

Community Dialogue

Community Summit on Green Infrastructure
Syracuse, New York



**Northeast Ohio
Regional Sewer District**



Northeast Ohio Regional Sewer District (NEORS)

Clean water: The Sewer District



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Northeast Ohio Regional Sewer District

Governance

- Created in 1972 by Court Order
- Governed by seven Trustees
- Servicing all or part of 62 member communities, >1 million customers
- Average daily flow treated ~200 million gallons



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355

square miles



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■ District Service Area

— Interstate

□ County Boundary

Northeast Ohio Regional Sewer District

Responsibility

- Wastewater Treatment Plants
- Interceptor sewers
- Wet weather programs
 - Combined Sewer Overflow (CSO) Control
 - Regional Stormwater Management



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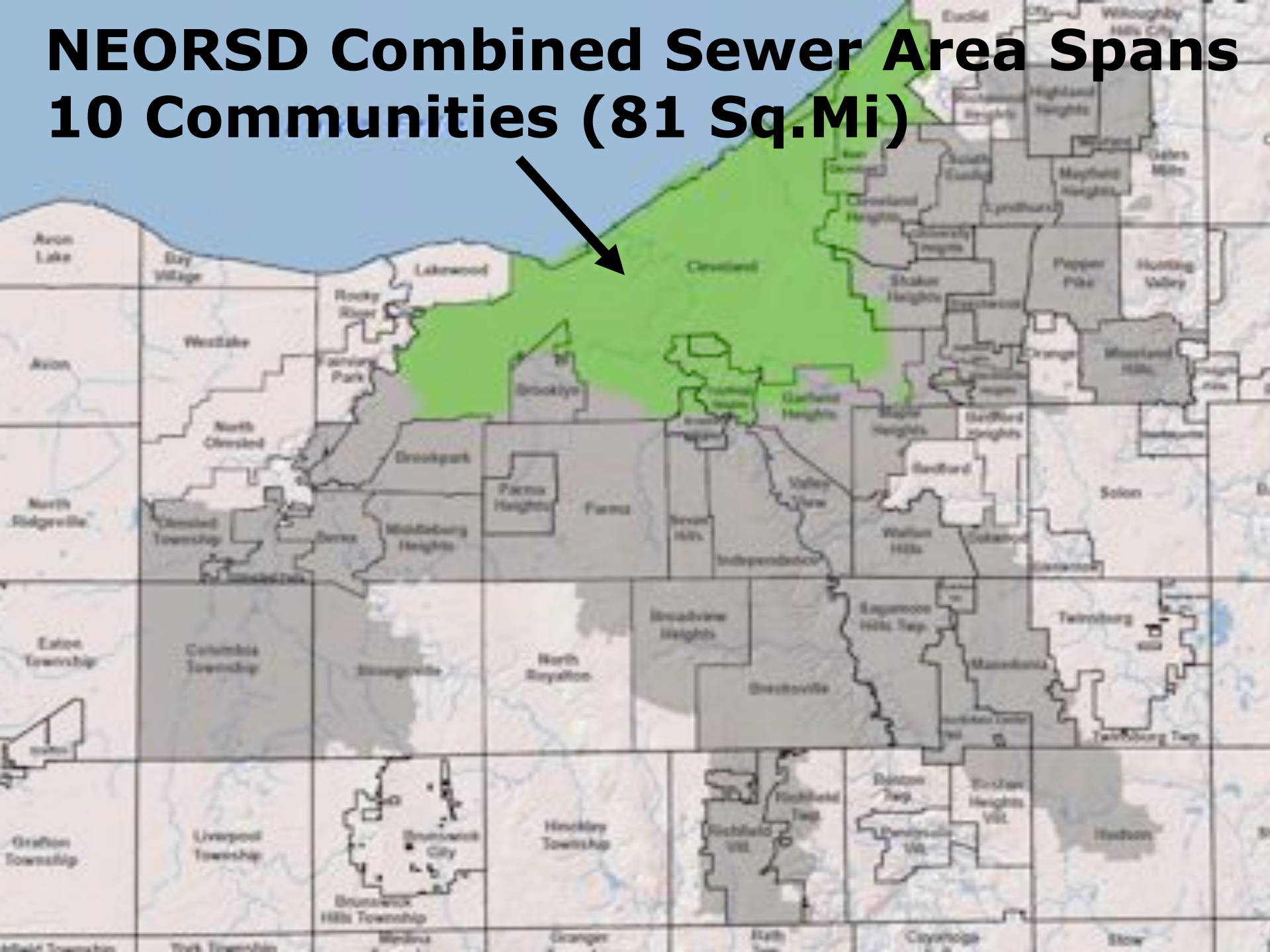
Northeast Ohio Regional Sewer District



312 miles

Total length of District-owned
sewers and interceptors

NEORSD Combined Sewer Area Spans 10 Communities (81 Sq.Mi)



A map of the NEORSD Combined Sewer Area, which spans 10 communities and covers 81 square miles. The map shows various communities including Avon Lake, Day Village, Lakewood, Rocky River, Westlake, Avon, North Olmsted, North Ridgeville, Solon, and many others. A large green area in the center of the map, covering parts of Cleveland, Brooklyne, and surrounding areas, is highlighted to represent the combined sewer area. An arrow points from the text 'NEORSD Combined Sewer Area Spans 10 Communities (81 Sq.Mi)' to this green area.

