Negotiated Long Term Control Plan Update

Submitted in accordance with conditions set forth in cover letter dated November 15, 2011

City of Akron

Control Measures, Design Criteria, Performance Criteria and Critical Milestones

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[1]	PERFORMANCE CRITERIA[2] (TYPICAL YEAR)	CRITICAL MILESTONES
CSO Control Measures					
Separation of Racks 8, 25, 21, 30 and 13: To be performed consistent with the Consent Decree Section (V).					
Storage Basins					
1	Rack 3	Storage Basin(s)	Minimum storage volume of 1,865,006 gallons	0 CSOs	Bidding of Control Measure –June 30, 2018 Achievement of Full Operation-Nov 30, 2020
2	Rack 5 and 7	Storage Basin(s)	Minimum storage volume of 1,105,920 gallons	0 CSOs	Bidding of Control Measure –Oct 31, 2015 Achievement of Full Operation-Oct 31, 2017
3	Racks 10 and 11	Storage Basin(s)	Minimum storage volume of 2,518,616 gallons	0 CSOs	Bidding of Control Measure –June 30, 2018 Achievement of Full Operation-Dec 31, 2020

[1] The criteria for storage volumes are effective storage volumes and as such shall account for hydraulic and/or operational limitations and any other factors of consideration that are necessary to ensure that the basin(s) or tunnel will be able to store the specified volume identified in this column during either the largest typical year storm event (for the basins and the Northside Interceptor Tunnel) or the 8th largest typical year storm event (for the Ohio Canal Tunnel). Akron may propose that the effective storage volumes for the storage basins set forth in Rows 1-12, excluding Row 11.a., be reduced through the use of Green Infrastructure, in accordance with the requirements and review and approval process set forth in Exhibit 3 to this LTCP Update. Any demonstration by Akron that reduced storage volumes coupled with green infrastructure controls will provide the same or greater level of control in terms of CSO overflows in a typical year must be submitted to EPA and OH EPA for approval, by no later than six (6) months prior to the due date for the bidding of the relevant control measure.

[2] "Typical Year" is defined as the Adjusted 1994 Typical Year as defined in Appendix 1 to Attachment A of the Consent Decree. Number of overflows and bypasses are based on a 12-hour inter-event period.

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[1]	PERFORMANCE CRITERIA[2] (TYPICAL YEAR)	CRITICAL MILESTONES
4	Rack 12	Storage Basin(s)	Minimum storage volume of 6,004,454 gallons	0 CSOs	Bidding of Control Measure –Nov 30, 2014 Achievement of Full Operation-Oct 31, 2017
5	Rack 14	Storage Basin(s)	Minimum storage volume of 1,927,842 gallons	0 CSOs	Bidding of Control Measure –Oct 31, 2014 Achievement of Full Operation-April 30, 2017
6	Rack 15	Storage Basin(s)	Minimum storage volume of 1,446,246 gallons	0 CSOs	Bidding of Control Measure –Nov 30, 2013 Achievement of Full Operation-Oct 31, 2015
7	Rack 22	Storages Basin(s)	Minimum storage volume of 2,424,446 gallons	0 CSOs	Bidding of Control Measure –Oct 31,2015 Achievement of Full Operation-Dec 31, 2017
8	Rack 26 and 28	Storage Basin(s)	Minimum storage volume of 2,296,669 gallons	0 CSOs	Bidding of Control Measure –Oct 31, 2021 Achievement of Full Operation-Dec 31, 2022
9	Rack 27 and 29	Storage Basin(s)	Minimum storage volume of 1,290,276 gallons	0 CSOs	Bidding of Control Measure –Jan 31, 2018 Achievement of Full Operation-Dec 31, 2019

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[1]	PERFORMANCE CRITERIA[2] (TYPICAL YEAR)	CRITICAL MILESTONES
10	Rack 36	Storage Basin(s)	Minimum storage volume of 1,133,074 gallons	0 CSOs	Bidding of Control Measure –Oct 31, 2015 Achievement of Full Operation-Oct 31, 2017
Tunnel Systems					
11	Racks 4, 16, 17, 18, 19, 20, 23, 24, 37	Ohio Canal Tunnel – Construct a 28-foot internal diameter tunnel, 5,550 feet in length, or any other combination of diameter and length that achieves the design criteria.	Minimum storage volume of 25,600,000 gallons. This volume excludes conveyance tunnels, dewatering tunnels/sewers, adits, and drop shafts.	No more than 7 CSOs Racks 4 and 37: 0 CSOs	Bidding of Control Measure –April 30, 2014 Achievement of Full Operation-Dec 31, 2018

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[1]	PERFORMANCE CRITERIA[2] (TYPICAL YEAR)	CRITICAL MILESTONES
11a	Racks 16, 17, 18, 19, 20, 23, 24,	Ohio Canal Tunnel – ACTIFLO™ Ballasted Flocculation Unit or equivalent technology that meets the Design and Performance Criteria and Disinfection	An ACTIFLO™ ballasted flocculation unit (sand ballast technology) or an EPA and OEPA- approved equivalent technology that meets the Performance Criteria, including disinfection, with a minimum sustained design capacity of 300 million gallons per day (208,000 gallons per minute). The hydraulic loading rate shall not exceed the manufacturer's recommendation.	Treated discharges must not exceed the following discharge limitations[3]: 1) 30 mg/l TSS 2) In the recreational season, no more than 10% of the samples taken during any 30 day period shall exceed 298/100 ml of E. coli. 3) The geometric mean of all the samples collected during the recreational season shall not exceed 126/100 ml of E.coli. 4) 0.024 mg/l residual chlorine	Bidding of Control Measure –April 30, 2024 Achievement of Full Operation-Oct 31, 2027

[3] Akron shall sample all discharges from the ACTIFLO™ and BioACTIFLO™ treatment units such that the samples are representative and accurately characterize the actual treated discharge once stable operation is achieved (beginning no more than (a) 20 minutes after discharge from the ACTIFLO™ treatment system begins; or (b) 40 minutes after discharge from the BioACTIFLO™ treatment system begins), and shall comply with all applicable NPDES permit requirements. CBOD5 and TSS shall be collected as flow proportioned composite samples taken over the entire period of each discharge once stable operation of the ACTIFLO™ or BioACTIFLO™ treatment systems is achieved. E. coli shall be collected as two or more grab samples taken during the period of discharge once stable operation of the Actiflo or Bioactiflo treatment systems is achieved.

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[1]	PERFORMANCE CRITERIA[2] (TYPICAL YEAR)	CRITICAL MILESTONES
12	Racks 32, 33, 34, 35	Northside Interceptor Tunnel – Construct a 20-foot internal diameter tunnel, 10,000 feet in length or any other combination of diameter and length that achieves the design criteria.	Minimum storage volume of 23,000,000 gallons. This volume excludes conveyance tunnels, dewatering tunnels/sewers, adits, and drop shafts.	0 CSOs	Bidding of Control Measure –April 30, 2023 Achievement of Full Operation-Dec 31, 2026

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
WPCS Control Measures							
(1) Measures at WPCS							
13	WPCS Phase 1: Akron shall upgrade conventional secondary treatment capacity to 130 MGD in accordance with either 13a or 13b below, as required in Section V (Specific Action Project), Paragraph 10 (Upgrade WPCS to 130 MGD) of the Consent Decree.						
13a.	WPCS Phase 1	WPCS	Upgrade conventional secondary treatment capacity to 130 MGD by implementing step feed operation in Train 6, as described in Paragraph 10.a of the Consent Decree.	Secondary treatment to achieve a minimum sustained capacity[4] of 130 MGD.	Secondary treatment to achieve a minimum sustained capacity of 130 MGD.	No more than 22 bypasses	Bidding of Control Measure –Oct 31,2011 Achievement of Full Operation-Oct 15, 2013
13b.	WPCS Phase 1	WPCS	Upgrade conventional secondary treatment capacity to 130 MGD by performing the upgrades identified in the Consent Decree in Section V.10.C.	Secondary treatment to achieve a minimum sustained capacity[4] of 130 MGD.	Secondary treatment to achieve a minimum sustained capacity of 130 MGD.	No more than 22 bypasses	Bidding of Control Measure – January 15, 2016 Achievement of Full Operation-Oct 15, 2017

[4] "Minimum sustained capacity" shall be the smallest acceptable peak capacity that can be sustained continuously for a minimum of 48 hours under normal operating conditions.

