

Northeast Ohio Regional Sewer District – CSO LTCP Cost Overview

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Agenda

- Comparison of historical CSO commitments
- Overview of Consent Decree Projects
- Negotiation history
- Long-term and Near-term rate implications
- Opportunities to reduce costs through use of Green Infrastructure (GI)



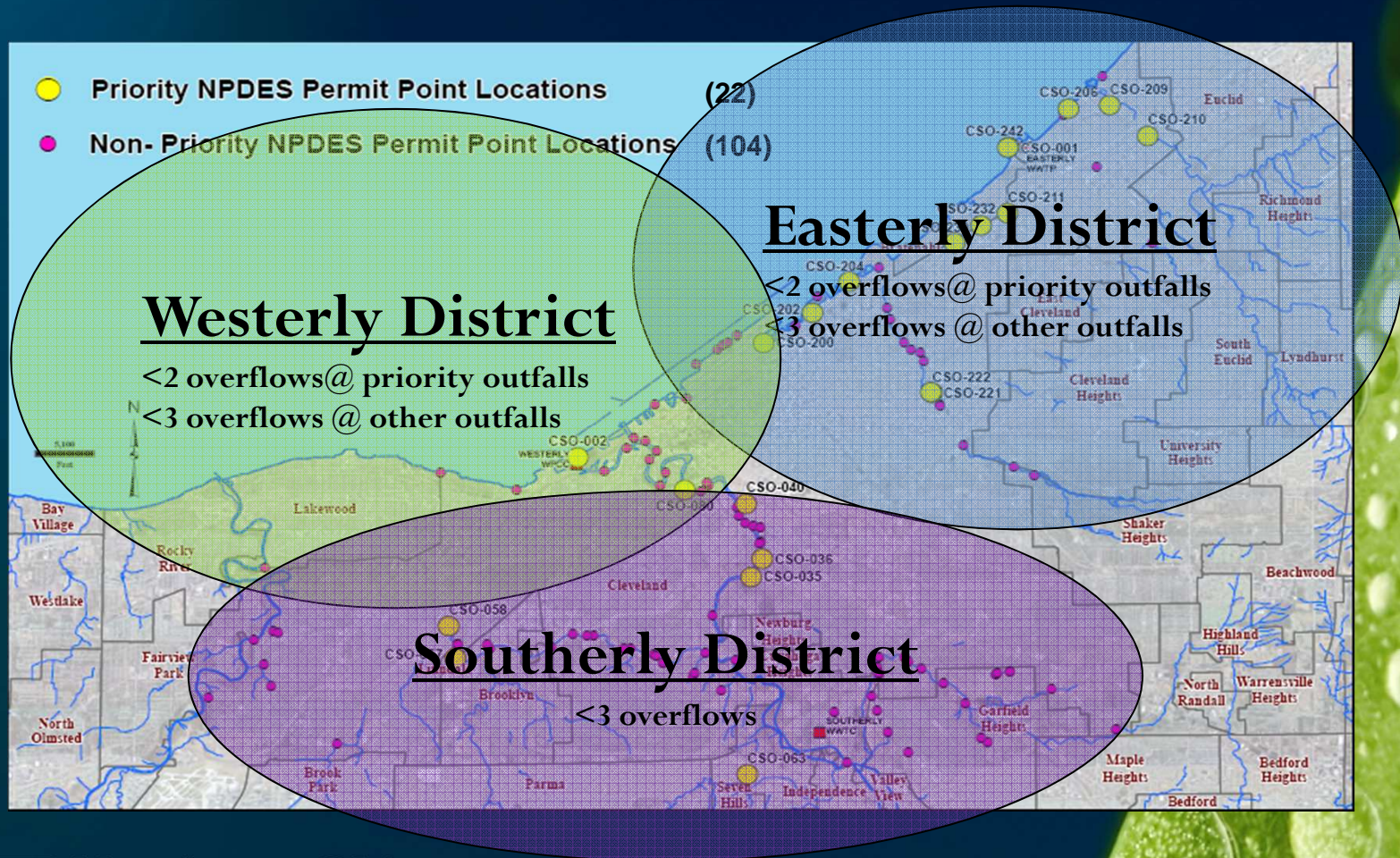
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Northeast Ohio Regional Sewer District CSOs “*By the numbers*”

Component	Baseline	Original Plan (2002)	Consent Decree Plan (2010)
Level of Control	Up to 80 overflows/year (some outfalls)	<4 overflows/year	<2 overflows/year
Remaining Overflow Volume (Typ. Year)	4,531,000,000 (reduced from 9 BG since 1970's)	1,097,000,000	
Implementation Schedule	~40 Years	30 Years	
Costs (2009\$)	~\$1B invested to-date	\$2.7B	
Percent Capture	N/A	97%	98%
Green Infrastructure	N/A	N/A	- 42 MG (\$44M) - Green-for-Gray



Northeast Ohio Regional Sewer District Combined Sewer Area (81.39 sq. miles)



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NEORSD Long Term Control Plan

- Mill Creek Storage Tunnel System
- Big Creek Storage Tunnel System
- Doan Valley Storage Tunnel System
- Euclid Creek & Dugway Storage Tunnels System
- Southerly Storage Tunnel System
- Shoreline Storage Tunnel System
- Westerly Storage Tunnel System
- NEORSD Service Area Boundary

Key locations and features on the map include:

- 411 MGD CEHRT** (Callout pointing to the western end of the service area boundary)
- 400 MGD CEHRT** (Callout pointing to the eastern end of the service area boundary)
- Expansion of secondary capacity** (Callout pointing to the eastern end of the service area boundary)
- Expansion of secondary capacity and CEHRT** (Callout pointing to the southern end of the service area boundary)

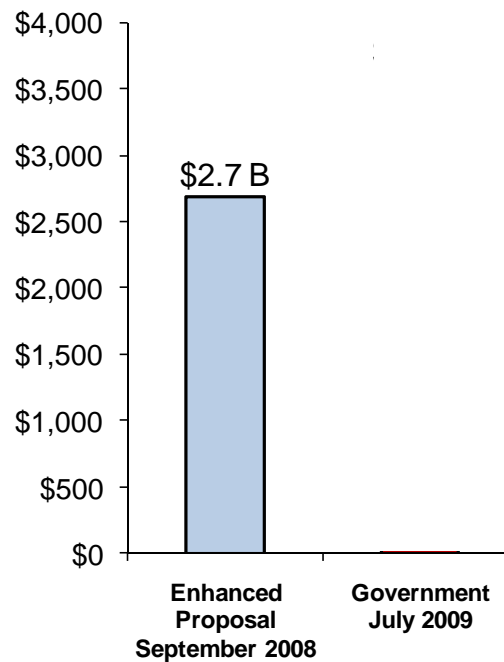
The map shows the NEORSD Service Area Boundary in red, with various storage tunnel systems in different colors. Major roads and landmarks are labeled, including Cleveland, Parma, and various airports and parks.