CSO Control Requirements

	1994 Federal CSO Policy	2002 Proposed NEORSD Plan	2009 EPA Proposed Modifications	2010 Consent Decree Plan
Level of CSO control	85% capture	97% capture	>98% capture	98% capture
Number of Overflows per Year	<4 overflows	<4 overflows	<0 overflows for sensitive areas	<2-3 overflows for sensitive areas
Timeframe	10 years or other as defensible	30 years	15 years	25 years
Affordability considerations	Yes	Yes	No	Yes
Cost		\$2.7B	\$3.7B	\$3B



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Project Clean Lake: The gray and the green of CSO control

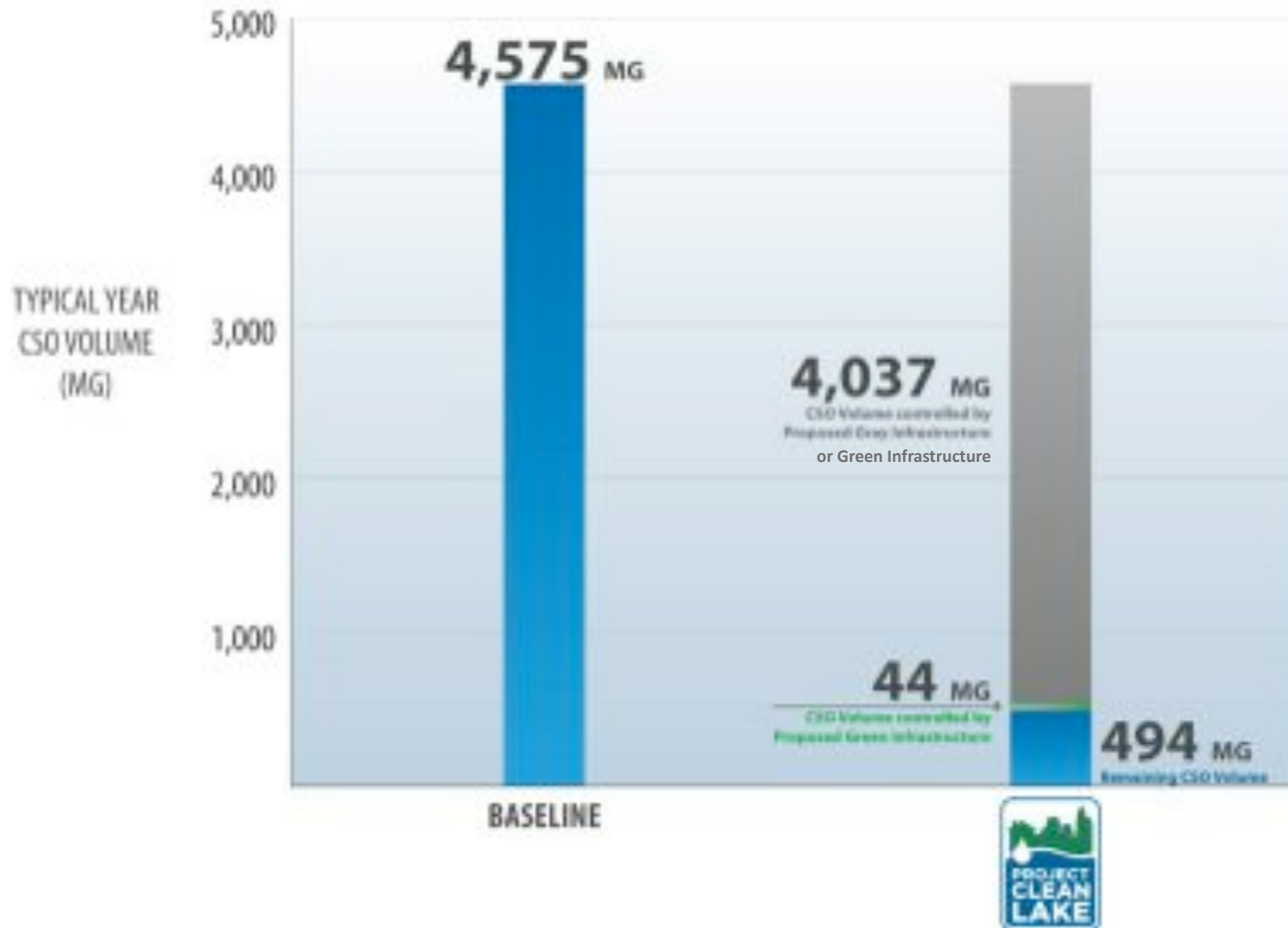


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Project Clean Lake: Level of Control



Deep Storage Tunnels Play Key Role



7 tunnel systems

- 21 miles
- 17' to 24' diameter
- 100' to 200' deep
- Three deep tunnel pump stations
- Drop structures
- Near-surface sewers , structures