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
14	WPCS Phase 1 BioACTIFLO Wet Weather Treatment Pilot Study (the "Pilot Study")	WPCS	Conduct the Pilot Study in accordance with Exhibit 1 to this Long Term Control Plan Update.	BioACTIFLO™ Biological ballasted flocculation system designed to meet parameters of approved study outlined in Exhibit 1. Maximum loading rates shall not exceed the manufacturer's recommendations.	See Exhibit 1	Not applicable (pilot study)	Pilot Study start date- May 1, 2012 Pilot Study Completion Date- Nov 30, 2013 Pilot Study Report submitted to EPA by Dec 31, 2013
15	WPCS Phase 2- Part 1	WPCS	Upgrade conventional secondary treatment capacity to 170 MGD	Secondary treatment to achieve a minimum sustained capacity of 170 MGD.	Secondary treatment to achieve a minimum sustained capacity of 170 MGD.	No more than 10 bypasses	Bidding of Control Measure –Feb 28, 2019 Achievement of Full Operation- Dec 31, 2021

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
16	WPCS Phase 2-Part 2	WPCS	Install BioACTIFLO™ ballasted flocculation to treat all flow that does not receive conventional secondary treatment.[5] In addition, all flows receiving BioACTIFLO shall receive disinfection.	A minimum sustained capacity of 110 MGD BioACTIFLO™ ballasted flocculation to treat all secondary treatment bypasses. Maximum loading rates shall not exceed the manufacturer's recommendations. In addition, all flows receiving BioACTIFLO shall receive disinfection.	BioACTIFLO™ ballasted flocculation to achieve a minimum sustained capacity of 110 MGD. In addition, all flows receiving BioACTIFLO shall receive disinfection.	Treated discharges must not exceed the following limitations:[3, 5] 1) 30 day average of 30 mg/l for TSS; 2) An average weekly discharge limitation of 298/100mL E.coli (during recreational season) 3) An average monthly discharge limitation of 126/100 ml E. coli (during recreational season) 4) 0.024 mg/l residual chlorine	Bidding of Control Measure –April 30, 2017 Achievement of Full Operation April, 30,2019

[5] If the biological ballasted flocculation unit has a dedicated disinfection system, all limits shall apply after the dedicated disinfection system. If the biological ballasted flocculation unit effluent is combined with conventional secondary treatment system effluent prior to disinfection, then the limits for TSS and CBOD5 will apply after the biological ballasted flocculation unit, but before flows from biological ballasted flocculation are combined with flows that went through conventional secondary treatment. E.coli and residual chlorine limits will apply after the combined disinfection unit.

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
Alternative Plan to Upgrading Conventional Secondary Treatment to 170 MGD: • If US EPA approves in writing an Alternative Plan A in accordance with Exhibit 2 to the LTCP Update, then Akron shall implement the control measures specified below in Rows 17 and 18, instead of the control measures specified in Rows 15 and 16. • If US EPA approves in writing an Alternative Plan B, in accordance with the Attachment to the LTCP Update, then Akron shall implement the control measures specified below in Rows 19 and 20, instead of the control measures specified in Rows 15 and 16.							
17	Alternative Plan A-Phase 2-Part 1	WPCS	Upgrade conventional secondary treatment capacity to achieve the minimum sustained capacity specified in Alternative Plan A approved by U.S. EPA	Conventional secondary treatment capacity will be designed to achieve at least the minimum sustained capacity specified in Alternative Plan A approved by U.S. EPA	Conventional secondary treatment facilities will achieve the minimum sustained capacity specified in Alternative Plan A approved by U.S. EPA	Comply with current NPDES permit limits.	Bidding of Control Measure – February 28, 2019 Achievement of Full Operation- December 31, 2021

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
18	Alternative Plan A-Phase 2-Part 2	WPCS	Install BioACTIFLO™ ballasted flocculation to achieve the minimum capacity specified in Alternative Plan A approved by U.S. EPA. In addition, all flows receiving BioACTIFLO shall receive disinfection.	BioACTIFLO™ ballasted flocculation plus disinfection facilities will be designed to achieve (1) at least the minimum capacity specified in Alternative Plan A approved by U.S EPA (2) the effluent limitations of specified in the Performance Criteria for this Row	BioACTIFLO™ ballasted flocculation facilities will achieve the minimum sustained capacity specified in Alternative Plan A approved by U.S. EPA and all flows up to that minimum sustained capacity must be disinfected.	Treated discharges must not exceed the following limitations:[3, 5] 1) 30 day average of 30 mg/l for TSS; 2) An average weekly discharge limitation of 298/100mL E.coli (during recreational season) 3) An average monthly discharge limitation of 126/100 ml E. coli (during recreational season) 4) 0.024 mg/l residual chlorine	Bidding of Control Measure – April 30, 2017 Achievement of Full Operation-April 30, 2019
19	Alternative Plan B-Phase 2-Part 1	WPCS	Upgrade conventional secondary treatment capacity to achieve the minimum sustained capacity specified in Alternative Plan B approved by U.S. EPA	Conventional secondary treatment capacity will be designed to achieve at least the minimum sustained capacity specified in Alternative Plan B approved by U.S. EPA	Conventional secondary treatment facilities will achieve the minimum sustained capacity specified in Alternative Plan B approved by U.S. EPA	Comply with current NPDES permit limits.	Bidding of Control Measure –Dec 31, 2019 Achievement of Full Operation-Dec 31, 2021

ROW #	UPGRADE PHASES	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA	PERFORMANCE CRITERIA (TYPICAL YEAR)		CRITICAL MILESTONES
					CAPACITY (MGD)	NUMBER AND EFFLUENT LIMITATIONS OF BYPASSES	
20	Alternative Plan B-Phase 2-Part 2	WPCS	Install BioACTIFLO™ ballasted flocculation to achieve the minimum capacity specified in Alternative Plan B approved by U.S. EPA. In addition, all flows receiving BioACTIFLO shall receive disinfection.	BioACTIFLO™ ballasted flocculation facilities will be designed to achieve the effluent limitations specified in the Performance Criteria for this Row Maximum loading rates shall not exceed the manufacturer's recommendations. In addition, all flows receiving BioACTIFLO shall receive disinfection.	BioACTIFLO™ ballasted flocculation facilities will achieve a minimum sustained capacity specified in Alternative Plan B approved by US EPA and all flows up to that minimum sustained capacity must be disinfected.	Treated discharges must not exceed the following limitations:[3,5,6] 1) 30-day average of 30 mg/l for TSS and 25mg/l for CBOD5; 2) 7-day average of 45 mg/l for TSS and 40 mg/l CBOD5; 3) An average monthly discharge limitation of 126/100 ml E. coli (during recreational season) 4) An average weekly discharge limitation of 298/100mL E.coli (during recreational season) 5) 0.024 mg/l residual chlorine	Bidding of Control Measure -April 30, 2017. Achievement of Full Operation-April 30, 2019

[6] The terms "30-day average" and "7-day average" shall have the meaning for those terms set forth at 40 CFR 133.101

ROW #	CONTROL MEASURE LOCATION	DESCRIPTION	DESIGN CRITERIA[7]	PERFORMANCE CRITERIA (CAPACITY)	CRITICAL MILESTONES
(2) Collection System Measures					
21	Parallel Relief Interceptor and Pump Station	Installation of parallel relief sewer between Survey Station 88+00 and the WPCS and associated pump station to convey wastewater to WPCS	At a minimum, 7 ft inside finished diameter sewer from WPCS to Survey Station 88+00, along with associated pump station and flow monitoring, designed to allow at a minimum, transport and flow of 180 MGD to the WPCS	Conveyance capacity under normal operating conditions of projects outlined in Rows 21-22 to allow transmission of 280 MGD to the WPCS	Bidding of Control Measures: Parallel Relief Interceptor – July 31, 2015; Pump Station – Nov. 30, 2015 Achievement of Full Operation- Nov. 30, 2017
22	Main Outfall Sewer	Perform inspections and rehabilitation consistent with the Main Outfall Sewer Supplement[8] to the Approved CMOM Program as outlined in Section VII of the Consent decree.	Ensure the integrity of the sewer allowing for the transport of flow to the WPCS in accordance with the certification provided in Exhibit 4.	Conveyance capacity under normal operating conditions of projects outlined in Rows 21-22 to allow transmission of up to 280 MGD to the WPCS. Through Nov. 30, 2017, the Main Outfall Sewer shall allow transmission of up to 280 MGD to the WPCS. Thereafter, except during emergency conditions, the Main Outfall Sewer from Survey Station 88+00 to the WPCS shall be operated to preclude surcharge and at a maximum of 200 MGD.	Full Operation shall be maintained consistent with Main Outfall Sewer Supplement to the Approved CMOM Program

[7] Transmission conveyance capacity under normal operating conditions combined from both sewers to achieve a minimum effective combined flow of 280 MGD.

