

Appendix 1 to Consolidated Fifth Amended Consent Decree

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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
Easterly Plant						
1	Increase Secondary Treatment Capacity	Increase secondary capacity from 300 MGD to a sustained capacity of 400 MGD	Elimination of the Primary Effluent Bypass (PEB)	Provide secondary sustained treatment capacity of 400 MGD	Eliminate the primary effluent bypass; provide secondary treatment to meet NPDES effluent limits	1. Bid Year: 2014 2. Achievement of Full Operation: 2016
2	Treatment of CSO 001 using chemically enhanced high-rate treatment (CEHRT) in combination with a diversion structure and a drop structure that allows flow to either be directed to the Euclid Creek/Dugway Storage Tunnel System or the CEHRT facility.	<p>1. Design and construct a CEHRT facility at the Easterly WWTP to treat CSO 001 flows that exceed the capacity of the Easterly WWTP.</p> <p>CEHRT is chemically enhanced sedimentation followed by high-rate disinfection.</p> <p>2. Design and construct a flow diversion structure and a drop structure that together allow the diversion of flow rates that exceed the combined capacity of the Easterly WWTP and the CEHRT to the Euclid Creek/Dugway Storage Tunnel System.</p>	CSO 001 ⁶	<p>1. Design a CEHRT facility to meet the Performance Criteria for flows up to the CEHRT design treatment capacity of at least 175 MGD and as follows:</p> <p>a. Design the necessary settling tankage to provide a maximum peak surface overflow rate of 8.333 gpd/ft² at the design treatment capacity;</p> <p>b. Design the necessary separate disinfection tankage to provide a minimum disinfection contact time of 8.5 minutes at the design treatment capacity and a minimum dechlorination contact time of 2.5 minutes at the design treatment capacity which shall be at least 175 MGD;</p> <p>c. Design the necessary chemical feeds, storage tanks and associated mixing equipment to provide the chemical dosages at the design treatment capacity which shall be at least 175 MGD, below; and</p> <p>d. Install the necessary flow monitoring equipment (suited to each flow monitoring location's hydraulic characteristics) that measures flow at the following locations, at all anticipated flow rates:</p> <p>i. Influent flow to the CEHRT from the flow diversion structure;</p> <p>ii. CEHRT discharge flow;</p> <p>iii. Volume contained in the CEHRT that is returned to the WWTP; and</p> <p>iv. flow from the diversion structure to the drop structure.</p> <p>2. Design the CEHRT chemical feed systems to be capable of providing the following nominal chemical dosage rates at the design treatment capacity which shall be at least 175 MGD:</p> <p>a. Coagulant: 35 mg/l (as polyaluminum chloride or equivalent chemical and dose)</p> <p>b. Flocculant: 5 mg/l (as neat polymer concentration or equivalent chemical and dose)</p> <p>c. Disinfectant: 12 mg/l (as NaOCl or equivalent chemical and dose); and</p> <p>d. Dechlorination chemical: 20 mg/l (as NaHSO₃ or equivalent chemical and dose).</p> <p>The above chemical doses are design values and as such, NEORS is not required to operate the CEHRT using these chemical doses. NEORS may use substitute chemicals in combination with or in lieu of those specified above, provided the chemicals comply with all appropriate federal and state regulations and the use achieves the required Performance Criteria. Nothing in the previous sentences relieves NEORS of any Performance Criteria or NPDES permit obligations.</p> <p>3. The CEHRT shall be designed to control TSS to no greater than 30 mg/l for all flows up to its design treatment capacity which shall be at least 175 MGD.</p> <p>4. Construct a flow diversion structure and all necessary associated conveyance structures that allow the following:</p> <p>a. The diversion of flows that exceed the Easterly WWTP's capacity up to a peak flow rate of at least 490 MGD with at least 175 MGD to the CEHRT; and</p> <p>b. The diversion of remaining flows that are not directed to the CEHRT facility up to 315 MGD to the Euclid Creek Tunnel/Dugway Storage,</p>	<p>1. Numeric Performance Criteria</p> <p>a. Except as provided in 1.b. below, the following Numeric Performance Criteria apply for the duration of the Consent Decree:</p> <p>i. The 7-day arithmetic mean of Qualifying Samples collected and analyzed on a continuous rolling basis in accordance with Section 2.3.8 of Appendix 2 shall not exceed 40 mg/l TSS;</p> <p>ii. The 7-day geometric mean of Qualifying Samples collected and analyzed on a continuous rolling basis in accordance with Section 2.3.8 of Appendix 2 shall not exceed 284/100 ml E. coli; and</p> <p>iii. Total residual chlorine (TRC) shall not exceed 0.038 mg/l in any sample collected and analyzed in accordance with Section 2.3.8 of Appendix 2.</p> <p>b. Following the CM 2 Phase 1 Post-Construction Monitoring Period described in Section 2.3.8 of Appendix 2 and for the duration of the Consent Decree thereafter, any NPDES permit effluent limitations for TSS, E. coli and/or TRC, apply instead of the Numeric Performance Criteria set forth above, if both:</p> <p>i. There is an NPDES permit with numeric effluent limitations and monitoring requirements for discharges from the CEHRT for the specific parameter (TSS, E. coli and/or TRC) that are legally in effect (i.e., the limitations and requirements are not stayed) and those effluent limitations and monitoring requirements do not include, incorporate, or otherwise account for flows that do not go through the CEHRT; and</p> <p>ii. NEORS provides written notification to the U.S. EPA and Ohio EPA in accordance with Section XVII (Notices) of the Consent Decree of these facts. The date on which the NPDES permit effluent limits begin to apply as the Performance Criteria in lieu of the Numeric Performance Criteria set forth above for TSS, E. coli and/or TRC shall be the date of the written notification, provided that both of these conditions are met.</p> <p>c. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to the Numeric Performance Criteria listed in number 1.a. above.</p> <p>d. Nothing in these Numeric Performance Criteria relieves NEORS of any permit obligations.</p> <p>2. Operational Performance Criteria</p> <p>a. Discharge through CSO 001 only when the capacity of the Easterly WWTP has been exceeded.</p> <p>b. Maximize treatment through CEHRT to treat all flows up to the design treatment capacity which shall be at least 175 MGD.</p> <p>c. All influent flow at rates that exceed the combined peak capacities of the Easterly WWTP and the CEHRT shall be directed via the diversion structure and drop shaft to the Euclid Creek/Dugway Storage Tunnel System.</p> <p>d. Partially treated and untreated flows shall not be discharged through CSO 001 unless either:</p> <p>i. The following three criteria are met:</p> <p>a. Flow going through full treatment at the Easterly WWTP equals or exceeds the capacity of the WWTP;</p> <p>b. Flow to the CEHRT equals or exceeds the design treatment capacity which shall be at least 175 MGD; and</p> <p>c. Flow to the Euclid Creek/Dugway Storage Tunnel System equals or exceeds established set points for required control.</p> <p>or</p>	<p>1. Construction Award: Within 24 months of entry of the Fifth Amendment to the CD.</p> <p>2. Achievement of Full Operation: Within 78 months of entry of the Fifth Amendment to the CD.</p>