Expansion of secondary capacity

Expansion of secondary capacity and CEHRT

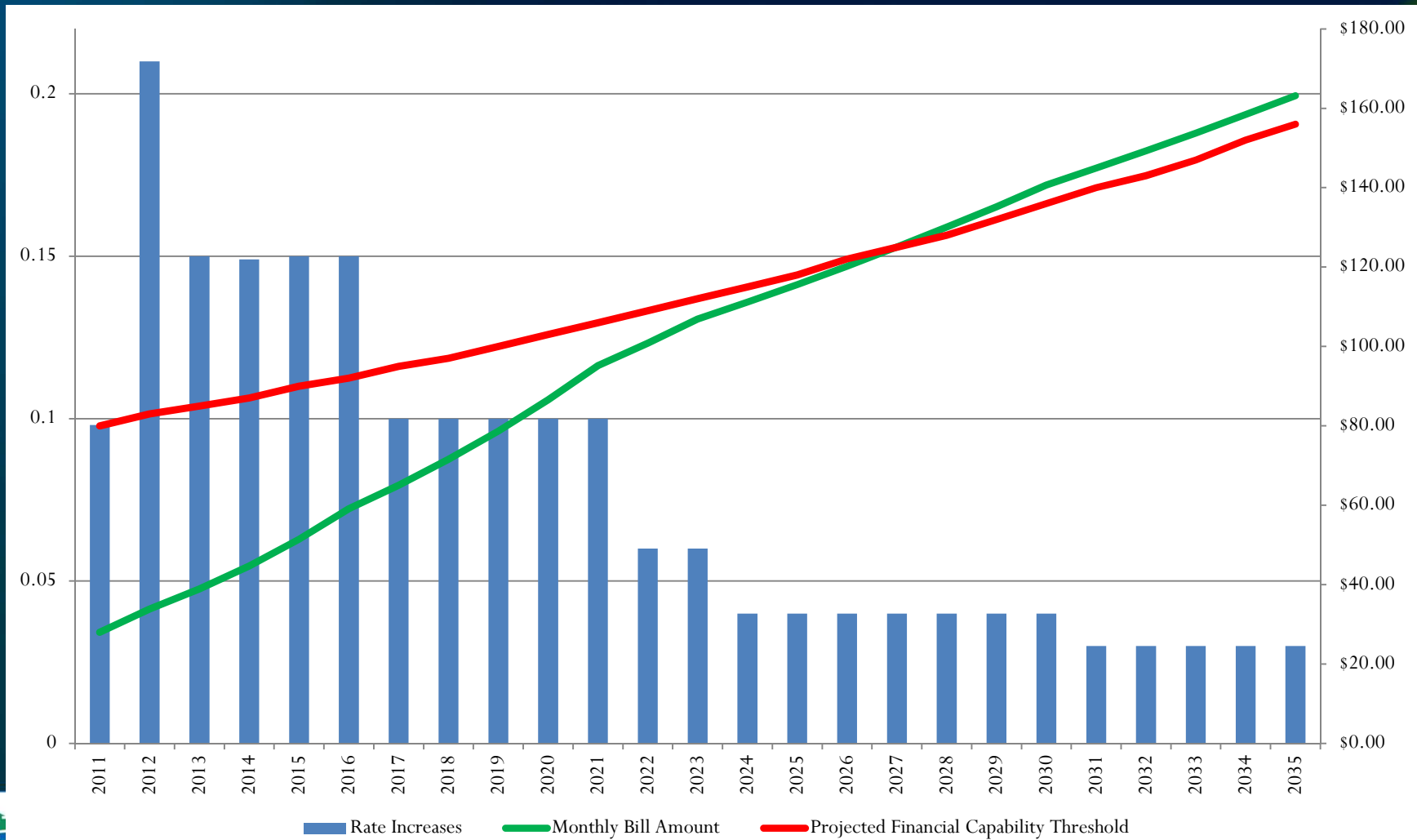
CSO LTCP – Recent Negotiation History

\$ Millions (2009\$)



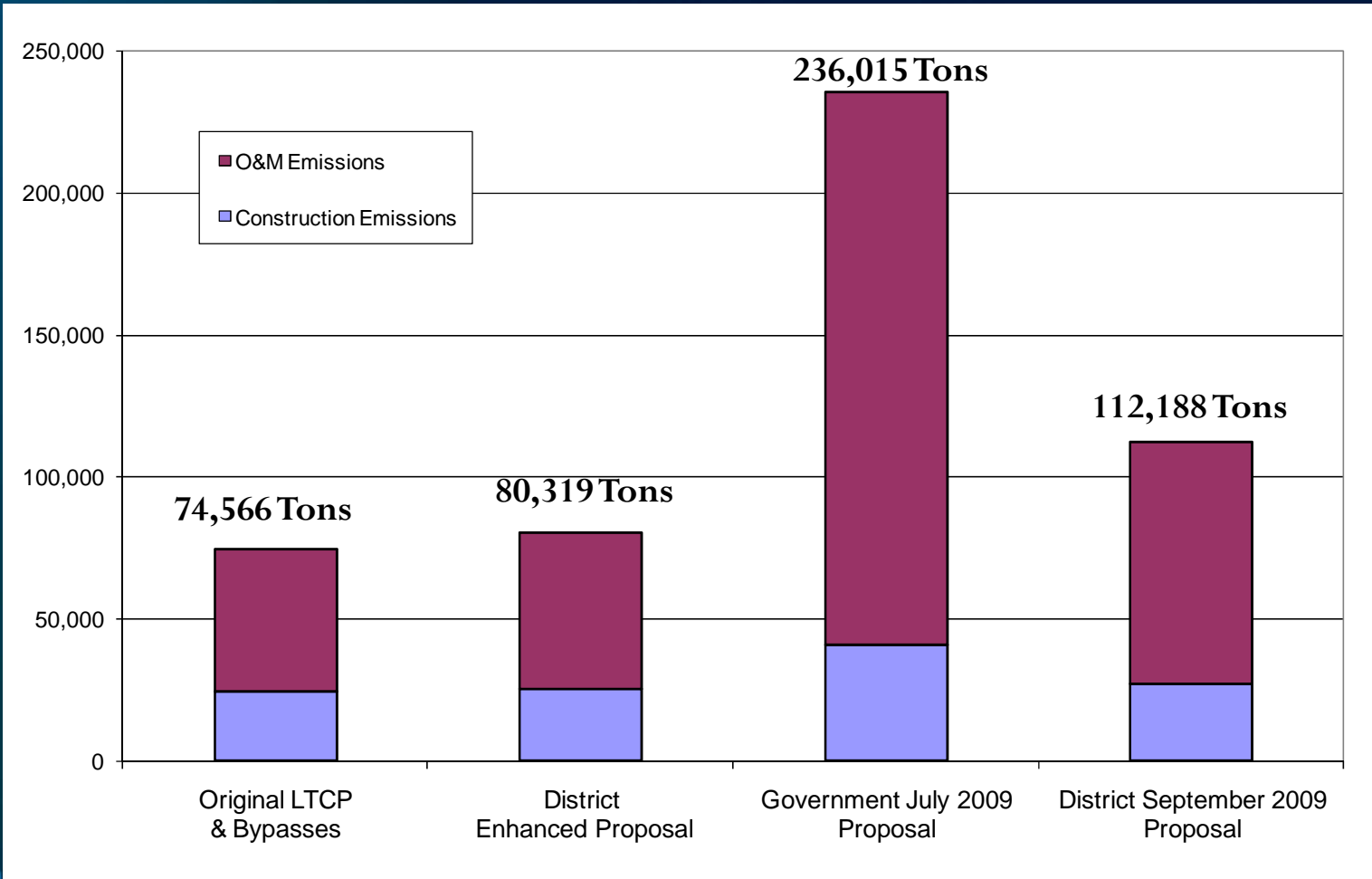
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Worst case Scenario (\$3.7B over 20 years) — Projected Long-term Rate Impacts



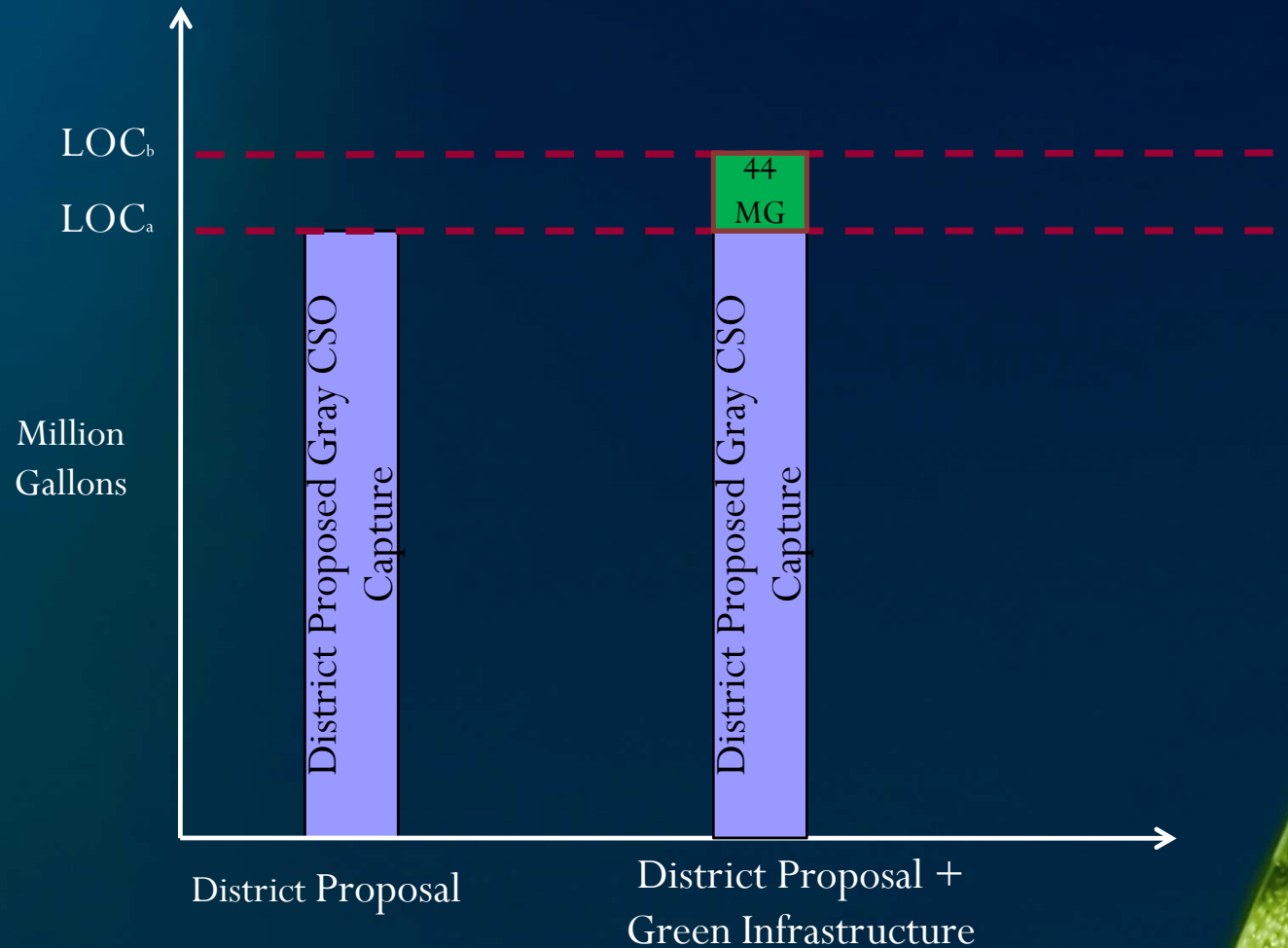
Lifecycle GHG Emissions Provided Leverage to Reduce Government Demands