[8] The Main Outfall Sewer Supplement to the Approved CMOM shall include, but not be limited to, and a Main Outfall Sewer Emergency Response Plan and Schedule for Repair of Defects discovered during internal and external inspections of the Main Outfall Sewer. These items are documented in Exhibit 5.

EXHIBIT 1

EXHIBIT 1 TO THE LTCP UPDATE - APPENDIX 3 TO CONSENT DECREE

***United States v. City of Akron, et al.*, N.D. Ohio Case No. 5:09CV272**

The City of Akron
Water Pollution Control Station
BioACTIFLO™ Wet Weather Treatment System Pilot Study

This document is an exhibit to the approved Long Term Control Plan ("LTCP") Update for the City of Akron (the "City") and describes the BioACTIFLO™ Wet Weather Treatment System Pilot Study (the Pilot Study) that will be conducted by the City in accordance with this Consent Decree. The Pilot Study will comprise two separate sub-studies: the Treatment Effectiveness Study and the Comparative Study. The objective of the Treatment Effectiveness Study is to demonstrate whether or not BioACTIFLO™ biological ballasted flocculation is capable of achieving effluent limits identified in the performance criteria column in Row 20 of the approved LTCP Update (the "Performance Criteria") at the City's Water Pollution Control Station ("WPCS"). The objective of the Comparative Study is to collect data to compare the performance of the BioACTIFLO™ system to Akron's conventional secondary treatment system in treating pathogens and conventional pollutant parameters during wet weather events.

This document is separated into four sections. Section I is an overview of the Pilot Study. This section addresses the proposed process flow diagram, physical layout, and parameters that will be required to be determined and/or defined in order to implement the study.

Section II describes the Treatment Effectiveness Study. Treatment effectiveness will be based on the ability to meet the performance criteria specified in Row 20 of the LTCP Update.

Section III describes the Comparative Study. The Comparative Study is not part of the demonstration that is described in Section II, and the data gathered from the Comparative Study will not be used as part of the evaluation of the demonstration in Section II.

Section IV outlines requirements and procedures that will be part of the Quality Assurance Project Plan (QAPP). The QAPP is a formal document describing the necessary quality assurance (QA), quality control (QC), and other technical activities that will be implemented to ensure that the results of the work performed will satisfy the study objectives. It will be developed in detail by Akron at a later date and then submitted to EPA and OH EPA for approval. Both the Treatment Effectiveness and Comparative Studies will be addressed in the same QAPP.

I. Pilot Study Overview

The City's QAPP will establish the specific operational parameters of how the Treatment Effectiveness Study will be conducted. The QAPP will define the alternative BioACTIFLO™ influent flow streams that

will be evaluated during the Study, provide detailed descriptions of the pilot test facilities, and define the testing plan parameters that will be used to evaluate the pilot treatment unit. The City will construct and operate the BioACTIFLO™ pilot plant in accordance with final dates provided for in Row 14 of the approved LTCP Update.

A. Full-Scale Process Alternatives

During the study period, Akron shall evaluate the performance of BioACTIFLO™ on treating wet weather flow that would be diverted from the flow stream prior to primary treatment. This configuration provides the City with an opportunity to reduce loading of the Primary Settling Tanks (PSTs), which could improve primary and secondary treatment performance of the existing treatment system. For the full-scale implementation, Akron plans to direct the BioACTIFLO™ effluent to the existing disinfection facilities. Two potential configurations of how BioACTIFLO™ could be implemented at WPCS are shown in Figure 1 as Alternative 1 and Alternative 2, though other configurations or operating scenarios could be considered. In both alternatives, between 130 and 170 MGD would be treated through the conventional primary and secondary treatment systems (the exact flow rate will be based on the results of the Treatment Effectiveness Study) and up to 60 MGD maximum would be directed to the existing Stormwater Retention Tank (SRT). In Alternative 1, the BioACTIFLO™ influent flow stream would be a blend of SRT overflow and PST influent. In Alternative 2, the BioACTIFLO™ influent flow stream would be PST influent. The feasibility, advantages, disadvantages, and costs need to be evaluated to determine which arrangement should be evaluated as part of the pilot study, or if there are other arrangements that should be considered.

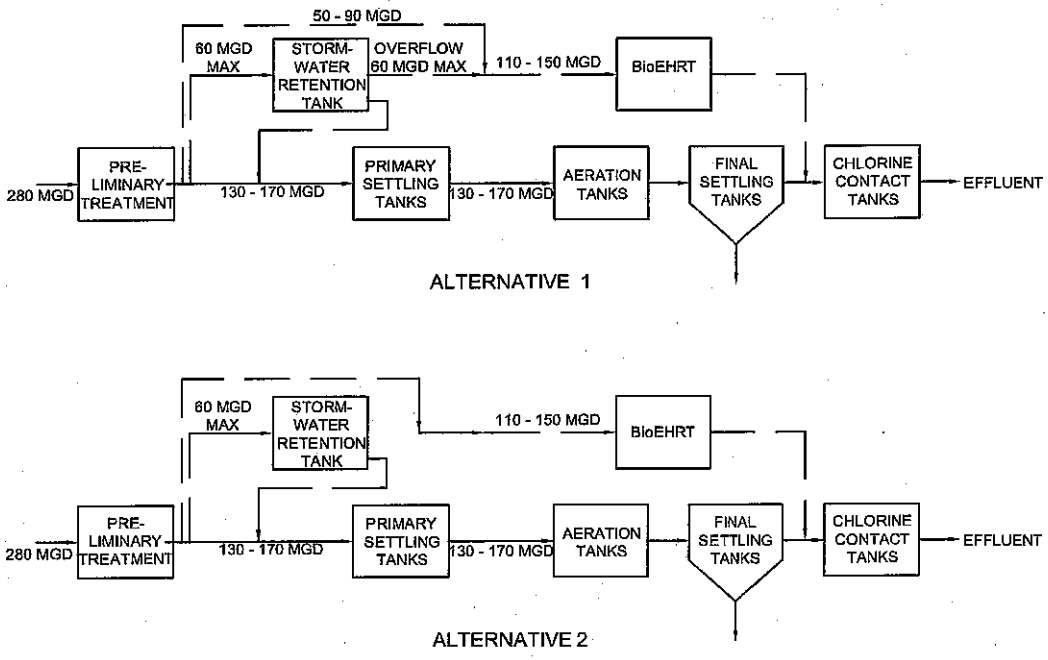

Figure 1 – Akron WPCS Flow Diagram Alternatives

B. Pilot Facilities

The pilot capacity shall be a 0.3 MGD BioACTIFLO™ pilot unit, which is the largest test pilot size available from the BioACTIFLO™ manufacturer. It is anticipated that this unit will be sited at the Akron WPCS next to Aeration Basin No. 1. The BioACTIFLO™ influent is anticipated to be pumped from the SRT effluent and/or the Primary Settling Tank influent depending on the proposed alternative configuration. The Return Activated Sludge source to the pilot unit is anticipated to be from the Final Settling Tanks. It is expected that the BioACTIFLO™ effluent will be recycled for full biological treatment and disinfection as described below. Bench-top laboratory testing shall be performed to simulate disinfection based on the operation of the existing Chlorine Contact Tank. This testing will involve obtaining an effluent volume of several liters from the BioACTIFLO™ pilot unit, placing the effluent in a large beaker, adding sodium hypochlorite to achieve the desired dose, providing rapid mixing using a mechanical laboratory stirring device for the desired contact time, ceasing the stirring operation, de-chlorinating the disinfected volume, and placing an appropriately sized sample into a bottle for laboratory testing. Disinfection testing shall also be performed on BioACTIFLO effluent utilizing a pilot scale ultraviolet (UV) disinfection unit. Details on disinfection dosages and contact times will be agreed upon with EPA. The appropriate contact time will be determined by the City through an evaluation of the actual operation of the existing disinfection system, as outlined in the QAPP. The City will perform these simulated disinfection tests to demonstrate achievement of the Performance Criteria per footnote 5 of the approved LTCP Update. The QAPP shall specify the disinfection sampling procedures and requirements for the test or pilot. Akron shall provide, on an ongoing basis, the results from the bench-top testing, for EPA to use in

determining if the simulated sodium hypochlorite and/or UV disinfection achieve the Performance Criteria set forth in Row 20. Laboratory data reports for each sampling event will be provided to EPA within 2 working days after Akron receives preliminary data reports from the testing laboratory.