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2. Pilot Testing Report: Within 42 months of Work Plan Approval¶
3. Design Commencement: Within 6 months of Pilot Testing Report Approval¶
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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
				<p>System via the drop structure required in number 5, below.</p> <p>5. Construct a tunnel drop structure that is connected to and receives flow from the diversion structure required in number 4, above, with the capacity to convey the remaining peak flow (up to 315 MGD) to the Euclid Creek/Dugway Storage Tunnel System. A tunnel drop structure designed to a specific conveyance capacity (e.g., 315 MGD) will be capable of conveying higher flow rates at times than the specified conveyance capacity.</p>	<p>ii. Discharge is necessary to prevent flooding due to rapid increases in flow rates caused by short, intense wet weather events that elevate hydraulic profile in the flow diversion structure faster than flow measurement and control gates can respond.</p> <p>e. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to the Operational Performance Criteria listed in numbers 2.a through 2.c, above.</p> <p>3. CSO 001 Discharge Frequency Limits: Reduce CSO 001 discharge events to 17 CEHRT-treated and 2 untreated (or 2 partially CEHRT-treated) in a Typical Year.</p>	
	Westerly Plant					
3-1	Treatment and Disinfection of CSO 002 Demonstration/Pilot Project	Demonstration or pilot testing of chemically enhanced high rate treatment (CEHRT) within the existing CSO treatment facility (CSOTF) quads. CEHRT is chemically enhanced sedimentation followed by high rate disinfection.	CSO 002	Demonstrate or pilot performance of CEHRT of CSO 002 flow for up to 411 MGD peak flow designed to control to 30 mg/l of TSS.	Achieve 40.0 mg/l TSS averaged across 7 consecutive activations; 126/100 ml E. coli (rec. season geomean) 284/100 ml E. coli (rolling 7 days of activation geomean); and 0.038 mg/l residual chlorine NTE.	<p>1. Work Plan: Submitted by January 1, 2011.</p> <p>2. Demonstration Testing Report: Within 54 months of Work Plan Approval</p>
3-2	Treatment of CSO 002 using chemically enhanced high rate treatment (CEHRT)	<p>Provide CEHRT in the existing CSO treatment facility (CSOTF) at the Westerly WWTP and in all expansions to the CSOTF to treat flows that exceed the capacity of the collection system and/or the Westerly WWTP.</p> <p>CEHRT is chemically enhanced sedimentation followed by high rate disinfection.</p>	CSO 002	<p>1. Modify and expand the existing CSOTF to provide CEHRT to meet the Performance Criteria for flows up to the design treatment capacity of 411 MGD. Modifications and expansions of the CSOTF shall include the following:</p> <ul style="list-style-type: none"> a. expansion of the existing CSOTF volumetric capacity to be used for CEHRT from approximately 6 MG to a minimum of 10.5 MG; b. construction of the necessary additional settling tankage to provide a maximum peak surface overflow rate of 10,500 gpd/ft² at the design treatment capacity of 411 MGD; c. construction of a coagulant feed and contact channel to provide a minimum nominal coagulant contact time of 1 minute at 411 MGD from the point of coagulant feed to the most upstream CEHRT settling bay inlet gates; d. construction of the necessary tankage to provide a minimum disinfection contact time of 4 minutes and a minimum dechlorination contact time of 1 minute; e. installation of the necessary chemical feeds, storage tanks and associated mixing equipment to provide the nominal chemical dosages at 411 MGD specified in criterion number 2, below; and f. Installation of the necessary flow monitoring equipment (suited to each flow monitoring location's hydraulic characteristics) that measures flow at the following locations, at all anticipated flow rates: influent flow (flow through CEHRT plus flow conveyed through the center channel when the center channel diversion gates are opened); CEHRT discharge flow; and excess flows, if an excess flow conduit is built/installed. <p>2. Design the CEHRT chemical feed systems to be capable of providing the following nominal chemical dosage rates at the design flow rate of 411 MGD:</p> <ul style="list-style-type: none"> a. Coagulant: 45/35 mg/l (as FeCl₃/polyaluminum chloride or equivalent chemical and dose); b. Flocculant: 4 mg/l (as neat polymer concentration or equivalent chemical and dose); c. Disinfectant: 12 mg/l (as NaOCl or equivalent chemical and dose); and d. Dechlorination chemical: 18 mg/l (as NaHSO₃ or equivalent chemical and dose) <p>The above chemical doses are design values and as such, NEORS is not</p>	<p>1. <u>Numeric Performance Criteria</u></p> <ul style="list-style-type: none"> a. Except as provided in 1.b, below, the following Numeric Performance Criteria apply for the duration of the Consent Decree: <ul style="list-style-type: none"> i. The 7-day arithmetic mean of Qualifying Samples collected and analyzed on a continuous, rolling basis in accordance with Section 2.3.7 of Appendix 2 shall not exceed 40 mg/l TSS; ii. The 7-day geomean of Qualifying Samples collected and analyzed on a continuous, rolling basis in accordance with Section 2.3.7 of Appendix 2 shall not exceed 284/100 ml E. coli; and iii. Total residual chlorine (TRC) shall not exceed 0.038 mg/l in any sample collected and analyzed in accordance with Section 2.3.7 of Appendix 2. b. Following the CM 3-2 Phase 1 Post-Construction Monitoring Period described in Section 2.3.7 of Appendix 2 and for the duration of the Consent Decree thereafter, any NPDES permit effluent limitations for TSS, E. coli, and/or TRC, apply instead of the Numeric Performance Criteria set forth above, if both: <ul style="list-style-type: none"> i. There is an NPDES permit with numeric effluent limitations and monitoring requirements for discharges from the CEHRT for the specific parameter (TSS, E. coli and/or TRC) that are legally in effect (i.e., the limitations and requirements are not stayed) and those effluent limitations and monitoring requirements do not include, incorporate or otherwise account for flows that do not go through the CEHRT; and ii. NEORS provides written notification to the U.S. EPA and Ohio EPA in accordance with Section XVII (Notices) of the Consent Decree of these facts. The date on which the NPDES permit effluent limits begin to apply in lieu of the Numeric Performance Criteria set forth above for TSS, E. coli and/or TRC shall be the date of the written notification, provided that both of these conditions are met. c. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to the Numeric Performance Criteria listed in number 1.a, above d. Nothing in these Numeric Performance Criteria relieves NEORS of any permit obligations. <p>2. <u>Operational Performance Criteria</u></p> <ul style="list-style-type: none"> a. Discharge through CSO 002 only when the capacity of the collection system and/or the Westerly WWTP has been exceeded; and 	<p>1. Construction Award: Within 24 months of entry of the Second Amendment to the CD.</p> <p>2. Achievement of Full Operation: Within 78 months of entry of the Second Amendment to the CD.</p>