Balanced Combination of Gray and green

Improve the Collections System



Increased WWT Capacity
Treatment & Disinfection



Storage Tanks



Pump Station Upgrades

Optimize the Existing Sewer System



Regulator modifications



In-Line Storage



Relief Sewers



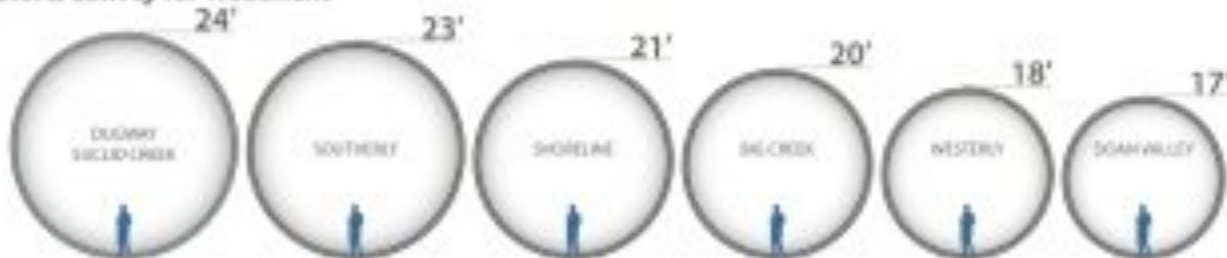
Separation

GRAY

TYPICAL YEAR CSO REDUCTION

4,037 MG

Store/Convey for Treatment



LEVEL OF CONTROL

98%

Project Clean Lake: THE GREEN

Green infrastructure



Project Clean Lake
includes two options
for green infrastructure

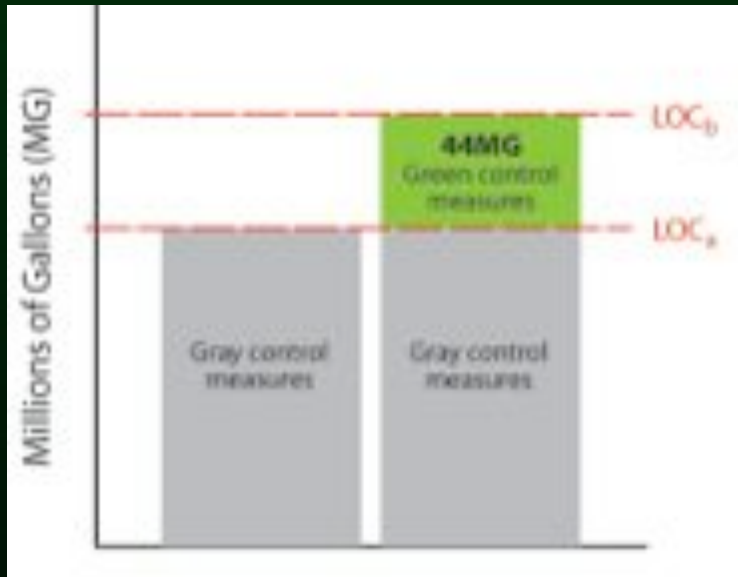


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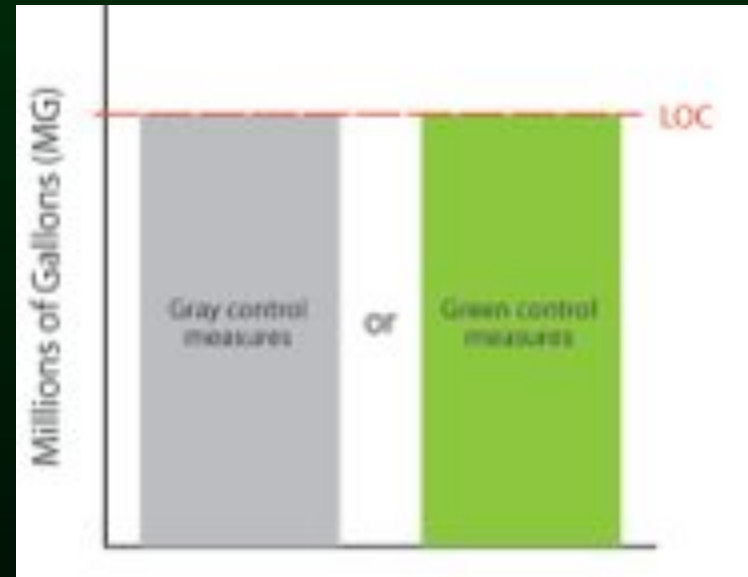


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CSO Consent Decree includes **two options for Green Infrastructure**



Appendix 3: "Gray plus Green"
(District submitted Green Infrastructure
Plan December 2011)



Appendix 4: "Gray vs.
Green" (Opportunity to "right-size" gray
using green)