Akron shall recycle back to the secondary treatment system all BioACTIFLO™ effluent during pilot operation, solids discharged from the hydrocyclone, and contents that may be dewatered from the pilot unit following operation. It is anticipated that the effluent and other matter will be recycled back to the first pass of an Aeration Basin. This will ensure that the effluent will receive full secondary treatment and disinfection prior to discharge.

Coagulant, polymer, and other supplemental chemical addition (e.g., alkalinity addition as necessary for effective coagulation) may be used during this Pilot Study. Chemical storage, batching, and dosing logistics shall be assessed. Various types of coagulant and polymer may be used during the pilot testing. Initial selection of coagulant and polymer types and doses shall be based on jar testing results.

C. Testing Plan

A suggested testing plan is listed in Table 1. This testing plan is preliminary and will be further reviewed by Akron and the manufacturer of BioACTIFLO™. In addition, the WPCS flow characteristics, including alkalinity, total suspended solids, CBOD5, soluble BOD, and mixed liquor suspended solids concentrations need to be evaluated in order to develop the final testing plan. Wet weather events shall be simulated at the beginning of the Pilot Study to determine the optimal combination of testing parameters prior to treating actual wet weather events, as outlined in the QAPP. The coagulant and polymer dosages may be adjusted during the study to meet performance objectives.

Table 1: Preliminary Testing Plan

Parameter	**Testing Conditions**
Biological Retention Time	9, 15, 18, and 20 minutes
Clarifier Rise Rate	30, 40, and 50 gpm/sf
MLSS concentration	800, 1000, and 1,200 mg/L
Coagulant Dosage (Alum)	30-35, 45-50, and 65-70 mg/L
Polymer Dosage (Anionic)	0.5, 1.0, and 1.5 mg/L

II. Treatment Effectiveness Study

As explained above, the objective of the Treatment Effectiveness Study is to demonstrate whether or not BioACTIFLO™ biological ballasted flocculation is capable of achieving the Performance Criteria identified in Row 20 of the approved LTCP Update at the City's WPCS. Based upon the results of the Treatment Effectiveness Study, U.S. EPA will determine whether or not BioACTIFLO™ biological ballasted flocculation at the WPCS is an acceptable technology for treating wet weather flow at the Akron WPCS in conjunction with the secondary treatment facilities. This determination will be made by comparing the results of the data generated under this Section II with the performance criteria in Row 20 of the approved LTCP Update. U.S. EPA's determination is subject to Section XIV, Dispute Resolution, of the Consent Decree.

A. Parameters and Analytical Methods

Table 2 provides the parameters and methods that shall be used during the Treatment Effectiveness Study. Modifications may be proposed in the QAPP based upon the results of the first trial runs discussed in Section IV. The QAPP shall identify any deviations from the methods specified below and will also identify the number of tests that will need to be analyzed at each sampling location.

Table 2: Treatment Effectiveness Study Parameters

	Parameter	Method
Field Tests	Air Temperature	Field Measurement
	Dissolved Oxygen (DO)	Field Measurement
	Flow Volume (or Rate)	Field Measurement
	pH	Field Measurement
	Turbidity	Field Measurement
	Water Temperature	Field Measurement
Laboratory Tests	Alkalinity	SM 2320
	Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	SM 5210 B
	Chemical Oxygen Demand (COD)	SM 5220 or EPA 410.4
	E. coli	Colilert® Method (Colilert Reagent version of SM 9223B)
	Phosphorus	SM 4500-P
	Soluble BOD (sBOD)	SM 5210 B using a sample filtered through 0.45-0.50 μm pore size
	Total Suspended Solids (TSS)	SM 2540 D

III. Comparative Study

The Comparative Study performed by Akron shall provide U.S. EPA with data on the effectiveness of the BioACTIFLO™ process in treating pathogens and other conventional pollutant parameters, both as a stand-alone process and in combination with downstream disinfection. The Comparative Study will allow Akron and U.S. EPA to compare the effectiveness of BioACTIFLO™ to Akron's conventional WPCS. As part of this study, the City shall gather and analyze samples for specific parameters requested by U.S. EPA as shown in Section III.A below. Akron shall collect and analyze the samples for the Comparative Study at the same time as the samples are collected and analyzed for the Treatment Effectiveness Study. The QAPP will identify the testing procedures, including the primary and alternate laboratories that Akron will use, as well as the process to address the situation if, due to logistical and/or testing laboratory constraints, Akron is not able to analyze samples for adenoviruses, campylobacter, enterococcus, salmonella, cryptosporidium, giardia, and coliphage for specific tested events.

A. Parameters and Analytical Methods

Table 3 provides the parameters and methods that will be used during the Comparative Study. Modifications may be proposed in the QAPP based upon the results of the first trial runs discussed below. The QAPP will identify any deviations from the methods set forth below.

Table 3: Comparative Study Parameters

Parameter[1]	Method
Adenoviruses, types 40 and 41	Adenovirus is analyzed using integrated cell culture (ICC) - TaqMan® Reverse Transcription Polymerase Chain Reaction (RT-PCR). Briefly, cultured cell monolayers (used as viral hosts) are inoculated with adenoviral samples followed by cell harvesting, lysis and mRNA extraction as described earlier (Ko et al., 2005). Samples are treated with DNAse to eliminate potential DNA contamination and adenoviral mRNA is quantified using quantitative real time RT-PCR (Ko et al. 2005). (Ko , G., N. Jothikumar, V.R. Hill, and M.D. Sobsey (2005). "Rapid detection of infectious adenoviruses by mRNA real time RT-PCR." Journal of Virological Methods. 127:148-153.) Positive and negative controls will be included and recovery efficiency will be assessed. Quality Assurance/Quality Control measures follow recommended EPA guidelines (EPA 815 B 04 001 - Quality Assurance/ Quality Control Guidance for Laboratories Performing PCR Analyses on Environmental Samples, October 2004). Analyses to be carried out so as to focus on viable rather than total viral counts.

Table 3: Comparative Study Parameters	
Parameter[1]	**Method**
Campylobacter	A mRNA detection method for thermotolerant *Camplyobacter* spp. has not been established and Sung et al. (2004) showed evidence of viability correlating poorly with mRNA detection. (Sung, K.D., N.J. Stern, and K.L. Hiett (2004). "Relationship of Messenger RNA Reverse Transcriptase-Polymerase Chain Reaction Signal to *Campylobacter* spp. Viability." *American Association of Avian Pathologists*. 48(2):254-262). The following procedure for combining enrichment, isolation, and species confirmation will be followed: Campylobacterjejuni will be analyzed by quantitative PCR (QPCR). Samples will undergo filtration, enrichment, and isolation using selective media (Coulliette and Noble 2009). Samples will be identified as C. jejuni positive and viable when colonies illustrate similar morphology and biochemical test results as in comparison to positive controls. Confirmation at the species level will be conducted by using QPCR as described by Nayak (2008). (Coulliette, A.D. and R.T. Noble (2009). "Campylobacter spp. in Eastern North Carolina Shellfish Harvesting Waters: Comparison of Detection Methods and Relation to Fecal Indicator Bacteria." Water Research. IN REVIEW.;Nayack, A.K. (2008). "Stability and Quantitative Surveillance of Helicobacter pylori and Campylobacter jejnui in Environmental Waters by Real Time QPCR." Master Thesis. Summer 2008. Michigan State University, Department of Fisheries and Wildlife. Advisor: Joan B. Rose) Analyses to be carried out so as to focus on viable rather than total viral counts.
Enterococcus	Enterolert™ method (ASTM D6503-99)
Salmonella	EPA Method 1682
Fecal coliform	Fecal Coliforms Membrane Filter Technique, SM 9222 D, Modified
Cryptosporidium and Giardia	Cryptosporidium and Giardia in Water by Filtration/IMS/FA (EPA Method 1623)
Coliphage	Somatic and F+ specific coliphage are fecal indicator organisms that have similar environmental resistance properties to enteroviruses. Coliphage are detected using double agar layer methods and E.coli hosts as described in EPA method 1601 (Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure. 2001. EPA 821-R-01-030. Office of Water, Washington D.C.)
Total Chlorine Residual (as applicable)	Field/on-site measurement

[1] In the Comparative Study, Akron shall also include the parameters listed under Table 2: Treatment Effectiveness Study Parameters.

