

*United States and State of Ohio v. Northeast Ohio
Regional Sewer District*

Consent Decree
Appendix 3

Green Infrastructure Requirements

APPENDIX 3

To Consent Decree, *United States and State of Ohio v. Northeast Ohio Regional Sewer District (N.D. Ohio)*

Green Infrastructure Requirements

1. NEORSD is conducting a Green Infrastructure Feasibility Study (the “Study”) to determine the nature and extent of Green Infrastructure control measure opportunities for its service area. The results of the Study will be used for purposes of both Tier 1A and 1B Green Infrastructure control measures as described herein. For the purposes of this Appendix, Tier 1A shall mean 44 million gallons (“MG”) of wet weather flow controlled by Green Infrastructure control measures in a typical year above the Gray Infrastructure control measures required by the Consent Decree. Tier 1B Gallons shall mean gallons of wet weather flow controlled by Green Infrastructure control measures in a typical year in excess of the 44 MG captured through the Green Infrastructure control measures (Tier 1A) required in this Appendix that do not exceed \$42 million in cost.
2. **Green Infrastructure Plan.** No later than December 31, 2011, NEORSD shall submit to EPA and Ohio EPA for approval in accordance with Paragraph 20 of the Consent Decree, a Green Infrastructure Plan (the “Plan”) to achieve the following performance criteria:

Performance Criteria. The Plan shall propose a process for locating, designing, constructing, operating, and evaluating a set or sets of Green Infrastructure control measures to capture a minimum of 44 MG of wet weather flows in a typical year that would otherwise be discharged by NEORSD’s CSOs. This 44 MG volume of capture (Tier 1A) shall be in addition to the capture per typical year that would be achieved by all of the other Gray Infrastructure control measures required under the Consent Decree in the absence of the Green Infrastructure control measures. In particular, CSO reduction provided by the Plan’s measures can count toward the required minimum volume only during events in which CSO activation occurs or would have occurred following construction of the Gray Infrastructure control measures required under the Consent Decree. NEORSD shall expend \$42 million, reduced to present value as of the Effective Date of the Consent Decree, for the construction and installation of Tier 1 Green Infrastructure control measures.

3. **Content and Submission of the Plan.** In the Plan, NEORSD shall identify those specific Green Infrastructure control measures which store, infiltrate, and/or evapotranspire precipitation and reduce wet weather flows into the combined sewer system that meet the requirements set forth below and provide the information set forth below:

Geographic Coverage. The Green Infrastructure control measures shall be located within the NEORSD combined sewer area. The Plan shall explain NEORSD’s prioritization for choosing locations for the Green Infrastructure control measures. The prioritization scheme for such locations shall include areas where: (1) Green Infrastructure control measures will help NEORSD meet Consent Decree performance standards; (2) land ownership will readily

accommodate permanent Green Infrastructure control measures, such as areas where parcels can be acquired from the Cleveland City Land Bank, the Cuyahoga County Land Re-utilization Corporation and the City of Cleveland Industrial/Commercial Land Bank; and (3) Green Infrastructure control measures can improve socio-economic conditions in the NEORSD service area, including in neighborhoods that are comprised predominantly of households that have low household incomes or concentrated minority populations.

Preservation of Practices/Ownership/Access. The Plan shall demonstrate how NEORSD shall insure it will be able to retain permanent access and sufficient control over the land devoted to the Green Infrastructure control measures set forth in the Plan. For example, NEORSD may provide this demonstration by showing how it will acquire ownership of land parcels, or obtain legally-binding agreements with Cuyahoga County or the pertinent governing authority or landowner to retain permanent access and sufficient control of the parcels.

Public Participation. NEORSD shall provide for, and describe in the Plan, a public participation process that actively involves the affected public in the decision-making for selection of the Green Infrastructure control measures and locations where the Green Infrastructure control measures will be located. The public participation process shall include, but will not be limited to, people living in neighborhoods that are composed primarily of households that have low household incomes or concentrated minority populations.

Schedule. NEORSD shall include in the Plan a schedule for implementation of Green Infrastructure control measures to meet the performance criteria. The schedule shall lay out implementation steps/milestones such that all Green Infrastructure control measures planned to meet the 44 MG capture requirement shall be completed within eight years of entry of the Consent Decree.

Methods for Measuring Achievement of the 44 MG Capture Performance Standard. The Plan shall describe how NEORSD will adjust the hydrologic model parameters directly related to the Green Infrastructure control measures (prior to and during model recalibration required as set forth in Appendix 2) as necessary to accommodate changes in model parameterization caused by shifts in runoff hydrology from the Green Infrastructure control measures. The District shall then use the model in two forms (the first encompassing all CSO control measures including the Green Infrastructure control measures proposed, and a second model identical to the first, but without the Green Infrastructure control measures), to simulate the “controlled” system's typical year performance. The District shall use the difference in performance between the two simulations to gauge compliance with the requirement that Green Infrastructure control measures mitigate a minimum additional CSO volume of 44 MG per typical year.