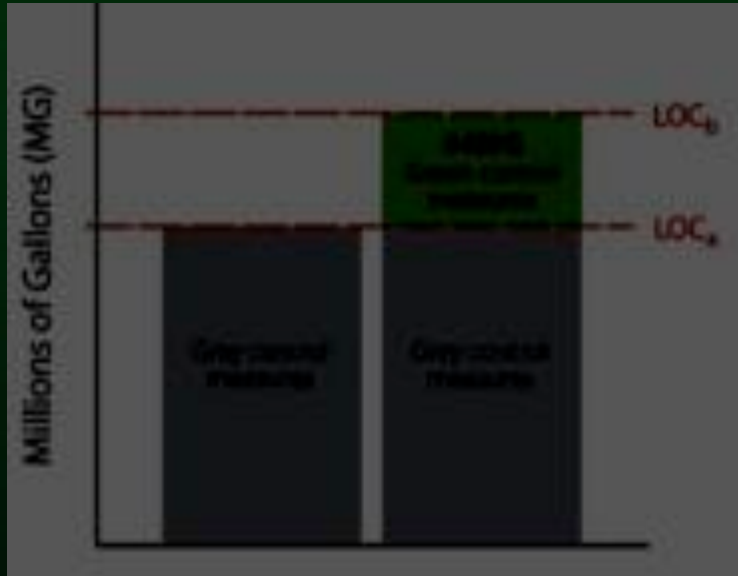


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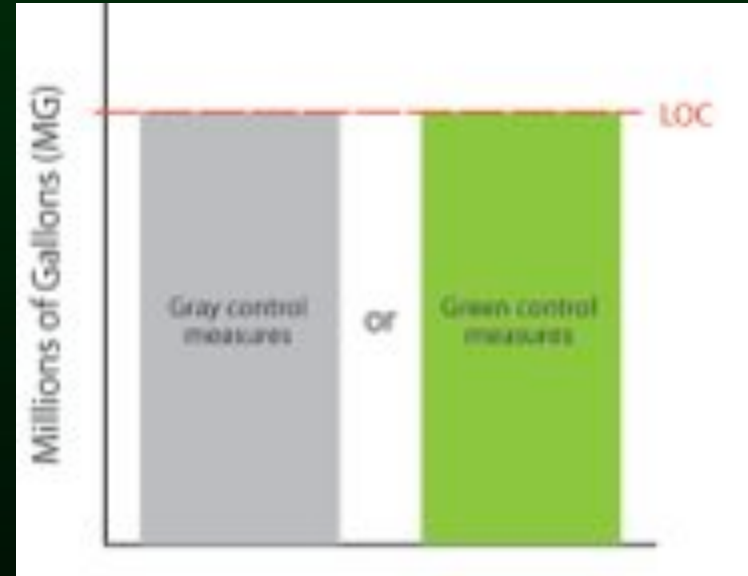


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(District submitted Green Infrastructure
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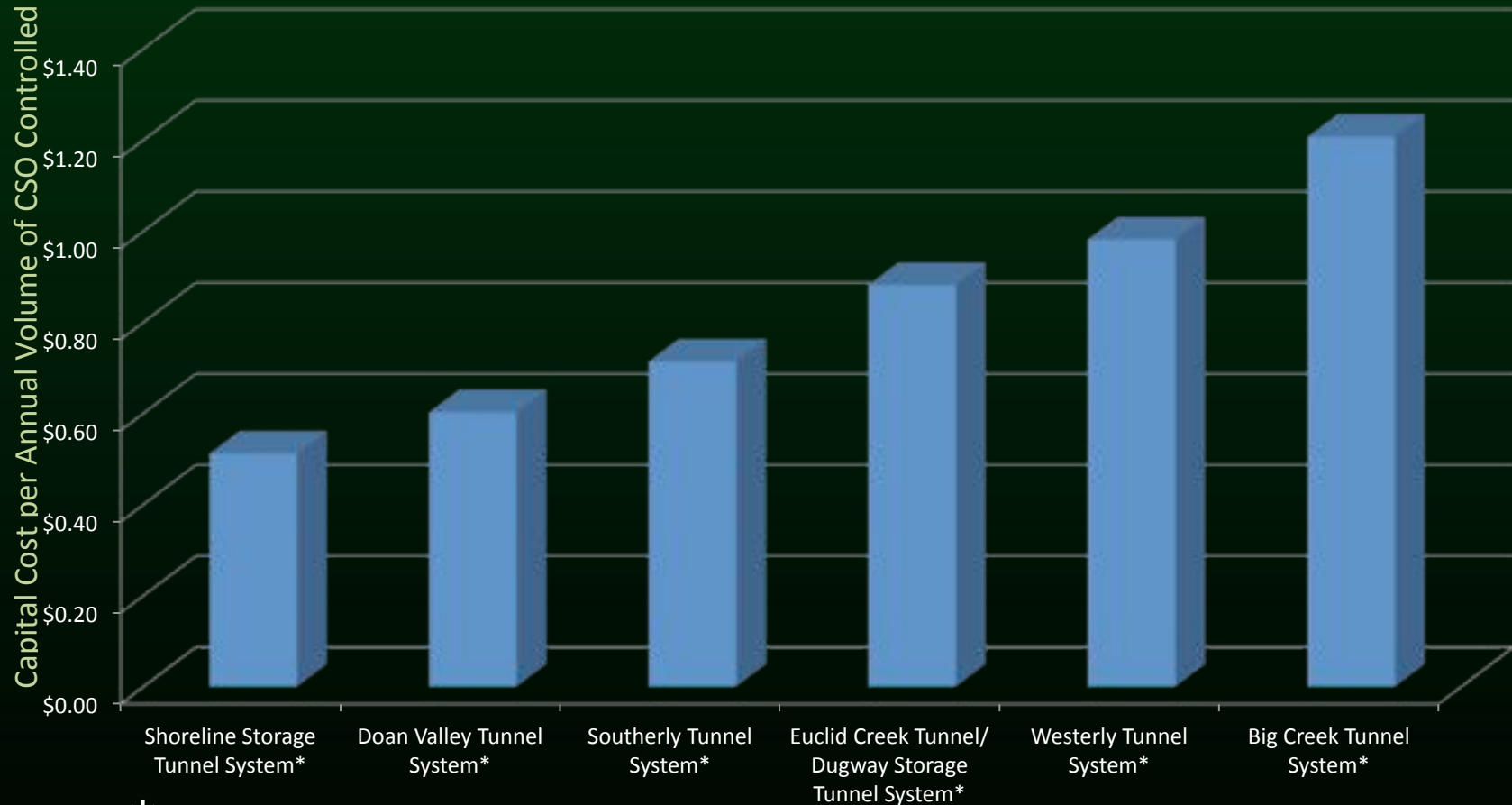