IV. Quality Assurance Project Plan

The Pilot Study shall begin on or about May 1, 2012 and be completed no later than December 31, 2013, in accordance with the approved QAPP which will be prepared and submitted to U.S. EPA by February 1, 2012. Initial calibration testing using "artificial" tests shall begin on or about March 1, 2012 to optimize the testing conditions prior to testing actual wet weather events. The start dates of March 1 and May 1, 2012 are dependent on weather and availability of the manufacturer's pilot equipment. The QAPP shall set forth, among other things, the sampling protocol for the Pilot Study, including both the Treatment

Effectiveness Study and the Comparative Study. The QAPP will identify the type, timing, frequency, and volume of sampling required during the pilot study.

A. Sampling Requirements

The first phase of sampling for the Pilot Study shall begin on or about May 1, 2012 and continue to October 31, 2012, and the second phase of the Pilot Study shall begin on or about April 1, 2013 and continue until November 31, 2013. The start and completion dates are dependent on actual weather conditions. Except as discussed herein, the City will sample during each qualifying wet weather event that occurs during the Pilot Study. Qualifying events will be dependent upon the alternative chosen for the Pilot Study and will be further defined in the QAPP. A total of twenty (20) wet weather events will be sampled for each of the following: the Treatment Effectiveness Study and the Comparative Study. Such sampling may occur concurrently. If 15 wet weather events have been tested by July 31, 2012, then "artificial" events shall be simulated to achieve a total of 20 events by October 31, 2012, and the Pilot Study will be completed by October 31, 2012. If less than 15 wet weather events have been tested by October 1, 2012, the Pilot Study shall be shut down on October 31, 2012 and restarted on or about April 1, 2013 (dependent on weather) for the second phase. The specific manner in which such "artificial" events will be conducted will vary based on the testing alternative and will be described in the QAPP. Dry weather primary effluent may be used as a surrogate for wet weather influent.

As mentioned earlier, Akron shall perform sodium hypochlorite and UV disinfection through bench-top and pilot scale testing. Akron shall provide ongoing test results to EPA. Laboratory data reports for each sampling event will be provided to EPA within 2 working days after Akron receives preliminary data reports from the testing laboratory.

Akron shall use a 12-hour inter-event duration. This means that if the qualifying event stops and starts again before 12 hours, this is considered one wet weather qualifying event and would not require re-sampling. However, if the bypass event stops and starts again 12 or more hours later, these are considered separate wet weather qualifying events. Due to logistical issues, it is possible that the City might not be able to obtain samples from some storm events that occur shortly after the 12-hour inter-event duration. The City will provide U.S. EPA with a written explanation if the City is unable to sample a any such storm event. The QAPP will identify the testing procedures, including the primary and alternate laboratories that Akron will use, as well as the process to address the situation if, due to logistical and/or testing laboratory constraints, Akron is not able to analyze samples for adenoviruses, campylobacter, enterococcus, salmonella, cryptosporidium, giardia, and coliphage for specific tested events.

Under the QAPP, Akron will be required to collect samples at the following locations (Sampling Locations) during each sampling event:

- BioACTIFLO™ Pilot Influent
- BioACTIFLO™ Pilot Effluent
- BioACTIFLO™ Effluent combined with conventional treated effluent, Bench-top Disinfection (for Treatment Effectiveness Study only)
- BioACTIFLO™ Pilot Effluent, Bench-top Disinfection
- BioACTIFLO™ UV Pilot Effluent
- Main Plant Post-screening Raw Influent
- Main Plant Secondary Effluent
- Main Plant Final Disinfected Effluent (only if the plant is disinfecting effluent at the time the bypass event occurs, otherwise perform Bench-top Disinfection)
- Main Plant, post-secondary UV Pilot Effluent

Akron will be required to analyze the collected samples per the sampling plans set forth in Sections II and III and in the QAPP. The three main plant samples are intended to provide a baseline data set.

B. Sampling Protocol

In particular, in the QAPP, Akron shall define the minimum number of discrete grab samples and composite samples that it will analyze during the pilot study. Per the QAPP, Akron shall perform continuous sampling where necessary to meet the study objectives. Also, in the QAPP, Akron shall provide that sampling of effluent from the BioACTIFLO™ will begin after stable operation of the BioACTIFLO™ is achieved, within 40 minutes of discharge from the BioACTIFLO™ unit. Further, the QAPP shall require that Akron continue sampling while the BioACTIFLO™ treatment facility is actively treating flow. Akron shall develop and propose the sampling duration and intervals by reviewing WPCS hydrographs during bypass events. The sampling duration and intervals shall be developed to provide sufficient data to characterize the performance of the BioACTIFLO™ unit during the entire bypass event. Specific details regarding the number and timing of obtaining samples for pathogen monitoring will be included in the QAPP, based upon information gathered during the trial runs explained below.

C. Sampling Trials

The QAPP shall require Akron to perform two sampling trials in order to develop specific procedures for pathogen sampling prior to the actual sampling events described above. The first trial is to ensure that

Akron is familiar with the specific sample collection and analysis procedures for this study. Akron shall collect samples of the Main Plant Post-screening Raw Influent, the Main Plant Secondary Effluent, and the Main Plant Final Disinfected Effluent. These samples may be collected during a wet or dry weather event. After collecting the samples, Akron will analyze them for the pathogens listed in Section III. The purpose of the second trial is to identify and address any logistical concerns for collecting samples required for the Comparative Study during actual wet weather events. During the second trial, Akron will collect samples from the sampling locations identified above during a wet weather event. The QAPP will define the number and frequency of the required samples. Sampling will begin after stable operation of the BioACTIFLO™ is achieved.

D. Sampling Specifics and QA/QC Procedures

The QAPP shall require appropriate sample collection, storage, preservation, and handling procedures developed through consultation with the laboratories that will conduct the analyses and trial monitoring. The procedures will focus on the enumeration of viable rather than total organisms. The QAPP will also identify plant operational data that Akron must collect during each sampling event, such as flow rates, chemical feed rates, and related matters. In addition, the QAPP will identify the quality assurance and quality control procedures needed to ensure the quality of the data that will be generated. Further, the QAPP will include an itemized list of anticipated study costs.

The QAPP shall also set requirements for specific holding times between collection of a sample and the commencement of analysis of the sample. Adhering to the prescribed standard methods for holding times may not be possible for all parameters. Any acceptable deviation from standard method holding times will be set forth in the QAPP. Akron will endeavor to keep holding times under 24 hours unless the applicable standard method allows for a longer holding time.

E. Reporting

If the Pilot Study is conducted in two phases as discussed in Section IV.A, by December 15, 2012, Akron shall submit to EPA an interim update report that contains the following information for each wet weather event during the period of the study:

- BioACTIFLO™ event time, date and duration.
- Date and time of collection for each sample.
- Status of the target treatment units.
- Status of the target treatment units and operational data collected in accordance with the

QAPP including hourly flow rates.

- The average hourly and total rainfall amounts for the Akron service area.
- Main Plant and pilot unit total flow and hourly flow rates during the sampling period.
- Summary of analytical results of samples for Treatment Effectiveness Study.
- Analytical results for the Comparative Study- Including copies of the actual laboratory reports.
- Comparison of percent removals for TSS and CBOD for the Comparative Study.
- QA/QC results identifying any of the analytical or sampling discrepancies.

By December 31, 2013, if the pilot study is conducted in two phases, or by December 31, 2012, if the study is conducted in one phase as discussed in Section IV.A, Akron shall submit to EPA a final report that contains the following information for each wet weather event during the period of the study:

- BioACTIFLO™ event time, date and duration.
- Effluent flow hydrograph for the main plant and pilot unit.
- Date and time of collection for each sample.
- Wet weather secondary bypass hourly flow rates during each sampling event.
- Status of the target treatment units and operational data collected in accordance with the QAPP including hourly flow rates.
- Summary of analytical results of samples for Treatment Effectiveness Study.
- Analytical results for the Comparative Study.
- Comparison of percent removals for TSS and CBOD for the Comparative Study.
- The average hourly and total rainfall amounts for the Akron service area.
- Analytical results - Including copies of the actual laboratory reports.
- QA/QC results - Including copies of the laboratory QA/QC results; any discrepancies will be identified and explained by the city.
- Copies of completed chain of custody pages.

