

PROJECT CLEAN LAKE



NEORS D Green Infrastructure Plan Consent Decree Requirement

OVERVIEW

This fact sheet explains the unique nature of the District’s Green Infrastructure Plan. This Green Infrastructure Plan was prepared in response to a regulatory enforcement action and was developed to specifically comply with the requirements of Appendix 3 of the District’s Consent Decree. Appendix 3 requires the District to provide 44 MG of additional CSO capture with green infrastructure beyond that which will be achieved with the required gray infrastructure.

The Green Infrastructure Plan does not represent the District’s comprehensive approach to green infrastructure, nor does it detail the full extent to which the District may use green infrastructure to achieve the level of CSO control required under the District’s Consent Decree. Using a “triple-bottom-line” approach to evaluate and compare green infrastructure against gray infrastructure, the District will look for opportunities to replace the gray aspects of the District’s CSO control plan where green is deemed more cost-effective or beneficial.

BACKGROUND

In 2011 the Northeast Ohio Regional Sewer District (District) entered into a Consent Decree with the U.S. Department of Justice, U.S. Environmental Protection Agency, and Ohio Environmental Protection Agency (Agencies) to eliminate an estimated four billion gallons of CSO annually, and achieve 98% capture of CSO.

The plan by which the District will reach this goal is estimated to cost \$3 billion and will have to be completed within 25 years.

The District’s original proposed plan was based on traditional CSO control and treatment technologies, including seven (7) major deep storage tunnel systems and high-rate wet-weather treatment facilities at all three of the District’s wastewater treatment plants.

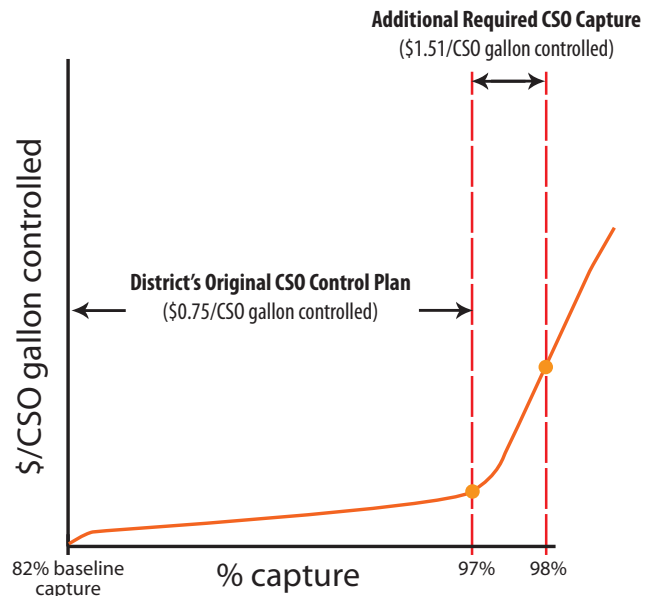
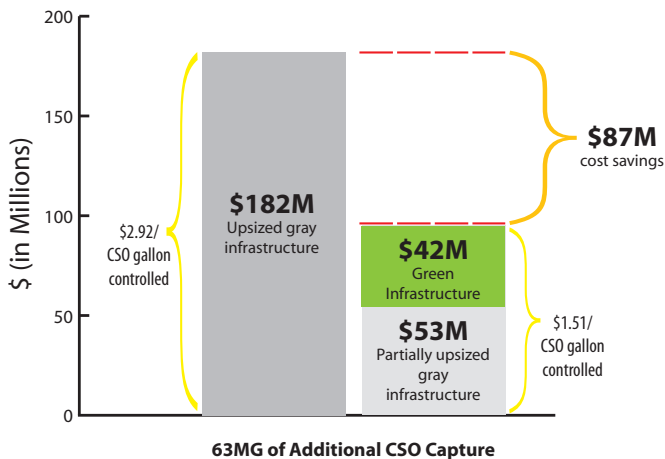
THE ROOTS OF GREEN IN THE DISTRICT’S CONSENT DECREE

One of the predominant focuses of the Consent Decree negotiations revolved around the *level of control* (LOC). The District’s original plan would reduce overflows to four or less in a typical year and capture 97% of the total volume of wet weather flow in the combined sewer system. Due to the proximity of CSO discharges to Lake Erie and the State of Ohio’s designation of Lake Erie as a “sensitive receiving water,” the District’s original CSO control plan did not meet the Agencies’ overall goals for CSO capture.