GI Project	Est. Construction Start	Est. Construction Cost	Est. Stormwater Capture (MG)	Est. CSO Reduction (MG)
GI Demonstration Project				
University Circle GI Demonstration	Completed	\$192,000	1.00	0.10
GI - Appendix 3 Projects				
Slavic Village Demonstration	Q1 2014	\$147,776	0.20	0.05
Fleet Avenue*	Q1 2014	\$1,300,000	9.00	0.90
Urban Agriculture	Q2 2014	\$5,607,126	9.50	1.80
Fairhill/MLK	<div> <ul style="list-style-type: none"> •6 gallons stormwater = 1 gallon of CSO reduction •Green Infrastructure Construction Costs: <ul style="list-style-type: none"> •\$1.79/gallon CSO Reduced, OR •\$0.30/gallon stormwater captured </div>			2.62
E.140th/Aspinwall GI				3.13
Woodland Hills GI				8.17
Kingsbury Run GI				10.00
Union/Buckeye GI				3.33
Industrial Corridor GI	Q3 2016	\$10,269,203	23.70	5.10
Doan Valley GI	Q2 2017	\$11,455,000	52.50	10.55
Appendix 3 TOTALS		\$81,740,997	266.00	45.65



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Cost-Effective CSO Control



*

Tunnel System: Includes all consolidation sewers, relief sewers, pump stations, etc. required to transport flows to and from the tunnels



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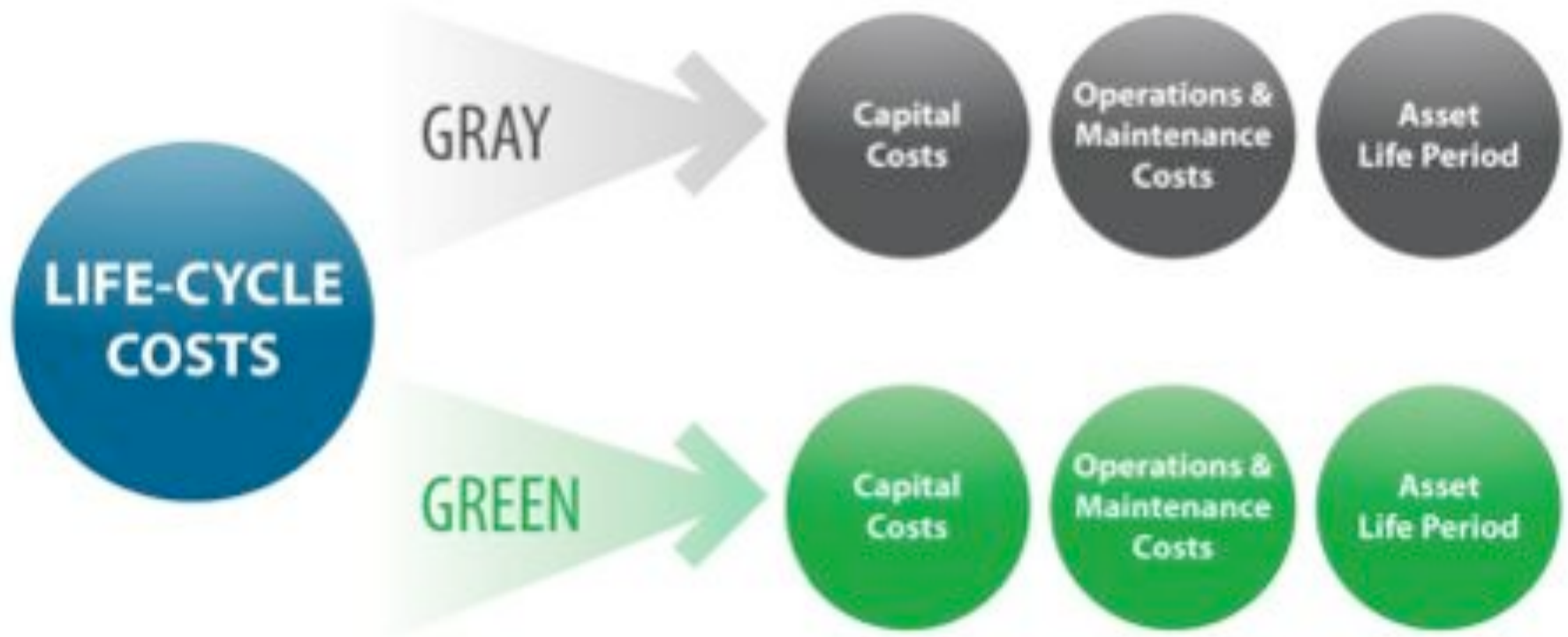
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Assessment of Benefits



*Construction Costs only
(does not include O&M)