Lifecycle GHG Emissions (Tons CO₂e)



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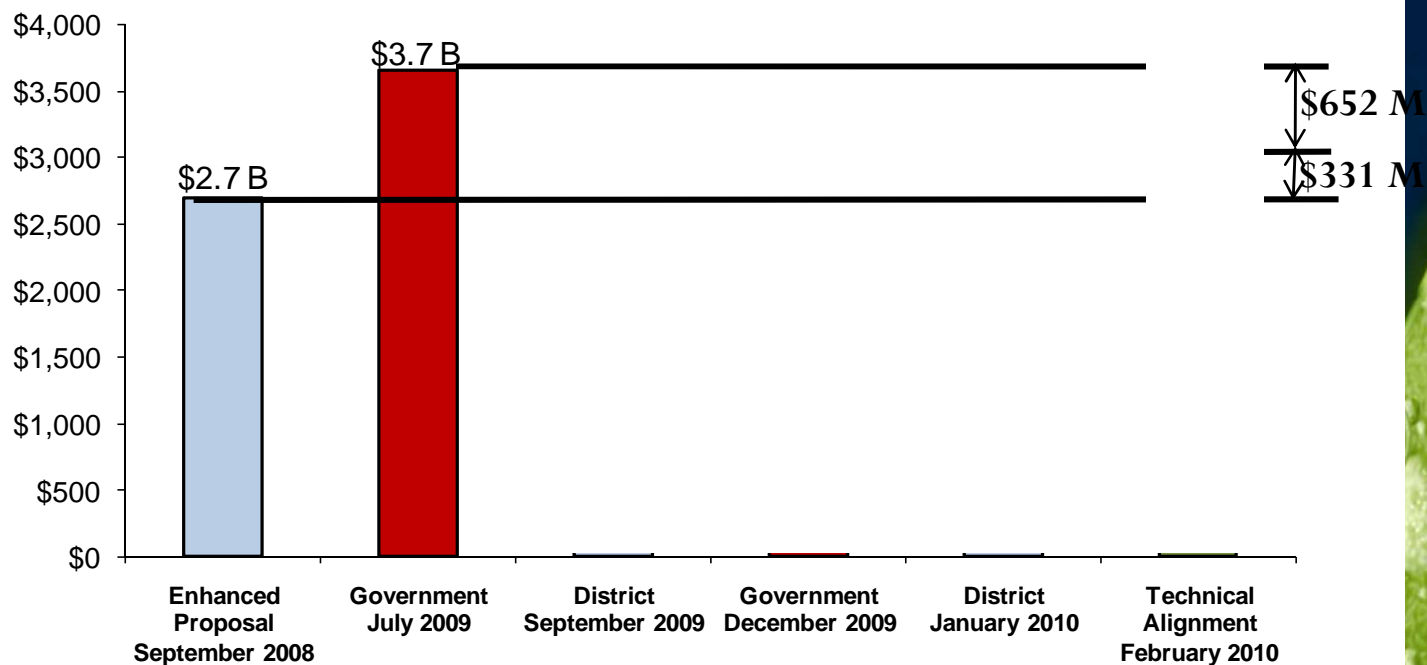
Green Infrastructure (GI) Proposed by District In-lieu of Bigger Tunnels



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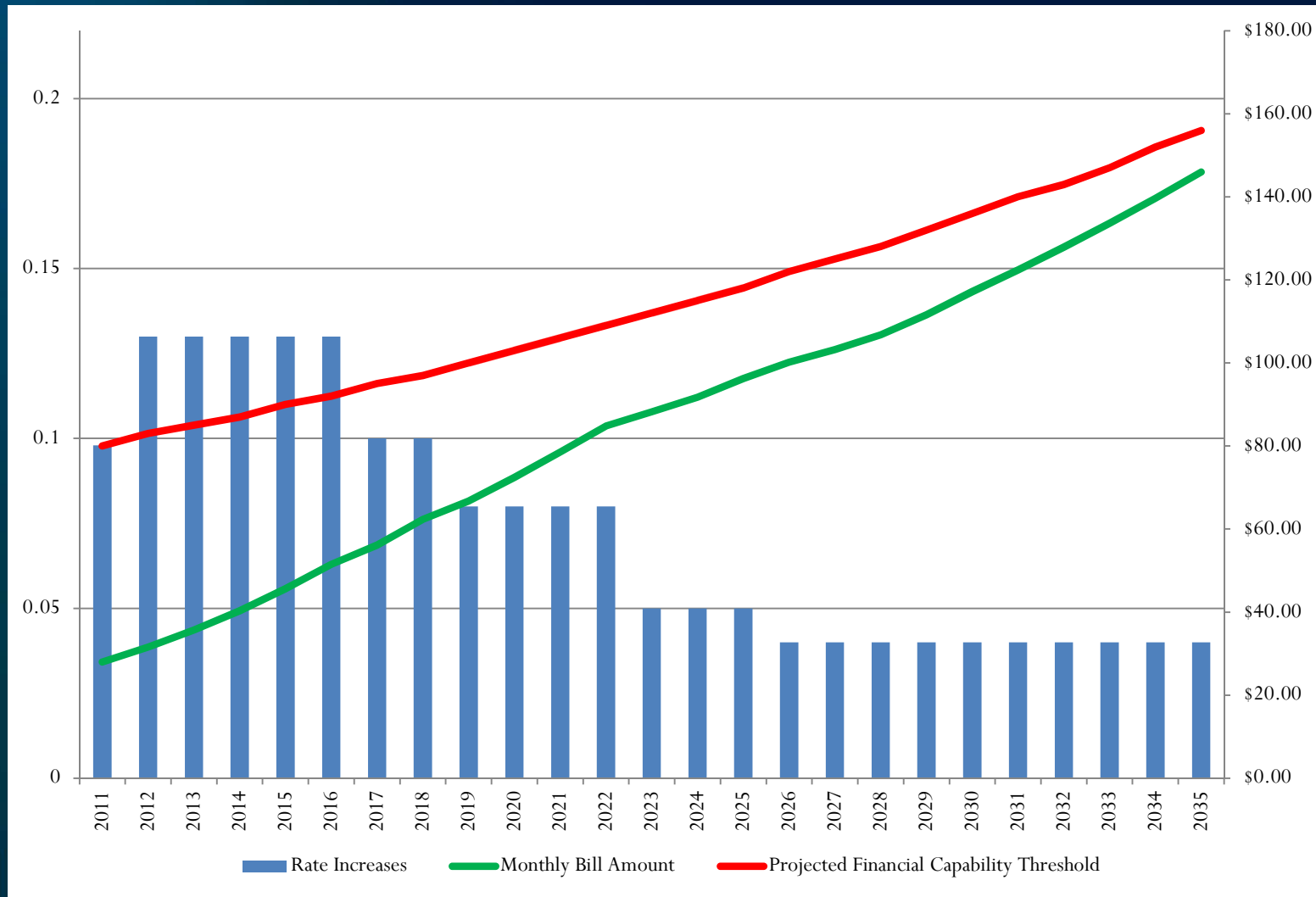
CSO LTCP Negotiation History

\$ Millions (2009\$)