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Deleted: Treatment and Disinfection of CSO 001 using Ballasted Flocculation⁶

Deleted: If pilot testing of CEHRT under Control Measure 2 does not meet performance criteria, construction of 400 MGD ballasted flocculation⁶ and disinfection system.

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Deleted: Provide ballasted flocculation⁶ treatment and high rate disinfection of CSO 001 flows up to 400 mgd peak inflow to 25 fully treated OF and 2 partially treated OF in a typical year. Design to control 30 mg/l of TSS.

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 2. Pilot Testing Report: Within 12 months of Work Plan Approval¶
 3. Design Commencement: Within 6 months of Pilot Testing Report Approval¶
 4. Construction Award: Within 18 months of Design Commencement¶
 5. Construction Completion: Within 30 months of construction award

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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
				<p>required to operate the CEHRT using these chemical doses. NEORSR may use substitute chemicals in combination with or in lieu of those specified above, provided the chemicals comply with all appropriate federal and state regulations and the use achieves the required Performance Criteria. Nothing in the previous sentences relieves NEORSR of any Performance Criteria or NPDES permit obligations.</p> <p>3. The CEHRT shall be designed to control TSS to 30 mg/l for all flows up to its design treatment capacity of 411 MGD</p> <p>4. If NEORSR includes an excess flow conduit around CEHRT for flows in excess of 411 MGD, the conduit shall be designed:</p> <ul style="list-style-type: none"> a. to convey flows in excess of 411 MGD around CEHRT; b. such that flows to the CEHRT are prioritized; and c. the excess flow conduit does not activate until 411 MGD has been reached at the CEHRT, or at lesser incoming flow rates, only as necessary, to protect the CEHRT facilities and/or the collection system as described in Operational Limits number 2.b. 	<ul style="list-style-type: none"> b. Maximize treatment through CEHRT to treat flows up to 411 MGD through CEHRT unless treatment of 411 MGD is not possible because flow in the CEHRT center channel has exceeded 411 MGD, and/or the hydraulic profile in the CEHRT center channel or the Northwest Interceptor results in a center channel diversion and/or flow through the excess flow conduit (if constructed) to reduce the risk of one, or both, of the following: <ul style="list-style-type: none"> i. flooding of CEHRT infrastructure or buildings; or ii. CSO discharges through the Westerly CSO outfalls hydraulically connected to and located upstream of the Westerly CEHRT. c. At CEHRT influent flow rates that exceed 411 MGD, continue to feed chemicals at effective dosages to treat those flows to the extent possible unless the CEHRT Center Channel gates open resulting in a center channel diversion, for the duration of the Consent Decree. d. If NEORSR includes an excess flow conduit around CEHRT for some amount of flow in excess of the design treatment capacity of 411 MGD, such conduit may not be used unless flow through CEHRT is maximized per numbers 2.a and 2.b, above, NEORSR shall operate the excess flow conduit pursuant to numbers 2.a. and 2.b, above. e. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to the Operational Performance Criteria listed in numbers 2.a through 2.d, above. <p>3. <u>CSO 002 Discharge Frequency Limits</u>: Reduce CSO 002 discharge events to 11 CEHRT-treated and 3 untreated (or 3 partially CEHRT-treated) in a <u>Typical Year</u>.</p>	
Southerly Plant						
4	Treatment of Primary Effluent Bypass Demonstration/Pilot Project	Demonstration or pilot testing of chemical addition within primaries bank 11 - 18 and high rate disinfection of the primary effluent bypass to assess performance.	PEB	Demonstrate or pilot performance of treatment and high rate disinfection of primary effluent bypass flows for up to 125 MGD peak flow designed to control to 30 mg/l TSS.	Achieve 40.0 mg/l TSS averaged across 7 consecutive activations; 126/100 ml E. coli (rec. season geomean) 284/100 ml E. coli (rolling 7 days of activation geomean); and 0.038 mg/l residual chlorine NTE.	<ol style="list-style-type: none"> 1. Work Plan: Submitted by January 1, 2011 2. Pilot Testing Report: Within 42 months of Work Plan Approval

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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