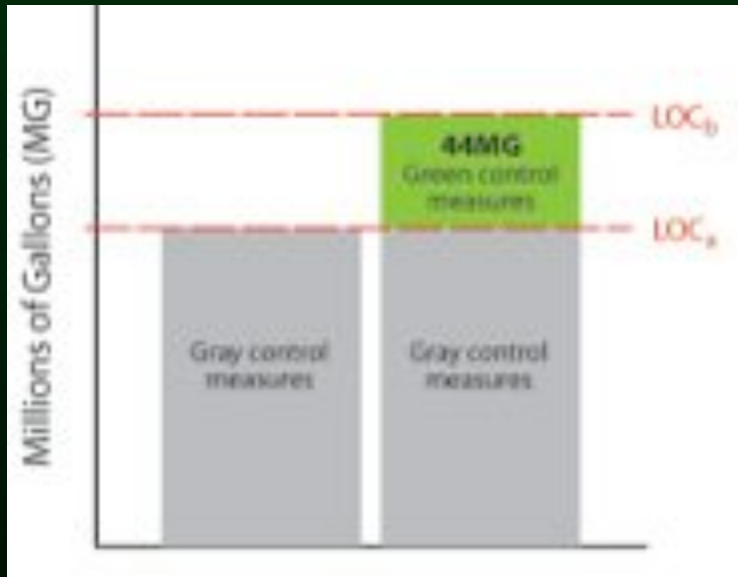
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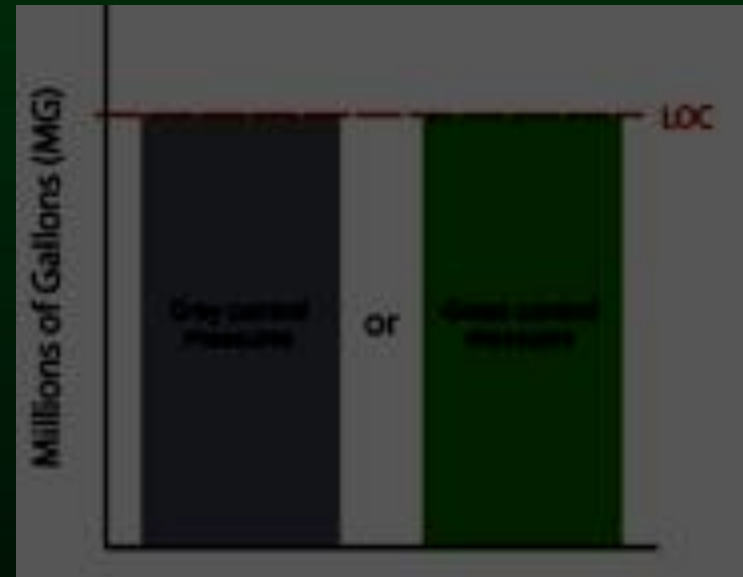
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Appendix 3 Green Infrastructure

