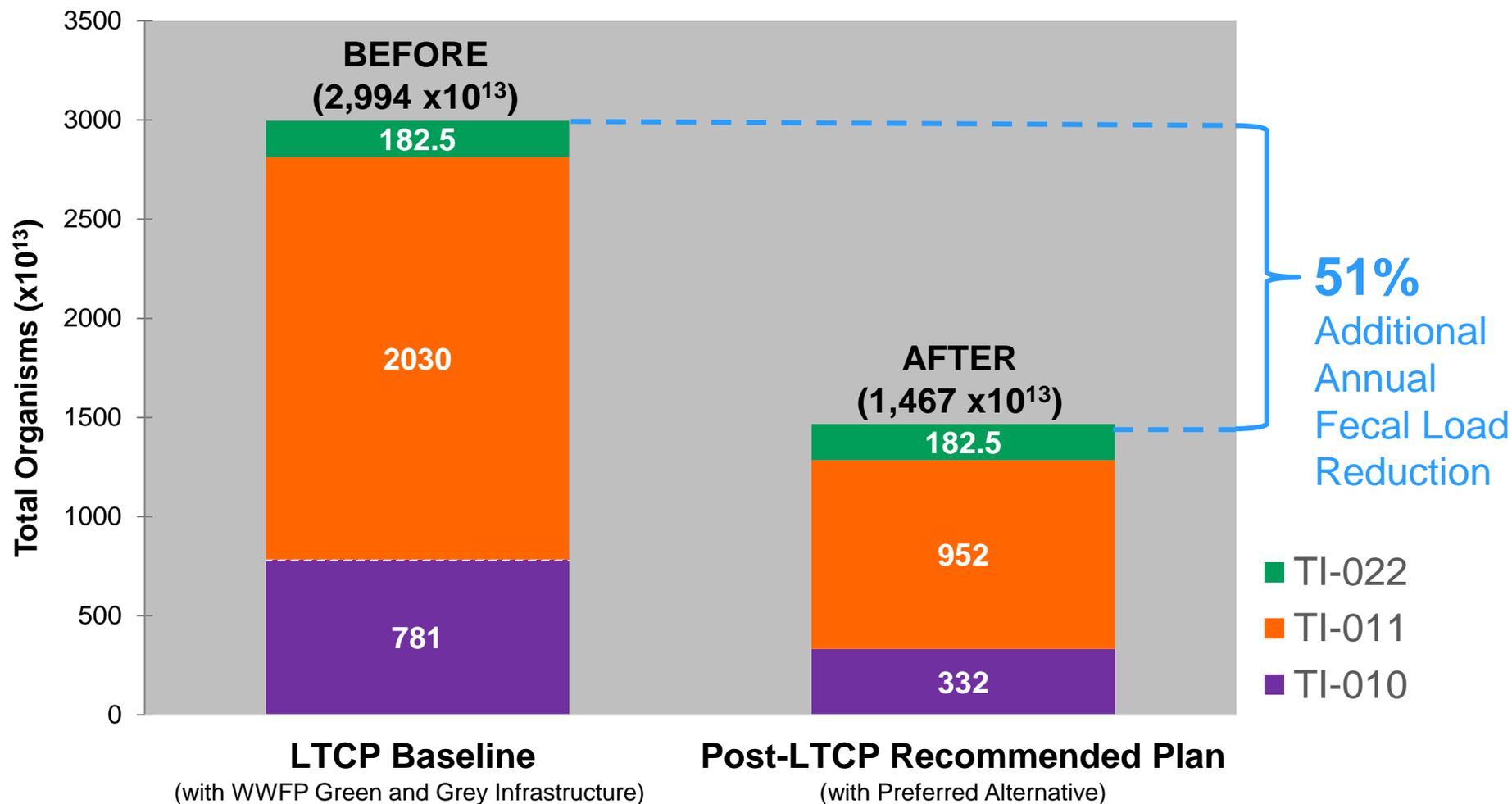
Flushing Creek: CSO Volume Reductions

- Volume Reduction: **53% annual CSO volume reduction** through completed / planned Green and Grey infrastructure implementation



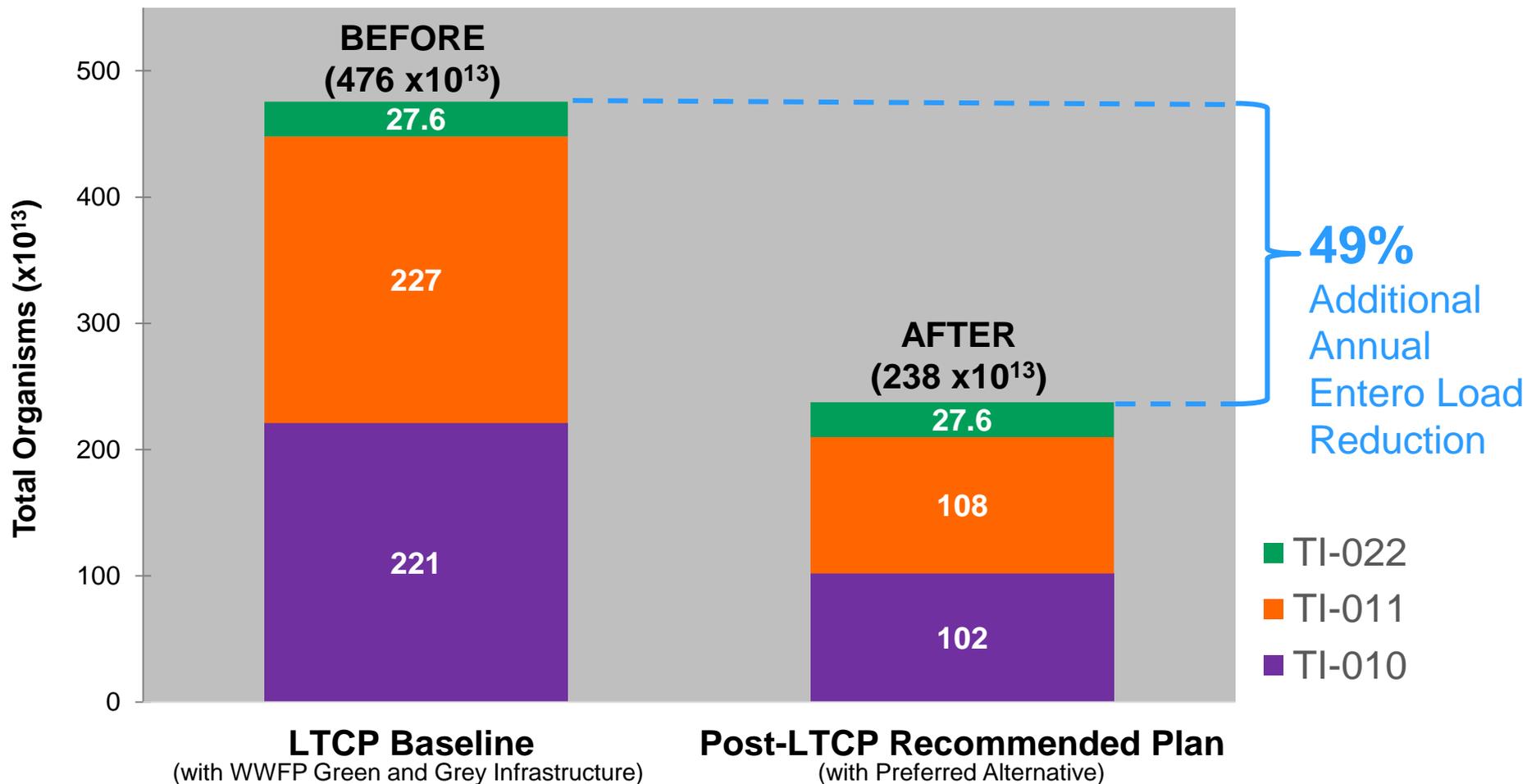
Flushing Creek: Fecal Load Reductions

- **Bacteria Reduction: Additional 51% Annual Fecal Reductions**
as a result of seasonal disinfection at outfalls TI-010 and TI-011 during May 1st to Oct 31st