In addition, the final report shall include an analysis of the removal effectiveness of the WWPTS with respect to the Performance Criteria. In this report, Akron shall also include an analysis of the expected disinfection inactivation effectiveness based on bench-top sodium hypochlorite and UV pilot scale disinfection tests performed on BioACTIFLO™ pilot unit effluent. This analysis should consider effectiveness based on each event individually, as well as overall effectiveness based on all wet weather events. In the report, Akron shall also identify any non-qualifying discharge events (i.e., events with an insufficient duration to collect sufficient sample volume, or other reason for the event to be non-qualifying) and provide the time, date, and duration for said events.

EXHIBIT 2

EXHIBIT 2 TO THE LTCP UPDATE - APPENDIX 3 TO CONSENT DECREE

***United States v. City of Akron, et al.*, N.D. Ohio Case No. 5:09CV272**

ALTERNATIVES TO SIZING SECONDARY TREATMENT CAPACITY

This document is an exhibit to, and incorporated into, the approved Long Term Control Plan ("LTCP") Update for the City of Akron (the "City").

1. In accordance with the Final LTCP Update:

   A. By no later than December 15, 2021, Akron shall upgrade its WPCS to a minimum 170 MGD conventional secondary treatment capacity (Row 15); and

   B. By no later than April 30, 2019, Akron shall install and achieve full operation of a BioACTIFLO™ ballasted flocculation at the WPCS, which includes disinfection. The BioACTIFLO™ ballasted flocculation shall be designed to achieve a minimum sustained capacity of 110 MGD, in order to treat all flow in a typical year that does not receive secondary treatment (Row 16).

2. Akron may propose by January 15, 2016, an alternative plan for sizing the capacity of the treatment system described in paragraph 1, above, provided the plan meets the requirements in either Paragraph 3 (Alternative Plan A) or Paragraph 4 (Alternative Plan B) below. U.S. EPA will approve or disapprove the alternative plan for sizing no later than April 30, 2016.

3. Alternative Plan A Requirements

   a. The Alternative Plan A specifies the conventional secondary treatment capacity that will be achieved, and that capacity is greater than the 170 MGD capacity achieved as a result of Phase 1 measures described in the Final LTCP Update (Row 15).

   b. The Alternative Plan A includes a BioACTIFLO™ ballasted flocculation unit, followed by disinfection, with sufficient capacity so that, when that capacity is added to the conventional secondary treatment capacity identified in paragraph 3.a., the total treatment capacity of conventional secondary treatment plus BioACTIFLO™ ballasted flocculation is 280 MGD.

4. Alternative Plan B Requirements

   a. The Alternative Plan B specifies the conventional secondary treatment capacity that will be achieved and that the capacity is no less than the 130 MGD capacity achieved as a result of Phase 1 measures described in the Final LTCP Update (Rows 13 a. or b.).

b. The Alternative Plan B includes a BioACTIFLO™ ballasted flocculation unit, followed by disinfection, with sufficient capacity so that, when that capacity is added to the conventional secondary treatment capacity identified in paragraph 4.a., the total treatment capacity of conventional secondary treatment plus BioACTIFLO™ ballasted flocculation is 280 MGD; and

c. Akron demonstrates through the Treatment Effectiveness Study described in Row 14 of the Final LTCP Update, that a BioACTIFLO™ ballasted flocculation facility, followed by disinfection, with the capacity identified in paragraph 4.b. above, will be able to consistently treat flows up to that capacity in a manner that ensures that the effluent limitations set forth as the Performance Criteria in Row 20of the Final LTCP Update will be met.

5. Akron's submission of either Alternative Plan A or Alternative Plan B shall be subject to Section XVII of the Consent Decree (Review and Approval Procedures). U.S. EPA's review and approval of either Alternative Plan A or Alternative Plan B shall be based upon whether or not the specific alternative plan meets the criteria set forth in this Exhibit 2. If U.S. EPA approves the Alternative Plan A, then Akron shall construct the Approved Alternative Plan A in accordance with the description, design and performance criteria, and dates for Bidding of Control Measure(s) identified in Rows 17 and 18 of the Final LTCP Update. If the U.S. EPA approves the Alternative Plan B, then Akron shall construct the Approved Alternative Plan B in accordance with the description, design and performance criteria, and dates for Bidding of Control Measure(s) identified in Rows 19 and 20 of the Final LTCP Update.

EXHIBIT 3

EXHIBIT 3 TO THE LTCP UPDATE - APPENDIX 3 TO CONSENT DECREE
***United States v. City of Akron, et al.*, N.D. Ohio Case No. 5:09CV272**

I. Potential Green Infrastructure Projects to Reduce Effective Storage Volume Requirements in Rows 1 – 12 (excluding Row 11.a) of the LTCP Update.

Akron may submit a Green Infrastructure Proposal ("Proposal")[1] for approval to EPA and the Ohio EPA to reduce any effective storage volume or requirement in Rows 1 – 12, (excluding Row 11.a)[2] of the LTCP Update. Any proposed Green Infrastructure control measure, together with the other proposed control measures, must provide the same or greater level of control, in terms of CSO overflows in a typical year, as the original control measures set forth in Rows 1 – 12 (excluding Row 11.a) of the LTCP Update. The Proposal shall identify control measures which use Green Infrastructure, in combination with other control measures, to meet the Performance Criteria and Critical Milestones set forth in Rows 1 – 12 (excluding Row 11.a) of the LTCP Update and must be submitted to EPA and Ohio no later than six (6) months prior to the due date for the bidding of the relevant project. The terms of Section XVII (Review and Approval Procedures) and Section XV (Dispute Resolution) of this Consent Decree do not apply to EPA and Ohio EPA's review of any Green Infrastructure Project proposal submitted by Akron; rather, the review process set forth herein shall control.

Upon review of Akron's Proposal, EPA and Ohio EPA will either approve or disapprove the Proposal or approve the Proposal upon certain specified conditions. If the Proposal is disapproved by either EPA or Ohio EPA, the disapproval decision is final.[3] If the Proposal is approved by EPA and Ohio EPA, Akron shall either (a) construct and implement the Green Infrastructure control measures in accordance with the provisions and schedule in the approved Proposal and this Exhibit, or (b) construct and implement the original infrastructure control measures in accordance with the design criteria and schedules set forth in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3). Following construction, implementation and evaluation of any Green Infrastructure Proposal, if Akron is required to prepare either a Modified Proposal or a Green Infrastructure Corrective Action Plan ("GI CAP") as described in this Exhibit, the terms of Section XVII (Review and Approval Procedures) shall apply to EPA and Ohio EPA's review of any Modified Proposal or GI CAP, but Section XV (Dispute Resolution) of this Consent Decree shall not apply to EPA and Ohio EPA's review. Upon review of the Modified Proposal or GI CAP, following an opportunity for consultation with Ohio EPA, EPA's decision is final.

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[1] EPA and Ohio EPA encourage Akron to informally consult with the agencies in the early stages of preparing a Green Infrastructure Proposal to identify any questions or concerns about the nature of the substitution being considered.

[2] While the control measure in Row 11.a of the LTCP Update is excluded from this Exhibit, nothing herein is intended to restrict the rights of any party with respect to seeking modification of the Consent Decree under the Federal Rules of Civil Procedure, and nothing herein restricts the rights of Akron to seek modification of the Consent Decree under Section XXIV of the Consent Decree for the purpose of reducing the size of the Control Measure in Row 11.a of the LTCP Update through the use of Green Infrastructure.

[3] If EPA and Ohio EPA disapprove a Proposal, nothing herein precludes Akron from submitting a new, revised Proposal for the same Control Measure Location within the approved LTCP Update.

II. Definition

"Green Infrastructure" shall mean, for purposes of this Consent Decree, the range of stormwater control measures that use plant/soil systems, permeable pavement, or stormwater harvest and reuse, to store, infiltrate, evapotranspirate, or reuse stormwater and reduce flows to the combined sewer system. Green Infrastructure may include, but is not limited to, bioretention and extended detention wetland areas as well as green roofs and cisterns.

III. Requirements Applicable to Proposals for Green Infrastructure

Any proposal to reduce the effective volume requirements of any control measure using Green Infrastructure control measures shall result in compliance with the CSO control Performance Criteria in a typical year and critical milestones in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3). Proposed reductions in effective storage volumes shall be directly compensated for by Green Infrastructure control measures located within the drainage area of the infrastructure control measures to be reduced. All Proposals submitted pursuant to this Exhibit shall meet the requirements of Section III.A of this Exhibit.