\$42 Million for 44 Million Gallons in 8 Years with Green Infrastructure



APPENDIX 3 GREEN INFRASTRUCTURE

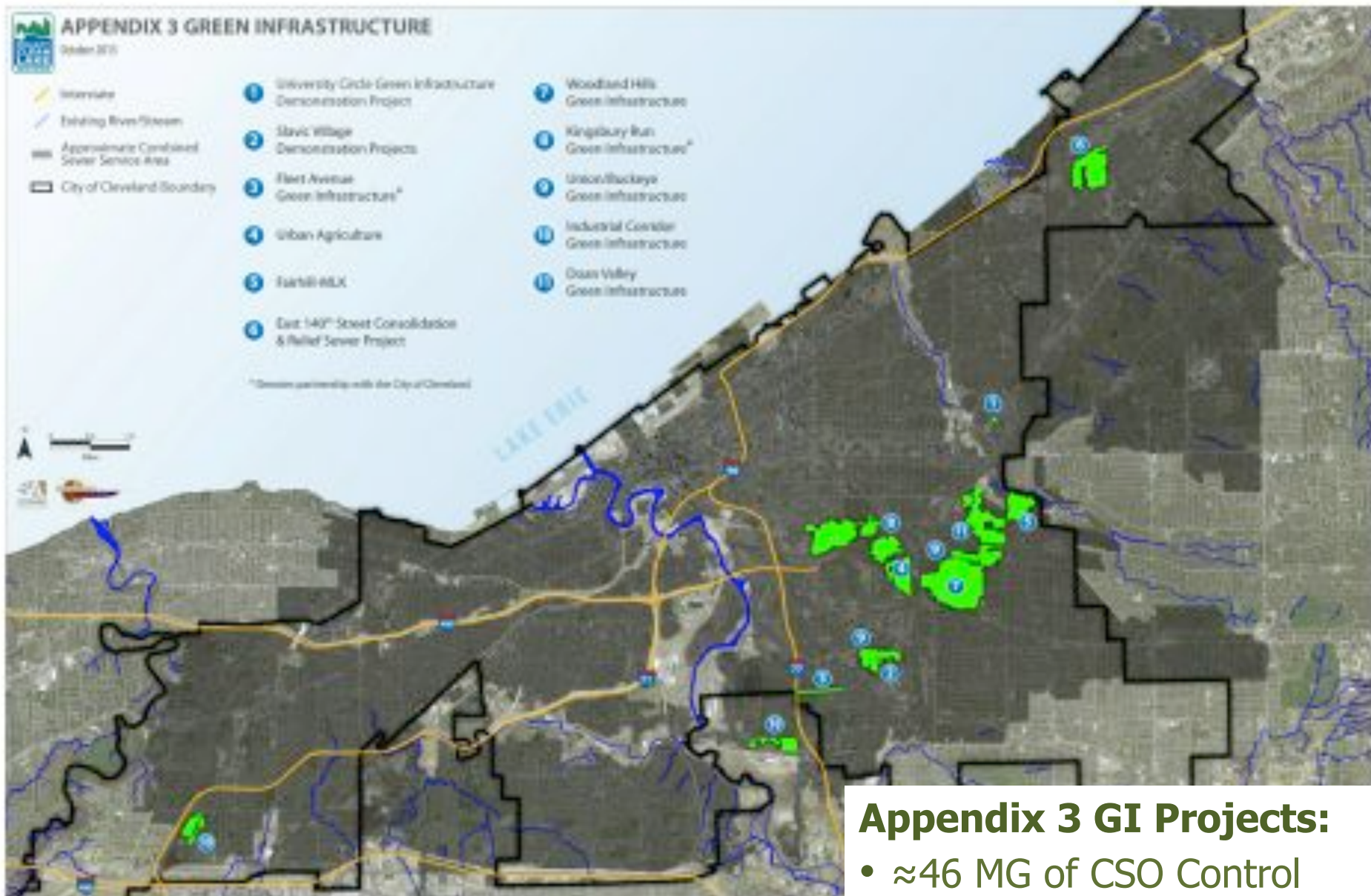
October 2015

- Interstate
- Existing River/Stream
- Approximate Combined Sewer Service Area
- City of Cleveland Boundary

- 1 University Circle Green Infrastructure Demonstration Project
- 2 Slavic Village Demonstration Projects
- 3 Fleet Avenue Green Infrastructure^a
- 4 Urban Agriculture
- 5 Fairhill MLK
- 6 East 140th Street Consolidation & Relief Sewer Project

- 7 Woodward Hills Green Infrastructure
- 8 Kingsbury Run Green Infrastructure^a
- 9 Union/Buckeye Green Infrastructure
- 10 Industrial Corridor Green Infrastructure
- 11 Dean Valley Green Infrastructure

^aGreen partnership with the City of Cleveland



Appendix 3 GI Projects:

- ≈46 MG of CSO Control
- ≈\$82 million Capital Cost
- 10 Projects: 2013-2019



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Promoting GI for CSO Control in Cleveland

- Engage City of Cleveland
 - They have the land
 - We have the consent decree
- Work with Community Development Corporations and neighborhoods
- Connect to development activities



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NEORSD Public Participation Process

- Involve affected public in decision making for GI control measures
- Location and type of GI control measures determined by:
 - Areas with high remaining overflow
 - Land available for dedication to large and permanent features
 - Neighborhood and City development activities



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NEORSD Public Participation Process

- City/NEORSD Green Infrastructure Steering Committee
- City of Cleveland Staff
 - Planning Commission
 - Office of Capital Projects - liason
- Cleveland City Council
- Community Development Corporations



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NEORSD Public Participation Process

- City of Cleveland and CDCs
 - GI Priority Area Identification
 - GI Project Development and Evaluation
 - Candidate GI Project Prioritization
- Controlling factors
 - Ability to control large volumes of SW to impact CSO volume
 - Large parcels available for control
 - Active CDC



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Fleet Avenue Green Infrastructure Project



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Fleet Avenue Green Infrastructure Control Measure

Existing Site

- 3 Vacant Parcels
- 0.27 total acres

Integrated with City street reconstruction

Green infrastructure result of neighborhood planning project



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Fleet Avenue Green Infrastructure Project

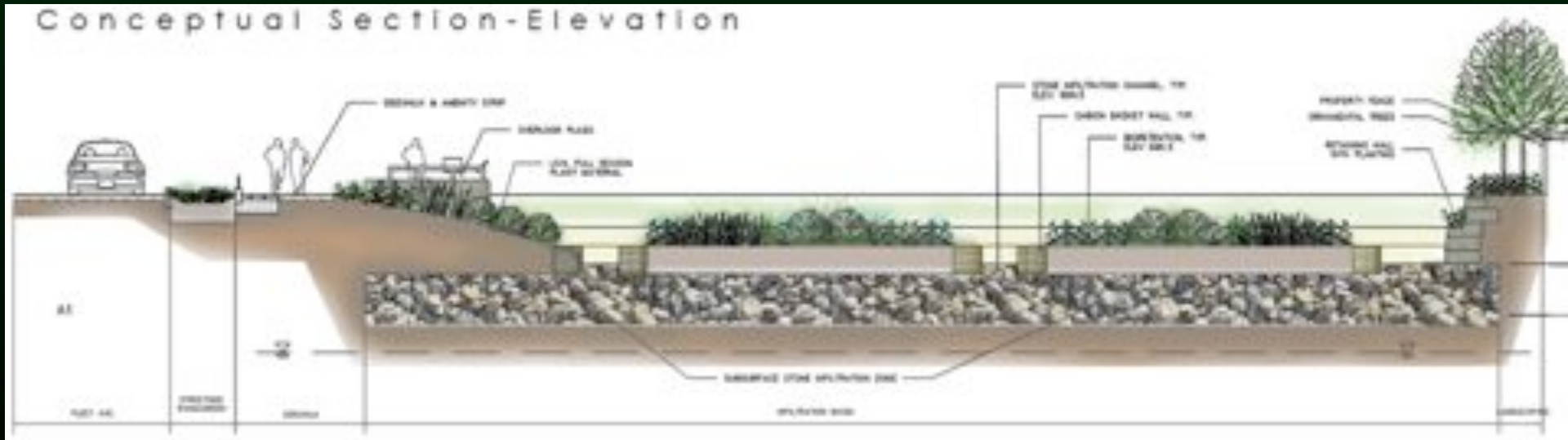


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- Provide a pedestrian overlook from Fleet Avenue
- Maximize infiltration capability
- Create a lush, colorful landscaped amenity