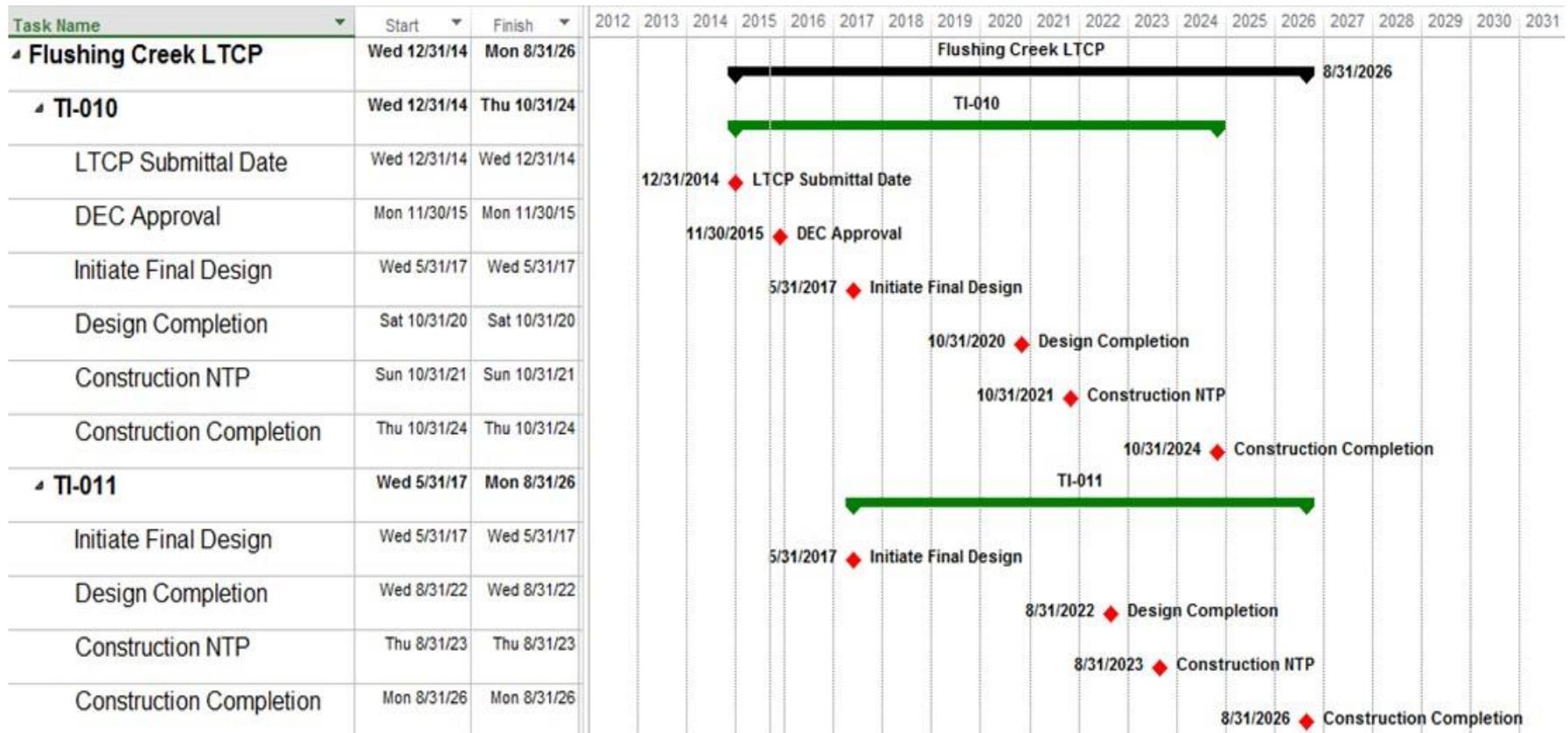


Flushing Creek: Enterococcus Load Reductions

➤ **Bacteria Reduction: Additional 49% Annual Enterococcus Reductions**
as a result of seasonal disinfection at outfalls TI-010
and TI-011 during May 1st to Oct 31st



Flushing Creek Tentative Implementation Schedule

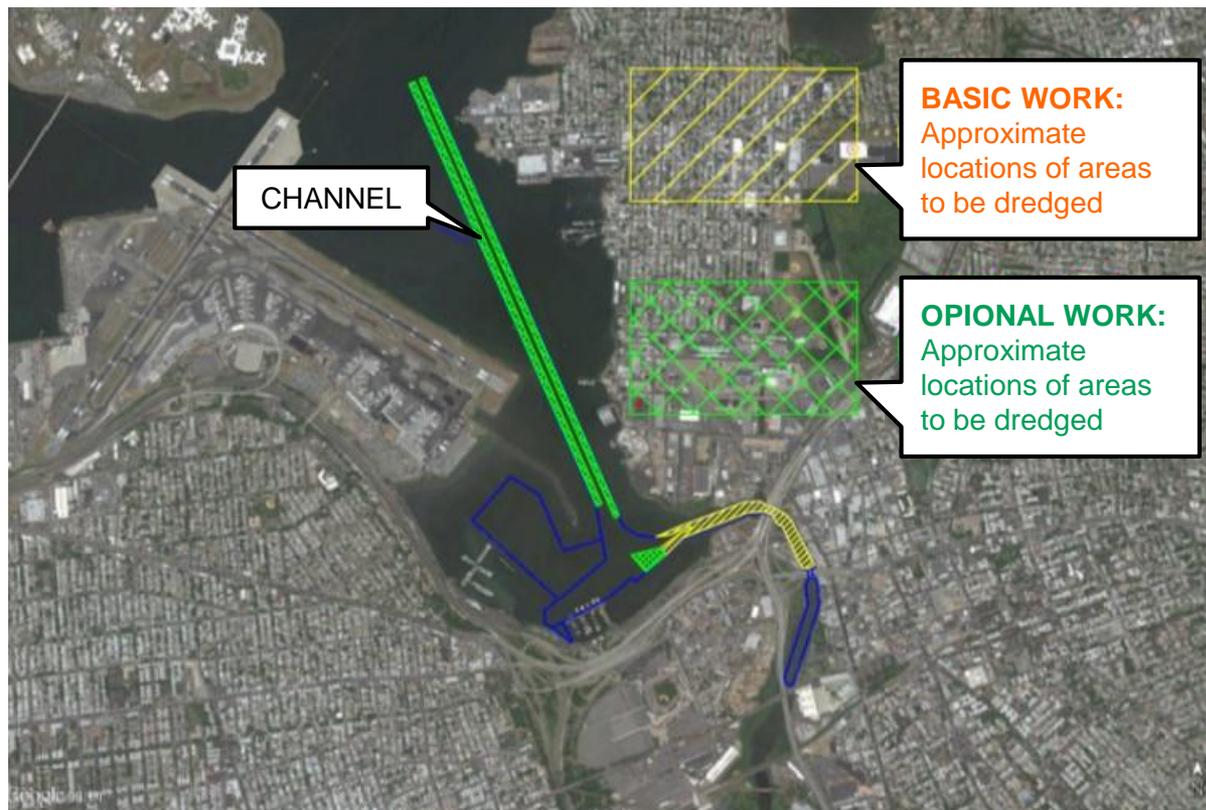
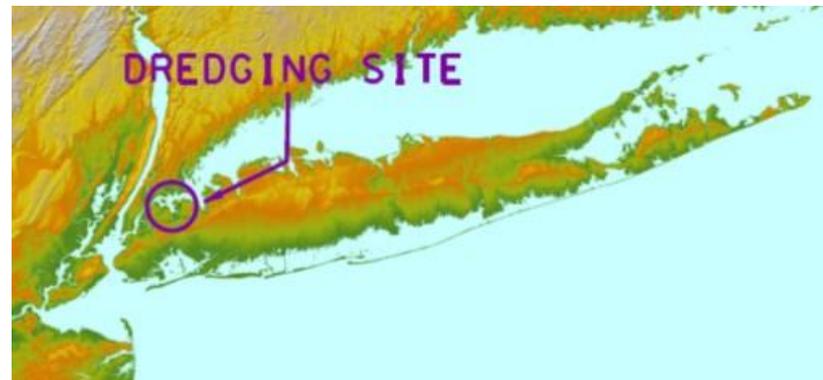