Environmental Justice (EJ) Considerations. The Plan shall set forth what efforts NEORSD will make to prioritize environmental justice considerations -- that is, considering neighborhoods with households that have low household incomes or concentrated minority

populations -- into its site selection process. The Plan shall provide for an evaluation of environmental justice considerations as a co-benefit of the Green Infrastructure control measures selected, pursuant to Paragraph 8, below. NEORS D shall consider collaborative decision making with community groups whenever possible in developing the Plan.

Operation and Maintenance. As part of the Plan, NEORS D shall describe the operation and maintenance activities, including schedules, for each Green Infrastructure control measure. NEORS D shall establish a procedure to manage information on the Green Infrastructure control measures.

4. **Implementation of the Plan.** Upon approval of the Plan by EPA and Ohio EPA, NEORS D shall begin implementing the Plan, including the construction, installation, operation, and maintenance, in accordance with the milestones, performance requirements, and schedules in the approved Plan. Within ten years of entry of the Decree, NEORS D shall demonstrate the effectiveness of implementation of the Green Infrastructure control measures, as described further below.
5. **Progress tracking and reporting.** As part of the semi-annual reporting required under Paragraph 37 of the Consent Decree, NEORS D shall track its implementation, operation, and maintenance of the Green Infrastructure control measures, including those project start dates and project completion dates set forth in the Plan, and report on such activities and accomplishments. Documentation, such as inspection reports or records relating to operation and maintenance, shall be maintained. NEORS D shall provide access to all such information and documentation to EPA and Ohio EPA.
6. **Evaluating the performance of Green Infrastructure control measures.** NEORS D shall submit its proposal to perform two proposed Green Infrastructure post-construction monitoring programs (“GIPCMs”), (a) site-specific and (b) sewershed-specific programs, to evaluate the performance and effectiveness of the Green Infrastructure control measures to EPA and Ohio EPA for review and approval. NEORS D shall submit two proposals for the site-specific GIPCM; Phase 1 within two years following entry of the Consent Decree to address projects to be implemented from 2012 through 2015, and a Phase 2 proposal by December 31, 2014 for a representative selection of the remaining site-specific projects. NEORS D shall submit its proposal for the sewershed-specific program within two years following entry of the Consent Decree. Once approved by EPA and Ohio EPA, NEORS D shall implement the GIPCM programs in accordance with the approved GIPCM plan. NEORS D shall submit Green Infrastructure post-construction monitoring reports providing the results of the GIPCM programs for approval to EPA and Ohio EPA in accordance with the GIPCM plan.
 - a. The site-specific GIPCM program shall evaluate the effectiveness of the Green Infrastructure control measures on a site-specific scale. The GIPCM plan shall set forth the ways the various *types* of Green Infrastructure control measures to be implemented (e.g., constructed wetland, etc.) will function to control wet weather flows (e.g., through storage, infiltration, and/or evapotranspiration), and the

monitoring/assessment methods that will be used to evaluate the performance and effectiveness of the various types of practices. The GIPCM plan shall set forth NEORSD's methods and procedures for evaluating the performance of Green Infrastructure control measures on a site-specific scale, such as monitoring practices during and after rain events to gauge storage and/or infiltration performance. The GIPCM plan shall establish procedures for conducting performance evaluations on the fully constructed and operating Green Infrastructure control measures. Under the site-specific program, performance evaluations shall assess the effectiveness of the practices in terms of the functions the Green Infrastructure control measure was intended to fulfill (e.g., storage, infiltration). Each Phase 1 site-specific Green Infrastructure control measure shall be monitored for a minimum of 12-months immediately following implementation. The results of each site-specific GIPCM will be submitted to EPA and Ohio EPA, as set forth in the GIPCM plan as part of the next semi-annual report submitted to EPA and Ohio EPA pursuant to the reporting requirements of Paragraph 37 of the Consent Decree.

- b. The sewershed-specific GIPCM program shall set forth the steps NEORSD shall take to evaluate the performance and effectiveness of Green Infrastructure measures on a sewershed scale. Examples of such methods and procedures include collecting rainfall and wet weather flow data sufficient in scope and detail to allow: (i) characterization of the performance of the Green Infrastructure measures in a sewershed, and (ii) hydrologic adjustment of the sewershed portion of the collection system model to determine the impacts of the Green Infrastructure measures on system performance within the subject sewershed. NEORSD shall adjust the hydrologic model parameters directly related to the Green Infrastructure control measures as necessary (prior to and as needed during model recalibration required as set forth in Appendix 2) to accommodate changes in model parameterization caused by shifts in runoff hydrology from the Green Infrastructure measures. The District shall then use both the appropriate CSO model without the Green Infrastructure measures, and the model that includes the Green Infrastructure measures, to simulate the sewershed's typical year performance both with and without the Green Infrastructure measures in order to demonstrate the CSO volume reduction.