5-1	Increase Secondary Treatment Capacity at Southerly Wastewater Treatment Plant (WWTP)	<p>Increase secondary capacity from 400 MGD to a sustained capacity (i.e., continuous secondary treatment for a minimum of 24 hours) of 480 MGD by expanding the second stage secondary treatment capacity from 400 MGD to 480 MGD.</p> <p>This expansion will be achieved by expanding the Southerly Second Stage Lift Station (SSLS) firm pumping capacity (i.e., capacity with largest pump out of service) to 480 MGD and making other Southerly WWTP improvements, which include the completion of the Southerly Second Stage Settling Improvements Project. The first stage secondary treatment capacity will remain 215 MGD.</p> <p>The construction and operation of the expansion of secondary treatment at the Southerly WWTP is known as Enhanced Secondary Treatment (EST).</p>	PEB	Provide sustained secondary treatment (i.e., continuous secondary treatment for a minimum of 24 hours) of 480 MGD by expanding the Southerly SSLS firm pumping capacity (i.e., capacity with largest pump out of service) to 480 MGD and completing all other improvements necessary to provide a sustained secondary treatment capacity of 480 MGD.	Provide sustained secondary treatment to meet NPDES effluent limits at Outfall 001. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to this Performance Criteria.	Achievement of Full Operation: December 31, 2024
5-2	Treatment of Primary Effluent Bypass with chemically enhanced high rate treatment (CEHRT)	Provide CEHRT in primary settling tanks (PST) 11-14 and the primary effluent bypass (PEB) channel at Southerly WWTP to treat flows that exceed the Southerly WWTP secondary treatment capacity. CEHRT is chemically enhanced sedimentation followed by high rate disinfection.	PEB	<ol style="list-style-type: none"> Install and/or implement all necessary hydraulic and structural modifications to the PST influent channel, PSTs, and PEB channel to meet the Performance Criteria for flows up to the peak CEHRT design capacity of 255 MGD. Design the CEHRT chemical feed capacities such that the following nominal chemical dosage rates for flows up to the peak CEHRT design capacity of 255 MGD can be provided: <ol style="list-style-type: none"> Coagulant: 50 mg/l (as FeCl₃ or equivalent chemical and dose) Flocculant: 4 mg/l (as neat polymer concentration or equivalent chemical and dose) Disinfectant: 12 mg/l (as NaOCl or equivalent chemical and dose) Dechlorination chemical: 26 mg/l (as NaHSO₃ or equivalent chemical and dose) <p>The above chemical doses are design values and as such, NEORS is not required to operate the CEHRT using these chemical doses. NEORS may use substitute chemicals in combination with or in lieu of those specified above, provided the chemicals comply with all appropriate federal and state regulations and the use achieves the required Performance Criteria. Nothing in the previous sentences relieves NEORS of any Performance Criteria or NPDES permit obligations.</p> Install mixing and/or channel improvements in the PEB channel to provide adequate chemical mixing to achieve dechlorination and meet the Performance Criteria listed in number 1.a.iii. The CEHRT shall be designed to control TSS to 30 mg/l for all flows up to its design treatment capacity of 255 MGD. 	<ol style="list-style-type: none"> <u>Numeric Performance Criteria</u> <ol style="list-style-type: none"> Except as provided in 1.b, below, the following Numeric Performance Criteria apply for the duration of the Consent Decree: <ol style="list-style-type: none"> The 7-day arithmetic mean of Qualifying Samples collected and analyzed on a continuous, rolling basis in accordance with Section 2.3.6 of Appendix 2 shall not exceed 40 mg/l TSS; The 7-day geometric mean of Qualifying Samples collected and analyzed on a continuous, rolling basis in accordance with Section 2.3.6 of Appendix 2 shall not exceed 284/100 ml E. coli; and Total residual chlorine (TRC) shall not exceed 0.038 mg/l in any sample collected and analyzed in accordance with Section 2.3.6 of Appendix 2. Following the CM 5-2 Phase 1 Post-Construction Monitoring Period described in Section 2.3.6 of Appendix 2 and for the duration of the Consent Decree thereafter, any NPDES permit effluent limitations for TSS, E. coli, and/or TRC, apply instead of the Numeric Performance Criteria set forth above, if both: <ol style="list-style-type: none"> There is an NPDES permit with numeric effluent limitations and monitoring requirements for discharges from the CEHRT for the specific parameter (TSS, E. coli, and/or TRC) that are legally in effect (i.e., the limitations and requirements are not stayed) and those effluent limitations and monitoring requirements do not include, incorporate or otherwise account for flows that do not go through the CEHRT; and NEORS provides written notification to the U.S. EPA and Ohio EPA in accordance with Section XVII (Notices) of the Consent Decree of these facts. The date on which the NPDES permit effluent limits begin to apply in lieu of the Numeric Performance Criteria set forth above for TSS, E. coli and/or TRC shall be the date of the written notification, provided that both of these conditions are met. 	Achievement of Full Operation: Within 68 months of entry of the Second Amendment to the Consent Decree.