*This is the projected schedule pending DEC approval of the Flushing Creek LTCP

- **Continue to implement the Green Infrastructure Program**
- **Implement Preferred Alternative**
 - Seasonal disinfection at outfalls TI-010 and TI-011
- **Perform a Use Attainability Analysis (UAA)** to evaluate factors (e.g. physical, chemical, biological, economical, etc.) affecting water quality attainment
- **Establish a wet-weather advisory** during the recreational season (May 1st – Oct 31st)

Per ACOE Website:

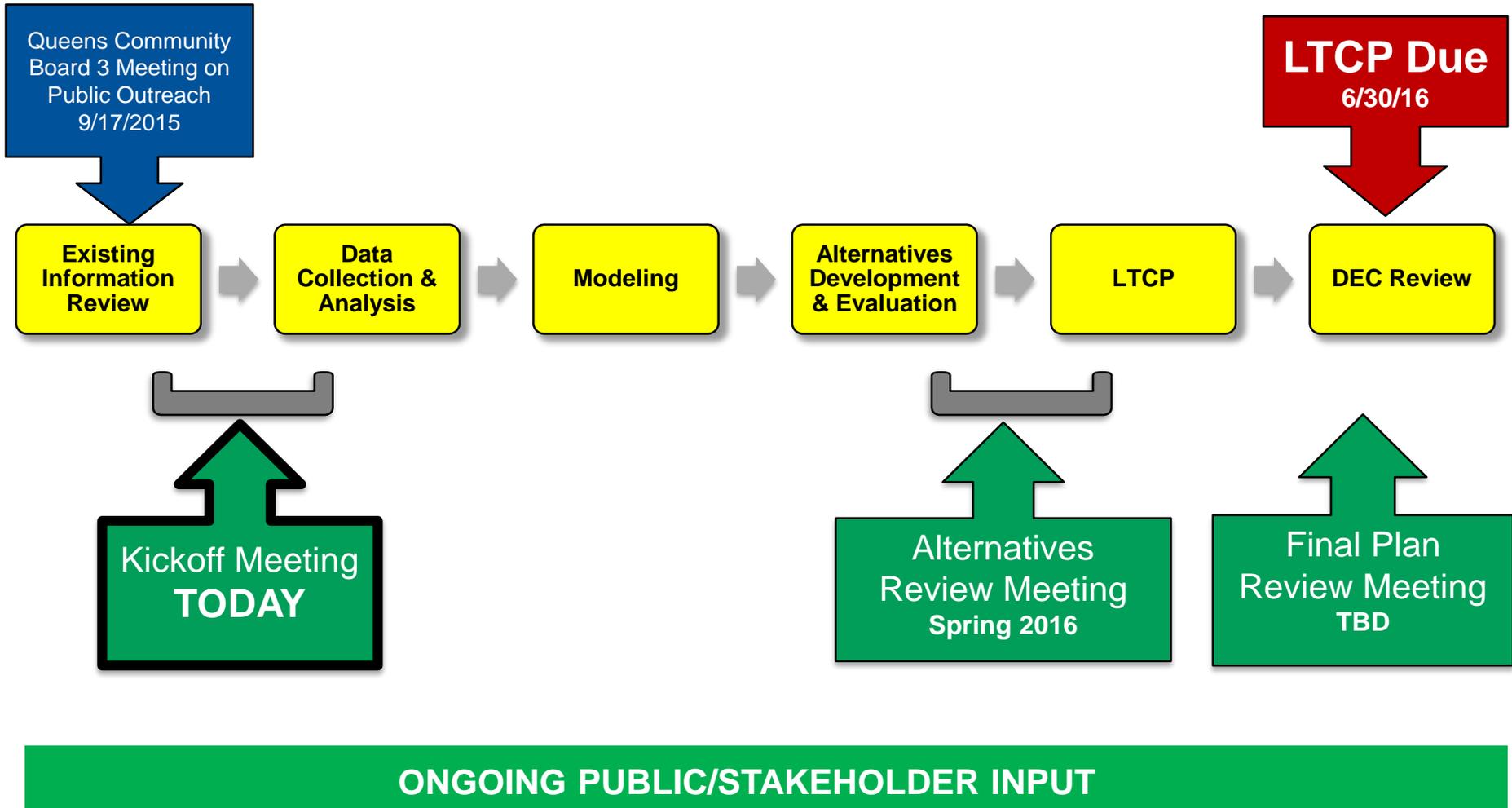
- Plan to dredge portions of the navigation channels of Flushing Bay and Creek
- Project advertised and bids received in July 2015
- Expect to initiate work later this year



Flushing Bay (FB) LTCP Kick-Off Meeting



Flushing Bay LTCP Process & Public Involvement



➤ **Goal:**

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

➤ **Activities:**

- Local public meetings in each watershed and existing forums
- Annual citywide public meetings
- Meeting with key stakeholders and organizations
- Briefings with elected officials and their staff