7. **Failure to Meet Performance Criteria.** If the Green Infrastructure post-construction monitoring report submitted by NEORSD fails to demonstrate that the Green Infrastructure control measures have met the performance criteria specified in Paragraph 2, plus any additional Tier 1B Gallons that meet the requirements of Paragraph 9, then within 180 days of submission of the report, NEORSD shall submit to EPA and Ohio EPA a corrective action proposal. The corrective action proposal shall define the Green or Gray Infrastructure enhancements/ expansions to be carried out to address performance shortcomings and ensure the performance criteria are met. The proposal shall include a schedule for completion of all corrective action measures and an updated post-construction monitoring plan to evaluate whether the corrective actions have resulted in the performance criteria being met. The performance criteria specified in Paragraph 2, above, plus any Tier 1B Gallons that meet the requirements of Paragraph 9 must be achieved within twelve years of entry of the Consent

Decree. The “Achievement of Full Operation” date for green infrastructure control measures to control Tier 1A and 1B gallons is 12 years from the date of entry of the Consent Decree.

8. **Evaluating the co-benefits of Green Infrastructure control measures.** Within three years following EPA approval of the Plan, NEORSD shall submit a report to EPA and Ohio EPA quantifying the anticipated co-benefits of NEORSD’s Green Infrastructure control measures. Co-benefits, for the purposes of this Consent Decree, mean the benefits, in addition to mitigating wet weather flow, that are achieved by NEORSD’s CSO Program in Appendix 1. In the report, NEORSD shall describe the methods to be used to identify/analyze co-benefits. The co-benefits to be evaluated and quantified include, at a minimum, the following:

- Life-cycle costs
- Ecological benefits (ecosystem services)
- Socio-economic and/or quality of life benefits to low-income or minority populations
- Provision of recreational benefits
- Climate change-related effects, including change in carbon footprint
- Energy savings
- Air quality
- Aesthetics
- Jobs
- Property values

NEORSD may engage with research and development organizations to access expertise or advice on how to conduct assessments, or may also collaborate or enter into memoranda of understanding to improve the quality of monitoring and reporting.

9. **Substitution of Tier 1B Green Infrastructure Control Measures Exceeding 44 Million Gallon Capture for Gray Infrastructure Control Measures.** If, through the use of modeling, NEORSD demonstrates in the Plan that its \$42 million in expenditures for Green Infrastructure control measures in accordance with this Appendix will result in the capture of more than the required 44 MG of wet weather flows in a typical year, NEORSD may apply to EPA and Ohio EPA to use this predicted additional wet weather flow capture to decrease the amount of Gray Infrastructure control measures otherwise required by the Consent Decree, as more fully described in Appendix 4. For the purposes of this Appendix, Tier 1B Gallons shall mean gallons of wet weather flow controlled by Green Infrastructure in a typical year above the 44 MG captured through the Green Infrastructure control measures (Tier 1A) required in this Appendix that do not exceed \$42 million in cost. In the portion of the Plan describing the generation and application of Tier 1B Gallons, NEORSD shall provide specific information to EPA and Ohio EPA documenting the amount of Tier 1B Gallons and the engineering and modeling basis for determining the availability and number of Tier 1B Gallons. NEORSD shall propose how the Tier 1B Gallons should be applied to downsize the required Gray Infrastructure control measures required by Appendix 1 in accordance with the following requirements:

- a. Tier 1B Gallons shall be applied to allow no more than one gallon decrease in capture of wet weather flows through Gray Infrastructure control measures for each gallon of capture achieved via Green Infrastructure control measures.
- b. Tier 1B Gallons shall be applied within the same sewershed and water body where the Tier 1B Gallons were generated.
- c. Tier 1B Gallons cannot be applied so as to increase the number of activations in a typical year above the performance standard amount for any CSO outfall or treatment plant bypass (as set forth in Appendix 1), may not result in a decrease of the total gallons captured in a typical year for any body of water, and may not result in any increase in bypass or untreated discharge volume in a typical year for any wastewater treatment plant.

The portion of the Plan regarding using Tier 1B Gallons to reduce the Gray Infrastructure required by Appendix 1 shall meet the requirements of Sections 1-4 of Appendix 4. EPA and Ohio EPA's approval of NEORSD's proposal to obtain and apply such Tier 1B Gallons shall not be considered to be a material change in the Consent Decree.