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					c. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to these Numeric Performance Criteria listed in number 1.a, above d. Nothing in these Numeric Performance Criteria relieves NEORS of any permit obligations. 2. <u>Operational Performance Criteria</u> a. Discharge through the CEHRT when: i. the flow rate into the Southerly WWTP secondary treatment system is equal to or greater than the maximum secondary treatment capacity of 480 MGD; and ii. at lesser incoming flow rates, only as necessary, to protect the secondary treatment system from rapidly changing flow conditions caused by short intense wet weather events that result in marked increase in peak flow rates. The length of time CEHRT can be utilized to adjust to the influence of rapidly changing flow conditions shall be minimized and limited to only the length of time the plant is influenced by such rapidly increasing flow rates and in no case shall exceed 30 minutes. b. At CEHRT discharge flow rates that exceed 255 MGD, continue to feed chemicals at effective dosages to treat those flows to the extent possible for the duration of the Consent Decree. c. The "Typical Year" component of the Consent Decree's Performance Criteria is not applicable with respect to these Operational Performance Criteria listed in numbers 2.a and 2.b, above. 3. <u>PEB Discharge Frequency Limits</u> : Reduce PEB discharge events to 3 CEHRT-treated and 0 untreated (or 0 partially CEHRT-treated) in a <u>Typical Year</u> .	
	Easterly CSO Projects³					
6	Euclid Creek Tunnel/Dugway Storage System	24 ft diameter storage tunnel, dewatering pump station, and consolidation/relief sewers that capture and store the CSO within Euclid and Dugway tributary sewersheds.	Outfalls 206, 208, 209, 210, 211, 212, 214, 230, 231, 232, 239, 242	Provide a minimum of 117 MG of effective storage volume ⁶ to capture flow from CSO outfalls 206, 208, 209, 210, 211, 212, 214, 230, 231, 232, 239, and 242.	When incorporated with all of the Euclid Creek and Dugway Brook tunnel components improvements, reduce overflow events to 2 or less in a <u>Typical Year</u> .	1. Bid Year: 2010 2. Achievement of Full Operation: 2020
7	Shoreline Tunnel System	21 ft diameter storage tunnel and consolidation sewers that capture and store CSO from the outfalls leading to Lake Erie from the area near East 12th Street to the connection of the Dugway/Doan Storage Tunnel system in Forest Hill Park. Includes multiple drop structures near existing outfalls to capture CSO.	Outfalls 093, 094, 095, 096, 097, 098, 200, 201, 202, 203, 204, and 205	Provide a minimum of 46 MG ⁷ of effective storage volume ⁶ to capture flow from CSO outfalls 093, 094, 095, 096, 097, 098, 200, 201, 202, 203, 204, and 205. Dewater into the ECT/ECT tunnel system.	When completed with all of the Shoreline Area tunnel components improvements, reduce overflow events to 2 or less at Priority outfalls, and 3 or less at other outfalls in a <u>Typical Year</u> .	1. Bid Year: 2021 2. Achievement of Full Operation: 2027
8	Doan Valley Tunnel System	17 ft diameter storage tunnel and consolidation/relief sewers that capture and store CSO from Doan Brook Area to the Dugway West Interceptor relief sewer. This includes a 8.5 ft consolidation sewer (MLK/Chester Conveyance Tunnel) to convey captured flow from the western CSO regulator locations along Doan Brook and 6 ft consolidation sewer (Woodhill Conveyance Tunnel) to convey combined sewer flow, a portion of relief flow, and some dry weather flow.	Outfalls 073, 217, 218, 219, 220, 221, 222, 223/224, 226, and 234	Provide a minimum of 48 MG ⁷ of effective storage volume ⁶ to capture flow from CSO outfalls 073, 217, 218, 219, 220, 221, 222, 223/224, 226, and 234.	When completed with all of the Doan Valley tunnel components improvements, reduce overflow events to 2 or less at Priority outfalls, and 3 or less at other outfalls in a <u>Typical Year</u> .	1. Bid Year: 2017 2. Achievement of Full Operation: 2021
Consolidated 9-10-11	Superior Avenue Pump Station (SAPS) Upgrade/ Stones Levee Pump Station (SLPS) Upgrade/ SAPS-SLPS-Canal Road Area Regulator Modifications	Upgrade and convert the existing SAPS to increase pumping capacity and wet well storage for purposes of providing sufficient conveyance and storage capacity for tributary regulators E-26, E-27, E-28, and SLPS. Separate the area tributary to the SLPS. Upgrade and convert the SLPS to a sanitary-only pump station. Separation will be achieved via modifications to regulator E-25, which is tributary to CSO outfall 235. This project will assist in alleviating surcharging in the combined sewer along West 3rd Street.	Outfalls 090, 235, CSO-SAPS, and CSO-SLPS; surcharging relief; additional storage capacity and flow attenuation	Upgrade and convert the SAPS to a dual (dry weather and wet weather) pump station with a minimum total firm pumping capacity (i.e., capacity with largest pump out of service) of 11.5 mgd, and a minimum of 0.22 MG wet well storage in the wet weather portion of the SAPS. Separate the entire area tributary to E-28. Separate the area tributary to the SLPS by sealing regulator E-25, and upgrading and converting the SLPS to a sanitary-only pump station having a minimum firm pumping capacity (i.e., capacity with largest pump out of service) of 0.7 mgd.	Convert CSO outfall 090 to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage. Convert CSO outfall 235 to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage. Reduce overflow events at outfall CSO-SAPS to 2 or less in a <u>Typical Year</u> . Convert outfall CSO-SLPS to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage.	1. Bid Year: 2017 2. Achievement of Full Operation: 2018