➤ **Communication Tools:**

- DEP Program Website

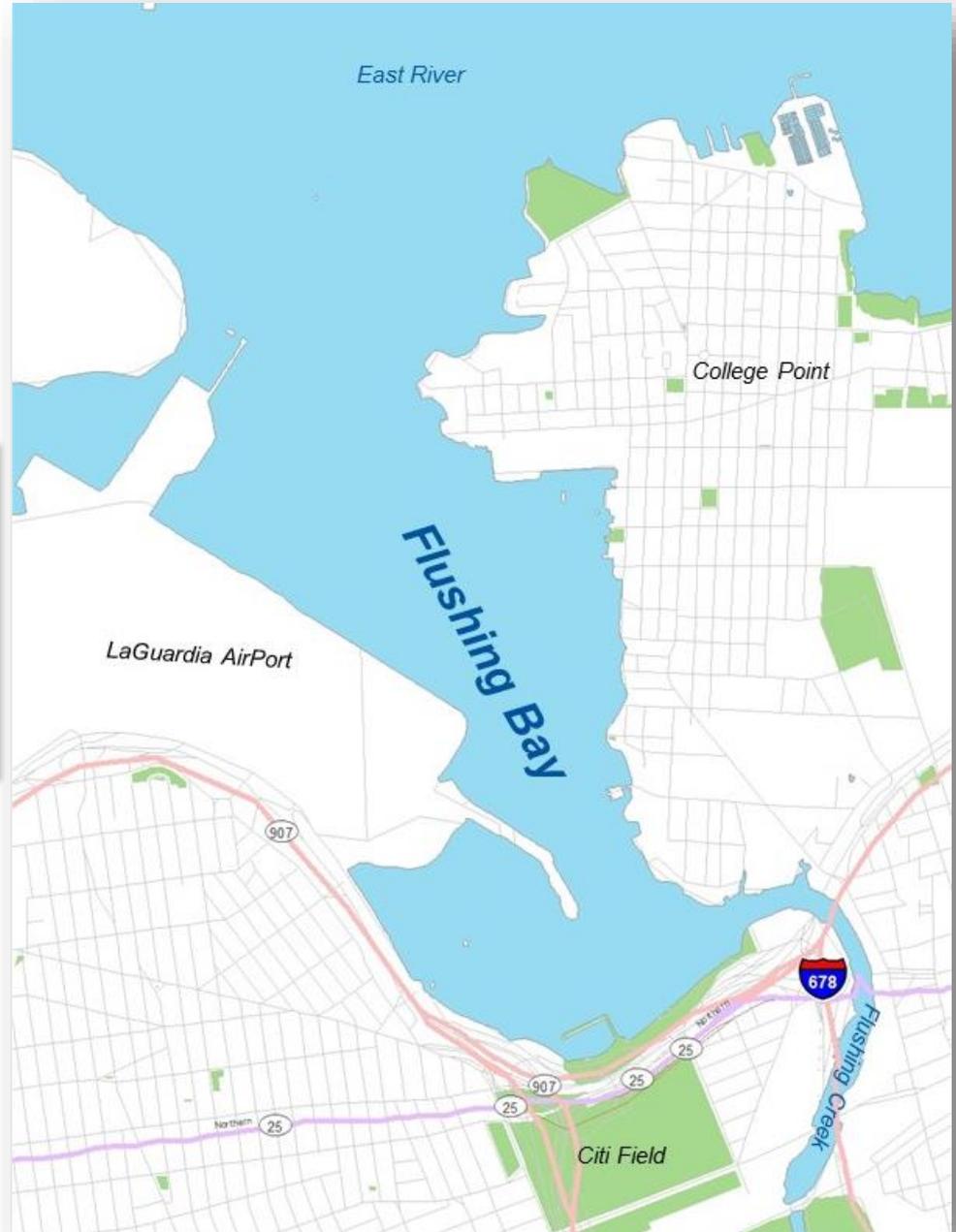
- DEP Social Media



- Advisories & Notifications

Flushing Bay Waterbody / Watershed Characteristics

Keith Beckmann, P.E.
LTCP Program Manager
DEP



CLASS I
Boating/Fishing

The best usages of Class I waters are secondary contact recreation and fishing. These waters are suitable for fish, shellfish and wildlife propagation and survival.

Dissolved Oxygen (mg/l)	Bacteria	
	Fecal Coliform (col/100 ml)	Total Coliform (col/100 ml)
≥ 4.0	≤ 2,000* (Monthly GM)	≤ 10,000 (Monthly GM)

*Note: New rulemaking proposed by DEC for primary contact criteria for Class I and Class SD of ≤ 200 col/100 ml for Fecal Coliform.



1) LaGuardia Airport Central Building Redevelopment

- Construct a new terminal south of the existing Central Building
- Build 4 concourses
- Maximize aircraft movement areas
- Provide new roadways and parking with direct access to the new terminal



2) The Eastern Emerald Hotel (Formerly LaGuardia Convention Center)

- 12-story, 106,000 SF mixed-use building
- 197 hotel guestrooms
- 206 residential apartments
- Community facility and parking garage



3) Special Willets

- Hotel, affordable housing
- Office and retail space
- Public esplanade
- Surface parking/recreational area

Willets West & Roosevelt Avenue

- Entertainment retail center
- Retail stores, movie theaters, restaurant, entertainment venues
- Surface parking



4) Flushing West Neighborhood Planning Study

- Potential Rezoning of C4-2, M3-1 and M1-1 districts
- Increase allowable residential density



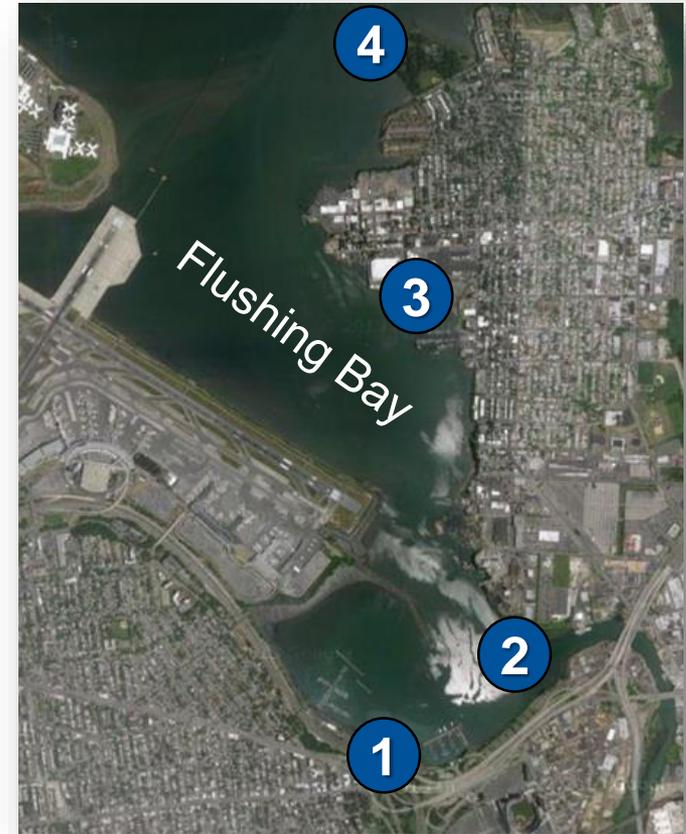
- Provide well-defined waterfront access and public amenity plan
- Recalibrate minimum off-street parking requirements
- Guide the height and massing of new buildings

➤ Waterfront Public Access

- 1 Flushing Bay Esplanade and Marina
- 3 Professional Service Center Park
- 4 Macneil Park

➤ Boat Access

- 2 Public Boat Dock
(East end of Flushing Bay Esplanade at 127th Pl)