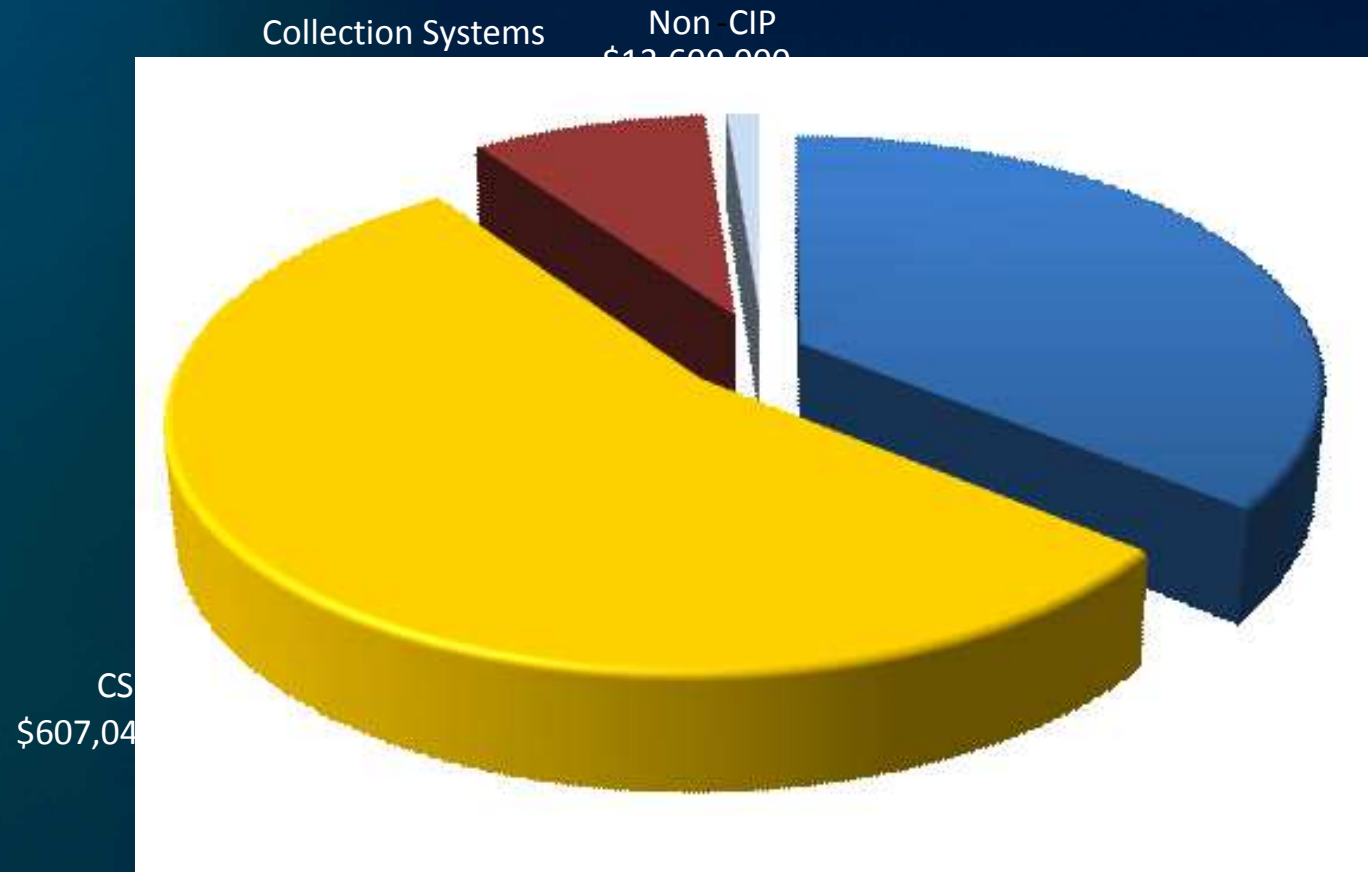
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Consent Decree Agreement (\$3B over 25 years)— Projected Long-term Rate Impacts



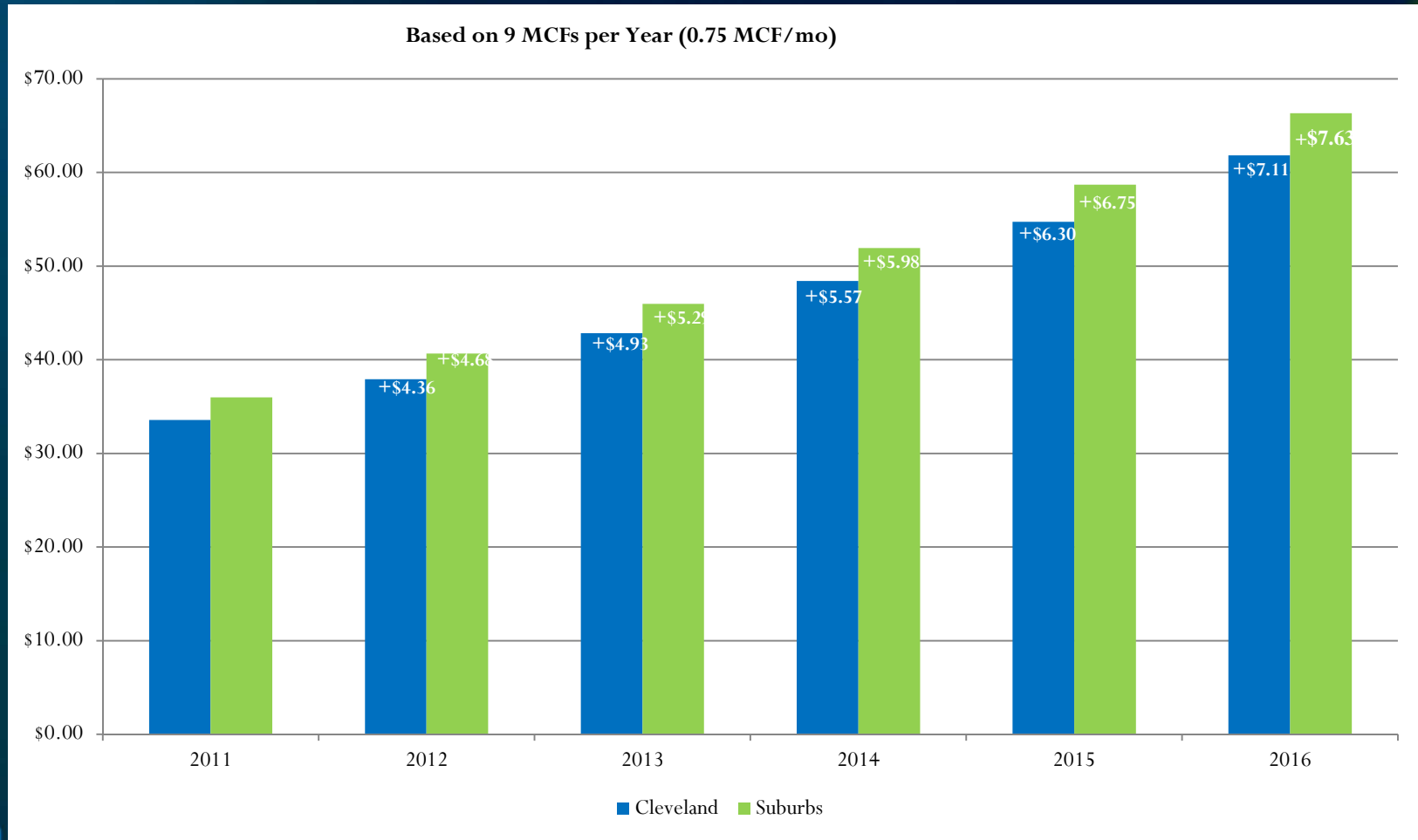
Near-term CIP Impacts 2010-2014

Total \$1,101,289,798



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Near-term Rate Impacts - Estimated Average Monthly Residential Sewer Bills



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NEORSD CSO LTCP – Proposed Tunnel Projects (Gray Infrastructure)

	Diameter (Feet)	Length (Feet)	Effective Storage Volume (MG)	# Overflows in Typ. Yr.	Estimated Construction Costs (\$MM)	Bid Year	\$/Gallon
Easterly District							
Euclid Creek/ Dugway Storage Tunnels	24	18,200	117	<2	\$198	2010	\$2.93
	24	14,400			\$145	2016	
Shoreline Storage Tunnel	21	15,660	43	<2 Priority <3 all others	\$180	2021	\$4.19
Doan Valley Tunnel	17	9,740	16	<2 Priority <3 all others	\$101	2017	\$6.31
Southerly District							
Southerly Tunnel	23	17,560	54	<3	\$196	2024	\$3.63
Big Creek Tunnel	20	19,500	46	<3	\$221	2028	\$4.80
Westerly District							
Westerly Tunnel	24	11,570	36	<2 Priority <3 all others	\$202	2020	\$5.61
Totals		~ 20 Miles	312 MG		\$1.243B		\$4.0 (avg.)