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Appendix 1 to Consolidated Fifth Amended Consent Decree

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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
		Modify regulators E-24, E-26, and E-27 to utilize the available storage in the existing combined sewer system along Canal Road. Regulator E-24 is tributary to regulator E-26.		Raise the weir in regulator E-24 a minimum of 10 inches, which corresponds to a minimum elevation of 652.40 ft. Seal regulators E-26 and E-27. Upon the next NPDES CSO Permit reissuance occurring after Achievement of Full Operation of this CSO Control Measure, seek removal from NEORSD's CSO Permit the following CSO outfalls: 090, 235, and CSO-SLPS.		
12	Flood Control & System Enhancement	District and intercommunity relief sewers that solely provide flooding relief for the 5-year, 6- hour design storm	Flooding relief for 5-year, 6-hour design storm	Provide capacity to carry the 5-year 6-hour design storm	Capacity to carry the 5-year 6- hour design storm	1. Bid Year: 2032 2. Achievement of Full Operation: 2034
13	East 55th Relief Sewer	Sewer configuration changes to provide wet weather flood relief for the existing E. 55th Street Interceptor.	Flooding relief for 5-year, 6-hour design storm	Provide capacity to carry the 5-year 6-hour design storm	Capacity to carry the 5-year 6- hour design storm	1. Bid Year: 2031 2. Achievement of Full Operation: 2032
Westerly CSO Projects⁴						
14	Westerly Tunnel System	24 ft storage/conveyance tunnel system with dewatering pump station and consolidation sewers that capture and store the CSO within Westerly tributary sewersheds.	Outfalls 074, 075, 080, 087	Provide a minimum of 38 MG⁷ of effective storage volume ⁶ to capture flow from CSO outfalls 074, 075, 080 and 087.	When completed with all of the Westerly Tunnel area tunnel components improvements, reduce overflow events to 2 or less at Priority outfalls, and 3 or less at other outfalls in a Typical Year.	1. Bid Year: 2020 2. Achievement of Full Operation: 2024
15	Columbus Road Storage	Modification of regulator WR-18 and construction of parallel pipe to capture and store flows until capacity is available in the Low Level Interceptor (LLI).	Outfall 078	Storage facility sized to capture a volume of 0.33 MG CSO from CSO 078 outfall. If storage is shared with CM 16, the total storage volume shall exceed 0.49 MG.	Reduce overflow events to 0 in a Typical Year.	1. Bid Year: 2018 2. Achievement of Full Operation: 2019
16	Center Street Storage	Modification of regulator WR-9 and construction of parallel storage pipe to capture and store flows until capacity is available in the LLI.	Outfall 076	Storage facility sized to capture a volume of 0.16 MG CSO from CSO 076 outfall. If storage is shared with CM 15, the total storage volume shall exceed 0.49 MG.	Reduce overflow events to 0 in a Typical Year.	1. Bid Year: 2023 2. Achievement of Full Operation: 2024
17	West Third Street Storage Separation	Sewer separation of area upstream of regulator WR-8 and CSO-082 to convert CSO-082 to a stormwater only outfall.	Outfall 082	Sewer separation along West 3rd Street and Literary Road to allow regulators WR-08 and WR-08A to be abandoned and to convert CSO-082 to a stormwater only outfall. Upon the next NPDES CSO Permit reissuance occurring after Achievement of Full Operation of this CSO Control Measure, seek removal of CSO outfall 082 from NEORSD's CSO Permit.	Convert CSO Outfall 082 to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage.	1. Bid Year: 2024 2. Achievement of Full Operation: 2025