Flushing Bay Drainage Area

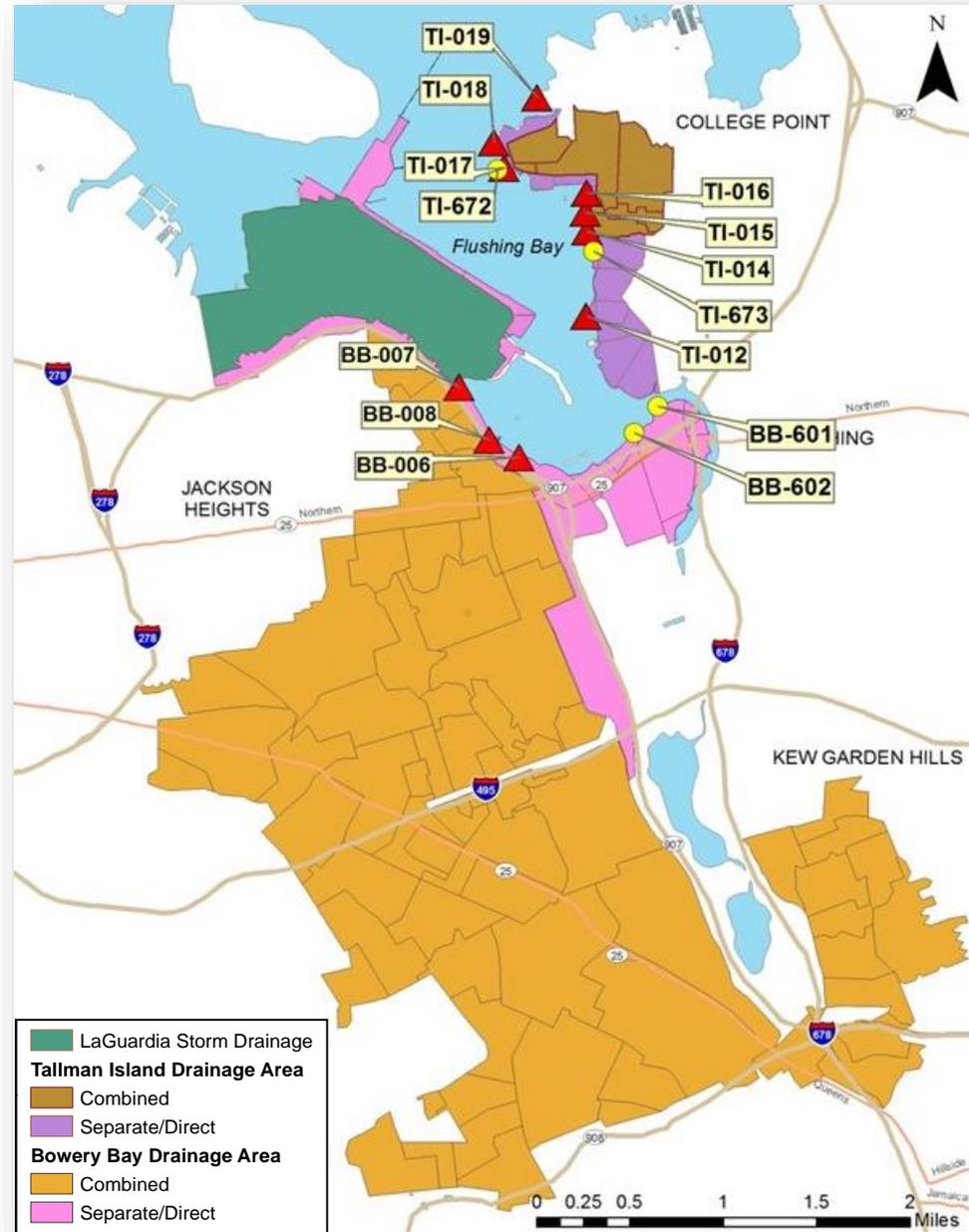
➤ Annual Wet-Weather Discharge Volume:

- ~1,300 million gallon
(*typical year pre-WWFP*)
- Outfalls BB-006 and BB-008 contribute over 90% of total discharge to Flushing Bay

➤ Sewer System:

- Tallman Island and Bowery Bay WWTP
- 10 CSO Outfalls (▲)
- 4 MS4 Outfalls (●)

	Bowery Bay WWTP	Tallman Island WWTP	LaGuardia Airport
Drainage Area Acres	5,603	404	596
Served by Combined Sewers	90%	18%	N/A

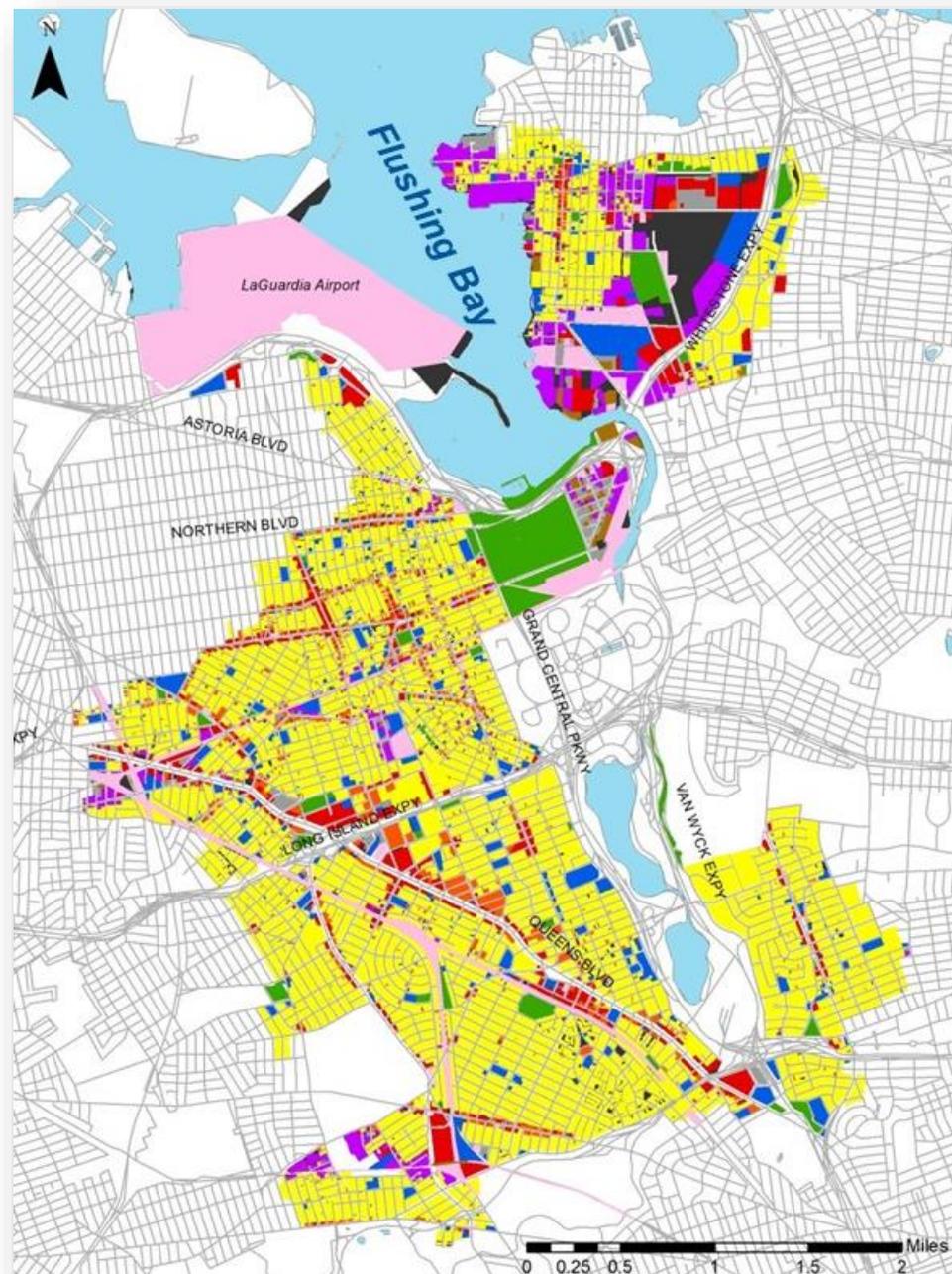


Flushing Bay Drainage Area Land Use

LEGEND

- Residential
- Mixed Residential and Commercial
- Commercial and Office
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Unknown

Residential & Commercial	62%
Transportation & Utility	15%
Other	7%
Public Facility	6%
Park and Open Space	5%
Industrial	5%