A. *Proposals to Meet Performance Criteria in the LTCP Update (Appendix 3)*

A Proposal to reduce the effective volume requirements of any control measure using Green Infrastructure control measures shall be consistent with this Consent Decree and shall at a minimum include the following:

1. A detailed description (to include specific technologies to be employed, project dimensions and configurations, material specifications and characteristics, to-scale project drawings that include the drainage area tributary to the proposed Green Infrastructure control measures, intended mode(s) of operation, and any other available information that may aid EPA and Ohio EPA in their assessment of the Proposal) of the Green Infrastructure control measures, all tasks required to implement the Proposal, a detailed cost estimate, and a schedule for completion of this work and implementation of the Proposal that is consistent with this Consent Decree including its Appendices.

2. A detailed comparative analysis of the typical year performance expected to be achieved with the implementation of the Green Infrastructure control measures and the other proposed measures that will be implemented under the Proposal, and of original control measure(s) in the LTCP Update whose effective volume or is to be reduced by the Green Infrastructure control measures. The analysis shall identify: (i) the expected baseline performance of the control measure(s) whose volume is to be reduced in terms of activation frequency, gallons of combined sewage controlled, and remaining gallons of CSO discharge; (ii) the expected performance of the downsized control measure(s) in terms of CSO activation frequency, gallons of combined sewage controlled, and remaining gallons of CSO discharge; (iii) the expected performance of the Green Infrastructure control measures in terms of activation frequency, gallons of combined sewage controlled, and remaining gallons of CSO

discharge; and (iv) the expected performance of the combination of the downsized control measure(s) and the Green Infrastructure control measures in terms of activation frequency, gallons of combined sewage controlled, and remaining gallons of CSO discharge. These analyses shall be carried out using the information and models used to develop Akron's LTCP, appropriate available performance data for the proposed Green Infrastructure control measures, and all monitoring information and data used in formulating the Proposal. The Proposal shall include detailed documentation of Akron's analyses, including detailed modeling results, engineering calculations, summaries of underlying assumptions and the bases for those assumptions, and detailed summaries of all data relied upon. The Proposal shall also include a detailed analysis and discussion of the long term effectiveness and performance expected to be achieved with implementation of the Proposal.

3. A description of the Green Infrastructure control measure operation and maintenance activities to be carried out, including schedules for maintenance.

4. A description of how Akron shall ensure it will be able to retain access and sufficient control over the land used for the Green Infrastructure control measures set forth in the Proposal. For example, Akron may demonstrate this by showing how it will acquire ownership of land parcels, or obtain legally-binding agreement with the landowner, to retain access and sufficient control of the parcels.

5. A description of post-construction monitoring and modeling to be performed to determine whether the Performance Criteria set forth in Rows 1 -12 (excluding Row 11.a) of the LTCP Update (Appendix 3) will be met upon completion and implementation of control measure(s) and Green Infrastructure control measures and other revised control measures outlined in the Proposal.

6. A description of the type of corrective action measures, in compliance with Section D. (Corrective Action Plans) of this Exhibit, that can be undertaken if post-construction monitoring and modeling of the Green Infrastructure control measures do not demonstrate that the Performance Criteria for the Proposal are being met.

7. A description of stakeholder outreach and public participation, implementation and planned, associated with the Proposal. The public participation for the Proposal shall include, but will not be limited to, people, households, and neighborhoods in the service area that have low household incomes or concentrated minority populations.

B. ***Provisions Applicable to Proposals to Substitute Green Infrastructure Control Measures to Reduce Effective Storage Volume of Tunnels***

The following additional provisions apply where a Proposal involves a reduction in the effective storage volume of any of the tunnels identified in Rows 11 and 12, but not including Row 11a, of the LTCP Update (Appendix 3).

1. Akron shall submit to EPA and Ohio EPA a Proposal for review and approval. The Proposal shall contain all of the information identified in Section A, above. In addition, the Proposal shall identify a date for the 30% design submittal for the

pertinent tunnel, and shall include specific identification of an appropriate number of demonstration projects. The identified demonstration sites and types of Green Infrastructure control measures shall be characteristic of the Proposal's total Green Infrastructure type, scale, and scope, and shall meet the following criteria:

(a) Unless otherwise approved by EPA and Ohio EPA, the identified demonstration sites and types of Green Infrastructure control measures shall be within the drainage area(s) to be impacted by the Proposal;

(b) The identified demonstration sites and types of Green Infrastructure control measures shall implement the types of Green Infrastructure technology proposed by Akron in the Proposal.

(c) The identified demonstration sites and types of Green Infrastructure control measures shall be of sufficient number and size, so as to provide an adequate understanding of the performance range likely to be realized by those technologies when implemented as per Akron's Proposal; and

(d) The identified demonstration sites and types of Green Infrastructure control measures shall be located in locations where soils, topography, and infiltration and drainage characteristics are characteristic of those to be encountered across the sites and Green Infrastructure control measures included in the Proposal.

The identified demonstration sites and types of Green Infrastructure control measures shall be planned so as to provide an adequate understanding of the performance range likely to be realized by those technologies when implemented pursuant to Akron's Proposal.

2. If EPA and Ohio EPA approve the Proposal, Akron shall construct and implement the identified demonstration sites and types of Green Infrastructure control measures described in the Proposal.

3. Akron shall conduct at least 1 year of post-construction monitoring of the identified demonstration sites and types of Green Infrastructure control measures described in the Proposal in accordance with the schedule in the approved Proposal.

4. Akron shall submit a report on the post-construction monitoring of the identified demonstration sites and types of Green Infrastructure control measures. The report will include all data collected and an analysis of the data indicating whether the data demonstrate that the identified demonstration sites and types of Green Infrastructure control measures meet the performance criteria set forth in the Proposal. If the data do not demonstrate that the Green Infrastructure control measures meet the performance criteria, Akron shall include with the report a Modified Proposal. The Modified Proposal shall replace the initial Proposal and describe what additional measures are needed, including additional Green Infrastructure and/or other infrastructure control measures to be constructed and

implemented to meet the performance criteria in Rows 11 and 12 (excluding Row 11.a) of the LTCP Update (Appendix 3). The Modified Proposal shall highlight changes from the initial Proposal. The Modified Proposal could include implementation of a greater amount of Green Infrastructure control measures than what was planned in the original Proposal or a resizing of the pertinent tunnel or other infrastructure control measures in order to achieve the performance standards set forth in Rows 11 and 12 (excluding Row 11.a) of the LTCP Update (Appendix 3). The report and Modified Proposal will describe the level of control actually being provided by the identified demonstration sites and types of Green Infrastructure control measures and include the volume reductions measured in the assessment along with what further control measures are needed to meet the performance criteria for the tunnel service area as specified in Rows 11 and 12 (excluding Row 11.a) of the LTCP Update (Appendix 3).

5. The report on the post-construction monitoring of the identified demonstration sites and types of Green Infrastructure control measures, including a Modified Proposal if necessary, shall be submitted no later than 30 days prior to the date of the 30% design submittal for the tunnel. If Akron fails to submit the report 30 days or more prior to the date of the 30% design submittal, the Proposal shall be considered disapproved and the design of the tunnel(s) and the development of detailed plans and specifications shall proceed based on the design and performance criteria specified in Rows 11 and 12 (excluding Row 11.a) of the LTCP Update (Appendix 3).

C. *Review/Approvals of the Green Infrastructure Proposal*

EPA and Ohio EPA shall review each Green Infrastructure Proposal submitted by Akron within 120 days, each report on the performance of the Green Infrastructure control measures, and each Modified Proposal, where needed. The Agencies may request clarification or supplemental information to make informed decisions on each Proposal. Upon the conclusion of reviews of Proposals or Modified Proposals, the Agencies will approve the Proposal, approve with conditions, or disapprove the Proposal.

Following a review of a report on the performance of the Green Infrastructure control measures, the Agencies shall concur or non-concur on the report's findings, including the Report's findings on compliance with the performance criteria in the LTCP Update (Appendix 3) and the finding that a Modified Proposal is or is not necessary. If the Agencies non-concur on a finding in a report that a Modified Proposal is not necessary, Akron shall submit a Modified Proposal to meet the performance criteria in LTCP (Appendix 3) and to fully address the substance of any comment the Agencies make with respect to the non-concurrence within 45 days of the date of the written non-concurrence notification.

D. *Provisions Applicable to Approved Green Infrastructure Control Measures*

Upon approval of a Green Infrastructure Proposal or Modified Proposal, Akron is authorized to implement Green Infrastructure control measures in conformance with the approved Proposal or

Modified Proposal. The following additional provisions apply to implementation of Green Infrastructure control measures:

1. Akron shall ensure access to and sufficient control over the land devoted to the Green Infrastructure control measures.