As an alternative to upsizing the gray infrastructure at an estimated additional cost of \$182M, the District agreed to a combination of upsized gray infrastructure and the use of green infrastructure to capture the additional CSO volume of 63 million gallons at an estimated additional cost of \$95M.

NEORSD Green Infrastructure Plan Consent Decree Requirement (cont.)

The green infrastructure component of this enhanced LOC provides an additional 44 million gallons of CSO capture at a prescribed expenditure of \$42 million. This proposal was accepted by the Agencies and memorialized in Appendix 3 of the Consent Decree.



“GRAY PLUS GREEN” (APPENDIX 3)

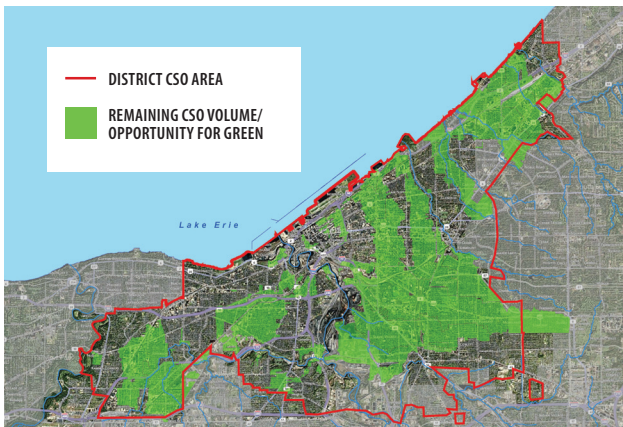
It is well documented that the cost for CSO capture increases nearly exponentially with higher levels of CSO control. The District’s original proposed CSO control plan was developed with these cost sensitivities in mind. The original “all gray” infrastructure plan was deemed cost-effective at \$0.75 per gallon of CSO controlled, and resulted in a 97% CSO capture. The method to achieve the Consent Decree required additional CSO capture beyond the original levels would be less cost-effective regardless of whether green or gray infrastructure was used. The graphic below depicts the difference in cost-effectiveness of the original proposed CSO control plan and the additional required CSO capture requirements including that of Appendix 3.

In combined sewer system (CSS) environments, the traditional stormwater management approach has been to drain all impervious surfaces into the combined system, rather than manage the flows on-site and closer to their source.

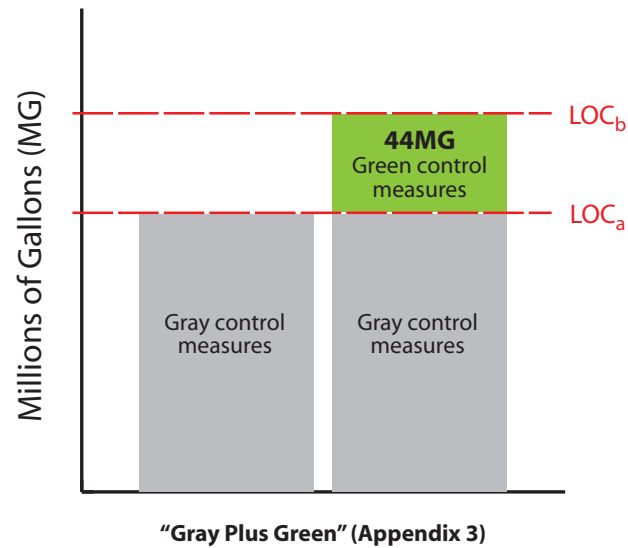
Recently, many CSS communities looking to address CSO problems are comparing traditional storage/treatment solutions, referred to as gray infrastructure, to less traditional urban stormwater management, referred to as green infrastructure. When governance structure, institutional controls, and schedules allow, a fair comparison between gray and green can be made. Given equal footing, the two methods of managing CSO may be compared economically from both a capital and operation/maintenance perspective, and a CSS community can develop an integrated plan that contains both types of infrastructure solutions.

Appendix 3 of the District’s Consent Decree and the Green Infrastructure Plan were the result of a regulatory enforcement action. To a large extent, the District’s Consent Decree dictates where and how green infrastructure can be deployed to achieve the requisite additional level of CSO control. Since the LOC to be provided by green infrastructure must be “in addition to” the CSO control to be provided by the gray infrastructure, the geographic area is constrained to those areas, highlighted in green on the map below, where there will be residual CSO remaining (approximately 540MG) after all of the planned gray infrastructure is built.