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Green Infrastructure Can be More Cost Effective and Deliver the Triple Bottom Line

Summary of Green Infrastructure Project Benefits

Prepared by: Strand Associates, Inc.®

Terraced Reforestation of Interstate 75 Right-of-Way	
Green Infrastructure Features	Terraced Berms with Amended Soil
Green Infrastructure Size	4,700 linear feet
Drainage Area	17 acres
Effective Storage	630,000 gallons
Project Cost	\$584,000
Cost per Gallon	\$0.93

St. Francis Apartments Early Success Project	
Green Infrastructure Features	Bioretention Basins
Green Infrastructure Size	7,000 square feet
Drainage Area	3 acres
Effective Storage	180,000 gallons
Project Cost	\$236,000
Cost per Gallon	\$1.31

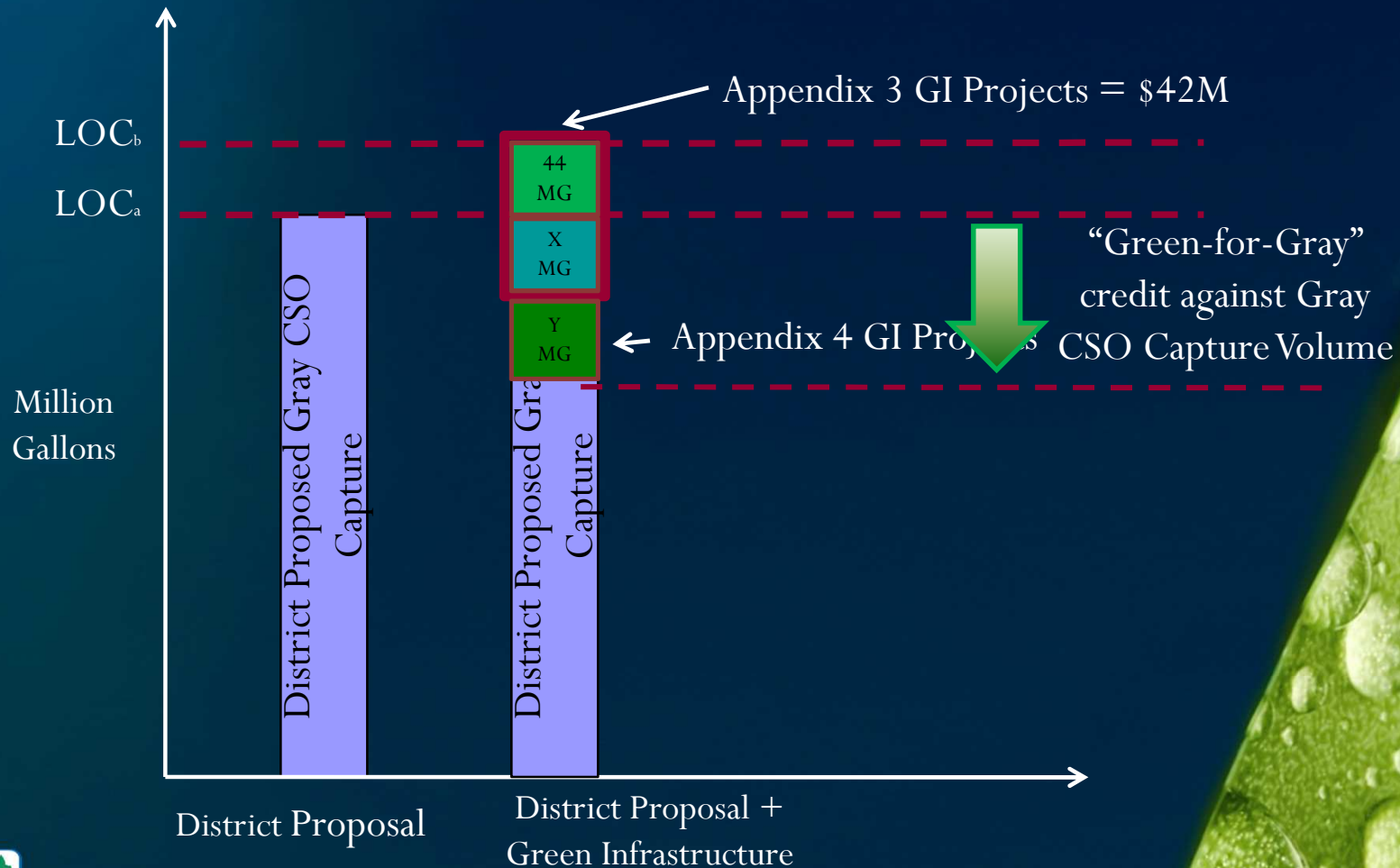
Roselawn Park Early Success Project	
Green Infrastructure Features	Bioretention Basins
Green Infrastructure Size	4,500 square feet
Drainage Area	10 acres
Effective Storage	75,000 gallons
Project Cost	\$187,500
Cost per Gallon	\$2.45



Avg. Cost for
Green
Infrastructure:
\$1.57/gal.

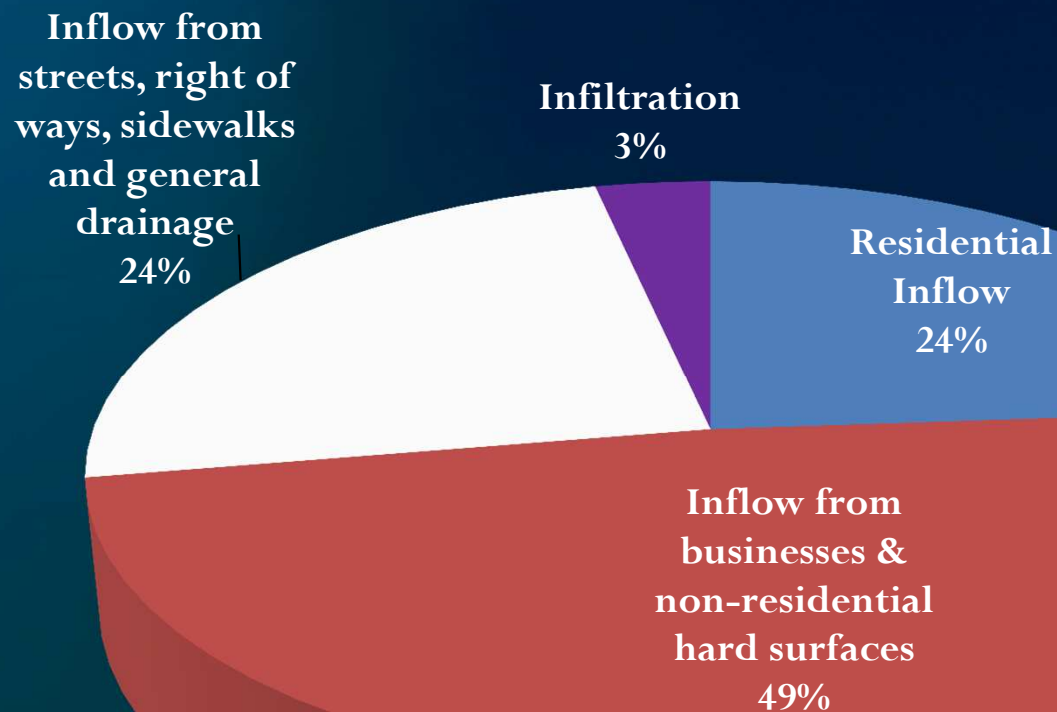
Up to
\$2.5/gal.
Cost Savings
over Gray

NEORSD Consent Decree Contains Provisions to Substitute “Green-for-Gray”



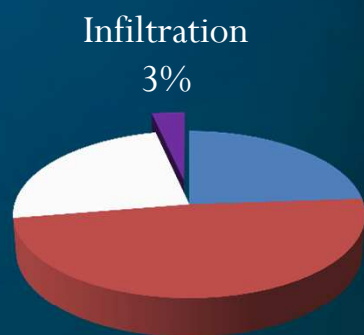
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Total Annual Wet-Weather Volume Within NEORSD Combined Sewer Area



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Traditional Gray Methods to Deal With Wet-weather Issues are Seldom Cost-Effective on their own



Infiltration:

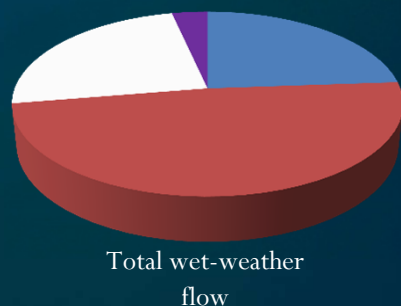
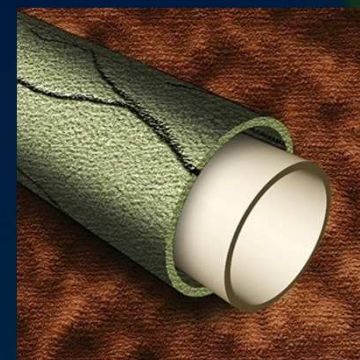
Cost

laterals: 250,000 = \$250,000,000

sewers: 1,200 miles = \$4.3 Billion

manholes: 4,000 = \$12,000,000

Total estimated cost = \$4.66 Billion



Sewer Separation:

Cost¹

Easterly district = \$1.53 Billion

Southerly district = \$1.47 Billion

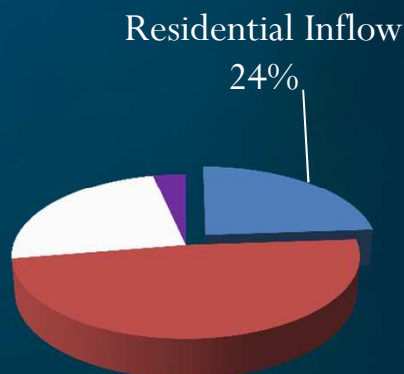
Westerly district = \$734,800,000

Total estimated cost = \$3.73 Billion



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Distributed Green Infrastructure May Be Challenged to Achieve the Overall Wet-Weather Volume Reduction Goals



Residential inflow:

Roof inflow = would require at least 24 rain barrels per home or an approximately 1,300 gallon cistern/storage tank per home to capture the required volume

Cost

rain barrels: 3,020,000 = \$166,300,000

pervious driveways: 126,000 = \$1.09 Billion

Total estimated cost = \$1.25 Billion

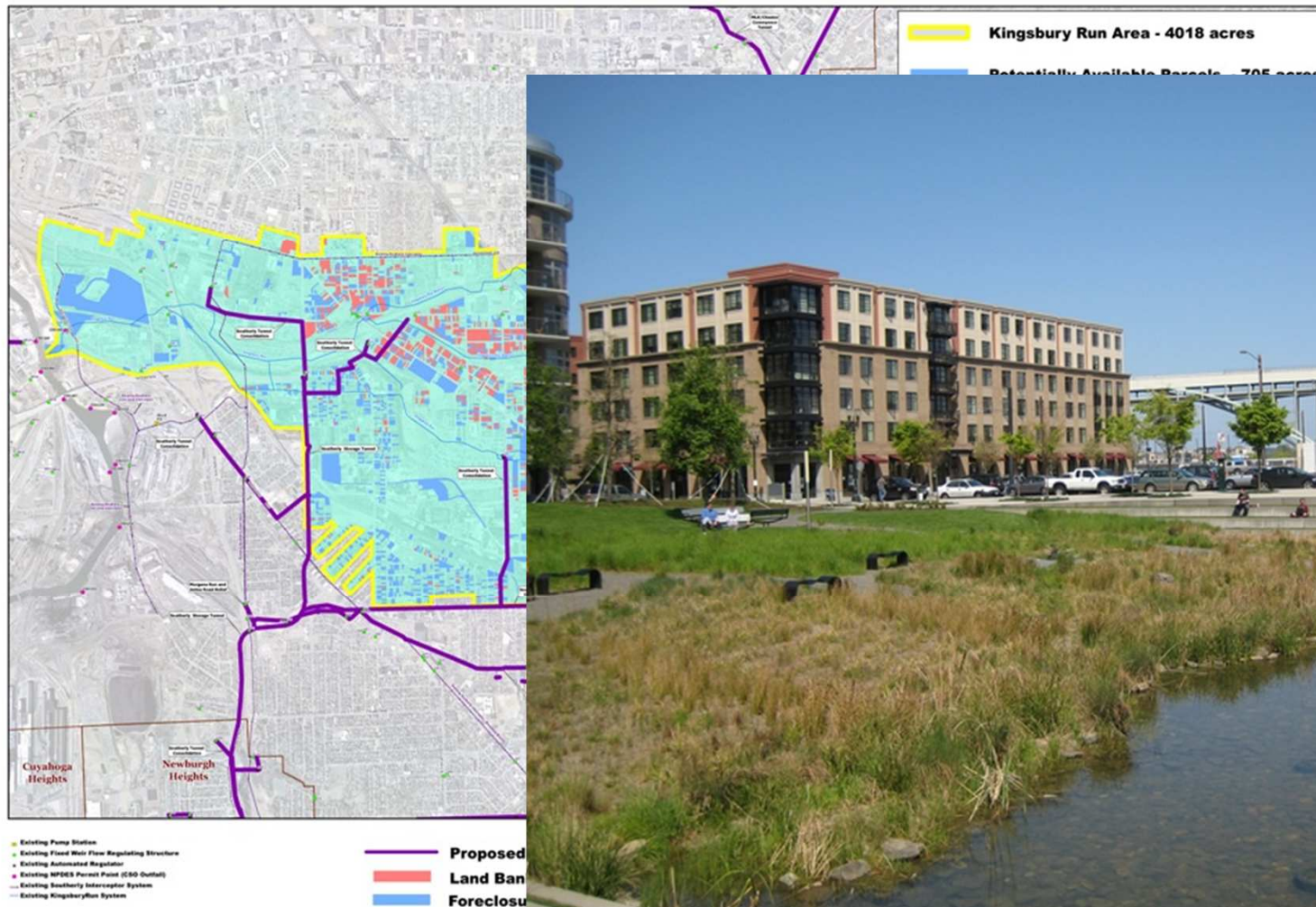


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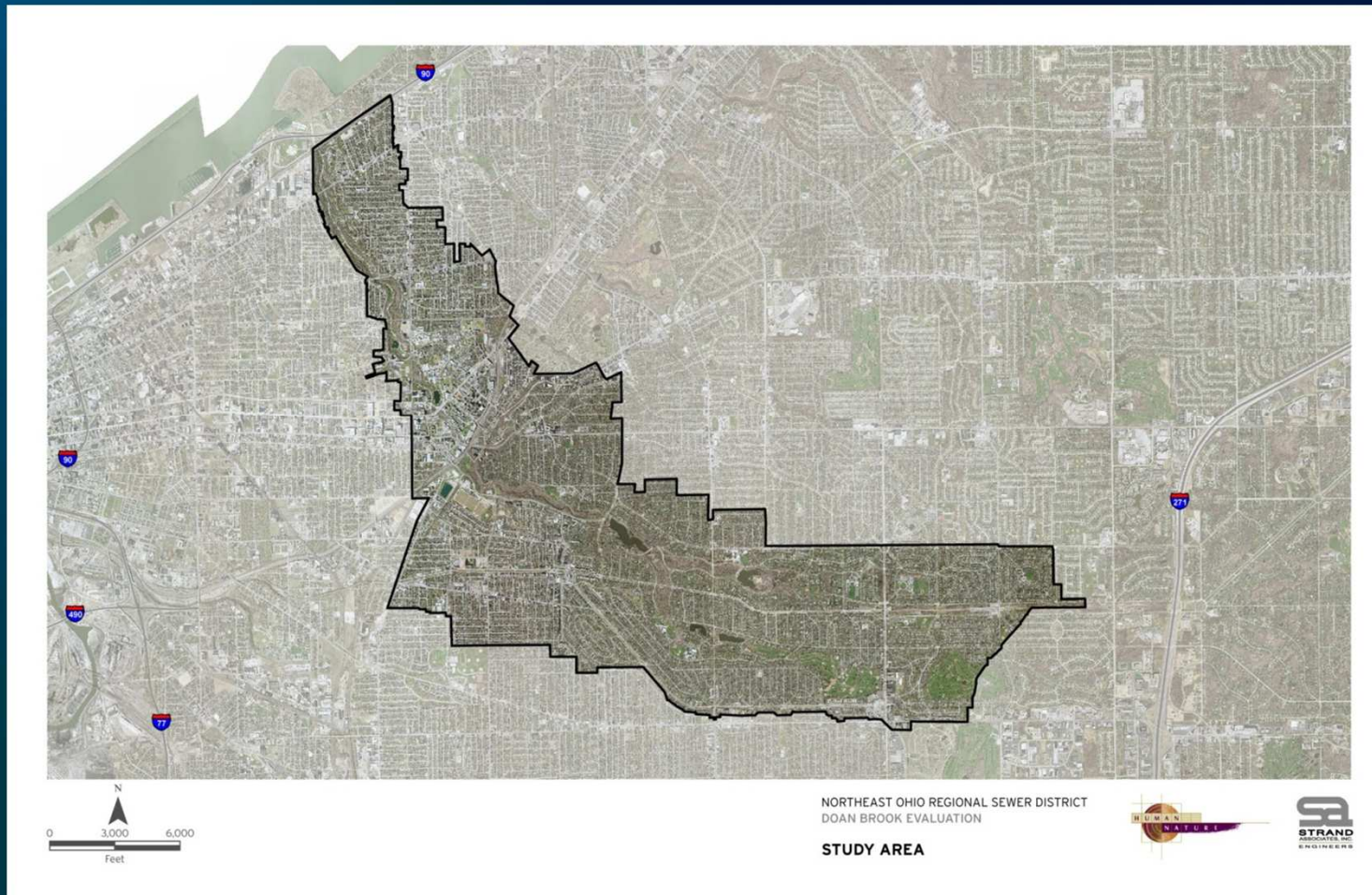
The Northeast Ohio Nexus of Opportunity: Vacant Properties = GI CSO Control