2. Akron shall carry out the public participation activities described in the approved Proposal.

3. Akron shall carry out and the operation and maintenance activities described and scheduled in the approved Proposal.

4. Akron shall track its implementation, operation, and maintenance of the Green Infrastructure control measures, and report on such activities and accomplishments as part of the semi-annual reporting required under Section XV and Attachment D of the Consent Decree.

5. The post-construction monitoring and modeling provisions of the Proposal shall be implemented to verify if the performance criteria for the Green Infrastructure control measures have been met.

6. If, following full completion of construction and implementation of the Proposal, the post-construction monitoring of those measures fails to demonstrate that the Proposal has met the applicable performance criteria; Akron shall submit to EPA and Ohio EPA a Corrective Action Plan as required by Section D of this Exhibit.

E. ***Corrective Action Plans***

If following post-construction monitoring, Akron fails to demonstrate to EPA and Ohio EPA that the scaled-down basin(s) coupled with the Green Infrastructure have met the pertinent Performance Criteria in a typical year as set forth in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3), Akron shall submit to EPA and Ohio EPA for their approval, a GI CAP as part of the Control Measure Report. The GI CAP shall describe: (1) the specific measures to be carried out to address performance shortcomings and ensure the performance criteria in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3) are met; 2) a schedule, as expeditious as possible, for implementation of corrective measures and (3) how the improvements when fully constructed shall be evaluated in accordance with this Exhibit. The corrective measures described in the GI CAP shall achieve the performance criteria set forth in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3).

EPA and Ohio EPA shall review each GI CAP submitted by Akron within 120 days. The Agencies may request clarifications or supplemental information to make informed decisions on each GI CAP. Upon the conclusion of the review of a GI CAP, the Agencies will approve the GI CAP, approve with conditions, or disapprove the GI CAP. If a GI CAP is disapproved, Akron must submit a revised GI CAP within 45 days of the date of the written disapproval notification addressing the deficiencies identified by EPA and Ohio EPA in the initial GI CAP. Akron shall implement those measures set forth in the approved GI CAP in accordance with the schedule in the approved GI CAP.

If the Green Infrastructure post-construction monitoring does not demonstrate that the constructed Green Infrastructure control measures are meeting the performance criteria in a typical year, Akron may implement early corrective measures to address identified deficiencies. Early corrective measures may include actions such as constructing additional Green Infrastructure capacity or increasing the size and/or capacity of other infrastructure control measures. Stipulated Penalties will not accrue and become payable if an individual Green Infrastructure control measure is not meeting the criteria on which the substitution was based beginning at the time the Green Infrastructure control measure begins operation. However, stipulated penalties will accrue and become payable as of the date of Achievement of Full Operation, as defined in the LTCP Update (Appendix 3), if at the time the pertinent Green Infrastructure and scaled-down control measure(s) together are not meeting the performance criteria in Rows 1 - 12 (excluding Row 11.a) of the LTCP Update (Appendix 3) for a typical year.

F. *Evaluating the Co-Benefits of Green Infrastructure Control Measures*

Akron shall submit a report to EPA and Ohio EPA quantifying the co-benefits of Akron's Green Infrastructure Proposal by December 31, 2027. Co-benefits, for purposes of this Consent Decree, means the benefits, in addition to mitigating wet weather flow, that are achieved by Akron's CSO Program in the LTCP Update (Appendix 3). In the report, Akron 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

G. *No Material Change*

EPA and Ohio EPA's approval of Akron's request to reduce the effective volume of the control measure(s) in Rows 1 – 12 (excluding Row 11.a) of of the LTCP Update (Appendix 3) using Green Infrastructure shall not be considered to be a material change in the Consent Decree.

EXHIBIT 4

AECOM

Akron CSO Program
166 South High Street
Room 701
Akron, Ohio 44308
www.aecom.com

330.375.2483 tel
330.375.2880 fax

EXHIBIT 4 TO THE LTCP UPDATE - APPENDIX 3 TO CONSENT DECREE

***United States v. City of Akron, et al.*, N.D. Ohio Case No. 5:09CV272**

On behalf of the City of Akron, Ohio, the undersigned, David M. Haywood, a civil/sanitary engineer licensed in the State of Ohio, hereby declares:

1. I am an employee of AECOM Technical Services working on the Akron, Ohio Combined Sewer Overflow Program for the City of Akron. I have knowledge of the condition of the Main Outfall Sewer based on the internal inspection of the Main Outfall Sewer that was performed by Redzone Robotics, Inc, between July 12, 2011 and August 6, 2011. This inspection consisted of internal closed circuit televising and sonar analysis of approximately 25,000 linear feet of the Main Outfall Sewer between Memorial Parkway and Akron's Water Pollution Control Station. Results of this inspection were documented in the City of Akron's Main Outfall Interceptor Sewer Condition Assessment report dated September 16, 2011.

2. To the best of my professional judgment in accordance with the standard of care applicable to professional civil/sanitary engineers performing services on sewers in Akron, Ohio, and based on the observations noted above, the Main Outfall Sewer is structurally sound and fit for service up to a flow of 280 MGD for the period from the present until Nov. 2017, with the understanding that flows between 220 MGD and 280 MGD result in surcharge in at least a portion of the Main Outfall Sewer, and the Main Outfall Sewer is structurally sound and fit for service in a non-surcharged condition up to October 15, 2028 when operated and maintained in conformance with the City's CMOM program. 'Structurally sound and fit for service' shall mean that (i) there is an acceptably low chance of structural failure that would result in the uncontrolled release of untreated sewage, and (ii) that the Main Outfall Sewer will not experience uncontrolled releases of sewage from the Main Outfall Sewer's manholes during peak flow events that are expected to occur during the Adjusted Typical Year as defined in Appendix 1 to Attachment A of the City's Consent Decree.

David M. Haywood, PE
Ohio PE #75034

EXHIBIT 5

EXHIBIT 5 TO THE LTCP UPDATE - APPENDIX 3 TO CONSENT DECREE
***United States v. City of Akron, et al.*, N.D. Ohio Case No. 5:09CV272**

Main Outfall Sewer Supplement to the Approved CMOM

Akron shall develop a Main Outfall Failure Response Plan (MOFRP) by December 15, 2011 for EPA review and approval. The MOFRP shall identify the procedures and resources that Akron will employ to expeditiously (i) repair any structural failure of the Main Outfall Sewer and (ii) to minimize the release of untreated sewage until such repair(s) are completed.

The MOFRP will describe the following information in detail:

1) Plan Overview
   a) Overview of Main Outfall Sewer
   b) Summary of 2011 Inspections and Reports
      i) Internal inspection
         (1) Rehabilitation projects with completion schedule
      ii) External inspection
         (1) Rehabilitation projects with completion schedule
2) Measures to Minimize Sewage Releases
   a) On-going measures
      i) Description of City's activities to reduce risk of sewage releases.
   b) Failure measures
      i) Temporary patching
      ii) Emergency pumping
      iii) In-system storage capacity
3) Repair Procedures. These procedures will be based in part upon "lessons learned" from an analysis of the 1980s failure and its subsequent repair. As part of this analysis and the development of repair procedures, Akron shall also evaluate the need and practicality of pre-purchasing or pre-assembling repair components or equipment (such as concrete formwork or rebar assemblies).
   a) Leaks
      i) Brick section
         (1) Typical repair methods
         (2) Typical repair materials
      ii) Concrete section
         (1) Typical repair methods
         (2) Typical repair materials
   b) Catastrophic failures
      i) Brick section
         (1) Typical repair methods
         (2) Typical repair materials
      ii) Concrete section
         (1) Typical repair methods
         (2) Typical repair materials

4) Emergency Repair Resources: Resources will include a list of contractors, equipment suppliers and vendors, including points of contacts and phone numbers, with which Akron has developed (or will develop by date of implementation) the relationship necessary to allow rapid contracting and contractor deployment and equipment purchase or leasing in the event of a substantial leak or catastrophic failure. Detailed information regarding the contracting mechanism(s) that Akron has implemented to allow such rapid contractor deployment, equipment lease and equipment and material purchase will be provided.
   a) Heavy construction
      i) Brick section
      ii) Concrete section
   b) Emergency pumping equipment
   c) Suppliers
      i) Concrete
      ii) Concrete repair forms
      iii) Concrete patch rebar assemblies
      iv) Steel cap sections
      v) Mortar and grout

Upon approval by EPA, Akron shall fully implement the MOFRP within 90 days.