Defining Geographic Coverage



The District’s Appendix 3 Green Infrastructure Plan is inextricably linked to the accompanying gray infrastructure projects, and must build on the LOC provided by those projects. The referenced Green Infrastructure Plan is not intended as a comparison between gray and green, rather it represents the level of CSO control the District estimates can be achieved through using “Gray plus Green.”



“GRAY VS. GREEN” (APPENDIX 4)

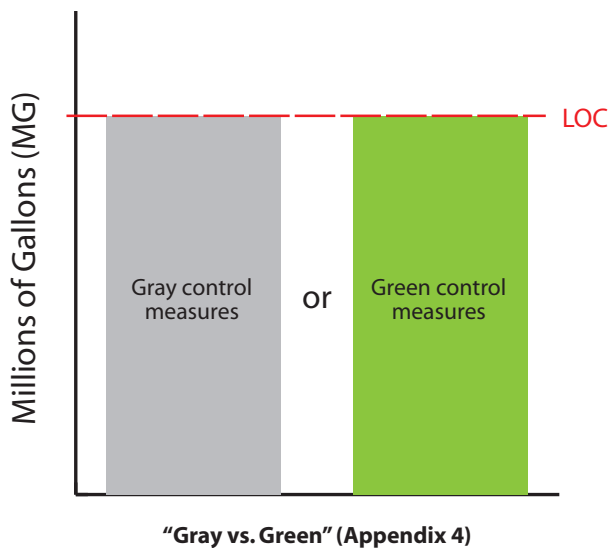
The door for using additional green infrastructure to control CSO was opened during the District’s Consent Decree negotiations. The District wanted to preserve the opportunity to re-visit any of the gray infrastructure aspects of the CSO control plan, and propose the substitution of green infrastructure wherever deemed more cost-effective or beneficial. As such, Appendix 4 of the Consent Decree was developed.

The District is deploying planning resources, in advance of each of the large tunnel designs, to look at the prospects of using green infrastructure to replace consolidation sewers, or down-size tunnels/shafts where an equivalent level of CSO control can be demonstrated.

NEORSD Green Infrastructure Plan Consent Decree Requirement (cont.)

The District is using a triple-bottom-line approach to evaluate and compare green infrastructure against gray infrastructure. The District will look at the economics, both construction and operation and maintenance, as well as the environmental and social aspects of gray and green infrastructure options. Through this triple-bottom-line analysis, the District anticipates exercising the flexibility of Appendix 4 to add even more green to our CSO control program.

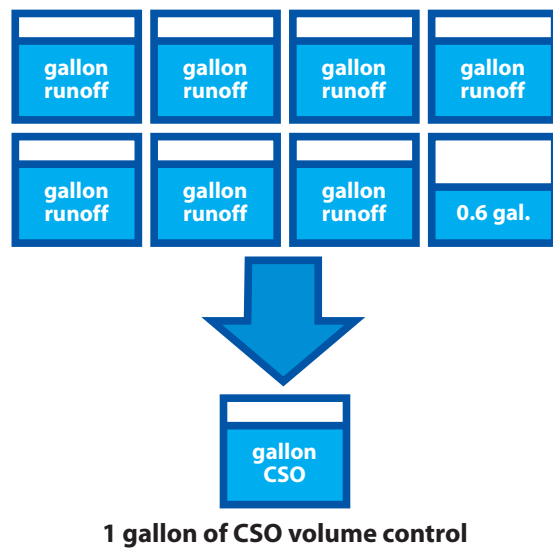
As a result, the focus of the modeling will be on CSO volume reduction, not stormwater volume control. This is an important distinction, as the industry focus of many green infrastructure programs has been on stormwater volumes and not CSO reduction. Preliminary modeling efforts by the District indicate that it may be necessary to control up to 8 gallons of stormwater in order to achieve 1 gallon of CSO reduction.



DEMONSTRATING CONTROL

The Consent Decree mandates that the District’s Appendix 3 green infrastructure projects be implemented within 8 years of the Date of Entry of the Consent Decree, but allows up to 25 years for the build-out of all CSO control measures. Since the Appendix 3 green infrastructure components will be built before the accompanying gray infrastructure projects, the District must rely on the hydraulic/hydrologic models used to develop the overall CSO control plan to demonstrate compliance. The models must prove that the Appendix 3 green infrastructure projects, in combination with the simulated gray infrastructure projects, will achieve the required LOC.

Example: Southerly Interceptor (7.6 gallons of runoff controlled)



As a result, the 44MG of CSO reduction required by Appendix 3 translates into approximately 352MG of stormwater volume controlled.



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