Long Term Control Plan vs. 2005-08 Foreclosure Data Analysis KINGSBURY RUN (CSO-040) SERVICE AREA ANALYSIS

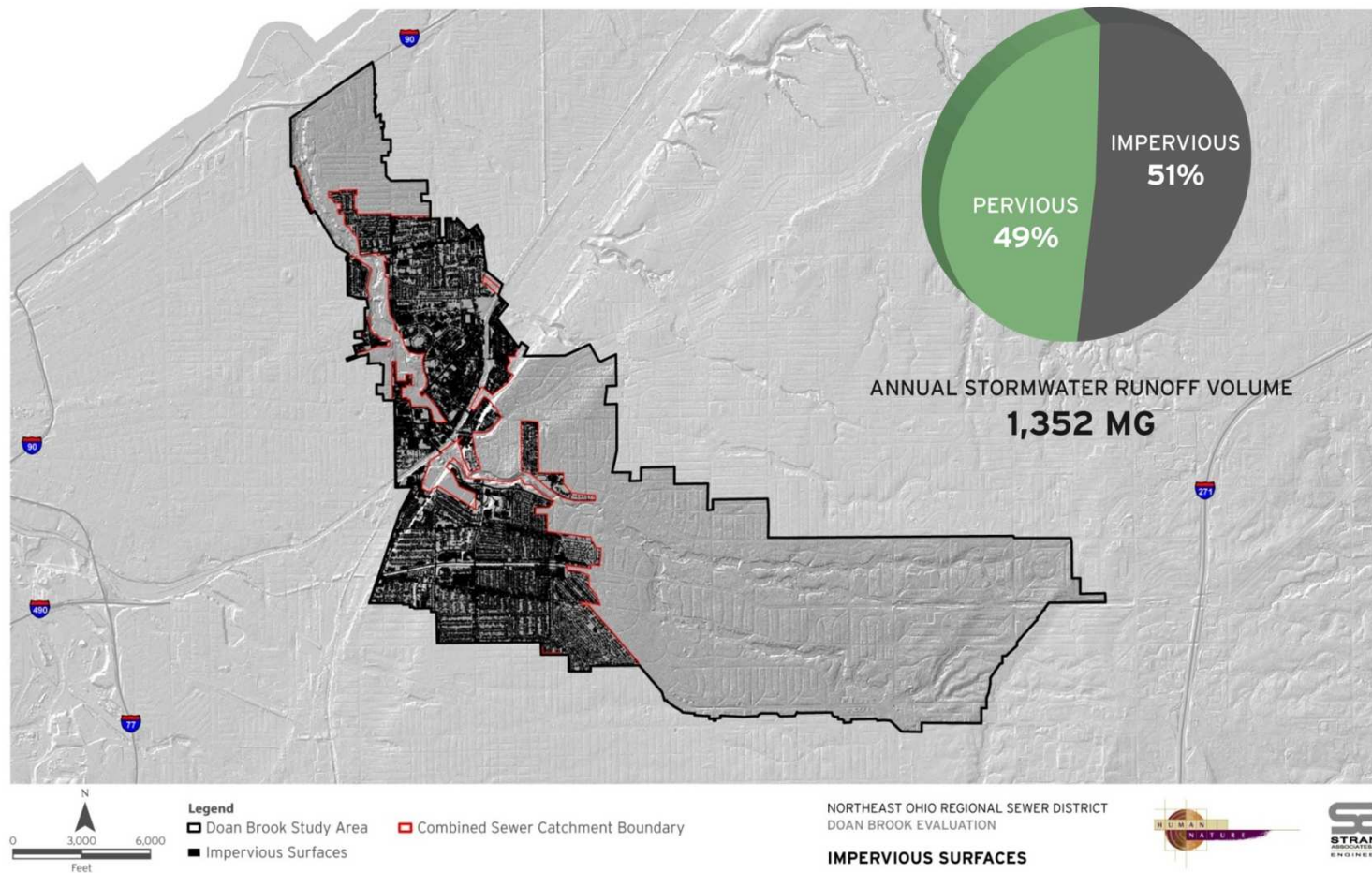


NEORSD Green Infrastructure Study: Doan Brook Watershed



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The Doan Brook “Trifecta”: Impervious Surfaces, Vacant Property, and Good Soils



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Next Steps

- Green Infrastructure Studies to be completed by December 31, 2011
 - Identify potential size of opportunities to downsize tunnels
 - Identify “quick-hit” projects to demonstrate effectiveness to EPA
- First semi-annual Report to EPA on July 1, 2011



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Questions??

Copy of Consent Decree can be Downloaded at www.neorsd.org:

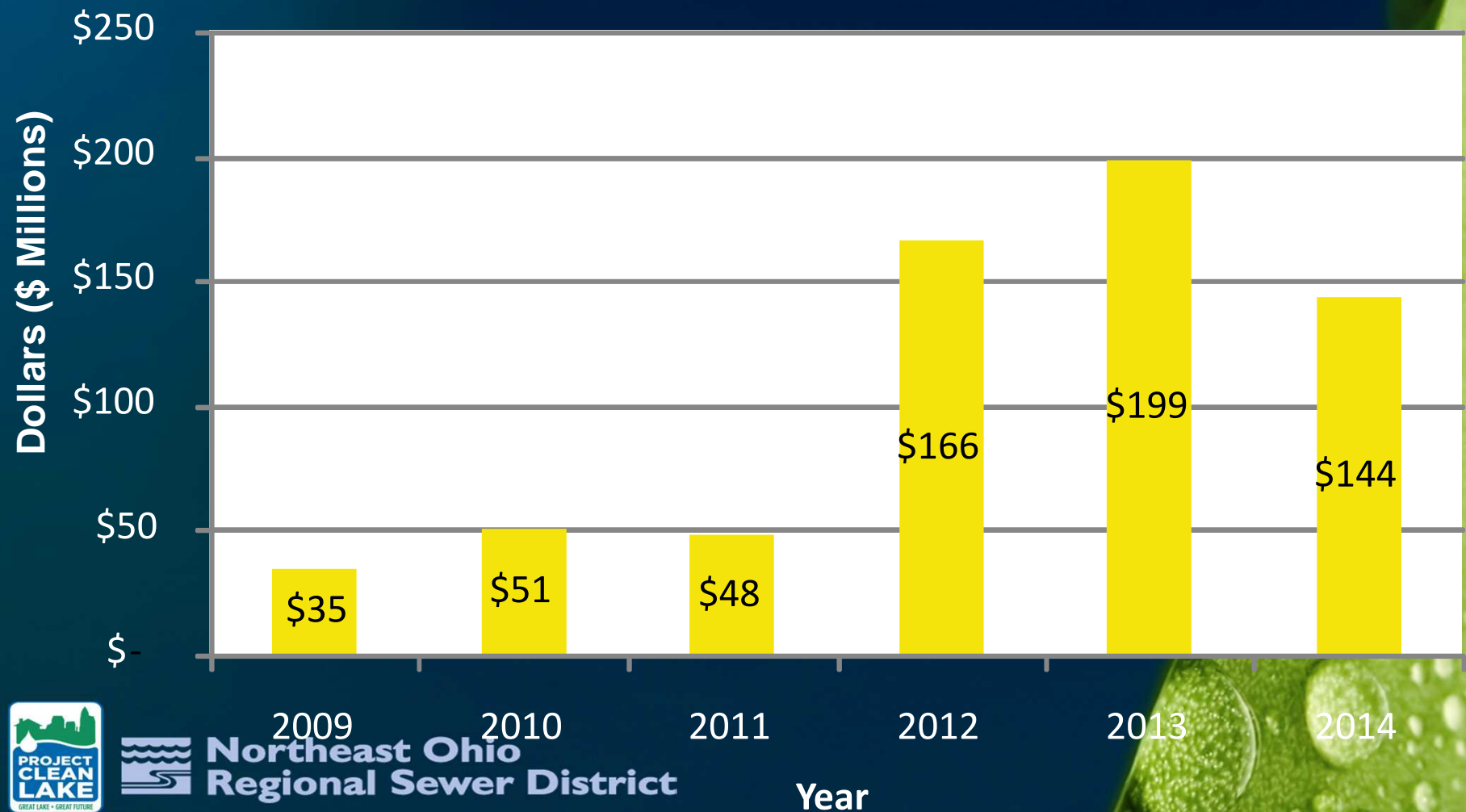


Email: RotunnoK@neorsd.org



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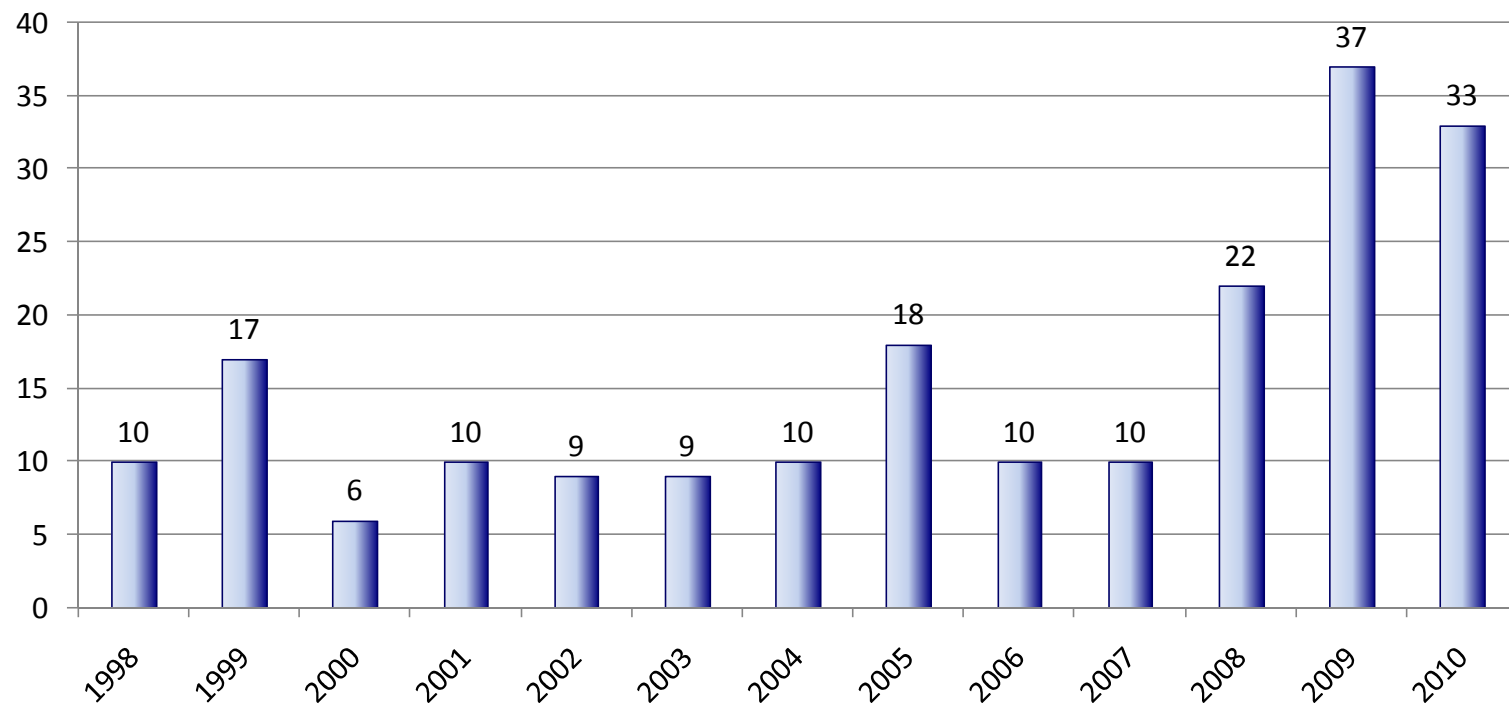
2009-2014 Cash Flow CSO Projects



History of District Project Awards

We Have Developed the People, Process, and Tools for a New Level of Delivery

Awarded Projects

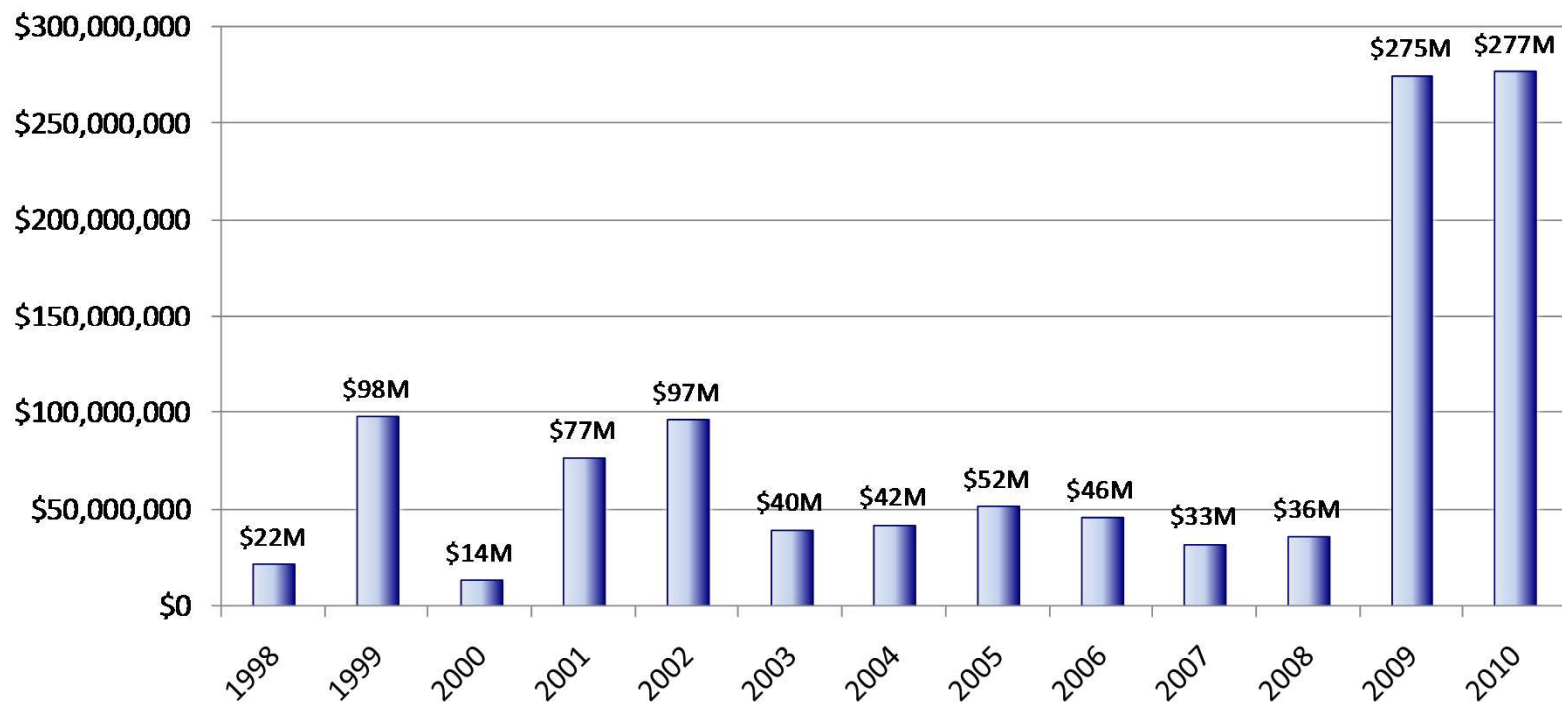


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History of District Award Value

We Have Developed the People, Process, and Tools for a New Level of Delivery

Award Value



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Wet-weather Treatment Facilities - Solids Removal Targets – TSS Effluent Goal



Data Source: 1997
Feasibility Study



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