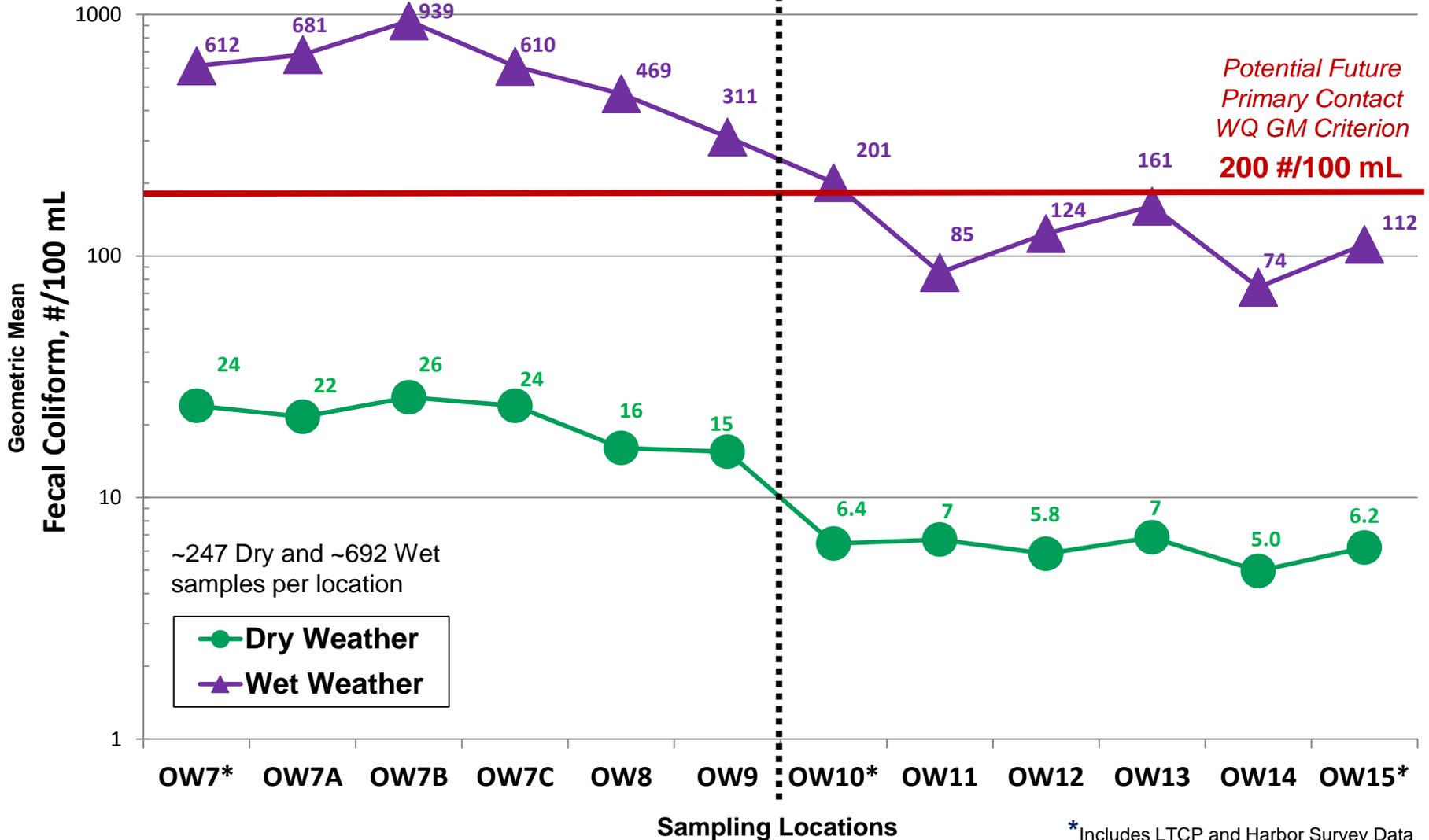


Flushing Bay Fecal Coliform Results

October 21, 2013 – May 7, 2014

Inner Bay

Outer Bay



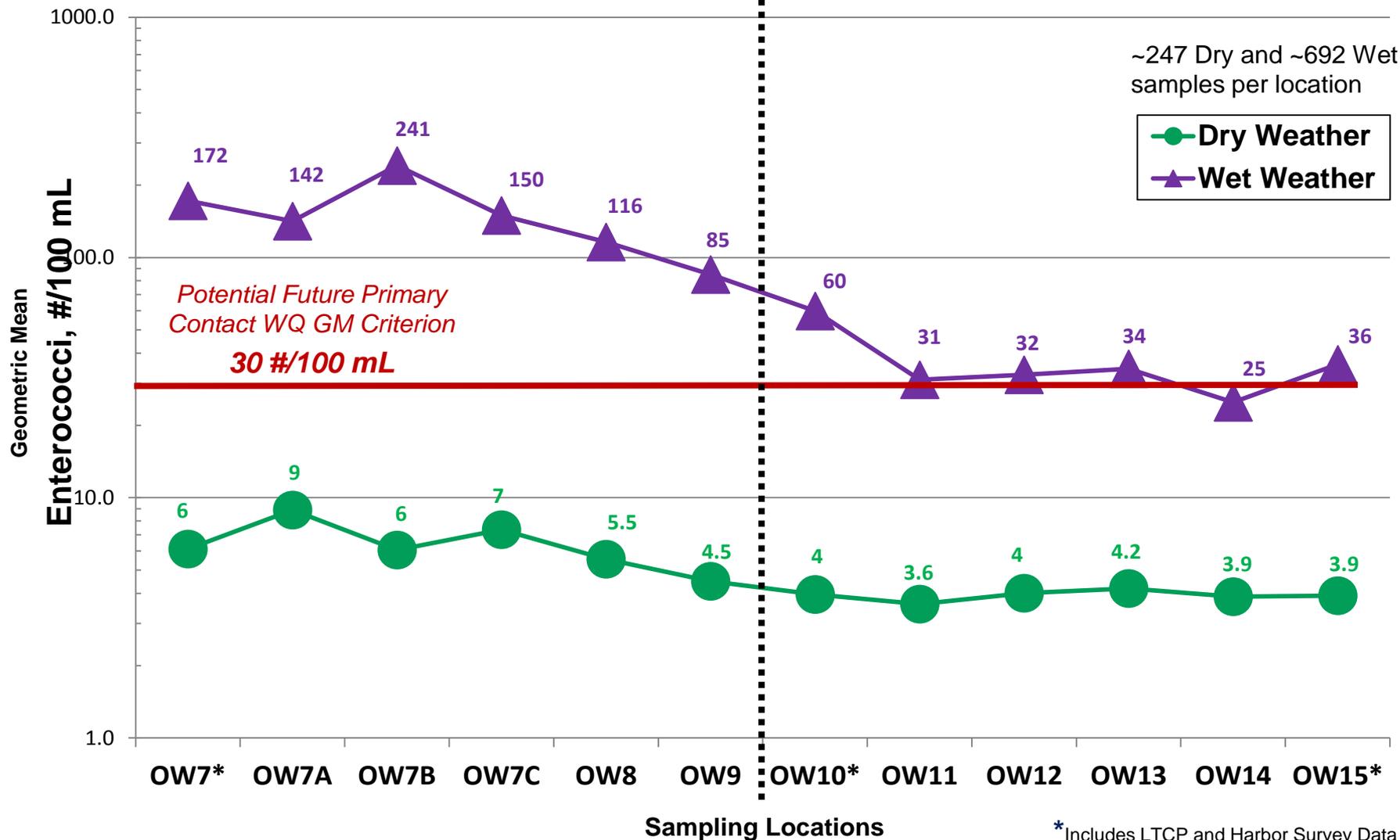
*Includes LTCP and Harbor Survey Data

Flushing Bay Enterococci Results

October 21, 2013 – May 7, 2014

Inner Bay

Outer Bay



*Includes LTCP and Harbor Survey Data

FB Landside Sampling / Flow Monitoring Program



- Duration
= July to Oct 2015
- No. of Locations
= 6
- 2 CSO Outfalls:
= **BB-006 and BB-008**
- CSO Water Quality Analysis for:
 - Fecal Coliform
 - Enterococci