18	Mary Street Pump Station (MSPS) Upgrade	Upgrade existing pump station from 8 mgd to a minimum of 12 mgd, and modification of the 84" CSO outfall pipe to allow its use as in-line storage.	Outfall 086	Upgrade MSPS to a firm pumping capacity (i.e., capacity with largest pump out of service) of 12 mgd. Construct and install a weir wall structure at the downstream end of the 84" CSO outfall pipe to allow its use as in-line storage creating a minimum of 0.50 MG storage. Install a dewatering pipe connecting the 84" CSO outfall pipe to the nearby interceptor.	Reduce overflow events to 4 or less in a Typical Year.	1. Bid Year: 2015 2. Achievement of Full Operation: 2017
19	Jefferson Avenue Separation	Seal regulator WR-07A Dry Weather Outlet (DWO) and verify separation of area upstream of regulator WR-07A to convert CSO outfall 240 to a stormwater only outlet.	Outfall 240	Seal regulator WR-07A DWO to convert CSO outfall 240 to a stormwater only outlet. Upon the next NPDES CSO Permit reissuance occurring after Achievement of Full Operation of this CSO Control Measure, seek removal of CSO outfall 240 from NEORSD's CSO Permit.	Convert CSO outfall 240 to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage.	1. Bid Year: 2027 2. Achievement of Full Operation: 2028
20	West 3rd St/Quigley Separation	Sewer separation of area upstream of regulators WR-1 and WR-2 and CSO-089 and disconnection of sewers from pump station tributary to CSO-089 to convert CSO-089 to a stormwater only outfall.	Outfall 089	Sewer separation along West 3rd Street to allow regulators WR-1 and WR-2 and pump station tributary to CSO-089 to be abandoned and to convert CSO-089 to a stormwater only outfall. Upon the next NPDES CSO Permit reissuance occurring after Achievement of Full Operation of this CSO Control Measure, seek removal of CSO outfall 089 from NEORSD's CSO Permit.	Convert CSO Outfall 089 to a stormwater only outfall such that it no longer has the ability to discharge sanitary or combined sewage.	1. Bid Year: 2021 2. Achievement of Full Operation: 2021
Southerly CSO Projects⁵						
21	Southerly Tunnel System	23 ft diameter tunnel storage system with dewatering pump station and consolidation relief sewers that capture CSO from outfalls leading to the Cuyahoga River by conveying wet weather flows to the Southerly Plant.	Outfalls 033, 035, 036, 039, 040, and 072	Provide a minimum of 60 MG⁷ of effective storage volume ⁶ to capture flow from CSO outfalls 033, 035, 036, 039, 040, and 072.	When completed with all of the Southerly Interceptor Area tunnel components improvements, reduce overflow events to 3 or less in a Typical Year.	1. Bid Year: 2024 2. Achievement of Full Operation: 2030
22	Big Creek Tunnel System	20 ft diameter tunnel system with consolidation/relief sewers that captures CSOs from outfalls leading to Big Creek, Spring Creek, and Rocky River and conveys the flows to the Southerly Plant through existing Big Creek Interceptor.	Outfalls 043, 044, 049, 050, 051, 053, 054, 055, 056, 057, 058, 059, 233, 238, & Cooley Avenue	Provide a minimum of 49 MG⁷ of effective storage volume ⁶ to capture flow from CSO outfalls 043, 044, 049, 050, 051, 053, 054, 055, 056, 057, 058, 059, 233, 238, & Cooley Avenue.	When completed with all of the Big Creek Interceptor Area tunnel components improvements, reduce overflow events to 3 or less in a Typical Year.	1. Bid Year: 2026 2. Achievement of Full Operation: 2034
23	CSO-045 Storage Tank	Storage tank to capture flows tributary to Jennings Road Pump Station (CSO-045)	Outfalls 045, 088	Storage facility sized to capture effective volume of 1.1 MG CSO from CSO 045 and 088 outfalls.	Achieve 4 overflows or less in a Typical Year.	1. Bid Year: 2021 2. Achievement of Full Operation:

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Appendix 1 to Consolidated Fifth Amended Consent Decree

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Control Measure (CM) No.	Control Measure	Description	CSOs Controlled	Design Criteria	Performance Criteria in a Typical Year ¹	Critical Milestones
						2023
24	CSO-063 Relief / Consolidation Sewer	Interbasin diversion of combined flows to the Southwest Interceptor and new SWI drop structure	Outfall 063	Convey controlled wet weather flows to SWI up to prescribed control level.	Achieve 1 overflows or less in a <u>Typical Year</u>	1. Bid Year: 2013 2. Achievement of Full Operation: 2014
25	Stickney Creek Intercommunity Sewer	Intercommunity relief sewer along the existing Stickney Creek Sanitary System to relieve flooding problems. Tributary to Stickney Creek Area Consolidation Sewer.	surcharging and flooding relief	Provide capacity to carry the 5-year 6-hour design storm	Capacity to carry the 5-year 6- hour design storm	1. Bid Year: 2033 2. Achievement of Full Operation: 2034

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1 - Typical Year of storm events as defined in the CSO Phase II Facilities Plans for the Westerly, Doan Valley, Easterly and Southerly Districts.

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2 - Discharge from 1st Stage outfall does not receive nitrification and is expected to meet plant-wide ammonia limits when averaged with discharge from 2nd Stage outfall.

3 - Easterly priority CSOs are 001, 073, 200, 202, 204, 206, 209, 210, 211, 221, 222, 230, 232 and 242. Easterly non-priority CSOs are 208, 212, 214, 231, 239, 090, 093, 094, 095, 096, 097, 098, 201, 203, 205, 217, 218, 219, 220, 223/224, 226, 234, 235, Superior Ave Pump Station (PS), and Stones Levee PS.

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4 - Westerly priority CSOs are 002 and 080. Westerly non-priority CSOs are 074, 075, 076, 078, 082, 086, 087, 088, 089 and 240.

5 - Southerly priority CSOs are 057, 058 and 063. Southerly non-priority CSOs are 043, 044, 045, 049, 050, 051, 053, 054, 055, 056, 059, 233, 238, and Cooley Avenue.

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6 - Effective storage volume is defined as the volume of combined sewage that can reliably enter and be stored by the specified tunnel during wet weather events and is the volume required to store CSO volumes during wet weather events to meet identified Performance Criteria plus a 10% contingency. Effective storage volume is storage tunnel volume; such volume may include usable volumes in tunnel adits and tunnel drop shafts. Effective storage volume does not include volume that may be stored in consolidation, conveyance or dewatering tunnels/sewers or in near-surface tunnel-related structures.

Deleted: 6 - Ballasted flocculation: A physical-chemical treatment process that uses continuously recycled media and a variety of additives to improve the settling properties of suspended solids through improved floc bridging (USEPA Wastewater Fact Sheet)[¶]
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7

7 - In accordance with Appendix 3, as amended by the Fifth Amendment to Consent Decree, NEORS shall achieve a minimum capture of 54 MG of wet weather flow in a Typical Year in addition to the wet weather flow reductions resulting from the construction and operation of the original Appendix 1 Gray Infrastructure CSO Control Measures. For purposes of post-construction monitoring to determine whether NEORS achieved the required wet weather flow reductions in accordance with Section 2.4.2 in Appendix 2, for Control Measures 7, 8, 14, 21, and 22, and only for such purposes, NEORS may use the following effective storage volumes that were included in Appendix 1 prior to the Fifth Amendment to Consent Decree to model the wet weather flow reductions resulting from construction and operation of Appendix 1 Gray Infrastructure CSO Control Measures, rather than the effective storage volumes set forth in Appendix 1 as amended by the Fifth Amendment to Consent Decree: Control Measure 7 (Shoreline Tunnel System) effective storage volume of 43 MG rather than 46 MG; Control Measure 8 (Doan Valley Tunnel System) effective storage volume of 16 MG rather than 18 MG; Control Measure 14 (Westerly Tunnel System) effective storage volume of 36 MG rather than 38 MG; Control Measure 21 (Southerly Tunnel System) effective storage volume of 54 MG rather 60 MG; and Control Measure 22 (Big Creek Tunnel System) effective storage volume of 46 MG rather than 49 MG. While NEORS may use these smaller effective storage volumes for modeling purposes only, NEORS shall design and construct the tunnels for these five control measures consistent with the larger effective storage volumes specified for each in the Appendix 1 table, as amended by the Fifth Amendment to Consent Decree.

8 - CSO 001 flows are discharged to Lake Erie through an outfall called Station Number 3PF00001002 ("Outfall 002"). Note a of Part I.B.1 of NPDES Permit 3PF00001*MD issued by Ohio EPA on February 13, 2019, states "[t]he discharge at this station [i.e., Outfall 002] is comprised of CSO 001 and any associated emergency bypass events at the treatment plant headworks."