Urban Agricultural Innovation Zone



Legend

- S&P Sewer (Kingsbury Rd)
- Proposed Storm Sewer



GREEN INFRASTRUCTURE DESIGN - JUNE 2013 - PRELIMINARY DRAFT FOR DISCUSSION PURPOSES ONLY

NORTHEAST CHICAGO REGIONAL BOARD DISTRICT
EARLY ACTION PROJECTS
URBAN AGRICULTURE GAP
CONCEPT



Urban Agricultural Innovation Zone – Existing Conditions



East 82nd Street / Glade Avenue

Urban Agricultural Innovation Zone – Existing Conditions



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Rid-All Green Partners – Urban Agricultural Innovation Zone

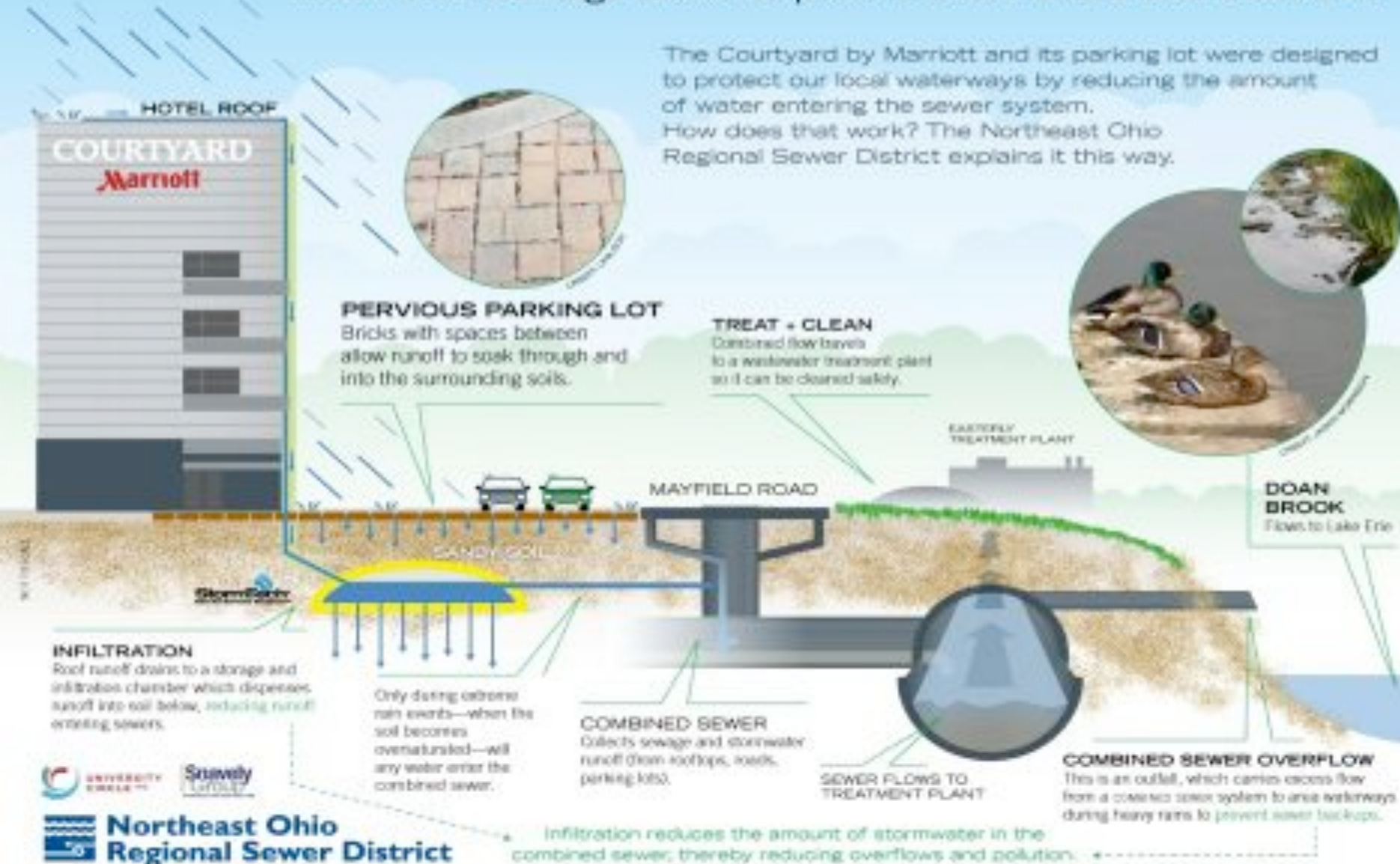


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09/19/2012-11-56

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How hotel drainage works to protect Doan Brook and Lake Erie





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Questions & Answers



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 Northeast Ohio
Regional Sewer District

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