Flushing Bay

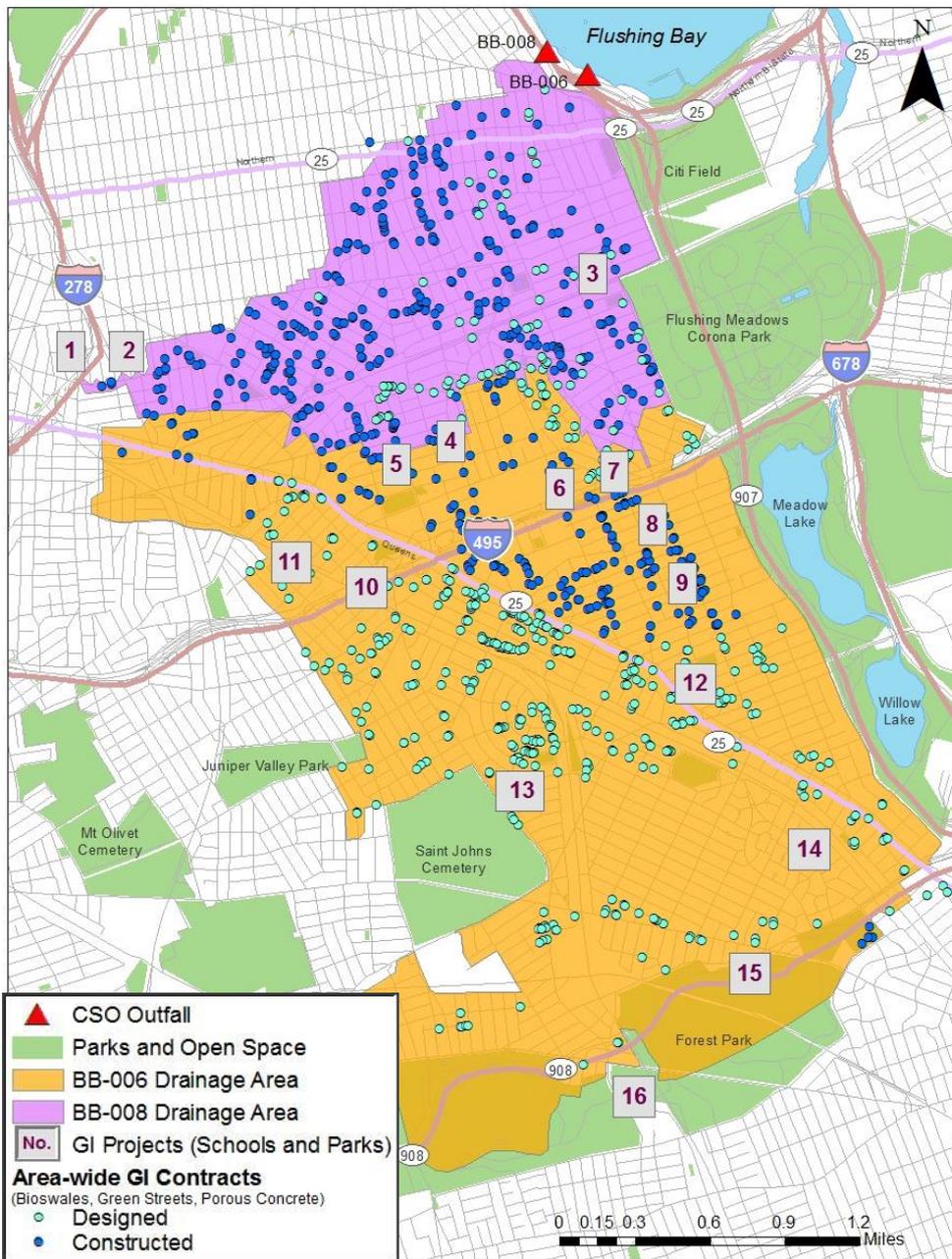
Water Quality Improvement Projects

Green and Grey Infrastructure

Angela Licata
Deputy Commissioner
DEP

Keith Beckmann, P.E.
LTCP Program Manager
DEP

Flushing Bay Built and Planned GI Projects



BB-008:

- 400 Bioswales
- 1 Stormwater Greenstreets
- 2 Parks
- 1 School

BB-006:

- 560 Bioswales
- 17 Stormwater Greenstreets
- 26,000 SF Porous Concrete Pilot
- 10 Parks
- 2 Schools

Public Property Retrofits

- | | |
|--|----------------------------------|
| 1. PS 12 James B. Colgate | 9. Annadale Playground |
| 2. Winfield Plaza | 10. Hoffman Park |
| 3. Corona Golf Playground | 11. PS 102 Bayview |
| 4. PS 13 Clement C. Moore | 12. Russel Sage Playground |
| 5. Newtown Playground | 13. The Painter's Playground |
| 6. Horace Harding Park | 14. Ehrenreich-Austin Playground |
| 7. Real Good Park | 15. Forest Park Union Turnpike |
| 8. JHS 157 Stephen A Halsey
(Already Constructed) | 16. Forest Park Victory Field |

Implemented GI Types:

- ✓ Permeable Pavers
- ✓ Synthetic Turf Field
- ✓ Pervious Concrete



Before



After

Grey Infrastructure

Results in CSO Reduction and Addresses Legacy CSO Odor Issues

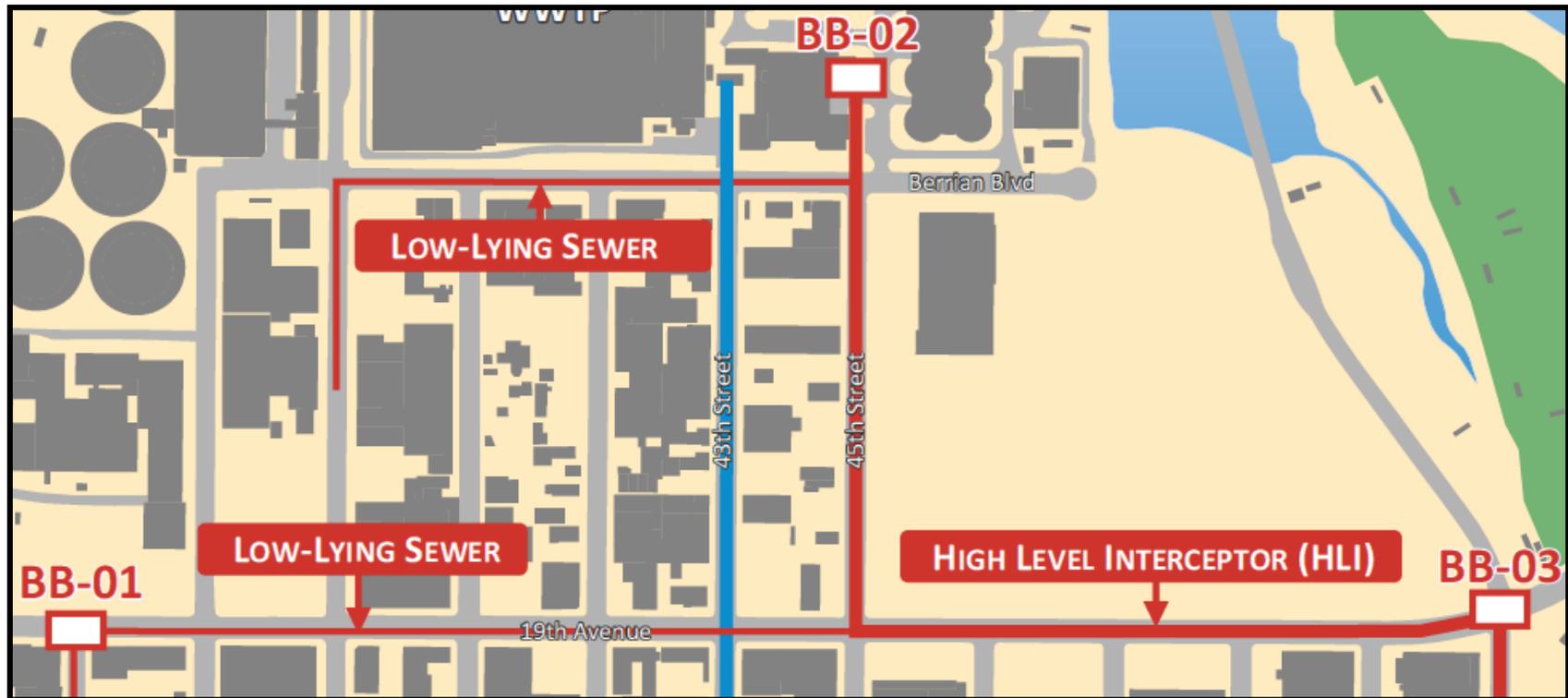
Waterbody/Watershed Facility Plan (WWFP) Recommended Implementation of Three Grey Infrastructure Projects:

- 1) Divert Low-Lying Sewers / Raise Weir BB-02
- 2) Regulator Modifications
- 3) Environmental Dredging of Flushing Bay

1) Divert Low-Lying Sewers / Raise Weir BB-02

➤ Divert low-lying sewers in the vicinity of Bowery Bay WWTP and raise the weir at regulator BB-02

- **Estimated Cost**
= \$5.6 Million
- **Construction Completion**
= December 2016
- **Current Status**
= In Construction



2) Regulator Modifications

➤ Bowery Bay high level interceptor regulator modifications at 5 regulators: BB-R4, BB-R5, BB-R6, BB-R9, and BB-R10

- **Estimated Cost**
= \$41.4 Million
- **Construction Completion**
= June 2018
- **Current Status**
= Design Completed

➤ Regulator modification at BB-R2 is covered under a separate project



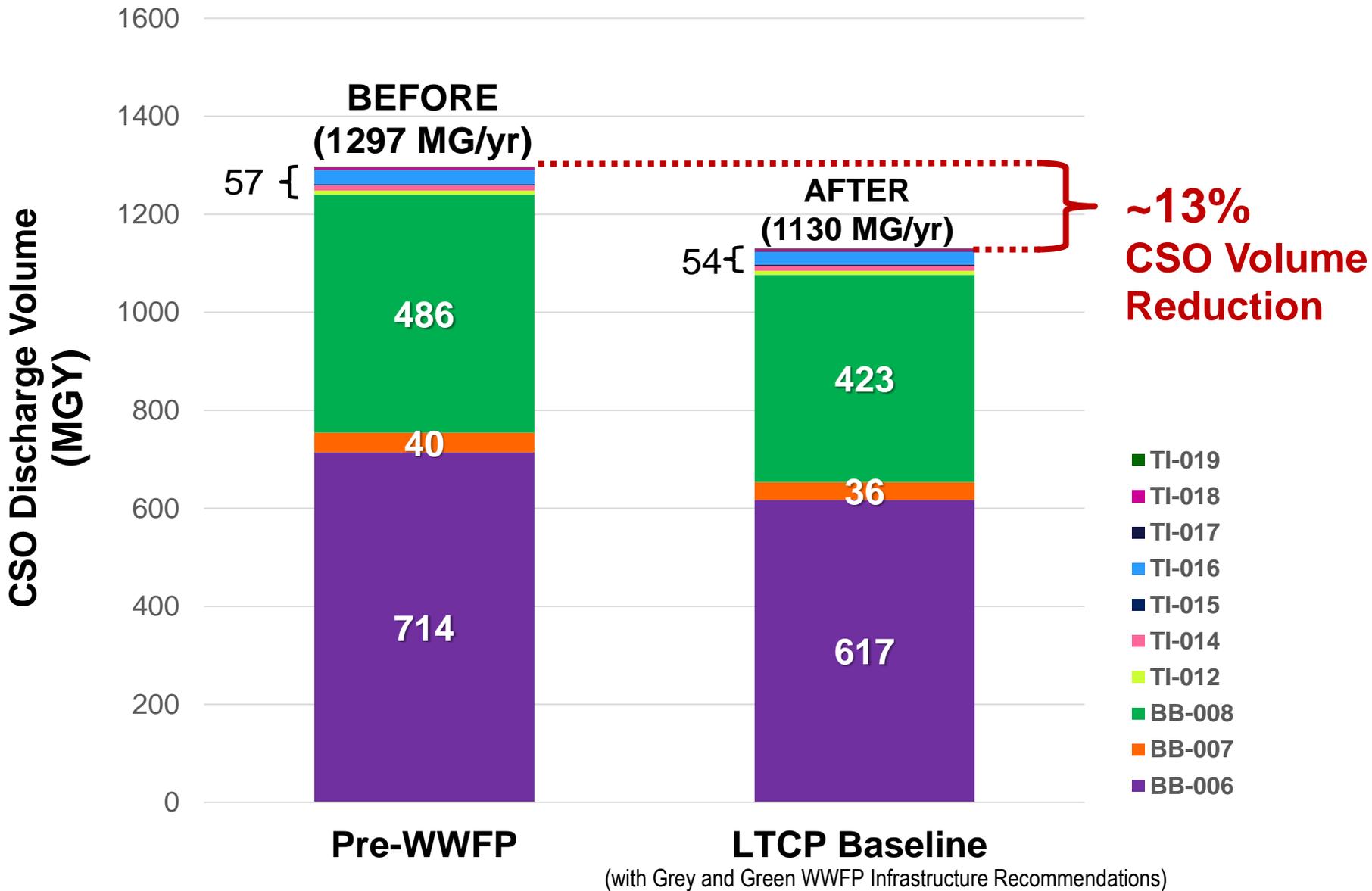
3) Environmental Dredging of Flushing Bay

- Removal of CSO related sediments that are exposed at low tides
- Dredge Area = 17.5 acres
- Dredge Quantity = 91,600 cubic yards
- Post-Dredge Depth = 4 feet below mean lower low water
- Removal of deteriorated piles and abandoned Pier head at Pier 2
- **Estimated Cost** = \$38.8 Million
- **Current status** = Design Completed

Milestone	Date
NTP Construction	March 2016
Complete Dredging & Planting	March 2019
Complete Wetlands Maintenance	March 2021



Flushing Bay Modeled CSO Volumes



Flushing Bay CSO Mitigation Options

INCREASING COMPLEXITY 

INCREASING COST 

System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Inflatable Dams Bending Weirs Control Gates	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping	
Water Quality / Ecological Enhancement	Floatables Control	Dredging	Dissolved Oxygen Improvement	Flushing Tunnel
Treatment <i>Satellite:</i>	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)
<i>Centralized:</i>	WWTP Expansion			
Storage	In-System	Shaft	Tank	Tunnel

Next Steps

Eric Landau
Associate Commissioner
DEP

- Public Comments will be accepted for Flushing Bay and Flushing Creek through October 30, 2015

- DEP/DEC to review public comments

- DEC to approve Flushing Creek LTCP

- Comments can 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